

# BIODIVERSITY MANAGEMENT PLAN (BMP)

## MASDAR INFINITY POWER HOLDING 200MW WIND POWER PROJECT IN GULF OF SUEZ

AUGUST 2023

FINAL



Regional Center for Renewable Energy and Energy Efficiency  
المركز الإقليمي للطاقة المتجددة وكفاءة الطاقة



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Issue and Revision Record:

Template Code		QF-PM-01-15	Template Revision No.	REV – 0
Version	Date	Description	Reviewed By	Approved by
REV 0	3 July 2023	Draft BMP	IBIS / EBRD	
REV 1	1 Aug 2023	Final BMP	IBIS/EBRD	

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## 1 EXECUTIVE SUMMARY

This document details the construction Biodiversity Management Plan (BMP) for the construction phase for the 200 MW Infinity Wind Energy Project (the Project), Gulf of Suez, Egypt. It also includes outline details only of the operational BMP. A separate operational BMP will be prepared at a later stage of the Project and prior to commencement of the operational phase.

The Project is seeking to align with IFC Performance Standard 6 (PS6) and EBRD Performance Requirement 6 (PR6). The BMP has been produced following the Project's Critical Habitat Assessment, where the Egyptian Spiny-tailed Lizard was identified as being a Priority Biodiversity Feature and potential impacts to globally important numbers of migratory soaring birds were also highlighted.

The Project is located on the Red Sea/Rift Valley flyway and globally-important concentrations (i.e., >1% of the global population) of five bird species, the Levant Sparrowhawk (*Accipiter brevipes*), White Stork (*Ciconia Ciconia*), Steppe Eagle (*Aquila nipalensis*), European Honey-buzzard (*Pernis apivorus*) and Black Stork (*Circona nigra*) were recorded migrating over the Project site during surveys. Furthermore, the Gebel El Zeit Important Bird Area is roughly 8.6 km from the Project concession at its nearest point and is designated for migratory soaring birds and is a known staging/bottleneck site. The area is clearly of critical importance to migratory birds, and the Project will carefully mitigate potential impacts – which may otherwise have disproportionate effects on the global population. There is no evidence from surveys that these species regularly use the area as a stop-over site in normal circumstances, or that this area is a bottleneck within the already-restricted flyway. It has thus not been identified as being Critical Habitat for migratory species or under any other criteria.

Habitat on site appears to broadly be Natural Habitat. One reptile, the Egyptian Spiny-tailed lizard (VU), and six migratory bird species (Sooty Falcon (*Falco concolor*) (NT), Eastern Imperial Eagle (*Aquila heliaca*) (VU), Greater Spotted Eagle (*Aquila clanga*) (VU), Pallid Harrier (*Circus macrourus*), Steppe Eagle (EN) and Egyptian Vulture (*Neophron percnopterus*) (EN)) are considered to be Priority Biodiversity Features on account of their global conservation statuses.

The Project is committed to achieving at least no net loss for the Egyptian Spiny-tailed Lizard, the priority bird species and Natural Habitat, and to demonstrate this achievement through a robust monitoring and adaptive management program.

The key requirements of this BMP include the following:

1. Implementation of general biodiversity measures related to: (i) mandatory E&S training for all workers covering all aspects of this BMP, (ii) pollution control measures to be applied across the whole of the site and for the off-site disposal of wastes; (iii) assigning speed Limits and driving Limits within the Project Site; (iv) establishing worker code of conduct including in particular prohibition of hunting / collection of animals and plants
2. Following construction an area of at least 45 hectares (0.44 km<sup>2</sup>) will be enhanced using appropriate, native planting in suitable parts of the Project Area
3. Pre-construction surveys for Egyptian Spiny-tailed Lizard burrows based on which project component siting should avoid these areas and as a last option (if avoidance is not possible) a capture and release program must be implemented.
4. Pre-construction surveys for sensitive species (i.e. those qualifying as Priority Biodiversity Features) of migratory birds will be completed in Spring and Autumn during the construction period

## 2 INTRODUCTION

### 2.1 The Report

This document details a Biodiversity Management Plan (BMP) for the construction phase of the Infinity Wind Farm Project, Gulf of Suez, Egypt. This BMP aims to:

- To protect and conserve biodiversity
- To promote sustainable management and use of natural resources through the adoption of practices that integrate conservation needs with the project.

The document also includes outline details only of the operational BMP. However, a separate operational BMP will be prepared at a later stage of the Project and prior to commencement of the operational phase.

### 2.2 The Project Site and the Study Area

The Project is located in the Ras Gharib Local Governmental Unit of the Red Sea Governorate of Egypt, approximately 240 km to the southeast of the capital city of Cairo. The nearest town is Ras Gharib, which is located 18 km to the southeast of the Project area.

The Project is located within a Strategic Area that has been allocated by the New and Renewable Energy Authority (NREA) for wind farm development projects (shown in *Figure 1*). The Strategic Area has a total planned capacity of 1,500 MW and covers 300km<sup>2</sup> with the Infinity Wind Farm proposed to occupy approximately 37.5 km<sup>2</sup> of this (shown in blue in *Figure 1*).

Being located by the western coastline of the Gulf of Suez, the project site and the general study area are located along the Red Sea/Rift Valley flyway. This is one of the most important migration flyways for migratory soaring birds in the world with over 1.5 million soaring birds migrating through it twice a year (Birdlife, 2020). The flyway links the European breeding grounds with the African wintering areas for at least 37 migratory soaring bird species. Regular migration monitoring along the western coast of the Gulf of Suez where the project is located has shown that there is a significant difference in the level of use of the area during migration seasons. Research has shown that this part of the flyway is used by much larger numbers of birds during spring migration in comparison with autumn migration seasons.

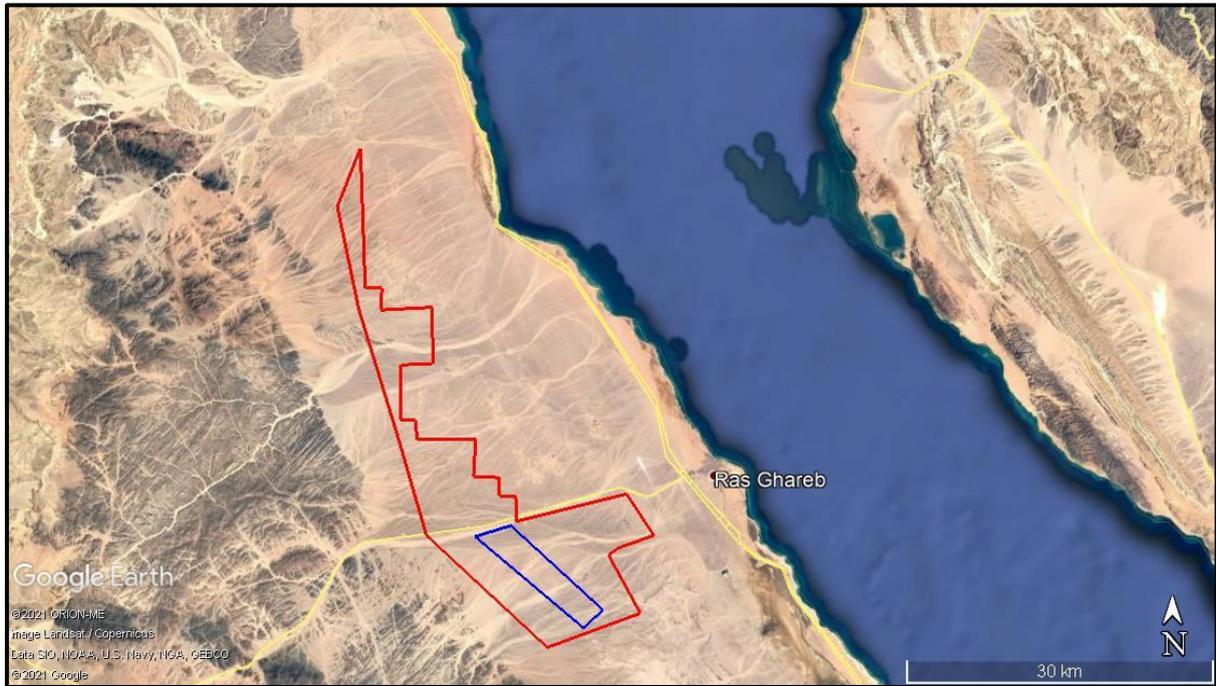
Approximately 8.5 km east of the site is the Gebel El Zeit Important Bird area (IBA) which is a narrow, 100-km-long strip of land extending along the Gulf of Suez/Red Sea coast, from Ras Gharib in the north to the bay of Ghubbet El Gemsa in the south. This contains several pools of hyper-saline water and large patches of saltmarsh as well as two large shallow bays with extensive intertidal mud and sandflats (Birdlife, 2023). The IBA and surrounding area is known to be used by over 250,000 migratory soaring birds each year, with many of these birds crossing between the western shore of the Gulf of Suez and the Sinai peninsular on their spring and autumn migrations. The IBA location in relation to the project site is shown in *Figure 2* and a map of the concentrated Rift Valley/Red Sea flyway elements is shown in *Figure 3* (N.B. birds migrate across the general area in Spring and Autumn, however concentrated crossing points have been identified at several locations along the coastal areas of Egypt).

As part of the Environmental and Social Impact Assessment (ESIA) for the project, in-flight monitoring assessments were undertaken at the project site during the spring and autumn seasons 2021. Additionally, a comprehensive literature review was completed. Based on the Egyptian Environmental Affairs Agency (EEAA) requirements, avifaunal in-flight monitoring will be carried out for two additional seasons in autumn 2023 and spring 2023 while operational monitoring will be carried out, including on-demand turbine shutdown and fatality monitoring as part of the Active Turbine Management Plant (ATMP) that is already being implemented in the region as a whole.

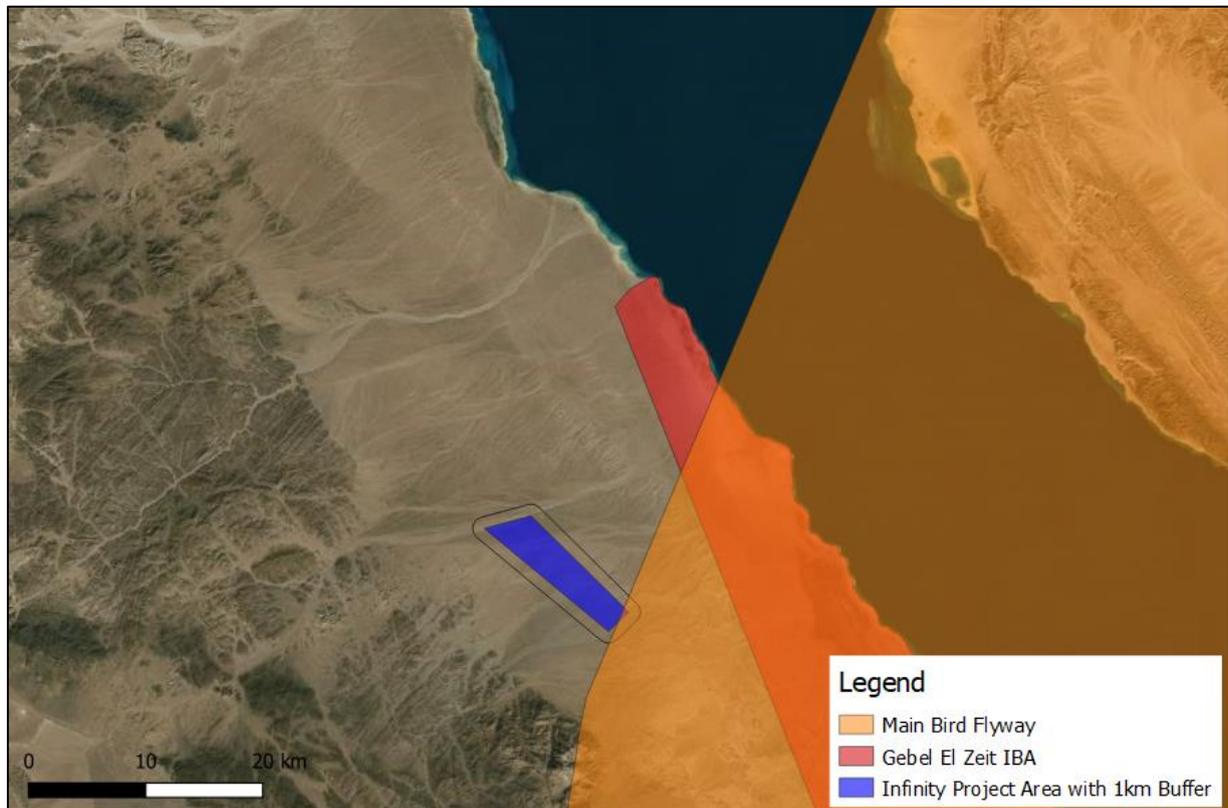
A Critical Habitat Assessment has also been completed for the Project. This found that the site was not Critical Habitat for any species, on account of birds in significant number and/or of higher conservation concern not

interacting with terrestrial features within the Project Area and buffer, although important numbers of migratory soaring birds were observed flying over the site. Habitat on site appears to broadly be Natural Habitat.

One reptile, the Egyptian Spiny-tailed lizard (VU), and six migratory bird species – Sooty Falcon (*Falco concolor*) (NT), Eastern Imperial Eagle (*Aquila heliaca*) (VU), Greater Spotted Eagle (*Aquila clanga*) (VU), Pallid harrier (*Circus macrourus*) (NT), Steppe Eagle (EN) and Egyptian Vulture (*Neophron percnopterus*) (EN) are considered to be Priority Biodiversity Features on account of their global conservation statuses and will be the focus of this BMP document.



**Figure 1: Project Site as Part of the 300km<sup>2</sup> Area Allocated for Wind Farm Developments**



**Figure 2: Project Site in relation to Gebel El Zeit IBA and Red Sea Flyway**

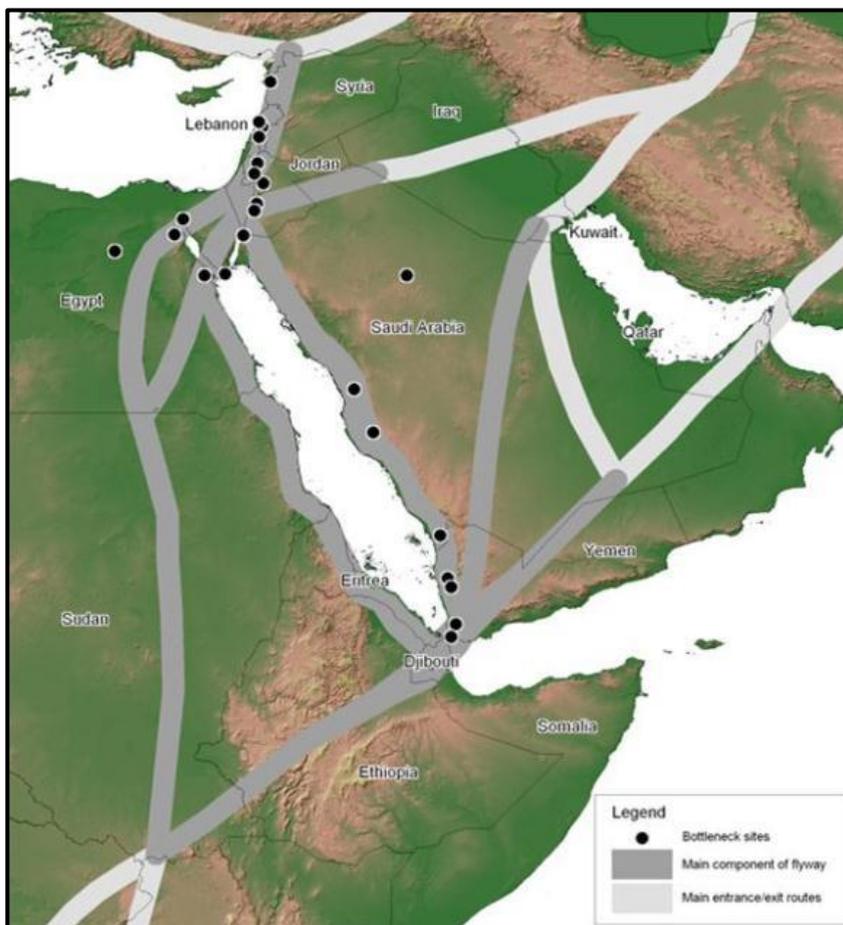


Figure 3: Map of the main elements of the Rift Valley/Red Sea flyway showing key bottleneck sites (Source: BirdLife International)

### 2.3 Lenders Standards

Standards for the IFC and EBRD performance standards/requirements are detailed below. Other lenders involved in this Project (Proparco and JICA) use standards which reflect those stipulated by IFC therefore to avoid repetition we cover these institutions needs within those shown below.

The Lender requirements indicate that protecting and conserving biodiversity, and its ability to change and evolve, is fundamental to sustainable development. The requirements set out in this Performance Standard have been guided by the Convention on Biological Diversity, which defines biodiversity as “the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species, and of ecosystems.” The three principal objectives are:

- a) to protect and conserve biodiversity,
- b) to maintain the benefits from ecosystem services, and
- c) to promote the sustainable management and use of natural resources through the adoption of practices that integrate conservation needs and development priorities

The overall objective of the Project is to ensure:

- Ecological processes are maintained and are not disrupted.
- Impacts on fauna and flora species as a result of construction and O&M activities are minimized.
- “No net loss” for any Priority Biodiversity Features / Feature of Significant Biodiversity Value.
- Net Gains for Critical Habitat qualifying species; and

- Ensure no net negative residual impact on other ecological receptors.

Achieving these objectives requires that the mitigation hierarchy is exercised to ensure Project-related impacts are managed through taking appropriate avoidance, minimization and restoration measures before biodiversity offsets are considered to compensate for significant residual impacts.

## **2.4 Purpose and Scope**

This BMP details the Project's biodiversity management initiatives, commitments, and obligations with the aim to safeguard and promote the viability of priority species and habitats associated with the Project. This BMP includes biodiversity mitigation and management measures that will be followed by the Developer and EPC Contractor during the pre-construction and construction phases. Outline mitigation, monitoring and management measures for the operational phase of the Project are detailed below however a separate Operational BMP will be prepared prior to the commissioning of the Project.

Implementation of this BMP will ensure the Project's alignment with best practice, legislative requirements and the Project's commitments to biodiversity. It is a dynamic document that will be adapted and updated as and when new information becomes available throughout the lifespan of the Project to ensure its relevancy.

The purpose of this document is to:

- Set out the Project commitments and obligations related to biodiversity, and ensure compliance with relevant legislation, and the overarching requirements of the Project.
- Provide a summary of the baseline biodiversity conditions within the Project site.
- Identify activities that may have an impact on fauna and flora, highlighting the major biodiversity threats.
- Specify management, mitigation and enhancement measures / actions to be implemented for the Project to control impacts affecting the biodiversity within the project's area of influence.
- Identify roles and responsibilities for the implementation of identified actions.
- Outline training requirements, including awareness raising for workers.
- Specify monitoring and evaluation criteria, including KPIs to demonstrate no-net loss and net gains where applicable.
- Outline reporting requirements to Project stakeholders.

This document is considered part of the ESMS that will be implemented during the construction phase of the Project.

The BMP is structured as follows:

- Section 3: Provides an overview of the biodiversity elements within the Project Area
- Section 4: Presents the key impacts anticipated from each phase of the Project
- Section 5: Presents the mitigation requirements to be implemented
- Section 6: Presents monitoring and evaluation measures
- Section 7: Presents the biodiversity offset measures to be implemented
- Section 8: Roles and responsibilities related to the plan

### 3 OVERVIEW OF BIODIVERSITY

#### 3.1 Study Area

##### 3.1.1 Legally Protected Areas

No national or international designations were identified within the site boundary.

The Project location is not located within any existing or planned natural protectorates, where the closest is around 15-20km away to include the planned natural protectorate at Wadi Qena as well as Ras Shukheir

##### 3.1.2 Internationally Recognized Areas

The nearest designated IRA is the Gebal El Zeit IBA which is located approximately 12km east of the Project site. This is designated as an important migration corridor for soaring migrants, particularly birds of prey and White Storks (*Ciconia ciconia*).

#### 3.2 Habitats, Flora and Terrestrial Fauna

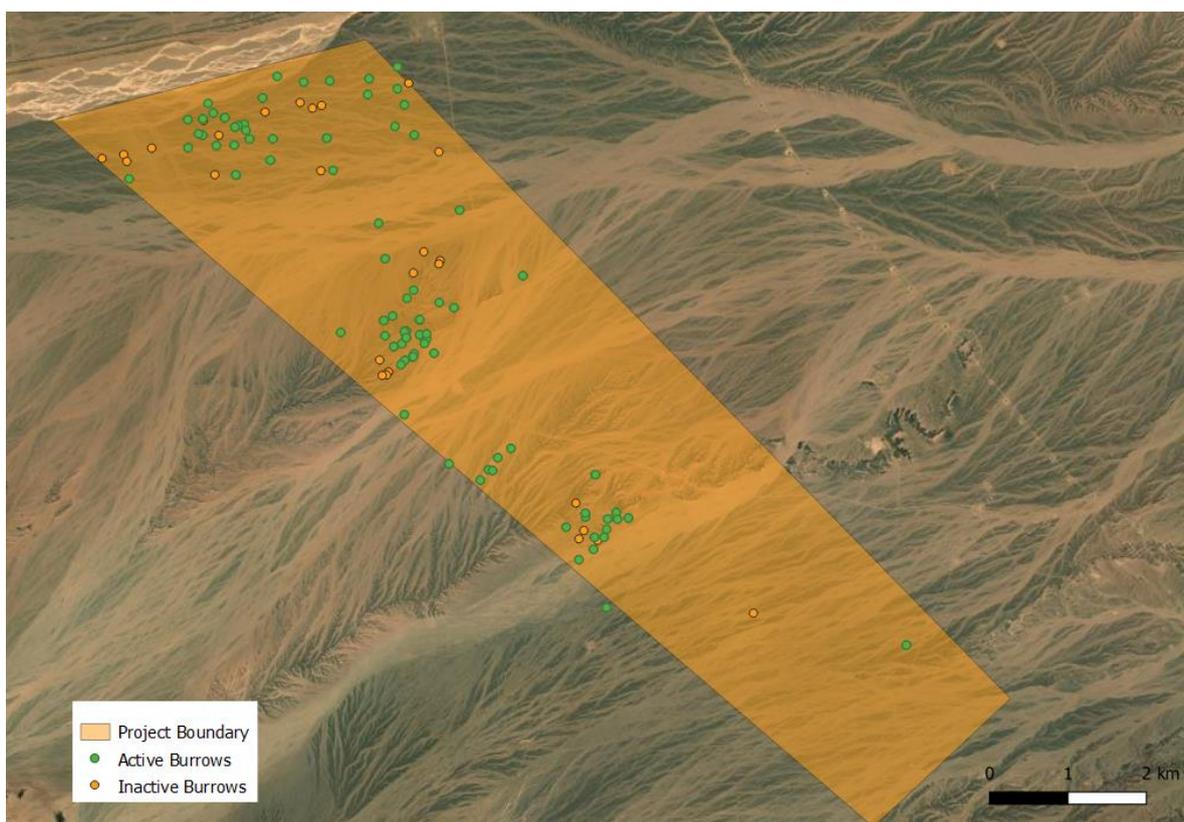
A field survey was undertaken at the Project site during the spring and autumn 2021. The focus of the field survey was mainly to identify key habitats and identify any outstanding biodiversity taxa and/or elements that could require specific focus.

The initial field survey mainly included field observations, where the site was examined carefully for the presence of active animals, animal signs and tracks, active burrows, remains or any other vital signs that indicate the activity of animals. The research team focused on areas of high priorities; mainly wadis since they are believed to be the main corridors that animals would use in moving around the site. The team carried out route-transects along the wadis searching for any of the above-mentioned signs of animal presence. Similar approach was followed for the flora survey where the survey focused on sides of wadis and any areas where vegetation was noticed it was recorded.

A follow up survey of the terrestrial areas of the site was undertaken in Spring 2023 to accurately identify and map burrows and sighting of the Egyptian Spiny-tailed Lizard/Dabb (*Uromastyx aegyptia*) (VU).

No rare or threatened habitats were identified during the surveys, although the Project Area is considered largely Natural Habitat, being primarily Hamada Desert, with occasional Wadis. No endemic or higher conservation status plant species were identified in the surveyed area, similarly no endemic or higher conservation status mammal species were identified in that area either. Wide ranging species such as the Striped Hyena (*Hyaena hyaena*) (NT), Nubian Ibex (*Capra nubiana*) (VU) and Dorcas Gazelle (*Gazella dorcas*) (VU) were identified as having ranges which overlap with the Project Area, however no evidence of these was found during the surveys.

One globally vulnerable reptile species, the Egyptian Spiny-tailed Lizard was found in the Project Area during the surveys. The species was recorded along with its burrows as noted below. In total 123 burrows were identified during the most recent surveys (Spring 2023), of these 95 were considered active at the time of survey (defined by having footprints, drag marks or signs of fresh digging at the entrance), and 28 not active. Figure 4 shows the location of the identified burrows.



**Figure 4: Egyptian Spiny-tailed Lizard Burrows (Circles) within Project Site**

### 3.3 Birds

Vantage point surveys were undertaken at the site in spring and autumn 2021, with four vantage points selected to cover the entire Project Area. On any one day at least two of these were surveyed by experienced surveyors, with all flight times, direction and heights recorded on standardized forms. In total the site received over 1,200 hours of survey in spring (from 20<sup>th</sup> February to 20<sup>th</sup> May), and over 1,400 hours in autumn (10<sup>th</sup> August to 10<sup>th</sup> November) to cover the major periods of migration in the region.

In spring 2021 over 62,000 birds were recorded flying over the site on migration, including Eastern Imperial Eagle (IUCN VU), Egyptian Vulture (IUCN EN), Greater Spotted Eagle (IUCN VU), Pallid Harrier (IUCN NT), Sooty Falcon (VU) and Steppe Eagle (IUCN EN), as well as nearly 25,000 Steppe Buzzard and nearly 26,000 White Stork. No birds were recorded staging or roosting on the site and there are no terrestrial features such as carcass dumps or waterbodies which would act as an attractant to species on migration.

During autumn 2021 a total of 573 birds were observed during the surveys including Egyptian Vulture, Pallid Harrier and Sooty Falcon, as well as 330 European Honey Buzzards and 200 Great White Pelican. As with spring, no birds were recorded staging or roosting on the site and there are no terrestrial features such as carcass dumps or waterbodies which would act as an attractant to species on migration.

### 3.4 Assessment of Ecological Receptors

#### 3.4.1 Modified and Natural Habitats

The Project Area contains largely Natural Habitat, being primarily Hamada Desert, with occasional Wadis. No endemic or higher conservation status plant species were identified in the surveyed area. Approximately 44 Ha of Natural Habitat will be impacted during the proposed works which correspond to direct footprint impacts. However, there will be other impacts such as disturbance and displacement which can occur in areas well outside the footprint areas.

### 3.4.2 Critical Habitats

No species triggering Critical Habitats were identified during the surveys, although six species of bird were observed flying over the site which qualify as Priority Biodiversity Features, in addition one reptile species qualifying as a PBF has also been confirmed on site. The species and the relevant qualifying criterion are shown below in Table 1.

**Table 1: Species considered to be Priority Biodiversity Features**

Species	Status	PBF Criterion Reached
Eastern Imperial Eagle	IUCN VU	Criterion 2 - Threatened Species
Greater Spotted Eagle	IUCN VU	Criterion 2 - Threatened Species
Sooty Falcon	IUCN VU	Criterion 2 - Threatened Species
Steppe Eagle	IUCN EN	Criterion 2 - Threatened Species
Egyptian Vulture	IUCN EN	Criterion 2 - Threatened Species
Pallid Harrier	IUCN NT	Criterion 2 - Threatened Species
Egyptian Spiny-tailed Lizard	IUCN VU	Criterion 2 - Threatened Species

## **4 IMPACT ASSESSMENT**

This section presents the key anticipated impacts during the construction phase of the Project.

### **4.1 Priority Biodiversity Features**

#### **4.1.1 Birds**

The construction phase of the project is expected to include clearance/leveling of land, excavation of turbine foundations, crane pads and building footprints, cable route trenching and the construction of internal roads.

Surveys on site did not identify any important feeding or nesting areas within the survey area and as such impacts during construction of the Project are predicted to be of minor/negligible significance at a local level, since no important feeding or nesting areas are being directly impacted but changes on site are considered to be permanent.

#### **4.1.2 Terrestrial**

The construction phase of the project is expected to include clearance/leveling of land, excavation of turbine foundations, crane pads and building footprints, cable route trenching and the construction of internal roads.

Surveys have identified a population of Egyptian Spiny-tailed Lizards on site, with 95 of the 123 burrows found inside the Project boundary determined to be active. This equates to approximately 0.025 animals per hectare assuming each burrow is used by an individual animal. If work continues unmitigated potential impacts to this species are likely to be high at a local level.

No other sensitive or rare species were found during the surveys so impacts to other species are not anticipated.

### **4.2 Habitats and Flora**

Habitats present on the Project site are considered to be largely natural although no plant species of conservation importance or threatened habitats have been identified during the studies. In total the Project footprint will result in the permanent loss of an estimated 44 hectares (0.44 km<sup>2</sup>) of Hamada desert. Losses of desert habitat are due to the construction of turbine bases, crane pads, building infrastructure, cable trenching and internal road networks and are considered to be of minor significance at a local level.

## 5 MITIGATION AND MANAGEMENT

### 5.1 Overall Approach to Biodiversity

The Project will seek to proactively address impacts and proposes to use an adaptive management approach (plan-do-check-act-replan) to reduce their potential severity.

The Project will follow the principles of the “mitigation hierarchy” as defined under IFC and EBRD E&S requirements. Those require that measures are taken to avoid creating E&S impacts from the outset of development activities, and where this is not possible, to implement additional measures that would minimize, mitigate, and as a last resort, offset and/or compensate any potential residual adverse impacts.

Management is defined as any actions that correspond to the four elements of the mitigation hierarchy, as described below.

- **Avoidance:** actions taken to fully prevent impacts to biodiversity values, such as changing the spatial design of a project to prevent impacts in specific locations
- **Minimization:** actions taken to reduce the duration, intensity and/or extent of impacts that cannot be completely avoided
- **Rehabilitation/Restoration:** actions taken to return areas to beneficial use and, if possible, assist in the recovery of the ecosystem that has been degraded, damaged, or destroyed
- **Biodiversity Offset:** measurable conservation outcomes resulting from actions designed to compensate for significant residual adverse biodiversity impacts arising from project development after appropriate prevention and mitigation measures have been taken. The goal of biodiversity offsets is to achieve no net loss and preferably a net gain of biodiversity on the ground with respect to species composition, habitat structure, ecosystem function and people’s use and cultural values associated with biodiversity.

The measures detailed in this chapter of the BMP deals with the first three steps in the mitigation hierarchy and any actions are based on impacts identified in the Project’s ESIA.

### 5.2 General – Biodiversity

The measures detailed in this section are designed to avoid or minimize general impacts on the environment and biodiversity. Specific actions in relation to Priority Biodiversity Features are also included which will ensure that there are no-net losses for the qualifying species.

#### Project Ecologist

The Developer is responsible for the appointment of an in-county Project Ecologist who will oversee all construction mitigation and monitoring that is detailed in the following sections.

#### Induction and Training

As required within the **ESMS Manuel**, the EPC Contractor will design and deliver to all Project Employees, including subcontractors, mandatory E&S training covering all aspects of this BMP.

Training will be provided through an induction program, toolbox talks, ongoing job specific training, refreshers, and exercise/drills. A copy of the induction-training program shall be submitted to Developer HSSE Manager for comment within 7 days of Notice to Proceed. The EPC Contractor shall provide training and attendance records to the Developer HSSE Manager, upon request. Only specific topics relevant to biodiversity are included in this document.

All personnel and visitors shall have completed the Project’s induction before having access to the Project Site and/or commencement of a task or any other works on the Project Site.

Training and inductions will include a specific section in relation to biodiversity and the measures that have been

put in place to avoid and / or minimize impacts to biodiversity as well as mitigation measures and habitat re-instatement and enhancements. A summary of the controls relating to biodiversity is included below and these measures are in place in order to avoid and minimize direct impacts within the project site as well as indirect impacts to the wider landscape and Protected Areas (e.g., IBA/KBA).

### Pollution Control

The **Waste Management Plan** must identify pollution control measures to be applied across the whole of the site and for the off-site disposal of wastes. These measures will avoid or minimize impacts on habitats and biodiversity.

To avoid contamination, hydrocarbons will be stored in a secured bunds to be located on impermeable surfaces with controlled drainage away from natural water courses. Bunds will be sufficient to contain 110% of the volume of liquids to be stored within. They will also be fully contained to stop contamination of rainwater run-off. In addition, refueling of vehicles and machinery will only occur in designated areas.

All hazardous materials must be correctly stored to limit chances of contamination of the area. Generally, it would be advisable to use biodegradable hydraulic oils, where possible.

### Speed Limits and Driving Limits within the Project Site

The **Traffic and Transport Management Plan** must require that all driving be permitted on formal site roads and off-road driving is prohibited, unless it is driving within a works area (e.g. moving equipment or infrastructure around the site or for maintenance operations). Site wide speed limits and limits of driving are to be strictly enforced by the EPC Contractor in order to avoid / minimize the impacts of driving and vehicles on biodiversity. Speed limits should be set to 20 km/h on on-site roads / tracks and at 10 km/h in off-road areas. Enforcement of speed limits and limits of driving will minimize impacts on habitats, flora, birds, mammals, reptiles and amphibians on site through the prevention of killing and injuring and reducing the likelihood of erosion and degradation of the habitats.

All site workers should adhere to national speed limits when driving to and from site.

### Hunting / Collection of Animals and Plants

The worker code of conduct within the **Labor and Working Conditions Management Plan** must include the ban on hunting and or collection of animals and plants from the Project Area to be strictly enforced and this will avoid and minimize any construction related impacts on biodiversity features within the Project Area, especially Egyptian Spiny-tailed Lizards since hunting/collection are considered some of the major threats to this species. All contractors and site staff will be reminded that this ban is also effective within areas outside of the Project Area (e.g. within the wider landscape and nearby Protected Areas) and any training should also include details of any relevant national legislation protecting rare and endangered species as well as any national schemes (e.g. to reduce impact of trade in species).

### Invasive Species

Measures regarding the control of invasive species will be fully implemented to avoid the introduction and spread of invasive species within the Project Area *or the wider landscape and nearby Protected Areas*. In order to control / limit the spread or introduction of invasive species the following will be completed:

- Responsible sourcing of any materials being imported on to the site
- Continual survey of the site and any laydown areas, including soil storage areas, for the presence of non-native or invasive species and recording and reporting if any are observed
- Training of contractors / site staff as part of the induction process
- Measures to remove any identified non-native or invasive species within the site boundary if found. Measures will include:
  - Production of an Invasive Species Management Plan

- Mechanical removal (e.g. cutting, pulling) and disposal to a safe location off site (invasive species should not be composted or simply cut and left as these methods can contribute to their proliferation)
- Chemical removal (e.g. blanket application of pesticides, spot treatments)

#### Site Cleanliness and Control of Pest Species (e.g. Rats)

The **Waste Management Plan** must state that the site, including all offices and workers buildings are to be kept free of rubbish and litter, including food waste, as these might attract pest species and/or scavenging birds. All waste will be placed into appropriate bins and containers which will be appropriately sealed (e.g. lids or covers) to prevent pest species entering. In all cases priority will be for the use of mechanical control measures for pest species such as setting of live traps. Passive methods of control, such as chemical poisoning with baits or glue traps will only be used if there are no other feasible alternatives due to the potential to harm non-target species found within, and outside of, the Project Area. Finally, if pest species are caught, they will be humanely killed and if any non-target species are caught will be released, unharmed, away from site buildings.

### 5.3 Pre and During Construction Phases

#### 5.3.1 Habitats and Flora

No sensitive habitats or species of plant were identified during the surveys but the site is situated within largely Natural Habitat and therefore habitat loss for Project infrastructure will be kept to a minimum. All areas of Natural Habitat being removed will be measured and recorded prior to work taking place so that a quantitative assessment of habitat loss can be completed.

Following construction an area of at least 45 hectares (0.44 km<sup>2</sup>) will be enhanced using appropriate, native planting in suitable parts of the Project Area, this will ensure that no net loss of habitat as a result of the works. Any areas of additional planting will be monitored as part of the biodiversity monitoring program and any species which do not establish will be replaced.

#### 5.3.2 Terrestrial Fauna

##### Mammals

Wide ranging species such as the Striped Hyena (*Hyaena hyaena*) (NT), Nubian Ibex (*Capra nubiana*) (VU) and Dorcas Gazelle (*Gazella dorcas*) (VU) were identified as having ranges which overlap with the Project Area, although no evidence of these species has been found during the surveys. Ongoing monitoring will be undertaken and the results of the monitoring will be included in seasonal reporting and this BMP document updated accordingly.

##### Reptiles

Pre-construction surveys for sensitive species (i.e. those qualifying Priority Biodiversity Features) of herpetofauna have taken place. The locations of known/active burrows used by Egyptian Spiny-tailed Lizard have been marked throughout the Project Area.

Prior to the start of construction suitable sites for the release of relocated Egyptian Spiny-tailed Lizards will be identified and mapped. A suitable translocation receptor site must;

- Be within 10 km of the Project site.
- Contain appropriate vegetation (both for food and cover).
- Have suitable soil types to allow animals to dig and create new burrows.
- Not already be close to carrying capacity for this species.

Capture and movement of Spiny-tailed Lizards will only be completed as a last resort. All works will be completed at least 50m from active burrows. Locations where burrows are present between 50 and 100m 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.

Detailed design for the final layout will take into account the results of the pre-construction surveys and Project infrastructure will be sited to avoid the identified burrows. 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, details of this are provided below.

Prior to work in an area containing Spiny-tailed Lizard burrows any remaining burrows within 50m of proposed works will be re-checked by the 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.

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.

Studies have shown that soft releasing Spiny-tailed Lizards leads to a better survival rate than simply releasing the animals into a new site<sup>1</sup> 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 2m x 2m and be covered to provide shade and prevent attack from above. A “starter hole” will be dug using a 20cm auger to a depth of approximately 30cm 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.

After the relocation period, a report will be prepared which will include the following information:

- Survey dates and timing of capture and release
- Weather conditions during survey and relocation effort
- Location of captured individuals
- Number of captured individuals during each relocation effort
- Number of juveniles, mature males and mature females
- Release sites used for relocation of each effort
- Number of males and females released at each site
- Number of mortalities during relocation effort

### **5.3.3 Birds**

Pre-construction surveys for sensitive species (i.e. those qualifying as Priority Biodiversity Features) of migratory birds will be completed in Spring and Autumn during the construction period.

A pre-construction walk-over survey will be undertaken of all working areas to check for the presence of ground nesting birds which would be at risk from construction related impacts. Surveys will be completed by an appropriately qualified ecologist and surveys will be undertaken in the hours after sunrise (up to 10:00). The surveyors will aim to identify behavior indicative of breeding activity (e.g. carrying food / nesting material / fecal

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<sup>1</sup> Translocation trial of spiny-tailed lizard or dhub in Dubai, UAE. Soorae, P. S. (ed.) (2018). Global Reintroduction Perspectives: 2018. Case studies from around the globe. IUCN/SSC Reintroduction Specialist Group, Gland, Switzerland and Environment Agency, Abu Dhabi, UAE. xiv + 286pp [https://iucn-ctsg.org/wp-content/uploads/publications/14\\_2018\\_Spiny-tailed\\_Lizard\\_UAE.pdf](https://iucn-ctsg.org/wp-content/uploads/publications/14_2018_Spiny-tailed_Lizard_UAE.pdf)

sacs, presence of nests, eggs or chicks (both nidifugous and nidicolous).

Where nests are found they will be recorded in full and their locations mapped, with the data transferred to Excel master sheets and Google Earth. Mapping will then be circulated to the project team along with details of a works exclusion zone. Exclusion zones will be dependent on the species of bird nesting along with its conservation status and be agreed with the qualified Project Ecologist.

Mitigation during construction will include timing work to remove suitable nesting habitat outside of the most sensitive times of year for ground nesting species, and for all clearance work within this time period to be done under the supervision of an on-site ecologist.

Impacts to migratory soaring birds through the construction period are considered to be unlikely based on surveys to date and none of these species having been recorded landing or interacting with the ground during their migration.

## **5.4 Operational Phase**

### **5.4.1 Operational Management Plan**

Full details of the operational management plan will be included within a specific Operational BMP document and the mitigation and monitoring measures to be applied by the Operator will include:

- Implement proper management measures to prevent damage to the biodiversity of the site. This could include establishing a proper code of conduct and awareness raising / training of personnel and good housekeeping which include the following:
- Prohibit hunting of any wildlife at any time and under any condition by workers onsite;
- Ensure proper storage, collection, and disposal of waste streams generated as discussed in detail above; and
- Restrict activities to allocated areas only, including movement of workers and vehicles to allocated roads within the site and prohibit off-roading to minimize disturbances.

### **5.4.2 AviFauna Monitoring and On-Demand Turbine Shutdown**

Monitoring during the operation of the wind farm will be completed in order to inform the actual impact caused by the wind farm on resident and migratory birds. The monitoring will be undertaken with the primary objective of collision avoidance but also secondary for migration monitoring behavior.

Monitoring must take place during the spring migration season (from late February until mid-May) and autumn migration season (from mid-August till mid-November). Throughout these periods, monitoring must take place continuously on a daily basis with full site coverage using vantage points and experienced surveyors.

Depending on the detailed findings of the follow-up in-flight monitoring, a detailed protocol will be prepared for the Shutdown On-demand, including a comparison between the various available options. Also, based on the accumulated findings of the assessments of the various seasons, the highest areas of sensitivity would be identified and key species of concern will be further identified so that they can be considered during the shutdown on-demand procedures.

### **5.4.3 Avi-Fauna Carcass Search during Operation**

During the operation phase, Post Construction Fatality Monitoring will be undertaken, with carcass searches surveys covering each turbine across the entire wind farm. The carcass search will demonstrate the effectiveness of mitigation measures such as turbine shut down and allow an estimation of the annual number of bird and bat deaths caused by the turbine.

## 6 ROLES AND RESPONSIBILITIES

### 6.1 Developer – HSSE Manager

Measures have been included in this BMP to ensure that the construction of the Project does not result in short, medium or long-term negative impacts on site wide ecological receptors, including those considered to be Priority Biodiversity Features.

The Developer is responsible for ensuring that the measures set out in this BMP / BMEP are completed in full and this will be achieved by ensuring that the EPC Contractor discharges their responsibility to conserve and enhance the ecological receptors found on the site, including Priority Biodiversity Features. This will ultimately be under the responsibility of the Developer HSSE Manager.

### 6.2 Developer – Project Ecologist

The Developer shall appoint an appropriately qualified and experienced Project Ecologist whose overall responsibility will be to oversee the implementation of the BMP during the construction of the project.

The Project Ecologist will be the custodian of this BMP, checking the Project performance against its requirements as well as triggers for additional actions. The BMP will be updated periodically as required depending on the results of the surveys and if necessary additional works may be required in line with the monitoring requirement / targets.

The Project Ecologist will be present on-site during periods when construction activities pose significant risk to priority species. The Project Ecologist should be granted the authority to issue permit to work and to stop works, if deemed necessary.

The Developer and EPC Contractor are required to support the Project Ecologist and provide him/her with the necessary resources, including personnel, in order that they can fulfil their responsibilities.

The Project Ecologist should be well trained in the practical elements of protected and sensitive species including handling of species that they may have to move and the recognition of sensitive habitats and plant species; he/she should also have a working understanding of wider environmental issues and the construction/engineering process. If these skills are difficult to obtain in country, then training exercises from international ecologists to 'upskill' the Project Ecologist may be required.

The key responsibilities of the Project Ecologist, include but are not limited to:

#### Document Management & Review

- Maintain the BMP and update as and when required.
- Draft biodiversity protocols and method statements, including biosecurity protocols, construction of hibernacula etc.
- Review and approve Contractor method statements to ensure biodiversity risks have been appropriately considered and that adequate management measures are specified.
- Liaise with EPC Contractor to ensure biodiversity is considered within the 'permit to work' systems.

#### On-site Activity

- Conduct walkthrough (rapid assessment) surveys immediately prior to works commencing in an area to identify features such as sensitive locations and species including the presence of Egyptian Spiny-tailed Lizard burrows and bird nesting areas along with other sensitive ecological receptors.
- This is required for all construction activities that pose risk to local biodiversity, such as site clearance, trenching, piling etc.

- Supervise the site clearance works and provide advice to the workforce when required. If clearance work is taking place in multiple locations at any one time the Project Ecologist may require additional assistance, if this is the case additional field ecologists may be drafted in to help cover the sites fully.

#### Training and Worker Awareness

- Provide worker awareness and training sessions on the requirements of the BMP, the need for the protection of local fauna, and the code of conduct that forbids poaching or deliberate killing of animals.
- Contribute to the production of an ecology section for the site wide induction which all new staff will have to complete prior to completing works on the site. This information should include details on the ecology of the site as well as identification charts for species found on the site.
- Prepare and deliver biodiversity management and control measures as part of the Toolbox Talks (TBT), which should include protocols for recording of incidental sightings as well as any road casualties.
- Organize and train personnel on animal rescue and relocation protocol.

#### Checking and Reporting

- Monitor and report on compliance against the BMP through the production of bi-annual ecology reports throughout the construction phase. These reports should contain the following:
  - Results of Pre-works surveys
  - Results of bi-monthly checks of the perimeter fencing and constructed PV panels
  - Details of chance-find events reported by onsite staff
  - Presence of any newly identified Priority Biodiversity Features or Valued Ecological Receptors.
- Conduct daily checks of the site during construction, such as working areas for cleaning operations and ensuring the requirements of the BMP are followed and prepare daily field notes.
- Monitor works and ensure that any species discovered are moved away from the work areas.
- Maintain a species database and update weekly based on site observations.
- Undertake biodiversity monitoring, data analysis and reporting throughout construction and operation phase of the project.
- Submit all data and related assessments in a timely manner and ensure that findings from the field are reported back to relevant stakeholders at regular intervals (full reports to be provided at least every quarter, carcass monitoring reports for example will be provided on a more regular basis e.g. monthly).
- Report any issues of non-compliance or incidents that require immediate action to the Developer HSSE Manager.
- Prepare and publish an annual ecology report to include the results of all of the on-site surveys completed. An annual ecology report should be produced after each of the annual monitoring programs.
- Submit all data to the Global Biodiversity Information Facility and eBird.
- Undertake pre-construction surveys for sensitive species (i.e. those qualifying as Priority Biodiversity Features) of migratory birds.
- If applicable, communicate nests found to the project team along with details of a works exclusion zone.
- Prepare and implement plans as applicable for timing work to remove suitable nesting habitat outside of the most sensitive times of year for ground nesting species.

### **6.3 All Staff – Site Workers (Developer, EPC Contractor and subcontractors)**

All site workers should be made aware of the ecological receptors present in the Project Area and all measures contained within this document will be included in the site induction. All workers are to be informed of their responsibility to the environment including but not limited to:

- Attend induction training
- Protection of all ecological receptors. Staff to be informed of discipline procedures for failure to comply to this.
- Adherence to site wide speed limits and informed that they will be enforced by site security staff.
- Reporting any spills of fuel, lubricants or other potentially polluting materials.
- Good housekeeping and disposal of all waste in accordance with site-wide policies, which should include recycling as much waste material as possible.
- Chance find reporting in accordance with the BMP.