AMUNET WIND POWER COMPANY 500MW AT GULF OF SUEZ IN EGYPT

Critical Habitat Assessment (CHA)

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LIST OF ACRONYMS

ATMP	Active Turbine Management Programme
AWPC	AMUNET Wind Power Company
BAP	Biodiversity Action Plan
BOO	Build, Own, Operate
CHA	Critical Habitat Assessment
DMU	Discrete Management Unit
ESIA	Environmental and Social Impact Assessment
FiT	Feed-IN Tariff
GoE	Government of Egypt
IBA	Important Bird Area
IFC	International Finance Corporation
IUCN	International Union for Conservation of Nature
KBA	Key Biodiversity Areas
MW	Megawatt
NBSAP	National Biodiversity Strategy and Action Plan
NGOs	Non-Governmental Organization
NREA	New and Renewable Energy Authority
PS	Performance Standard
RCREEE	Regional Centre for Renewable Energy and Energy Efficiency
UNDP	United Nations Development Programme
USA	United States of America
VU	Vulnerable
WDPA	World Database on Protected Areas

1 EXECUTIVE SUMMARY

This report is the Critical Habitat Assessment (CHA) for the Amunet 500MW Wind Power Project (the Project), a wind farm under development by the Amunet Wind Power Co. (AWPC) near the Gulf of Suez (Egypt). The Project is seeking to align with IFC Performance Standard 6 (PS6).

The Project is located within the Red Sea/Rift Valley flyway, a globally important migration corridor for migratory soaring birds (MSBs) and overlaps in its south-eastern corner by approximately 1km^2 with the Gebel El Zeit Important Bird and Biodiversity Area (IBA) / Key Biodiversity Area (KBA). The IBA/KBA is designated to protect a strategic location within the flyway where birds are funneled along the Gulf of Suez during their spring and autumn migration, often landing in large numbers and low flying.

Baseline surveys for Amunet and other wind projects in this area indicate that globally important numbers of eight bird species migrate through the airspace in this part of the flyway**.** The available evidence indicates the IBA/KBA overlap is not an area used as a stopover (resting/roosting) site. However, for the larger CHA Area of Analysis (*mAoA)* there is evidence that migrating birds are especially aggregated within the airspace close to the ground surface as they pass through this area indicating that the mAoA has the charactersitcs of a 'bottleneck'. within the already restricted flyway at Gebel El Zeit. Specifically, within a single migration season, low level flights through the *mAoA* have been recorded in numbers that exceed IFC Critical Habitat thresholds (Criterion 3) for 5 bird species: White Stork, Black Stork, Great White Pelican, Steppe Eagle, and Levant Sparrowhawk'. For each of these, the Project will need to demonstrate net gains in biodiversity as stated in PS6, *Paragraph 18'*

Additionally, the airspace within the Rift Valley / Red Sea flyway is regarded as Natural Habitat and MSB species with the highest potential to be impacted by the Project should be subject to no-net-loss requirements (PS6, *Paragraph 15)* with emphasis on those MSBs identified as priority biodiversity values in the Amunet Cumulative Effects Assessment (CEA)

The CHA and CEA will feed into a Biodiversity Action Plan (BAP), which will set out the Project's strategy to mitigate and manage impacts required to deliver: i) net gains for the five species that qualify the project as within Critical Habitat, and ii) no net loss for priority bird species identified in the CEA.

2 INTRODUCTION

2.1 Purpose of this report

This report is the Critical Habitat Assessment (CHA) for the Amunet Project (the Project), a wind farm located near the Gulf of Suez (Egypt) under development by Amunet Wind Power Co. (AWPC). The Project is seeking funding from the International Finance Corporation (IFC) for this development and will need to align with IFC Performance Standard 6 (PS6) for Biodiversity Conservation and Sustainable Management of Living Natural Resources.

The aim of this report is to:

- Identify Critical Habitat-qualifying biodiversity and Natural Habitat associated with the Project.
- Outline the implications of the outcome of the CHA for the Project; and
- Identify the recommended next steps for the Project.

It is important to note that this report builds upon earlier CHA work done within the Gulf of Suez area to include in particular: (i) CHA for Lekela North Ras Ghareb Wind Farm 250MW Project (TBC, 2018); and (ii) CHA for Red Sea Wind Energy (RSWE) 500MW Project (RCREEE, ECO Consult, 2020).

2.2 Project background

The Project site is located within the Red Sea Governorate. Administratively, the Red Sea Governorate is divided into 7 Cities (also known as Districts. The Project site is located within the Ras Ghareb City (or District) and therefore administratively is under the Ras Ghareb City Council. The Ras Ghareb District is further divided into Ras Ghareb town as well as 2 rural (village) local units (Zaafarana and Wadi Dara), located more than 50 km from the Project Site. The closest community settlement is Ras Ghareb city, located 9 km to the southeast. A 1,221.55 km^2 area has been allocated by the GoE to NREA for development of wind farms. Within this area, 284km^2 have been studied as a part of a Strategic Environmental and Social Assessment (SESA) (RCREEE, JV Lahmeyer Ecoda). Within this, a land area of 69.4km^2 has been allocated to the AWPC by NREA for the development of this Project (Figure 1)

Figure 1: AWPC BOO Project location in the Gulf of Suez.

The Project area is on the edge of the Red Sea/Rift Valley flyway for migratory soaring birds (MSBs). The Red Sea / Rift Valley flyway is used during the spring and autumn migrations by 37 species of MSB, numbering over 1.5 million individuals, along with a suite of migratory passerines. The flyway links breeding areas in

Europe and Western and Central Asia with wintering grounds throughout eastern and southern Africa, via the Middle East (Figure 2). Egypt is of strategic importance in this flyway, as the Gulf of Suez is one of the two main points for crossing the Red Sea: the other crossing point is at the southern end of the Red Sea, between Yemen and Djibouti (Porter 2005). These areas provide the shortest sea crossings between Africa and the Middle East.

The importance of the Gulf of Suez is seasonal; with many more individuals recorded during the northbound spring compared to the autumn migration, when most migration occurs southward down the Sinai Peninsula, and higher numbers cross into Africa further south through Bab el Mandeb. Five bottleneck sites occur in Egypt, at Ain Sukhna, and Suez at the northern Red Sea, and the El Qa plain, Ras Mohammed National Park and Gebel el Zeit at the southern end of the Red Sea (Porter 2005) (**Error! Reference source not found.**).

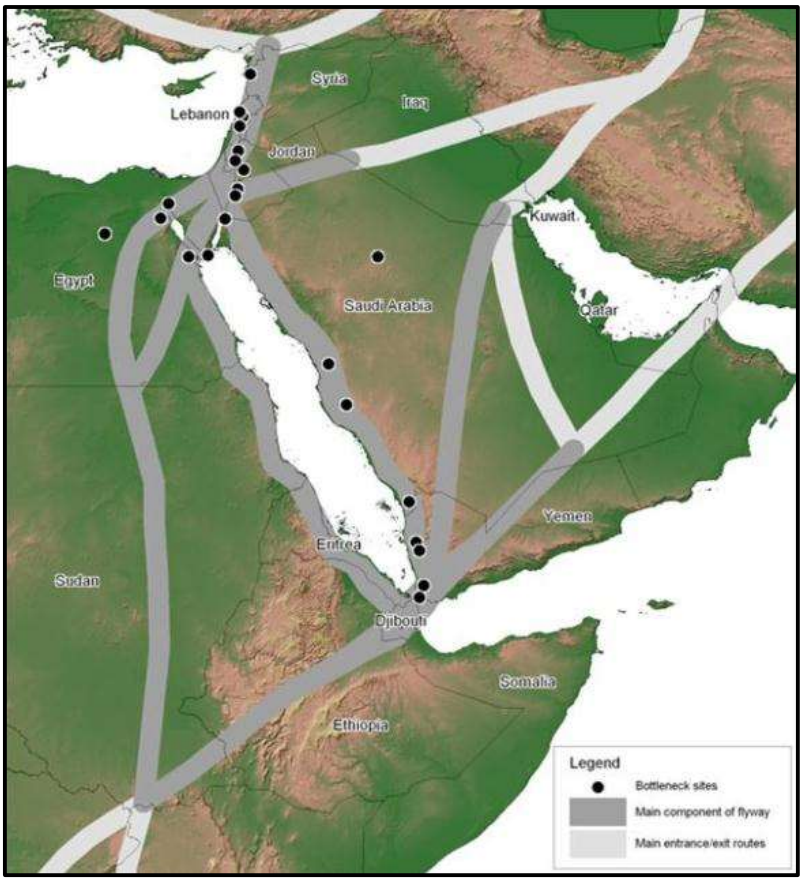

Figure 2: Map of the main elements of the Rift Valley/Red Sea flyway showing key bottleneck sites (Source: BirdLife International)

As a potentially high-risk biodiversity area for migratory birds, the Project area is already included in the strategic and operational framework protocol for evaluation of environmental impacts of wind turbines, bird monitoring and a proposed Active Turbine Management Programme (ATMP), currently being coordinated by the Regional Centre for Renewable Energy and Energy Efficiency (RCREEE) [1]. The ATMP is intended to become a single system through which the risk to MSBs across all wind farms in the Gulf of Suez can be managed. Bird monitoring studies have been undertaken under the RCREEE programme since 2016 for all specific wind projects in the region north to Ras Ghareb. AWPC commissioned separate site-specific studies of migratory birds to ensure data are available to support project-specific mitigation planning for the AWPC site. These studies were carried out by ECO Consult and Green Plus for RCREEE and AWPC during the spring seasons 2020, 2021, and 2022 as well as autumn 2020 and 2021.

As part of the ESIA, desk-based studies and site survey of flora and terrestrial fauna have been undertaken for the Project area, with results suggesting that the Project is characterized by an arid environment with

[1] http://www.rcreee.org/content/rcreee-launches-first-strategic-and-operational-framework-protocol-evaluation-environmental

sparce vegetation typical of the Red Sea coastal Desert ecoregion. Refer to the Amunet ESIA for additional details.

2.3 International Finance Corporation standards: PS6

The objectives of PS6 are to: protect and conserve biodiversity; maintain the benefits from ecosystem services; and promote the sustainable management of living natural resources through the adoption of practices that integrate conservation needs and development priorities.

PS6 identifies three classes of area based on (i) ecosystem condition ('quality' or 'state') and (ii) significance for biodiversity (Table 1). PS6 uses the term 'habitat' to refer to these areas, rather than the actual ecosystems within them. These classes are:

- Modified Habitat;
- Natural Habitat; and
- Critical Habitat. Critical Habitat is a subset of Modified and Natural Habitat.

Area condition is classified as either **Natural** or **Modified** based on the extent of human modification of the ecosystem. Arable fields and urban areas show "substantial modification" and would be classed as Modified; even heavily grazed arid regions usually retain most original species and ecological processes and so would in most cases still be considered Natural Habitat.

Areas of **high biodiversity value** are termed **Critical Habitat** by the IFC PS6. These consider the principles of threat (vulnerability) and geographic rarity (irreplaceability). Critical Habitat Assessment (CHA), therefore, is a process for identifying significant biodiversity risks associated with the Project.

Identification of Critical Habitat is independent of the state of the habitat: Critical Habitat-qualifying biodiversity may be present even in Modified Habitat, such as rare frogs in human modified landscapes in Europe.

Table 1: Summary of the PS6 scheme for classifying areas

Three classes of area identified in PS6		Condition of the area	
		Natural	**Modified**
Significant types or quantities of biodiversity (Critical Habitat-qualifying features)	**Present**	Critical Habitat	Critical Habitat
	Absent	Natural Habitat	Modified Habitat

3 APPROACH TO CRITICAL HABITAT ASSESSMENT

Identification of features which potentially meet thresholds for Critical Habitat were carried out through the following steps (IFC 2012a):

- Identification of an appropriate scale for assessment:
  - To undertake the analysis for biodiversity.
- Collection and verification of available information on biodiversity:
  - From the Strategic and Cumulative Environmental and Social Assessment, the ESIA, baseline surveys, literature review, specialist consultation and analysis; and
- Assessment against IFC criteria and thresholds for species and ecosystems:
  - To identify which biodiversity features may qualify the area as Critical Habitat.

3.1 Scale of assessment

CHAs are usually carried out at the landscape scale, using ecologically and/or administratively coherent units for determining the presence or absence of Critical Habitat-qualifying features under PS6 criteria 1 – 4. IFC GN6, paragraph 59 states that the project should identify an ecologically appropriate area of analysis to determine the presence of critical habitat for each species with regular occurrence in the project's area of influence, or ecosystem covered by Criteria 1-4. "*The client should define the boundaries of this area taking into account the distribution of species or ecosystems (within and sometimes extending beyond the project's area of influence) and the ecological patterns, processes, features, and functions that are necessary for maintaining them.*"' The Project is unusual in being likely to have few terrestrial impacts beyond its concession boundary, and in having most potential impacts in the context of a lengthy flyway for MSBs. Knowledge gaps relating to the spatial extent of MSB movements within the flyway limited the extent to which it was possible to determine an ecologically appropriate area of assessment as defined by IFC GN6. Attempting to address this CH for MSB species was assessed at the larger flyway scale and at smaller scale focused on the Project area where more detailed spatial MSB activity data was available (section 3.1.2).

3.1.1 Main Area of Assessment (*mAoA*)

Based on desk and field studies from the ESIA, the projects' area of influence for all but migratory soaring birds is unlikely to extend far beyond the Project concession, The *mAoA* was therefore defined as the concession and a 1km area all around it. (Figure 3). The total area of the main AoA is 64.9km^2

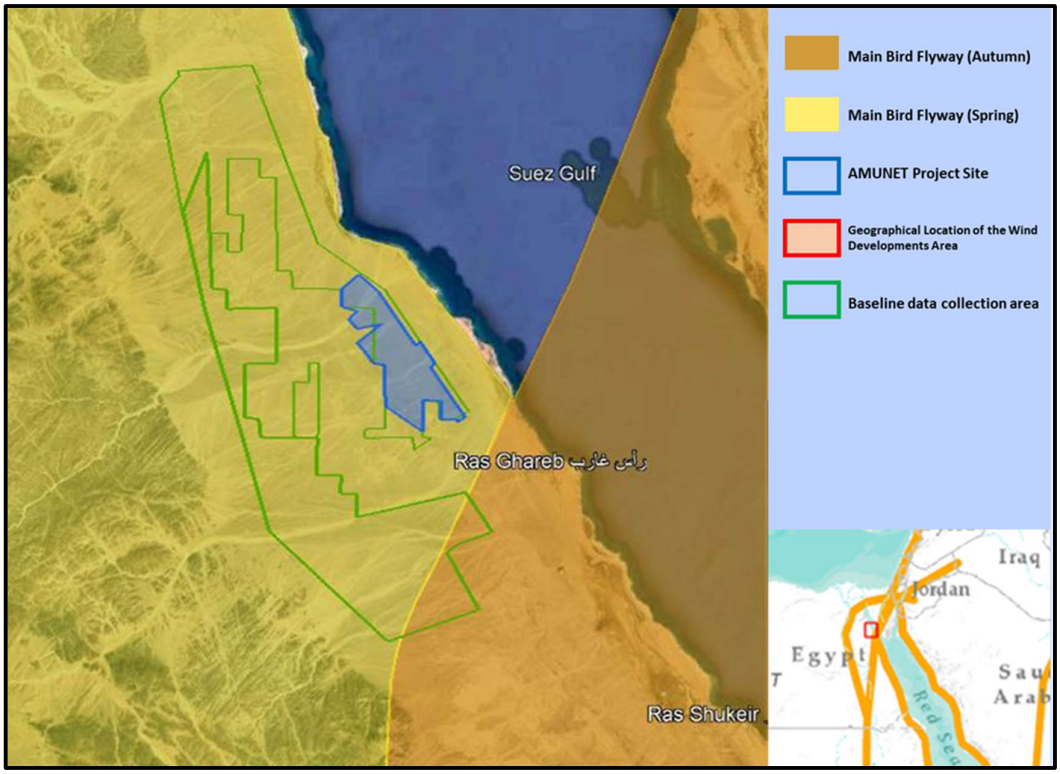

Figure 3: Main Area of Assessment (*mAoA*) for this Critical Habitat Assessment after Migratory Soaring Birds project (https://migratorysoaringbids.birdlife.org)

3.1.2 Area of Assessment for migratory soaring birds

Defining an area of assessment for migratory soaring birds that aligns with guidance in PS6 is challenging. IFC PS6 (Para. 16) specifies that (critical) habitats are defined as, among others, '*habitat supporting globally significant concentrations of migratory species and/or congregatory species*.' For migratory soaring birds we thus assessed the potential presence of Critical Habitat at two scales:

1. ***Within the entire flyway corridor within Egypt***. This is an arbitrary section of the whole flyway, but one that is sufficiently extensive to be precautionary and,
2. ***Within the mAoA*** where a more detailed assessment was possible, given data availability from baseline surveys.

At the flyway scale, a review of bird migration patterns based on publicly available satellite telemetry data (Feltrup-Azafzaf *et al.* 2016; Dagys & Zydelis 2018; Nagy *et al.* 2018) and published literature (Buechley *et al.* 2018) indicate that there are two main branches of the Asia-East Africa flyway in the Gulf of Suez region. Most birds pass down the Sinai Peninsula and cross the Gulf of Suez at its southern extreme. A significant minority, however, travel down the west coast of the Gulf of Suez along the coastal plain, a belt 35-40 km wide. The flyway along the western Gulf of Suez is not a broad, poorly defined, front, but rather a concentrated corridor. It is not possible, however, to map precise boundaries to such flyways, since they depend on the varying routes of individual migratory birds from year-to-year.

3.2 Available information

This assessment is based on existing documentation and interpretation of global and regional datasets. Spatial analysis of global databases (accessed through the IBAT portal) produced a candidate list of relevant features which may occur within the study areas (e.g., those with a distribution intersecting the study areas). All species classified as Critically Endangered, Endangered, Vulnerable or Data Deficient in the IUCN Red List was screened, as well as all species mapped by IUCN which could be considered restricted range. Data on potential protected areas and internationally recognised areas were also extracted from the Integrated Biodiversity Assessment Tool (IBAT).

Additional data were obtained from:

- Earlier CHA work done within the Gulf of Suez area to include in particular: (i) CHA for Lekela North Ras Gahrib 250MW Project (TBC, 2018); and (ii) CHA for RSWE 500MW Project (RCREEE, ECO Consult, 2020).
- The AWPC Project ESIA (RCREEE, ECO Consult and Green Plus 2021);
- AWPC Project autumn 2020, spring 2020, spring 2021,autumn 2021, and spring 2022 baseline bird studies (RCREEE, ECO Consult and Green Plus);
- RCREEE Strategic and Cumulative Environmental and Social Assessment Active Turbine Management Programme (ATMP) for Wind Power Projects in the Gulf of Suez (RCREEE 2018);

ESIA studies for other nearby wind farms:

- NIAT Wind Farm Project 500MW (RCREEE, ECO Consult and EcoConServ)
- Masdar Infinity Power Holding (IPH) 200MW (RCREEE, ECO Consult and EcoConserv)
- RSWE Wind Farm Project 500MW (RCREEE, ECO Consult and EcoConServ)
- Lekela North BOO Wind farm project (Environics)
- Infinity Wind Farm Project (RCREEE, ECO Consult and EcoConServ)
- Infinity 2 Wind Farm Project (RCREEE, ECO Consult and EcoConServ)

Other databases and available information:

- Alliance for Zero Extinction sites;

- BirdLife International Migratory Soaring Birds Project https://migratorysoaringbirds.birdlife.org
- Information about Key Biodiversity Areas is from the BirdLife International Data Zone and Protected Area information is from the World Database on Protected Areas (WDPA). Both of these datasets were accessed under licence from IBAT.

3.3 Robustness of this assessment

This assessment was conducted using the best available information. However, it is acknowledged that new information may change the conservation status of a species and therefore change the assessment.

Baseline surveys were mostly focused on diurnal bird species. Since many reptile and mammal species living in a desert are nocturnal and small species such as arachnids and insects were not the focus of surveys, their presence might not have been recorded during surveys. This is unlikely to affect the assessment since there is currently no indication of any threatened or restricted-range species in such groups likely to occur in the area.

While further research may affect individual species currently identified as reaching Critical Habitat thresholds, the overall assessment of importance of the area is unlikely to change. The proximity of the IBA to the Project is alone sufficient to demonstrate Critical Habitat values in the vicinity, and thus the need for well-considered mitigation plans and measures.

3.4 Assessment against PS6 criteria for Critical Habitat

Critical habitat was assessed against 5 criteria defined in IFC Guidance Note paragraph GN70-83.

3.4.1 Criterion 1 - Critically Endangered and Endangered Species

Species threatened with global extinction and listed as CR and EN on the IUCN *Red List of Threatened Species* are considered as part of Criterion 1 (PS6 GN70).

Thresholds for Criterion 1 (PS6 GN72***) are***:

a) Areas that support globally important concentrations of an IUCN Red-listed EN or CR species (≥0.5% of the global population AND ≥ 5 reproductive units GN16 of a CR or EN species).

b) Areas that support globally important concentrations of an IUCN Red-listed Vulnerable (VU) species, the loss of which would result in the change of the IUCN Red List status to EN or CR and meet the thresholds in GN72(a).

c) As appropriate, areas containing important concentrations of a nationally or regionally listed EN or CR species.

3.4.2 Criterion 2 - Endemic and Restricted-range Species

The term endemic is defined as restricted range. Restricted range refers to a limited extent of occurrence-EOO (GN74). For terrestrial vertebrates and plants, restricted-range species are defined as those species that have an EOO less than 50,000 square kilometers (km^2).

The threshold for Criterion 2 (PS6 GN75) ***is***:

a) Areas that regularly hold ≥10% of the global population size AND ≥10 reproductive units of a species (PS6 GN75).

For potential endemic and restricted-range species, ranges and global population estimates were extracted from the IUCN Red List and the proportion of the range within the *mAoA* used to estimate the % of the global population potentially present. This value was then assessed against the Criterion 2 threshold.

3.4.3 Criterion 3 - Migratory and Congregatory Species

Migratory species are defined as any species of which a significant proportion of its members cyclically and predictably move from one geographical area to another (including within the same ecosystem) (GN76). MSBs fall within this category.

Congregatory species are defined as species whose individuals gather in large groups on a cyclical or otherwise regular basis and/or predictable basis. For this assessment the most relevant example given is 'Species that utilize a bottleneck site where significant numbers of individuals of a species occur in a concentrated period of time (for example, for migration)' (GN77).

The threshold for Criterion 3 (PS6 GN78) ***are***:

a) Areas known to sustain, on a cyclical or otherwise regular basis, ≥ 1 percent of the global population of a migratory or congregatory species at any point of the species' lifecycle.

b) Areas that predictably support ≥10 percent of the global population of a species during periods of environmental stress.

Although large swathes of a narrow migratory flyway may meet Critical Habitat thresholds, to designate large parts of a flyway as Critical Habitat is unlikely to be useful and would be misaligned with other approaches to identification of sites of global conservation importance. For example, the global standard for identification of Key Biodiversity Areas (KBAs) states that '*Along migratory corridors, KBAs should be identified for stop-over or bottleneck sites rather than for the entire corridor*'. Informed by the KBA guidance, areas were only considered Critical Habitat if they showed evidence of being stop-over sites or bottlenecks (including areas where flying heights are aggregated close to the ground surface) within this already narrow migratory corridor.

This Critical Habitat Assessment thus required an approach for migratory soaring birds that differed from many other CHAs as the low flying height was a material factor in the assessment in considering the area as a 'bottleneck'. As stated in Section 3.1.2, the starting point for this assessment was to assess the potential presence of Critical Habitat in the entire flyway corridor within Egypt. The best source of data for such an exercise is the pre-existing IBA dataset produced by BirdLife. IBAs were identified in a national directory in 1999 (Baha El Din 1999) and updated in an Africa-wide compendium (Fishpool & Evans 2001). We used the most up-to-date data on IBAs, available from IBAT.

Additionally, data from field surveys in the vicinity of the Project, but not included in the *mAoA*, were checked for evidence of significant concentrations of migratory species (no congregatory or non-soaring migratory species were considered likely to meet thresholds, based on available data). These field surveys included:

- RCREEE Strategic Environmental and Social Assessment (RCREEE 2018);
- Project autumn 2020, spring 2020, spring 2021 and autumn 2021 baseline bird studies (RCREEE, ECO Consult and Green Plus);
- Autumn and spring migratory surveys for nearby wind farms such as:
- (i) NIAT Wind Farm Project (RCREEE, ECO Consult an EcoConserv);
- (ii) Masdar Infinity Power Holding (RCREEE, ECO Consult and EcoConserv); and
- (iii) RSWE Wind Farm Project (RCREEE, ECO Consult and EcoConServ);

- (iv) Lekela North BOO Wind Farm Project (Environics)

Point counts were grouped into independent survey areas crossing the flyway, i.e.: Amunet Survey area (RCREEE, ECO Consult and Green Plus), NIAT survey, Masdar IPH survey, RSWE survey. Each independent survey area uses a methodology that avoids the risk of double-counts within each survey area (no observations were conducted simultaneously at adjacent vantage points). For each species, the total count observed during each independent survey was compiled and compared to the global population but counts across survey areas were not summed together. Because of their locations, MSBs may pass in a successive way from one project to another.

For several species the IUCN Red List reports the estimated number of mature individuals only. The baseline data however report total numbers and do not differentiate between mature and immature birds. For species where the total population estimate was not reported, we developed an adjustment factor to obtain a total population estimate for those species. This ensures that the total number of individuals recorded during baseline surveys was compared to a global estimate of total individuals. This adjustment factor was based on the ratio of mature individuals to total individuals for related taxa as reported in the relevant Birdlife International species factsheets. We used Peregrine Falcon *Falco peregrinus* (93,300 mature individuals and 140,000 total individuals: ratio of 0.67), Taita Falcon *F. fasciinucha* (500-1,000 mature individuals and 750-1,500 total individuals: ratio of 0.67) and Greater Spotted Eagle *Clanga clanga* (3,300-8,800 mature individuals and 5,000-13,200 total individuals: ratio of 0.67) and Steppe Eagle *Aquila nipalensis* (62,744 mature individuals and 94,116 total individuals: ratio of 0.67) to derive an averaged ratio of 0.67 to be applied for all raptors.

A more detailed approach was possible within the *mAoA*, given baseline data availability. To assess the importance of migratory bird counts here, a precautionary approach was taken. The percentage of the global population was based on the lowest estimate of the global population (most bird population estimates have substantial confidence margins), (see Serckx et al. 2018). For some species this may significantly underestimate the global population. This is the case for Levant Sparrowhawk, for which the numbers of individuals observed migrating through the Gebel El Zeit IBA exceeds the lowest published estimate of the global population (Jobson et al. 2021, El-Gebaly & Al-Hassani 2017). In such a case, the assessment of the species made here is likely to need modification when an updated estimate of the global population is reviewed.

3.4.4 Criterion 4 - Highly Threatened or Unique Ecosystems

IFC prioritizes information from the IUCN Red List of Ecosystems[2] to determine Critical Habitat for criterion 4. This follows an approach similar to the Red List for Threatened Species and categorizes ecosystems using similar ratings (e.g for threatened ecosystems – Vunlerable, Endangered, Critically Endangered). Where formal IUCN ecosystem assessments have not been performed, assessments using systematic methods at the national/regional level, carried out by governmental bodies, recognized academic institutions and/or other relevant qualified organizations (including internationally recognized NGOs) may be used.

The threshold for Criterion 4 (PS6 GN80) ***are***:

a) Areas representing ≥5% of the global extent of an ecosystem type meeting the criteria for IUCN status of CR or EN.

b) Other areas not yet assessed by IUCN but determined to be of high priority for conservation by regional or national systematic conservation planning.

All ecosystems[3] known from the *mAoA* were screened against the IFC thresholds for highly threatened and unique ecosystems, and the Red List of Threatened Ecosystems criteria (Bland et al. 2016), considering the

[2] https://assessments.iucnrle.org/

[3] The Red List of Threatened Ecosystems guidance notes that other terms [in addition to 'ecosystem'] applied in conservation assessments –such as ecological communities, habitats, biotopes, and (largely in the terrestrial context) vegetation types – are regarded as operational synonyms of ecosystem type, providing they are adequately defined in accordance with the procedures described in the assessment process (Rodríguez-Clark *et al.* 2015)

entire extent of an ecosystem, together with areas in the wider landscape that are needed to maintain that ecosystem in a viable condition.

3.4.5 Criterion 5- Key evolutionary processes

PS6 GN81 refers to the structural attributes of a region, such as its topography, geology, soil, temperature, and vegetation, and combinations of these variables, can influence the evolutionary processes that give rise to regional configurations of species and ecological properties. Although key evolutionary processes may operate at various spatial scales, in the sense of PS6 these are usually considered at a relatively fine scale rather than broad biogeographic regions (e.g., an individual mountain that may have acted as a glacial refugium and thus hosted the evolution of a suite of endemic species). No quantitative significance thresholds exist for this criterion, so there is a reliance on expert opinion and qualitative value judgement.

4 CHA FINDINGS

4.1 Criterion 1 - Critically Endangered and Endangered Species

Assessment. *The Project does not qualify as within Critical Habitat under Criterion 1.*

Justification. No species meets the threshold for Criterion 1. For one species, Steppe Eagle (EN) baseline bird monitoring studies at the *mAoA* recorded globally important numbers (>0.5%) in all three study years. However, as Steppe Eagle occurs exclusively as a migrant, with each individual only present within the *mAoA* for very short time periods (typically les than an hour) as it transits through the airspace, this species is more appropriately assessed under criterion 3.

4.2 Criterion 2- Endemic and/or restricted-range species

Assessment. *The Project does not qualify as within Critical Habitat under Criterion 2.*

Justification. No species meets the threshold for Criterion 2.

- An endemic species is defined as one that has ≥ 95 percent of its global range inside the country or region of analysis.
- A restricted-range species for terrestrial vertebrates is defined if the extent of occurrence is 50,000 km^2 or less.
-

4.3 Criterion 3 - Migratory species and/or congregatory species

Assessment. *Based on the available evidence the Project qualifies as within Critical Habitat for five MSB species:*

- *Levant Sparrowhawk,*
- *Steppe Eagle,*
- *White Stork,*
- *Black Stork*
- *Great White Pelican.*

Justification. Other than MSBs, no migratory or congregatory species were found likely to meet PS6 thresholds in the *mAoA*. As stated in Section 3.1.2, MSBs were assessed at the flyway scale within Egypt and in more detail within the *mAoA*.

4.3.1 Migratory soaring birds: at a flyway scale within Egypt

There are 34 identified Important Bird Areas (IBAs) in Egypt, of which five were identified for (at least in part) congregations of birds (Table 2; **Error! Reference source not found.**). These sites are all considered bottlenecks for migratory soaring birds, and considered among the six most important sites on the flyway within the Middle East and North Africa (of about 24 such sites in that region: Porter 2005). This is because these "land-bridge" sites are located next to the shortest sea crossings between two land masses and so genuinely concentrate migratory soaring birds (which have difficulty migrating over water). A review of literature and expert consideration of other potential bottleneck sites in the flyway did not reveal any other likely candidate sites not yet identified as IBAs.

All five of these Important Bird Areas should be considered Critical Habitat, because they represent the most important bottleneck sites for migratory soaring birds in the flyway and – in most cases – involve stop-over (resting/roosting areas) and are areas where flights of a large numbers of individuals are aggregated in

airspace close to the ground. A more detailed assessment of the Gebel El Zeit IBA, part of which overlaps the the main AoA is given in section 4.3.2. below

Table 2 Important Bird and Biodiversity Areas for migratory soaring birds in Egypt

IBA	Map ref.	IBA Criteria*	Bottleneck?	Low flight?	Stop-over area?
Ain Sukhna	34	A1, A3, A4iv	Yes	Regularly	Regularly
El Qa plain	32	A1, A4iv	Yes	Regularly	No
Gebel El Zeit	31	A1, A4iv	Yes	Regularly	Regularly
Ras Mohammed National Park	33	A1, A4iv	Yes	Regularly	Regularly
Suez	30	A1, A4iv	Yes	Occasionally	Occasionally

* A1 highlights importance for threatened species; A3 for biome-restricted species; and A4iv for bottlenecks of migratory soaring birds

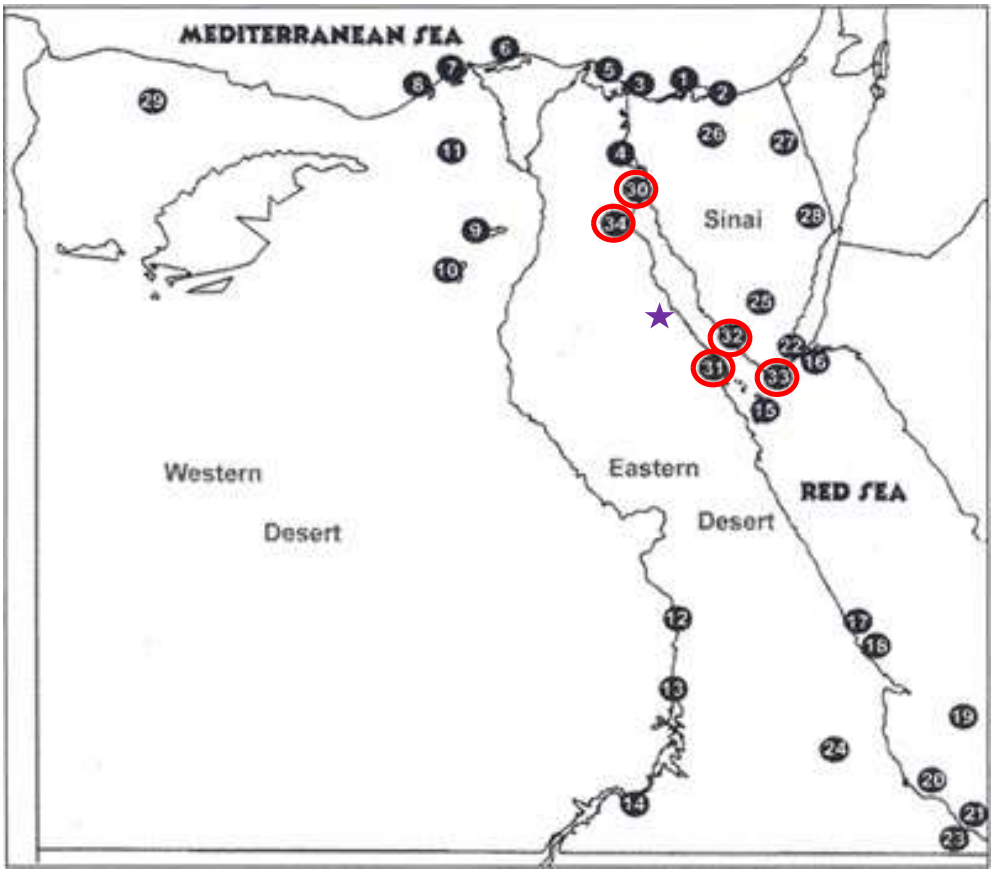

Figure 4: Important Bird and Biodiversity Areas of Egypt.
IBAs important for migratory soaring birds are circled in red. Ain Sukhna = 34, El Qa plain = 32, Gebel El Zeit = 31, Ras Mohammed National Park = 33, Suez = 30). Approximate project location marked with star. (Map source: Egyptian Environmental Affairs Agency)

4.3.2 Migratory soaring birds within the *mAoA*

Available data indicate that globally important numbers of eight MSB species seasonally migrate over the area within and surrounding the *mAoA* at levels wich have the potential to exceed thresholds for Critical Habitat under Criteria 3. The eight species are: Steppe Eagle, Levant Sparrowhawk, Eurasian Buzzard, European Honey-buzzard, Greater Spotted Eagle, White Stork, Black Stork and Great White Pelican.

Assessment of the mAoA overlap with the Gebel El Zeit IBA/KBA

The *mAoA* has a small overlap with the Gebel El Zeit IBA (Figure 6) (assessed as within Critical Habitat in Section 4.3.1). According to BirdLife International: *"Birds of prey, storks and pelicans migrate through and usually land, rest, or roost near the coastline and on the surrounding desert plains and hills. Resting and roosting storks, especially, utilize the two bays of Ghubbet El Zeit and Ghubbet El Gemsa and the saltmarsh at Sabkhet Ras Shukheir".* Within the IBA these areas are further south than the area overlapped by the main AoA. Baseline montoring of MSBs for the ESIA only detected relatively very small numbers of MSBs landing in the *mAoA,* and area which includes the overlap with the IBA, and although larger numbers may be present in adverse weather/environmental conditions e.g., sandstorms, these situations are likely to be unpredictable and reasonably irregular. The low incidence of birds landing/roosting in this area is further supported by the results of the Strategic and Cumulative Environmental and Social Assessment for Wind Power Projects in the Gulf of Suez (RCREEE 2018) which recorded very few birds landing and which concluded that the importance of this area as a roosting site for large soaring birds is low. Summarizing, the available evidence from bird migration studies indicates that the overlapping part of the Gebel El Zeit IBA is an area of relatively low importance for MSBs and other species for which the IBA is designated Specifically, there is no evidence from field surveys that the overlap is used as a stop-over during migration. Recognizing the status of the Gebel El Zeit IBA as an internationally recognized area of conservation importance and the need to preserve the integrity of the site no project related activities will take place in the area overlapping with the IBA, including but not limited to the installation of turbines or associated infrastructure.

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Figure 5: The Project Overlap with Gebel El Zeit IBA

Assessment of the *mAoA*

For the *mAoA* as a whole, MSB baseline flight activity data recorded large numbers of birds undertaking low-level flights where they have the potential to interact with wind turbines or other structures, indicating that the area has the characteristics of a 'bottleneck' within the already restricted flyway at Gebel El Zeit.

This was also evident from the existing field surveys at nearby projects (RSWE, NIAT, Masdar IPH, Ecoda 2013, RCREEE 2018).

Analysis of the *mAoA specific* flight data indicated that five of the eight candidate MSB species with globally important numbers passing through the *mAoA* and adjacent area exceeded Critical Habitat thresholds for Criterion 3 - based on the numbers undertaking low-level flights (<120m) during a single migration season. **These species are:**

- **Steppe Eagle** (IUCN Red List – Endangered)
- **Great White Pelican** (IUCN Red List – Least Concern)
- **Black Stork** (IUCN Red List – Least Concern)
- **White Stork** (IUCN Red List – Least Concern)
- **Levant Sparrowhawk** (IUCN Red List – Least Concern)

For the remaining three species Eurasian Buzzard, European Honey-buzzard, and Greater Spotted Eagle the numbers of individuals undertaking low-level flights was considerably below the Criterion 3 threshold. (See Appendix 1 for details of this assessment).

4.3.3 Robustness of the Criterion 3 assessment outcome

A principal challenge of assessing Critical Habitat for migratory soaring birds that are exclusively flying through airspace over a landscape, is the difficulty in defining an appropriate ecological area of analysis that aligns with PS6 GN59. The *mAoA* for this assessment, while broadly appropriate for the assessment of non-MSB species, represents only a small, arbritary sample of MSBs moving through the wider landscape. To determine an ecologically appropriate area of analysis better aligned with PS6 it would be necessary to better understand spatial migration patterns within this part of the flyway. Although these were not assessed, the numbers recorded during baseline monitoring at the *mAoA* varied considerably between monitoring years and one reason for this could be that birds were taking different flight routes across the landscape. If so, this would suggest that the *mAoA* was not large enough to fully capture the proportion of each of the eight species populations that use the airspace in this part of the flyway. If the main AoA had accounted for this, the number of low flying individuals would have been higher for all eight species with globally important concentrations. For the five species that exceeded thresholds this would mean that Criterion 3 thresholds would have been exceeded by a greater amount. For the three species, that did not exceed the Criteron 3 threshold (Greater Spotted Eagle (IUCN Red List – Vulnerable), European Honey-buzzard (IUCN Red List – Least Concern) Eurasian Buzzard (IUCN Red List – Least Concern) there is the potential that numbers could have exceeded the threshold. Looking at the available data (see Appendix 1) this is unlikely as the number of low flying individuals did not exceed 0.2% of the minimum global population for any the three species. This is especially unlikely for Eurasian Buzzard and Greater Spotted Eagle. For these two species, if all individuals recorded during the highest seasonal counts were low flying the Criterion 3 threshold would still not be exceeded (see Appendix 1 column D). Summarizing, the available evidence suggests that if information were available to better align the size of the main AoA with guidance in PS6 GN59 it is likely that the same five species would exceed the Criterion 3 threshold.

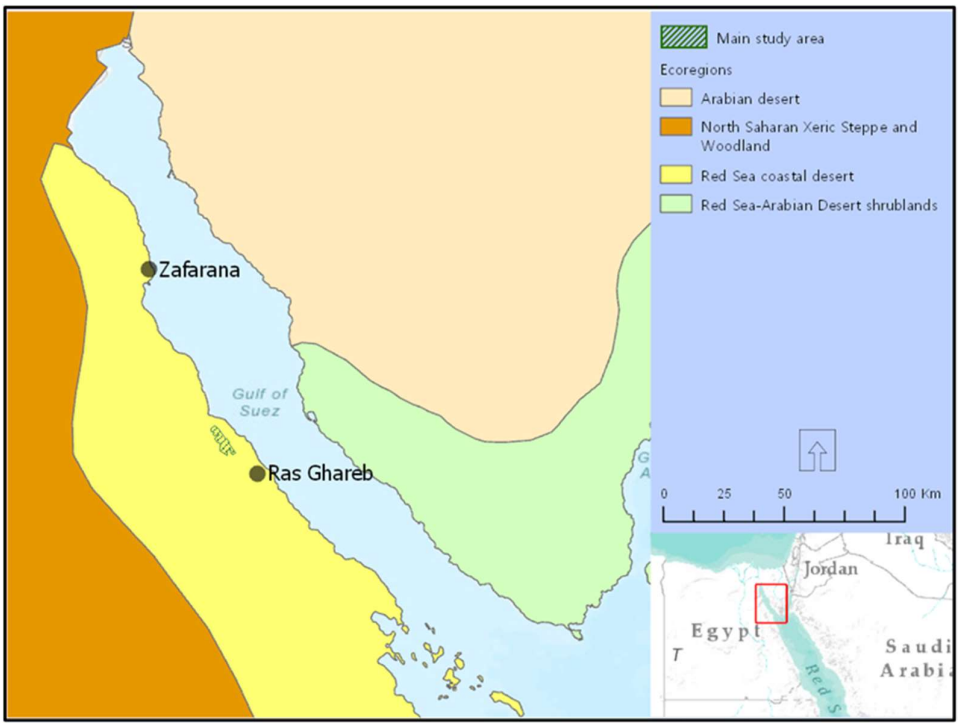
4.4 Criterion 4 - Highly Threatened or Unique Ecosystems

Assessment. *The Project area thus does not qualify as within Critical Habitat under Criterion 4.*

Justification. A qualitative evaluation of land cover across the Red Sea coast shows a largely desert area with no or minimal vegetation. Small patches of sparse shrubs are present along the sea and in a very small extent within the desert. Urban areas are developed in few locations along the Red Sea coast. Some trees have been recorded during field surveys, but canopy cover is almost non-existent in this region. Several wadis and their tributaries are present within the Project area and its vicinity of the Project that are generally barren but include some sparce vegetation (RCREEE 2018).

The west side of the Gulf of Suez is dominated by the Red Sea coastal desert ecoregion (Figure 3). The ecoregion covers 21,700km^2 and its status is Vulnerable (i.e., not highly threatened). No detailed information is available, but nothing suggests that this ecoregion covers particularly unique or threatened ecosystems.

This high-level qualitative evaluation of the primary habitats across Red Sea suggests that there are none that meet Criterion 4 and has also been reviewed against definitions for relevant Red List of Threatened Ecosystem categories (i.e., CR, EN) (Table 2).



WWF ecoregions in the vicinity of the Project area

Table 3: High-level qualitative assessment of habitats in the Project study area against Criterion 4

Habitat		Assessment
Vegetation type	Summary description	

Sparse shrub	• Vegetation restricted to sparse patches within drainage channels (wadis) and present in low density
	• Vegetation assemblages are composed of a low number of species that are widely distributed within the Arabian desert, coastal plains of Red Sea and Sinai Peninsula (RCREEE 2018)
		Red List of Threatened Ecosystems
		• **Reduction in geographic distribution**
		  ○ No – there is no current evidence to suggest a significant reduction in distribution
		• **Restricted geographic distribution**
		  ○ No – widespread habitat type
		• **Environmental degradation**
		  ○ No – the development of wind farms and oil & gas facilities might degrade this habitat type in the location of individual projects, but this will not lead to a broad-scale degradation of the ecosystem
		• **Disruption of biotic processes or interactions**
		  ○ No – there is no evidence of this
		• **Quantitative analysis that estimates the probability of ecosystem collapse**
		  ○ Not possible using currently available data
		
		Conclusion:
		• **Unlikely to meet Criterion 4**

4.5 Criterion v/5: Areas associated with key evolutionary processes

Assessment. *The Project area does not qualify as within Critical Habitat under Criterion 5.*

Justification. This criterion is defined by the physical features of a landscape that might be associated with particular evolutionary processes, and/or subpopulations of species that are phylogenetically or morpho-genetically distinct and may be of special conservation concern given their distinct evolutionary history (IFC 2012b, paragraph GN95).

Although key evolutionary processes may operate at various spatial scales, in the sense of PR6/PS6 these are usually considered at a relatively fine scale rather than broad biogeographic regions (e.g. an individual mountain that may have acted as a glacial refugium and thus hosted the evolution of a suite of endemic species). No quantitative significance thresholds exist for this criterion, so there is a reliance on expert opinion and qualitative value judgement. Areas associated with key evolutionary processes were screened using expert advice.

Given the very sparse vegetation, composed mainly of widespread desert plant species with limited evidence of local endemism, and the low density of animal species, it is very unlikely that any key evolutionary processes could occur in the Project area.

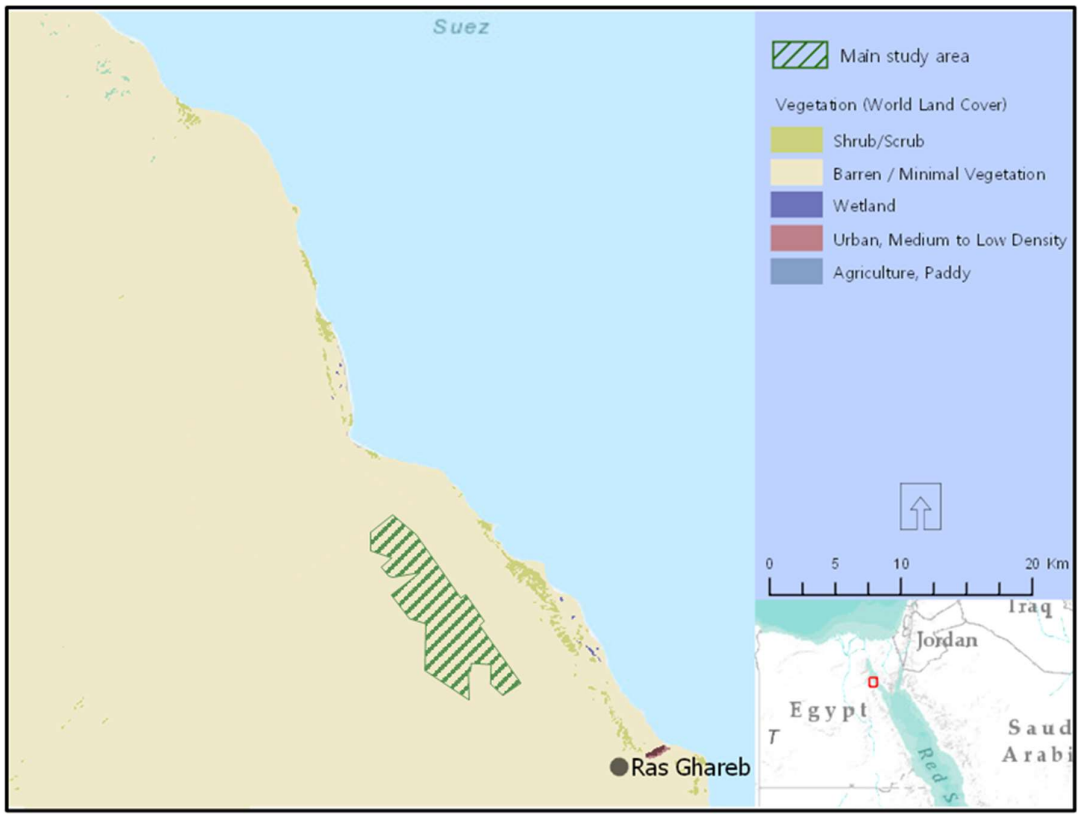


Figure 6: Vegetation cover in the vicinity of the Project

5 OTHER COLLISION-RISK SPECIES AND NATURAL HABITAT REQUIREMENTS

5.1 'Priority' species identified in the Cumulative Effects Assessment and ESIA

Additional to this CHA, the Project has conducted a Cumulative Effects Assessment (CEA) utilizing bird flight activity data collected across five migration seasons 2020/2. The CEA identified 10 species populations where the potential for project impacts from turbine collision mortality was moderate or high. These included all five species identifying the project within Critical Habitat plus five others:

- Egyptian Vulture (IUCN Red List – Endangered),
- Greater Spotted Eagle (IUCN Red List – Vulnerable),
- Pallid Harrier (IUCN Red List – Near Threatened),
- Booted Eagle (IUCN Red List – Least Concern) and
- Common Crane (IUCN Red List – Least Concern).

All 10 species belong to the group of MSBs for which the Gebel El Zeit IBA is designated.

IFC's GN6 defines Natural Habitats as 'areas composed of viable assemblages of plant and/or animal species of largely native origin, and/or where human activity has not essentially modified an area's primary ecological functions and species composition' and Modified Habitats as 'areas that may contain a large proportion of plant and/or animal species of non-native origin, and/or where human activity has substantially modified an area's primary ecological functions and species composition'. That said, these definitions are of limited value when the priority biodiversity values are associated with the air space rather than the terrestrial environment.

In the case of the project area, the barren desert landscape with sparse shrubs would be considered a natural habitat, and the air space affected by turbine blades and the overhead transmission line associated with the project infrastructure is also considered natural habitat as it's part of a migratory flyway for MSBs. Although Natural Habitat no-net-loss (NNL) requirements (PS6, Paragraph 15) apply to both, the effect on the terrestrial habitat will be minimal, given the size of the footprint with respect to overall size of the desert. NNL mitigation requirements will therefore be focused on the air space given the potential impact on MSBs, except for the Egyptian Spiny-tailed Lizard also considered a priority biodiversity value in the CEA that may be disturbed by earthmoving activities. Other species of stakeholder concern

In addition to CHA and priority biodiversity values identified in the CEA four MSBs were identified as of potential stakeholder concern. Aligned with assigning the Rift Valley/Red Sea flyway airspace as Natural Habitat these species will also be subject to NNL requirements where feasible, as explained above.

- Saker Falcon (IUCN Red List – Endangered),
- Sooty Falcon (IUCN Red List – Vulnerable),
- Eastern Imperial Eagle (IUCN Red List – Vulnerable),
- Lesser Spotted Eagle (IUCN Red List – Least Concern).

6 PROTECTED AREAS AND INTERNATIONALLY RECOGNISED AREAS

As discussed earlier, the Project site overlaps (with an area of 1km^2) with Gebel El Zeit Important Bird Area (IBA) (Figure 7). This internationally recognised area is *de facto* also a Key Biodiversity Area. This IBA is a 100 km-long strip extending from Ras Ghareb to the bay of Ghubbet El Gemsa, along the Gulf of Suez. The Gebel El Zeit area is a very important migration corridor and stop off point for soaring migrants, particularly birds of prey and storks. It is the narrowest point in the southern part of the Gulf of Suez. Over 250,000 White Storks and many other migrant soaring birds are funnelled through this stretch of coast on both spring and autumn journeys. Birds of prey, storks and pelicans migrate through and usually land, rest or roost near the coastline and on the surrounding desert plains and hills. The IBA is classified under criteria A1 (site regularly holding significant numbers of globally threatened species) and A4 (site known to hold congregations of more than 1% of the global population of a species).

Malahet Ras Shukeir is a small area (107 km^2) located 40 km south of Ras Ghareb town that has been proposed as a National Protected Area in 1999. El-Galala El-Qebalya is a proposed protected area to the north of the Project. Details on the proposed area are scant.

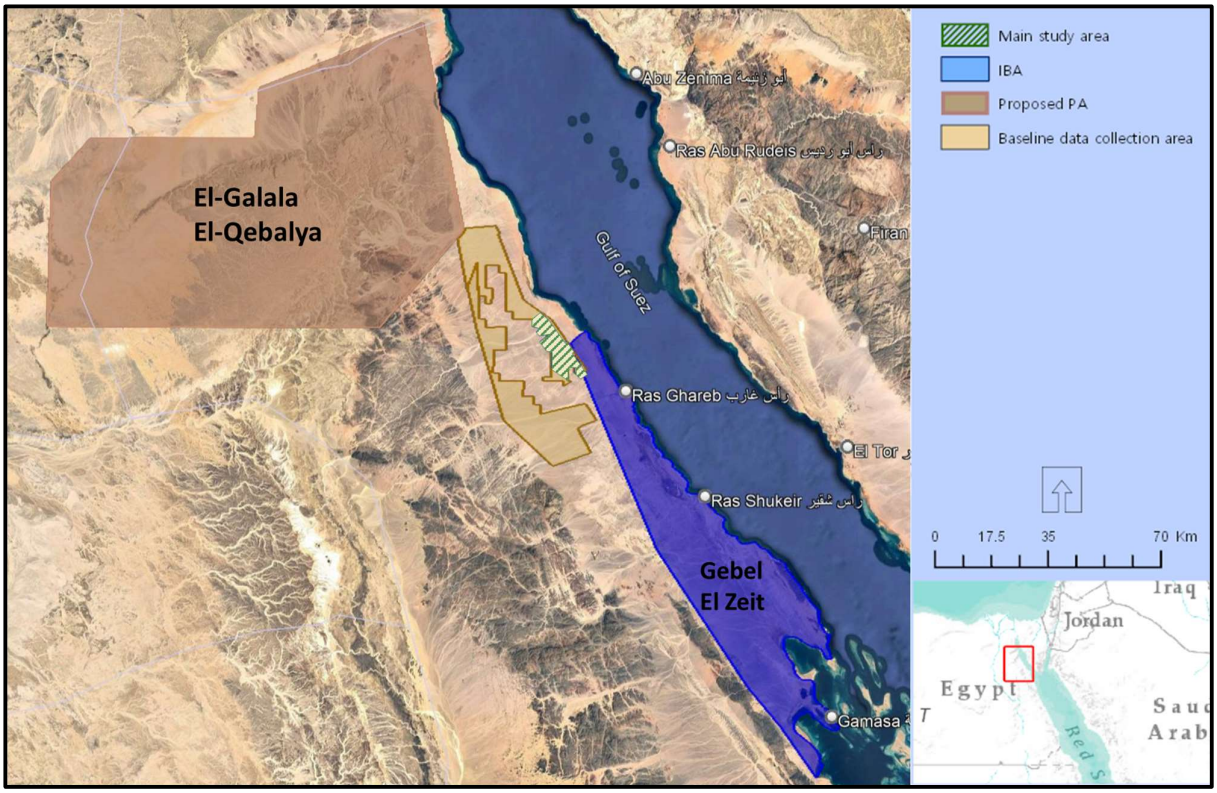


Figure 7: IBAs and PAs in the vicinity of the Project

7 IMPLICATIONS AND NEXT STEPS

The Project qualifies as within Critical Habitat under Criterion 3 for five MSB bird species. The project has a small overlap with the Gebel El Zeit IBA, however there is no evidence from field surveys that the overlap is used as a stop-over during migration. However, recognizing the status of the Gebel El Zeit IBA as an internationally recognized area of conservation importance, no project related activities will take place in the area overlapping with the IBA, including but not limited to the installation of turbines or associated infrastructure.

This recognition of biodiversity importance is based on the biodiversity values and *not* the potential impacts associated with the Project.

The Project will need to pay special attention to management of biodiversity impacts, particularly to avoid collisions of migratory soaring birds and highlights the priority biodiversity that the Project needs to consider during more detailed mitigation planning.

Where significant adverse impacts are predicted to occur, lender standards require projects to carefully follow the mitigation hierarchy. The five CH species will be subject to IFC net gain (NG) requirements. Additionally, five priority MSBs identified in the Amunet CEA along with Egyptian Spiny-tailed Lizard will be subject to IFC Natural Habitat NNL requirements.

There is a burden of proof on the Project to demonstrate that it is feasible to deliver no net loss or net gain. This can be performed by an evaluation of potential direct and indirect residual impacts. The Project has developed a CEA which identifies those species at highest risk from project related impacts and recommends potential migration actions that can be taken to mimimize these.

The cumulative effects and residual impact assessments will provide necessary information for the development of a Biodiversity Action Plan (BAP). The BAP should summarise anticipated impacts, demonstrate how the Project will apply the mitigation hierarchy, and forecast how the Project will achieve net gain and no net loss requirements for CH species and other priority biodiversity values respectively. The project will implement a comprehensive shut-down on demand programme designed to reduce impacts to negligible levels, and a robust long-term monitoring, evaluation, and adaptive management plan and explore offset and/or additional conservation actions, depending on the extent of residual impacts.

Following this step-by-step approach and developing these biodiversity documents will enable the Project to follow industry good-practice IFC standards for biodiversity. Demonstrating good practice through such biodiversity management will offer the Amunet Project an opportunity to lead practice in the region.

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APPENDIX 1

PS6 Critical Habitat Criterion 3 assessment for eight MSB species that were determined to have a total Rift Valley / Red Sea flyway population equal to or exceeding 1% of the global population.

For each species the assessment compares the season maximum number of individuals landing and low-flying (<120m) within the main Area of Analysis (*mAoA*) against the 1% minimum global population estimate. In the assessment birds resting/roosting are regarded as an indication of a stopover area and birds low flying regarded as an aggregation within the flyway, and characteristic of 'a bottleneck site'.

The assessment is based on ESIA baseline bird flight activity data from three spring migration seasons 2020-22 and two autumn migration seasons 2020-21.

Species highlighted red are the 5 species which exceed Critical Habitat Criterion 3 thresholds based on the information used in this assessment.

	Global/IFC criterion 3 threshold		*mAoA* max seasonal species estimates		*mAoA* max seasonal low-flying height assessment		Stopover assessment		Overall assessment		
Columns	A	B	C	D	E	F	G	H	I	J	K
Species	Minimum global population estimate	1% of minimum global population estimate	Seasonal maximum number of individuals recorded flying through the Amunet CHA *mAoA*	Seasonal estimate of % of the global population flying through the Amunet CHA *mAoA* [column C / column A]	Seasonal maximum number of individuals recorded flying through the Amunet CHA area of analysis ('study area') at a height with potential to interact with terrestrial structures in the landscape (i.e.,< 120m above ground level)	Seasonal estimate of % of the global population recorded flying through the Amunet CHA area of analysis ('study area') at a height with potential to interact with terrestrial structures in the landscape (i.e.,< 120m above ground level) [column E / column A]	Seasonal maximun number of indivduals recorded landing (stopover) within the Amunet CHA *mAoA*	Seasonal estimate of % of global population recorded resting/roosting (stopover) within the within the Amunet CHA *mAoA* [column G / column A	Number of individuals fulfilling Amunet CHA stopover/low flying criteria [column E + column G]	% of global population fulfilling Amunet CHA stopover/low flying Critical Habitat criteria [column I / column A]	Project lies within Critical Habitat (Citerion 3) for this species Y/N
Levant Sparrowhawk	**16700**	**167**	**6060**	**36.3%**	**801**	**4.8%**	**0**	**0%**	**801**	**4.8%**	**Yes**
Steppe Eagle	**78042**	**780**	**6791**	**8.7%**	**891**	**1.1%**	**2**	**0%**	**891**	**1.1%**	**Yes**
Greater Spotted Eagle	6513	65	21	0.3%	1	0.0%	0	0%	1	0.0%	No
Eurasian Buzzard	3340000	33400	29711	0.9%	5090	0.2%	5	0%	5090	0.2%	No
Black Stork	**24000**	**240**	**3202**	**13.3%**	**1631**	**6.8%**	**0**	**0%**	**1631**	**6.8%**	**Yes**
White Pelican	**260000**	**2600**	**19616**	**7.5%**	**14451**	**5.6%**	**0**	**0%**	**14451**	**5.6%**	**Yes**
European Honey Buzzard	309430	3094	10735	3.5%	727	0.2%	1	0%	727	0.2%	No
White Stork	**700000**	**7000**	**127607**	**18.2%**	**36805**	**5.3%**	**80**	**0%**	**36805**	**5.3%**	**Yes**