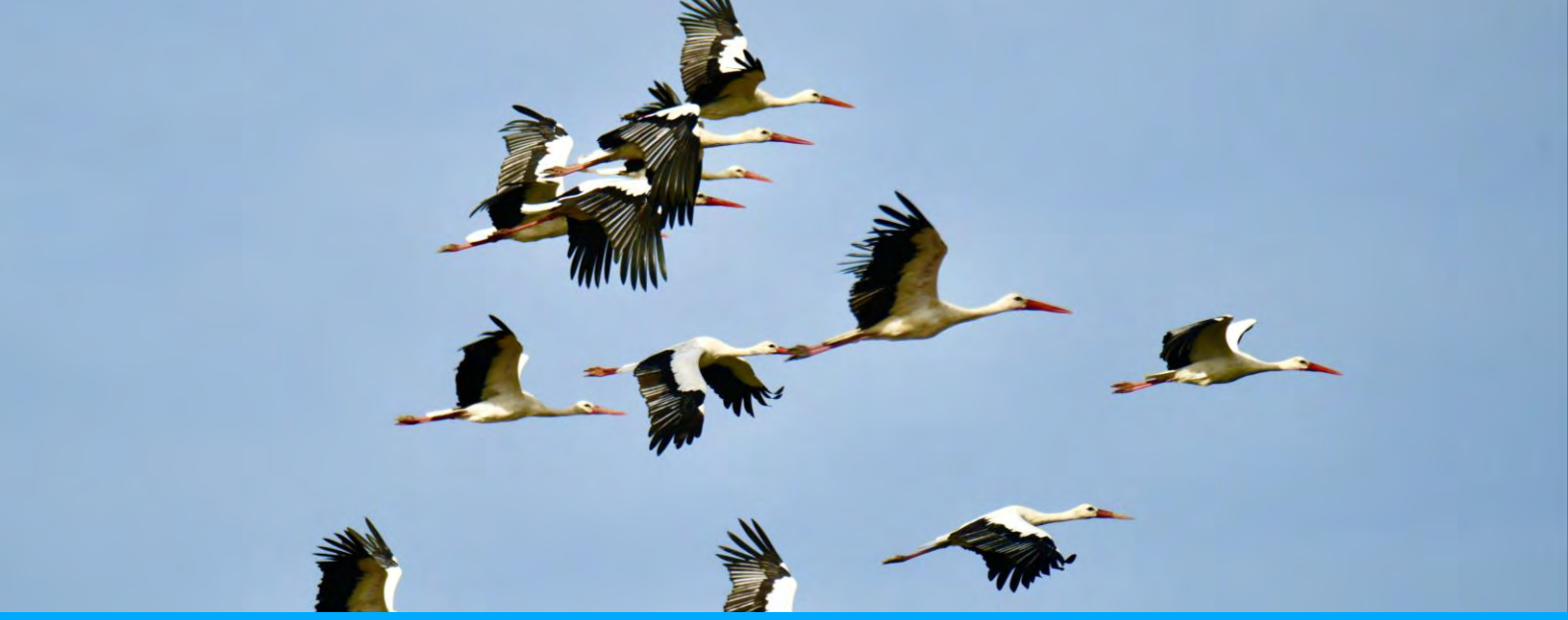

Draft final Cumulative Effects Analysis for the Scatec wind farm, Egypt

13 migratory bird species, three bat species, and one ecosystem as priority VECs for the Project, with impact thresholds varying from 0 – 5 for the migratory birds.

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Report date: March 2025

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Executive summary

This report presents the Cumulative Effects Analysis (CEA) to biodiversity of wind farm development by Scatec ASA (Scatec) in the Ras Gharib – Gebel El Zeit area on the Gulf of Suez, Egypt (the Project). The analysis identifies priority Valued Environmental Components (VECs) which are most at risk from the combined impacts of existing and potential wind developments and sets impact thresholds for adaptive management of mitigation measures. Additional actions that Scatec will undertake or support to contribute to managing cumulative effects of their developments together with others in the region are also presented.

To determine priority VECs for the Project, an approach modelled on the Tafila Region Wind Power Projects Cumulative Effects Assessment (IFC 2017), modified to the local conditions and data available, was developed. This approach uses information on species status, abundance and behaviour in the study area to determine each species *vulnerability*, the *relative importance* of the study area population (in combination, the *sensitivity* of the species to impacts) and the *likelihood of effect* to determine species of higher *overall risk* which should be considered as priority VECs for the project. Slightly different input parameters were used for birds, non-bird species and habitats. This results in **13 migratory birds, three bats, and one ecosystem as priority VECs for the Project** (Table 1). Impact thresholds have been set for bird VECs, which is the annual number of fatalities considered as a significant impact, and above which an adaptive management response is triggered, including the potential for changes to mitigation.

In addition the Project has carried out a Critical Habitat Assessment (TBC 2024) which identified 12 birds and Critical Habitat (CH) values and nine birds and one reptile as Priority Biodiversity Features (PBFs) (Table 1). The Project has a Net Gain target for Critical Habitat-qualifying biodiversity, and a No Net Loss target for priority VECs[1] and PBFs: species in all three groups are the target for on-site impact mitigation. Thresholds for CH-qualifying values and PBFs which are not priority VECs have been set following the same approach as for priority VECs.

In step 5, a set of Mitigation and Monitoring Actions are proposed (Section 6). These include those to be adopted by Scatec for their current project, and those that Scatec will undertake or support in order to contribute to managing cumulative effects from wind farm developments in the wider region. These mitigation and monitoring actions are aimed at minimizing turbine blade and power line collision fatalities for the 13 bird and three bat priority VECs, as well as for the one habitat VEC (wadis), during the construction and operational phases. The approach follows Good International Industry Practice (GIIP) and focuses on two areas:

- On-site mitigation and monitoring methods, to minimise collision risk, validate the effectiveness of proposed mitigation methods, allow estimation of residual impacts and provide information to adapt monitoring and mitigation to prevailing conditions; and,
- Collaborative efforts with other wind farm entities, to minimise the cumulative effects of all the proposed wind farm developments in the area.

[1] Priority VECs in the CEA would be considered the focus of NNL in the project area (following IFC 2017).

Table 1. Priority VECs (in bold), CH species in '( )' and PBFs in '[ ]' for the Scatec wind farm Project.

Species	Scientific name	Type	IUCN status*	CH	PBF	Overall risk	Threshold (fatalities / year)
Black Kite	*Milvus migrans*	Bird	LC		✓	Major	3
Black Stork	*Ciconia nigra*	Bird	LC	✓		Major	3
Booted Eagle	*Hieraaetus pennatus*	Bird	LC		✓	Moderate	0
Common Crane	*Grus grus*	Bird	LC	✓		Major	3
Eastern Imperial Eagle	*Aquila heliaca*	Bird	VU	✓		Major	0
(Egyptian Vulture)	*Neophron percnopterus*	Bird	EN	✓		Minor	0
Eurasian (Steppe) Buzzard	*Buteo buteo*	Bird	LC	✓		Major	5
European Honey-buzzard	*Pernis apivorus*	Bird	LC	✓		Major	5
Great White Pelican	*Pelecanus onocrotalus*	Bird	LC	✓		Major	3
Greater Spotted Eagle	*Clanga clanga*	Bird	VU	✓		Major	0
[Lesser Kestrel]	*Falco naumanni*	Bird	LC		✓	Screened out	3
(Lesser Spotted Eagle)	*Clanga pomarina*	Bird	LC	✓		Minor	3
Levant Sparrowhawk	*Accipiter brevipes*	Bird	LC	✓		Major	3
[Long-legged Buzzard]	*Buteo rufinus*	Bird	LC		✓	Minor	0
Pallid Harrier	*Circus macrourus*	Bird	NT		✓	Moderate	0
[Red-footed Falcon]	*Falco vespertinus*	Bird	VU		✓	Screened out	0
[Saker Falcon]	*Falco cherrug*	Bird	EN		✓	Negligible	0
[Short-toed Snake-eagle]	*Circaetus gallicus*	Bird	LC		✓	Minor	0
[Sooty Falcon]	*Falco concolor*	Bird	VU		✓	Negligible	0
Steppe Eagle	*Aquila nipalensis*	Bird	EN	✓		Major	0
White Stork	*Ciconia ciconia*	Bird	LC	✓		Major	5
Desert Pipistrelle	*Hypsugo ariel*	Mammal	DD			Major	Not established
Botta's Serotine	*Eptesicus bottae*	Mammal	LC			Moderate	Not established
Rüppel's Pipistrelle	*Pipistrellus rueppellii*	Mammal	LC			Moderate	Not established
[Egyptian Spiny-tailed Lizard]	*Uromastyx aegyptia*	Reptile	VU		✓	N/A	N/A
Wadi		Ecosystem				Not evaluated	N/A

1 Scope and objectives

This report presents a Cumulative Effects Analysis (CEA) to biodiversity of wind farm developments by Scatec ASA (Scatec) and other operations in the Gulf of Suez, Egypt. It aims to identify priority Valued Environmental Components[2] (VECs) for the Scatec site which are most at risk from the combined impacts of all the existing and potential wind developments identified within the study area (see Section 1.1), and sets impact thresholds for adaptive management of mitigation measures. The report presents, for the Scatec project:

- A list of potential biodiversity VECs;
- Identification of biodiversity VECs with 'sensitivity' to wind farm developments;
- A list of priority biodiversity VECs assessed to be at highest risk of cumulative effects from wind farm development in the study area;
- Impact threshold for priority bird VECs; and
- Mitigation, monitoring and other management opportunities for Scatec relevant to priority biodiversity VECs, including identifying opportunities where Scatec can contribute to the management of cumulative effects.

The analysis broadly follows the approach developed in the equivalent CEA reports for the Tafila Region Wind Power Projects in Jordan and the Lekela North Ras Ghareb wind farm in Egypt (IFC 2017; TBC 2019), along with the IFC's general guidance on cumulative impact assessment (IFC 2013). The approach has been adapted to the local context, particularly to account for the variation in quality and quantity of baseline data which have been collected by different developers in the landscape.

1.1 The Project and study area

The Scatec Project (the Project) is a 200 MW wind energy facility with approximately 25 turbines and associated infrastructure (e.g. Project roads, a sub-station and high voltage Overhead Transmission Line (OHTL)). The Project will be developed in the eastern desert by the Red Sea coast, near the Gulf of Suez (Egypt), in the Gabel el Zeit region of the Red Sea Governorate, approximately 35 km south of the coastal town of Ras Gharib (Figure 1). The region has been designated by the Egyptian New and Renewable Energy Authority (NREA) for wind farm development and NREA has acquired this land from the Government of Egypt and identified five clusters of individual wind farm plots within the area. Scatec has acquired a plot, identified in Figure 1, to develop a 200 MW wind energy facility. The CEA study area is the full NREA area as shown in Figure 1.

[2] This analysis focuses only on globally significant biodiversity values, species and ecosystems. The analysis does not include any evaluation of potential ecosystem service VECs. In addition, consultation with Egyptian stakeholders has not been feasible, and therefore VECs which might be considered as a priority by local experts, but not readily identifiable with global data sets, might be missed. A stakeholder review and input process is recommended to address this gap (see section 7)

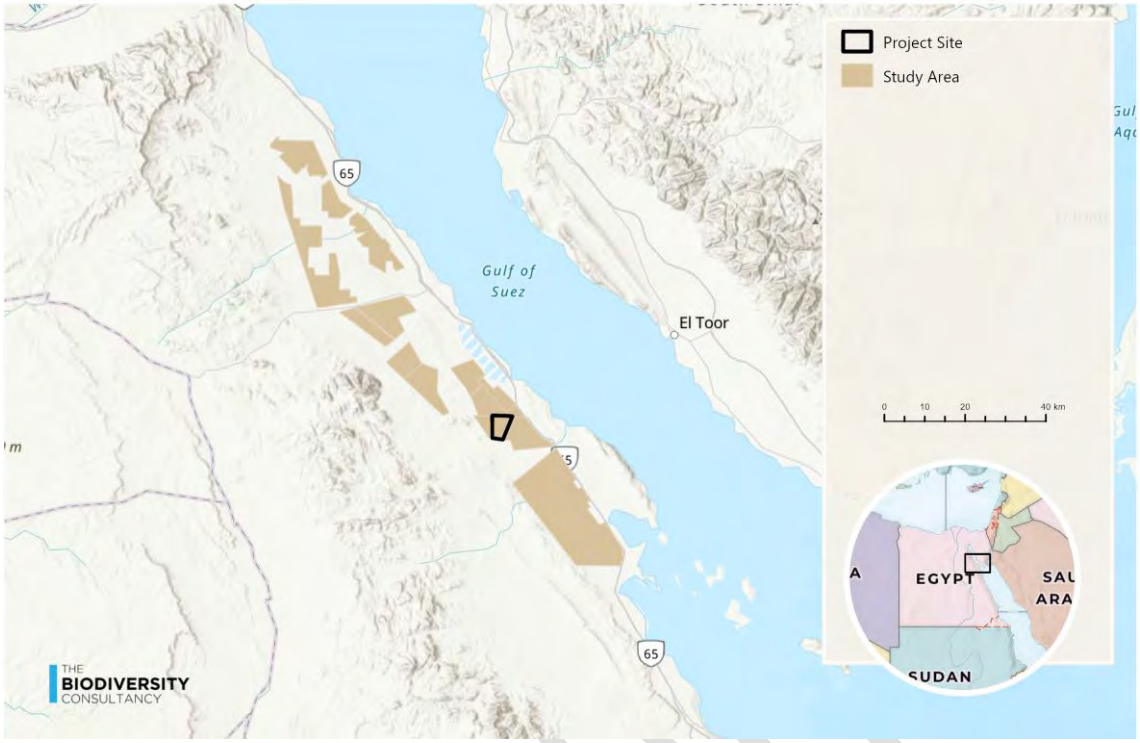

Figure 1. The Scatec site and wider study area, considering current and likely future wind developments.

1.2 On-site management of biodiversity risk

The Scatec wind farm Project has completed a Critical Habitat Assessment (CHA) (TBC 2024) which determined that the Project is located in an area of Critical Habitat (following IFC 2012; EBRD 2019; EIB 2022) for 12 species: Black Stork, Common Crane, Eastern Imperial Eagle, Egyptian Vulture, Eurasian (Steppe) Buzzard, European Honey-buzzard, Great White Pelican, Greater Spotted Eagle, Lesser Spotted Eagle, Levant Sparrowhawk, Steppe Eagle and White Stork (Table 2). Ten Priority Biodiversity Features (PBFs) (EBRD 2019, 2023) have also been identified for the Project: Black Kite, Booted Eagle, Lesser Kestrel, Long-legged Buzzard, Pallid Harrier, Red-footed Falcon, Saker Falcon, Short-toed Eagle, Sooty Falcon and Egyptian Spiny-tailed Lizard (Table 2). The CHA also found that the Project is in an area of primarily Natural Habitat (as defined by IFC 2012, 2019).

The Project must demonstrate a Net Gain for each Critical Habitat-qualifying species in accordance (following IFC 2012; EBRD 2019; EIB 2022). EBRD PR6 also requires no net loss (NNL) and preferably a net gain (NG) of PBFs over the long term, to achieve measurable conservation outcomes, while IFC PS6 also requires NNL of Natural Habitat and associated significant biodiversity, where feasible.

1.3 Periodic review of the CEA

This CEA will be reviewed every two years and updated in response to any new or changed information that has become available since the initial document or previous update. Changes which may affect the findings of this CEA include information:

- Recorded at the site: e.g. higher counts for a species than used in the priority VEC identification process, a lesser proportion of a species flying at low altitudes; or
- About the regional or global status of a species: e.g. a species being upgraded from Vulnerable to Endangered, a species' population trend changing from 'declining' to 'stable'.

Any implications for the project from changes to the findings of this CEA in response to an update of this document (e.g. either the species which are considered as priority VECs or the thresholds defined for a priority VEC) will only apply from the time that such an update is published and will not be applied retrospectively.

Table 2. Species considered to be Critical Habitat-qualifying and Priority Biodiversity Features

Species	Scientific name	IUCN Red List status	CH species / PBF
Black Kite	*Milvus migrans*	LC	PBF
Black Stork	*Ciconia nigra*	LC	Qualifies as CH
Booted Eagle	*Hieraaetus pennatus*	LC	PBF
Common Crane	*Grus grus*	LC	Qualifies as CH
Eastern Imperial Eagle	*Aquila heliaca*	VU	Qualifies as CH
Egyptian Spiny-tailed Lizard	*Uromastyx aegyptia*	VU	PBF
Egyptian Vulture	*Neophron percnopterus*	EN	Qualifies as CH
Eurasian (Steppe) Buzzard	*Buteo buteo*	LC	Qualifies as CH
European Honey-buzzard	*Pernis apivorus*	LC	Qualifies as CH
Great White Pelican	*Pelecanus onocrotalus*	LC	Qualifies as CH
Greater Spotted Eagle	*Clanga clanga*	VU	Likely qualifies as CH
Lesser Kestrel	*Falco naumanni*	LC	PBF
Lesser Spotted Eagle	*Clanga pomarina*	LC	Qualifies as CH
Levant Sparrowhawk	*Accipiter brevipes*	LC	Qualifies as CH
Long-legged Buzzard	*Buteo rufinus*	LC	PBF
Pallid Harrier	*Circus macrourus*	NT	PBF
Red-footed Falcon	*Falco vespertinus*	VU	PBF
Saker Falcon	*Falco cherrug*	EN	PBF
Short-toed Snake-eagle	*Circaetus gallicus*	LC	PBF
Sooty Falcon	*Falco concolor*	VU	PBF
Steppe Eagle	*Aquila nipalensis*	EN	Qualifies as CH
White Stork	*Ciconia ciconia*	LC	Qualifies as CH

2 The VEC screening process

VECs are attributes, both environmental and social, that are considered important in assessing the risks that a project, or suite of projects poses to the environment. VECs may include (IFC 2013):

- Physical features, habitats, wildlife populations (e.g., biodiversity);
- Ecosystem services;
- Natural processes (e.g., water and nutrient cycles, microclimate);
- Social conditions (e.g., health, economics); or
- Cultural aspects (e.g., traditional spiritual ceremonies).

Identification of VECs in this analysis is restricted to flora and fauna species and habitats. The analysis was carried out via a desk-based exercise using published and grey literature, and available spatial databases (accessed under licence from the Integrated Biodiversity Assessment Tool (IBAT)[3]. The need for rapid identification of risks to meet the project development time-line precluded the opportunity to carry out additional field work and stakeholder consultation, which might have led to additional VECs being identified.

3 The Cumulative Assessment framework for birds

3.1 Overview of the framework for birds

The framework for birds has two objectives: to identify bird species at highest risk from the potential impacts of developments in the study area, and to propose mitigation, monitoring and other management activities to address risks to those bird species. This framework follows a five-step process:

- **Step 1**: Develop a preliminary list of potential bird VECs comprising species potentially at risk from developments in the study area, because they are either known or predicted to occur in the study area (see Section 3.2).
- **Step 2**: Determine the relative *sensitivity* of the species, being a combination of the:
  - *Vulnerability* of the species; and
  - *Relative Importance* of the species' population in relation to the appropriate Unit of Analysis (UoA), i.e. the flyway population or global distribution (see Section 3.3).

[3] IBAT is a global biodiversity dataset setup by a partnership between BirdLife International, Conservation International, the International Union for Conservation of Nature (IUCN) and United Nations Environment Program World Conservation Monitoring Centre (UNEP-WCMC). It enables the access to key biodiversity datasets, such as the IUCN Red List, IUCN/UNEP-WCMC Protected Planet, IUCN-BirdLife Key Biodiversity Areas, etc. Integrated Biodiversity Assessment Tool (IBAT).

Species which were determined to have negligible *sensitivity* were dropped from analysis before proceeding to Step 3. For species where the flyway population comprised <1% of the global population, and for which any impact would be negligible for the species at a global level, were also dropped at this stage.

- **Step 3:** Determine the *overall risk* to the species from the cumulative effects of wind farm developments within the study area, being a combination of the:
  - *Sensitivity* of the species, as identified in Step 2; and
  - Cumulative *Likelihood of Effect* (LoE) rating for each species (see Section 3.4).

Those species with an *overall risk* of Major or Moderate are considered to be priority bird VECs for the project.

- **Step 4:** Determine an impact threshold for each priority bird VEC, being the point at which further fatality would be a risk to long-term viability of the population (see Section 3.5); and,
- **Step 5:** Propose a range of mitigation, monitoring and management actions, to avoid fatalities of priority bird VECs, and to accurately estimate priority bird VEC fatalities to facilitate compliance with thresholds and inform adaptive management responses (see Section 6).

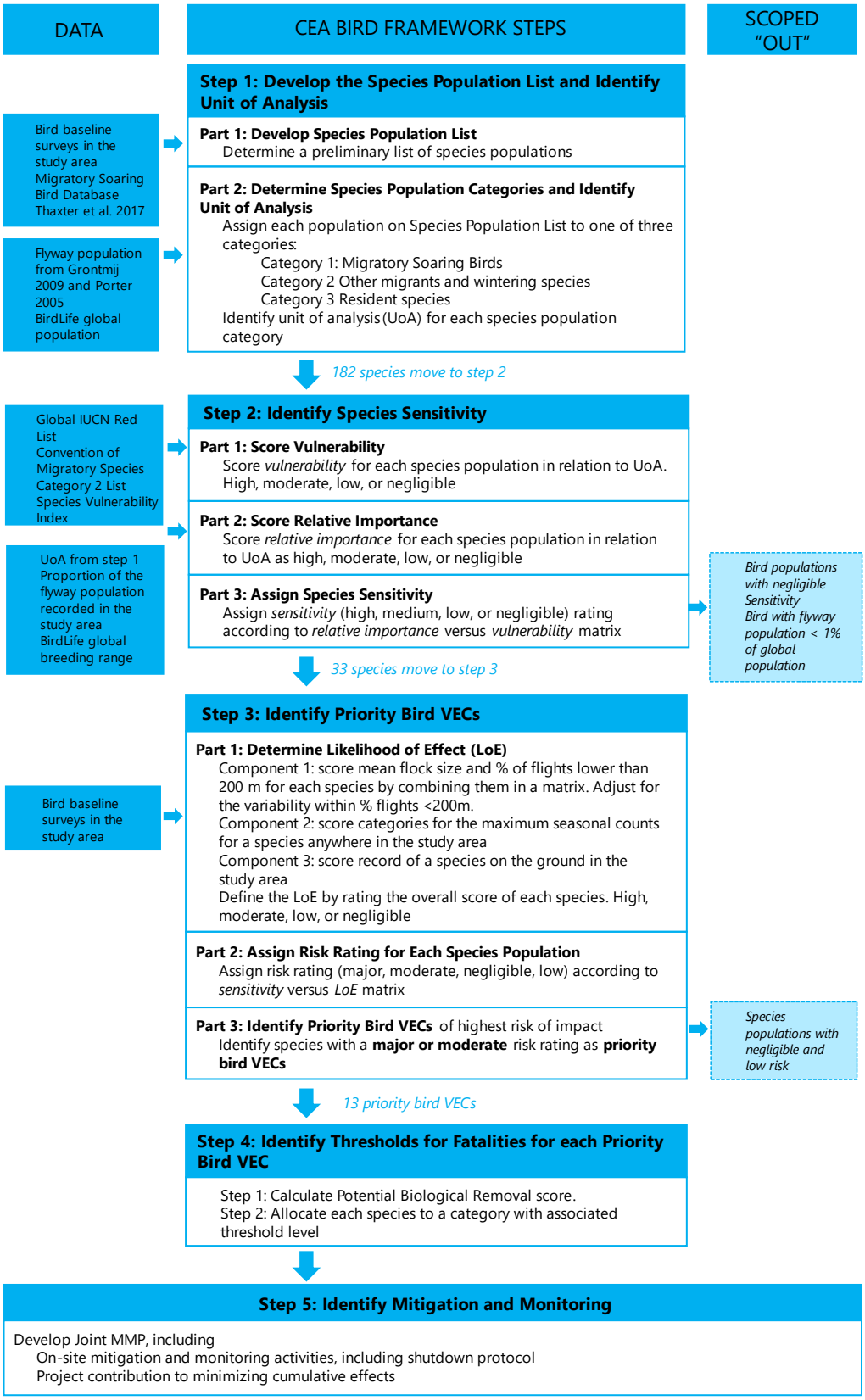

Figure 2. Process for cumulative effects analysis for priority bird VECs

3.2 Step 1 – Develop the bird species population list and identify the Units of Analysis

The purpose of Step 1 is to identify all bird species or populations that could potentially be at risk from the cumulative effects of the study area and to determine a relevant UoA by which any effects on each species or population should be measured.

3.2.1 Methods

A species list of all bird species known or likely to be present in the study area was extracted from IBAT, supplemented with any additional species recorded in:

- The Bird Migration Study (BMS), Environmental & Social Impact Assessment (ESIA) and Critical Habitat Assessment (CHA) for the Suez Wind Energy (SWE) wind farm Plot 2, adjacent to the Scatec Project to the east, which present bird baseline studies from spring and autumn 2022 and 2023 (EcoConServ *et al.* 2023, 2024a, 2024b, 2024c, 2024d);
- Migration of Soaring Birds at Gebel el Zeit (IBA) in relation to wind energy developments (Camiña Cardenal *et al.* 2024);
- RCREEE Strategic and Cumulative Environmental and Social Assessment Active Turbine Management Program (ATMP) for Wind Power Projects in the Gulf of Suez (Lahmeyer International & Ecoda 2018);
- The ESIA of Alfa Wind Project (EcoConServ 2016);
- Italgen Gabal El-Zeit 320 MW bird baseline studies in autumn 2008, spring 2009, autumn 2013, spring 2014 and autumn 2016 (Grontmij 2009; EcoConServ 2014, 2017);
- A survey in autumn 2006 in Gebel El Zeit Important Bird Area (Hilgerloh *et al.* 2011);
- Species qualifying the listing of Gebel El Zeit as an Important Bird and Biodiversity Area (BirdLife International 2024a);
- The Migratory Soaring Birds Tool (BirdLife International 2023), filtered by species mapped as occurring in the project area; and,
- The list of bird species included in the assessment of global vulnerability to wind power development compiled by Thaxter *et al.* (2017), filtered by species mapped in IBAT as occurring in the project area.

These species were then allocated to one of three categories, and an appropriate UoA determined for each category:

- **Category 1**: Migratory Soaring Bird populations (as per BirdLife International 2018), with the UoA being the Rift Valley / Red Sea flyway population. Data on populations of these species were sourced from Grontmij (2009), supplemented with information from Porter (2005) and TBC (2023) as needed;
- **Category 2**: Other migrants and wintering species' populations, with the UoA being the global breeding range extent (taken from BirdLife International 2024b), as no

national or regional estimates exist which would allow definition of a smaller UoA; or,

- **Category 3**: Resident species populations, with the UoA being the same as for Category 2 species.

3.2.2 Results

Step 1 produced a species population list of 182 bird species (Table 3, Appendix 1).

Table 3. List of bird species known or likely to be present in the study area

Order		Unit of Analysis			Number of potential VECs
Common Name	Family	Category 1 – MSB populations	Category 2 - Other migrants and wintering populations	Category 3 - Resident populations	
Diurnal birds of prey	*Accipitriformes*	19	0	4	**23**
Waterbirds	*Anseriformes*	0	8	0	**8**
Swifts, tree swifts and hummingbirds	*Apodiformes*	0	1	0	**1**
Hornbills, hoopoes, wood hoopoes	*Bucerotiformes*	0	1	0	**1**
Nightjars	*Caprimulgiformes*	0	1	0	**1**
Shorebirds	*Charadriiformes*	0	39	6	**45**
Storks	*Ciconiiformes*	2	0	0	**2**
Pigeons and doves	*Columbiformes*	0	0	1	**1**
Kingfishers and related species	*Coraciiformes*	0	3	0	**3**
Cuckoos	*Cuculiformes*	0	1	0	**1**
Falcons and Caracaras	*Falconiformes*	9	0	0	**9**
Ground feeding birds	*Galliformes*	0	1	1	**2**
Cranes, crakes and rails	*Gruiformes*	2	3	0	**5**
Perching birds	*Passeriformes*	0	56	11	**67**
Ibises, herons and pelicans	*Pelecaniformes*	1	4	4	**9**
Flamingos	*Phoenicopteriformes*	0	0	1	**1**
Sandgrouse	*Pteroclidiformes*	0	0	1	**1**
Nocturnal birds of prey	*Strigiformes*	0	1	0	**1**
Cormorants, gannets and boobies	*Suliformes*	0	1	0	**1**
	Totals	33	120	29	**182**

3.3 Step 2 – identify bird species' sensitivity

The purpose of Step 2 is to determine the *sensitivity* of each species or population identified in Step 1 based on its *vulnerability* at a national, regional, or international scale, depending on the UoA, and the *relative importance* of the study area to the population.

3.3.1 Methods

Sensitivity as considered here relates to the species' population known or likely to be present in the study area, and combines two components:

- **Vulnerability** was determined using; IUCN global threat status (IUCN 2024); IUCN North African threat status (Garrido *et al.* 2021); Category 2 of Annex 3 of the Convention of Migratory Species (CMS), reflecting species considered to have an unfavourable conservation status at a regional level within the Range States and territories, and also the Species Vulnerability Index (SVI) for species, mainly soaring birds, where this has been assessed (BirdLife International 2018). The guidance and associated ratings used to assess vulnerability are summarised in Table 4;
- **Relative importance** for Migratory Soaring Birds (MSBs) is the proportion of the Rift Valley / Red Sea flyway population recorded in the study area, and for other migrants/wintering populations and for resident species the global breeding range. The scoring and associated ratings used to assess relative importance for (1) MSBs and, (2) other migrants/wintering, and resident populations are summarized in Table 5 and Table 6 respectively. For the population recorded in the study area, this number was taken as the maximum count recorded in any season for any survey.

The *sensitivity* of the species is subsequently assigned based on a matrix (Table 7) that accounts for the combined *vulnerability* and *relative importance* ratings for each species. Species with a negligible *sensitivity* did not progress to Step 3. Additionally, species where the estimated flyway population was <1% of the total estimated global population were discounted, to reflect the very low importance of the Rift Valley / Red Sea flyway population at a global level[4].

Table 4. Vulnerability rating criteria

Vulnerability	Migratory Soaring Birds (and other species where an SVI has been designated)	Other migrants and Resident species *
Negligible	• LC on IUCN Global Red List, and SVI of 6 or below	LC on IUCN Global Red List, or LC on North African Red List (for resident species)
Low	• VU or NT on IUCN Global Red List and SVI 6 or below; • LC on IUCN Global Red List and SVI of 7 or 8; or	NT on IUCN Global Red List, or NT on North

[4] This resulted in the exclusion of Eurasian Sparrowhawk and Oriental Honey Buzzard.

Vulnerability	Migratory Soaring Birds (and other species where an SVI has been designated)	Other migrants and Resident species *
	• CMS Category 2 Species and SVI of 6 or below	African Red List (for resident species)
Moderate	• VU or NT on IUCN "Global" Red List and SVI of 7 or 8; • LC on IUCN Global Red List and SVI of 9 or 10; or • CMS Category 2 Species and SVI of 7 or 8	VU on IUCN Global Red List, or VU on North African Red List (for resident species)
High	• CR or EN on IUCN Global Red List; • VU or NT on the IUCN Global Red List and SVI of 9 or 10; or • CMS Category 2 Species and SVI 9 or 10	CR or EN on IUCN Global Red List, or CR/EN on North African Red List (for resident species)
Note: * LC – Least Concern, NT – Near Threatened, VU – Vulnerable, EN – Endangered, CR – Critically Endangered		

Table 5. Relative importance rating for Migratory Soaring Birds

Relative Importance	Maximum total count for a species within a single season from any one project in the study area as a percentage of flyway population
Negligible	≤ 1%
Low	>1% and ≤ 5%
Moderate	>5% and ≤10%
High	>10%

Table 6. Relative importance rating for other migrants and resident species

Relative Importance	Global resident or breeding range (km2) – extent of occurrence
Negligible	>10,000,000
Low	>100,000 and <10,000,000
Moderate	>50,000 and <100,000
High	<50,000

Table 7. Sensitivity rating matrix

Sensitivity		Relative Importance			
		Negligible	Low	Moderate	High
Vulnerability	Negligible	Negligible	Negligible	Low	Low
	Low	Negligible	Low	Low	Medium
	Moderate	Low	Low	Medium	High
	High	Low	Medium	High	High

3.3.2 Results

Step 2 produced a list of 33 bird species with greater than negligible *sensitivity* (Table 8)[5], of which eight were assessed as High sensitivity.

Table 8. Rating at Step 2 for species with greater than negligible sensitivity

Species	Scientific name	Rating		
		Vulnerability	Relative importance	Sensitivity
Bar-tailed Godwit	*Limosa lapponica*	Low	Low	Low
Bateleur	*Terathopius ecaudatus*	High	Negligible	Low
Bearded Vulture	*Gypaetus barbatus*	High	Negligible	Low
Black Kite	*Milvus migrans*	Low	High	Medium
Black Stork	*Ciconia nigra*	Moderate	High	High
Black-winged Pratincole	*Glareola nordmanni*	Low	Low	Low
Booted Eagle	*Hieraaetus pennatus*	Moderate	High	High
Broad-billed Sandpiper	*Calidris falcinellus*	Moderate	Low	Low
Cinereous Bunting	*Emberiza cineracea*	Low	Low	Low
Common Crane	*Grus grus*	Moderate	High	High
Curlew Sandpiper	*Calidris ferruginea*	Moderate	Low	Low
Cyprus Warbler	*Curruca melanothorax*	Negligible	High	Low
Cyprus Wheatear	*Oenanthe cypriaca*	Negligible	High	Low
Demoiselle Crane	*Anthropoides virgo*	Moderate	Negligible	Low
Eastern Imperial Eagle	*Aquila heliaca*	High	Moderate	High
Egyptian Vulture	*Neophron percnopterus*	High	Low	Medium
Eurasian Buzzard	*Buteo buteo*	Low	High	Medium
European Honey-buzzard	*Pernis apivorus*	Low	High	Medium
Great Snipe	*Gallinago media*	Low	Low	Low
Great White Pelican	*Pelecanus onocrotalus*	Moderate	High	High
Greater Spotted Eagle	*Clanga clanga*	High	High	High
Grey Plover	*Pluvialis squatarola*	Moderate	Negligible	Low
Griffon Vulture	*Gyps fulvus*	Moderate	Negligible	Low
Lanner Falcon	*Falco biarmicus*	Low	Moderate	Low
Lesser Spotted Eagle	*Clanga pomarina*	Moderate	Low	Low
Levant Sparrowhawk	*Accipiter brevipes*	Low	High	Medium
Long-legged Buzzard	*Buteo rufinus*	Low	Low	Low
Montagu's Harrier	*Circus pygargus*	Moderate	Negligible	Low
Pallid Harrier	*Circus macrourus*	Moderate	Moderate	Medium
Saker Falcon	*Falco cherrug*	High	Negligible	Low

[5] Two species that were initially rated above a negligible sensitivity but were not carried through to Step 3 due to the low importance of the flyway for the species were the Oriental Honey-buzzard (*Pernis ptilorhynchus*) and Eurasian Sparrowhawk (*Accipiter nisus*).

Species	Scientific name	Rating		
		Vulnerability	Relative importance	Sensitivity
Short-toed Snake-eagle	*Circaetus gallicus*	Low	Low	Low
Steppe Eagle	*Aquila nipalensis*	High	High	High
White Stork	*Ciconia ciconia*	Moderate	High	High

3.4 Step 3 – Conduct the ecological risk assessment and identify priority bird VECs

The purpose of Step 3 is to identify priority bird VECs from the 33 species populations scoped in at Step 2. This is done by combining each species' *sensitivity* score with an estimate of the *Likelihood of Effect* (LoE) which represents the site-specific risk, to identify those populations most at risk from adverse effects of the wind developments in the study area.

3.4.1 Methods

The LoE for each population was scored using three different collision risk components from the study area specific baseline dataset. The scores relate to; flight behaviour (component 1), abundance (component 2), and landing within the study area (component 3)[6]:

- **Component 1**. A matrix-derived score combining (i) the percent of individuals recorded flying below 200 m and (ii) the mean flock size (Table 9). This component is based on the reasoning that (i) those populations with a higher percentage of migrating individuals flying at approximately turbine rotor /powerline height (<200 m) will be at greater risk of collision, and (ii) populations with larger mean flock sizes will potentially have a higher risk of multiple fatality collision events. For each species population the proportion of individuals recorded flying below 200 m was calculated using the total number of individuals where flight height above/below 200 m was recorded. Species with no data for calculating the percent of records <200 m, were scored as having 50% of records <200 m. Mean flock size was derived from the average flock sizes reported during each survey period: no weighting was applied as not all surveys covered the full migration period for all species, and flocking behaviour might vary throughout this period. Species with no data on mean flock size were conservatively scored as having a maximum flock size equal to

[6] Data were sourced from bird migration studies for the Suez Wind Energy (SWE) wind farm Plot 2, adjacent to the Scatec Project to the east (EcoConServ *et al.* 2023, 2024c, 2024d); and bird monitoring studies from the JICA, FIEM and KFW wind farms (Project Blade), adjacent to the Scatec Project to the north (GreenPlus 2021a, 2021b, 2021c, 2022a, 2022b, 2022c, 2022d, 2022e). Where data were scarce, these were supplemented with bird baseline surveys of Lekela North Ras Gharib 250 MW Project (Environics 2016a, 2016b, 2017a, 2017b), located north of the Scatec Project.

the maximum count recorded in a season. For species with values for both percent of individuals below 200 m and mean flock size, the resulting matrix score was increased by one for those species with variability (taken as the standard deviation of all reported values for that species) greater than the median for all species percentage of flights <200 m. This additional precautionary step was added to account for situations where flight height behaviour was very variable and the average percent below 200 m was potentially less informative as a risk predictor;

- **Component 2**. A score based on the maximum total count for a species within a single season from any one project in the study area (Table 9) to reflect the reasoning that species with higher counts in the study area are more likely to be affected by wind developments; and,
- **Component 3**. A score to indicate whether a species had been recorded on the ground within the study area, irrespective of the numbers of individuals involved (species with records of landing scored 1, those without 0). Those species recorded on the ground must pass through the collision risk zone and hence are at greater risk of collision than those species for which landing on the ground has not been recorded.

These three components were summed to arrive at a final LoE score for each species (theoretical range 2-10), which was separated into quartiles to derive a LoE rating for that species (Table 11). This LoE rating was then combined with the *sensitivity* rating from Step 2 to derive an *overall risk* rating (Table 12). Species which had an *overall risk* of major or moderate were considered priority bird VECs for the study area.

Table 9. Matrix for scoring mean flock size and % of flights less than 200 m for each species.

Mean flock size	% of flights <200m			
	0-25	25-50	50-75	75-100
<10	1	1	2	2
10-50	1	2	2	3
50-100	2	2	3	4
>100	2	3	4	4

Table 10. Score categories for the maximum seasonal counts for a species in the study area.

Maximum season count	
Range	**Score**
0 to 10	1
10 to 1000	2
1000 to 10000	3
> 10000	4

Table 11. LoE rating based on overall score for each species evaluated at Step 3

LoE	
Overall score (based on quartiles)	**Level of Effect**

LoE	
≤2	Negligible
>2 and ≤4	Low
>4 and ≤6	Medium
>6	High

Table 12. Overall project risk matrix

Overall risk	Likelihood of effect			
Sensitivity	**Negligible**	**Low**	**Medium**	**High**
Low	Negligible	Minor	Minor	Moderate
Medium	Minor	Minor	Moderate	Major
High	Minor	Moderate	Major	Major

3.4.2 Results

Step 3 identified 13 species with an *overall risk* of major or moderate from the project, and these species are considered priority bird VECs for this analysis (Table 13)[7]. Therefore, the total list of 182 potential VECs has been filtered to 13 species (Table 14).

[7] Note that this list is derived from existing reports and a desk-top analysis. No in-country expert consultation has been carried out for this rapid assessment. Local stakeholder review may identify additional species of particular concern, or provide additional data which could affect the findings.

Table 13. Details of scores and ratings allocated to the 13 species identified as priority bird VECs

Species	Scientific name	Category	Red List status	CMS Category 2	SVI	Vulnerability	Highest count	Flyway population	% of UoA	Relative importance	Sensitivity	% flights <200m	Mean flock size	Variability in % flights <200 m[8]	Highest count	Landing in Area	LoE	Overall risk
Black Kite	*Milvus migrans*	1	LC	No	8	Low	39,090	132,700	29	High	*Medium*	59	7	26	39,090	Yes	*High*	*Major*
Black Stork	*Ciconia nigra*	1	LC	No	10	Moderate	6,738	19,500	35	High	*High*	62	14	22	6,738	Yes	*Medium*	*Major*
Booted Eagle	*Hieraaetus pennatus*	1	LC	No	9	Moderate	362	3,169	11	High	*High*	61	1	26	362	No	*Low*	*Moderate*
Common Crane	*Grus grus*	1	LC	No	10	Moderate	17,518	35,000	50	High	*High*	1	122	N/A	17,518	Yes	*High*	*Major*
Eastern Imperial Eagle	*Aquila heliaca*	1	VU	No	9	High	147	2,125	7	Moderate	*High*	82	1	26	147	Yes	*Medium*	*Major*
Eurasian Buzzard	*Buteo buteo*	1	LC	No	7	Low	153,471	1,250,000	12	High	*Medium*	60	14	31	153,471	Yes	*High*	*Major*
European Honey-buzzard	*Pernis apivorus*	1	LC	No	7	Low	157,055	1,000,000	16	High	*Medium*	51	44	27	157,055	Yes	*High*	*Major*
Great White Pelican	*Pelecanus onocrotalus*	1	LC	No	10	Moderate	54,231	70,000	77	High	*High*	71	294	25	54,231	Yes	*High*	*Major*
Greater Spotted Eagle	*Clanga clanga*	1	VU	No	9	High	3,985	2,180	183	High	*High*	81	7	27	3,985	Yes	*Medium*	*Major*
Levant Sparrowhawk	*Accipiter brevipes*	1	LC	Yes	6	Low	40,699	75,000	54	High	*Medium*	60	586	33	40,699	No	*High*	*Major*
Pallid Harrier	*Circus macrourus*	1	NT	No	8	Moderate	103	1,505	7	Moderate	*Medium*	78	1	30	103	Yes	*Medium*	*Moderate*
Steppe Eagle	*Aquila nipalensis*	1	EN	No	9	High	28,068	37,500	75	High	*High*	53	5	15	28,068	Yes	*High*	*Major*
White Stork	*Ciconia ciconia*	1	LC	No	10	Moderate	505,843	450,000	112	High	*High*	71	1123	26	505,843	Yes	*High*	*Major*

[8] Values are the standard deviation of all values for a species used to calculate the % of flights <200 m.

Table 14. Scoping of species populations in steps 1 to 3 of the Cumulative Effects Analysis

Group	Number of species		
	Step 1	Step 2	Step 3
All birds	**182**	**33**	**13**
Category 1: Migratory Soaring Birds	33	22	13
Category 2: Other migrants and wintering species	120	9	0
Category 3: Resident species	29	2	0
Filtered out	-	*149*	*169*

3.5 Step 4 – The threshold setting process

This step establishes a fatality threshold for each priority bird VEC from wind farm impacts, being the point at which further losses would be a risk to long-term viability of the population. Exceeding threshold values triggers a requirement for adaptive management, and this will lead to a review of wind farm operations and improvements to mitigation measures. The same process was also followed for CH-qualifying species and PBFs which were not also priority VECs.

Species with a declining population trend, either globally or regionally, were automatically assigned a threshold of zero (see Table 15) as existing losses are already likely to have exceeded the level which would pose a risk to long-term viability of the population. For all other species (with stable, unknown or increasing population trends), thresholds were assessed relative to the population size determined by their UoA, which was the Red Sea / Rift Valley flyway population for all species.

3.5.1 Methods

Stage 1: For each priority VEC (with stable, unknown or increasing population trends), the Potential Biological Removal (PBR) value was calculated, representing the annual number of fatalities that could be sustained without compromising long-term population viability. This precautionary approach is appropriate where there is only limited information on a species' population biology and uses species-specific rates of adult survival rate and year of first breeding to calculate an annual rate of human-caused mortality that, in the long term, would likely lead to a nonviable population. The PBR is calculated as:

$$PBR = \frac{1}{2} R_{max} N_{min} f$$

Where:

R_{max} is the annual recruitment rate, which can be calculated from the maximum annual population growth rate via $R_{max} = Y_{max} - 1$. Y_{max} is calculated as:

$$Y_{max} = \frac{(sa - s + a + 1) + \sqrt{(s - sa - a - 1)^2 - 4sa^2}}{2a}$$

with s as the mean annual adult survival and a as the mean age at first breeding (Niel & Lebreton 2005). Information on s and a were sought for each priority VEC, however where this was not available, parameters from a closely-related surrogate species were used (Table 15).

N_{min} is a conservative estimate of population size, and is calculated as:

$$N_{min} = \widehat{N} e^{(Z_p CV_{\widehat{N}})}$$

with $\widehat{N}$ as the population estimate from the UoA, Z_p as the p^{th} standard normal variate (set at -0.842) and $CV_{\widehat{N}}$ is the coefficient of variation for $\widehat{N}$ (set at 10%) (Wade 1998; Dillingham & Fletcher 2008) ; and,

f is the recovery factor, applied as per Dillingham and Fletcher (2008), with f = 0.5 for LC species, 0.3 for VU species and 0.1 for CR or EN species.

Stage 2: The PBR values provide an indication of the potential significance of additional impacts, and were not used to set the thresholds, but rather to assign the species into management categories. Species with a PBR >1,000 were assigned to Category 1, with a PBR 1,000-10,000 were assigned to Category 2 and those with a PBR >10,000 were assigned to Category 3 (Table 15). The rationale behind the categorisation is that for the species with the lowest PBRs any additional impact will have a population-level effect, while those with higher PBRs can cope with some additional mortality.

Potential stakeholder concerns, and the project aim of Net Gain / No Net Loss, have also been considered in setting the thresholds and result in conservative thresholds well below the PBR.

3.5.1.1 Thresholds

During operations, the Project will undertake fatality monitoring and other observations will be continuously through the migration period. Each fatality encountered will be documented in a 'priority bird fatality incident report', including identifying the species, and potential cause of death. These data will be reviewed periodically (timing to be determined) to evaluate whether thresholds have been exceeded, and adaptive management is triggered.

The annual thresholds for each species have been set as follows:

- Category 1 species: zero fatalities;
- Category 2 species: three fatalities;
- Category 3 species: five fatalities; and,
- All categories: An additional threshold is set of 20 fatalities in total, irrespective of the species involved.

The 'all categories' threshold has been set to address a potential scenario where low numbers of all species are impacted, but for which no individual species would trigger a threshold.

3.5.2 Results

Four priority VECs with a declining population trend were automatically assigned a fatality threshold of zero: Eastern Imperial Eagle, Greater Spotted Eagle, Pallid Harrier and Steppe Eagle (see Table 15). The threshold setting process led to one additional species (Booted Eagle) being assigned to Category 1 and so also having a fatality threshold of zero. For these five species, adaptive management actions are required if any fatalities are recorded. Five species were assigned to Category 2 and three species to Category 3. Species-specific PBR values ranged from 63 (Booted Eagle) to approximately 43,700 (Eurasian Buzzard) (Table 15).

3.5.2.1 Thresholds for CH-qualifying species and PBFs

In addition to priority VECs, species which are considered as CH-qualifying and PBFs also require thresholds to inform adaptive management. Thresholds for these species were developed following the same approach as described above the priority VECs. Four species with a declining population trend were automatically assigned a fatality threshold of zero; Egyptian Vulture, Red-footed Falcon, Saker Falcon and Sooty Falcon. The threshold setting process led to two additional species, Long-legged Buzzard and Short-toed Snake Eagle, being assigned to Category 1 and also having a fatality threshold of zero. For these six species, adaptive management actions are required if there are any fatalities. Two species, Lesser Kestrel and Lesser Spotted Eagle, were assigned to Category 2 with a fatality threshold of 3.

Table 15. Input parameters, sources and results for the calculation of the fatality threshold for each bird VEC, and other CH-qualifying species or PBFs.

Species	Scientific name	Unit of analysis	Flyway population	Red List status	Recovery factor	Mean adult survival	Mean age at first breeding	Source for demographic parameters	PBR value	Threshold category	Fatality threshold
Priority VECs											
Black Kite	*Milvus migrans*		132,700	LC	0.5	0.96	4	[9]	2,626	2	3
Black Stork	*Ciconia nigra*		19,500	LC	0.5	0.838	3	Tamás (2011) in eastern Europe	1,804	2	3
Booted Eagle	*Hieraaetus pennatus*	Red Sea / Rift Valley flyway	3,169	LC	0.5	0.96	4	[10]	63	1	0
Common Crane	*Grus grus*		35,000	LC	0.5	0.90	4	Mathews and Macdonald (2000) in the UK	1,005	2	3
Eastern Imperial Eagle	*Aquila heliaca*		Declining globally								0
Eurasian Buzzard	*Buteo buteo*		1,250,000	LC	0.5	0.90	3	Kenward et al. (2000) in the UK	43,739	3	5
European Honey-buzzard	*Pernis apivorus*		1,000,000	LC	0.5	0.86	3	BTO (2018a) for adult survival, and Jais (2018) for age at first breeding	40,066	3	5
Great White Pelican	*Pelecanus onocrotalus*		70,000	LC	0.5	0.78	3	[11]	3,334	2	3
Greater Spotted Eagle	*Clanga clanga*		Declining globally								0
Levant Sparrowhawk	*Accipiter brevipes*		75,000	LC	0.5	0.69	1	[12]	9,597	2	3
Pallid Harrier	*Circus macrourus*		Declining globally								0
Steppe Eagle	*Aquila nipalensis*		Declining globally								0
White Stork	*Ciconia ciconia*		450,000	LC	0.5	0.78	3	Barbraud *et al.* (1999) in France	21,430	3	5
Other CH-qualifying species and PBFs											
Egyptian Vulture	*Neophron percnopterus*		Declining globally and in Europe								0

[9] No demographic parameters exist for Black Kite, so information from Red Kite (Newton et al. 1989) was used as a surrogate

[10] No demographic parameters exist for Booted Eagle, so information from Red Kite (Newton *et al.* 1989) was used as a surrogate, as per IFC (2017)

[11] No demographic parameters exist for Great White Pelican, so information from American Brown Pelican (Walter *et al.* 2013) was used as a surrogate

[12] No demographic parameters exist for Levant Sparrowhawk, so information from Eurasian Sparrowhawk (BTO 2018b) was used as a surrogate

Species	Scientific name	Unit of analysis	Flyway population	Red List status	Recovery factor	Mean adult survival	Mean age at first breeding	Source for demographic parameters	PBR value	Threshold category	Fatality threshold
Lesser Kestrel	*Falco naumanni*	Red Sea / Rift Valley flyway	22,500	LC	0.5	0.71	2	Following IFC (2017)	1,629	2	3
Lesser Spotted Eagle	*Clanga pomarina*		50,000	LC	0.5	0.92	5	Meyberg *et al.* (2005) in Germany and Slovakia, Väli & Bergmanis (2017) in Baltic Europe	1,132	2	3
Long-legged Buzzard	*Buteo rufinus*		21,750	LC	0.5	0.90	3	Following IFC (2017)	761	1	0
Red-footed Falcon	*Falco vespertinus*		Declining globally and in Europe								0
Saker Falcon	*Falco cherrug*		Declining globally and in Europe								0
Short-toed Snake-eagle	*Circaetus gallicus*		8,783	LC	0.5	0.96	4	Following IFC (2017)	174	1	0
Sooty Falcon	*Falco concolor*		Declining globally and in Europe								0

3.5.3 Adaptive management

Adaptive management is triggered when target thresholds are exceeded and should follow a set of clear sequential actions, specifically:

- Conduct a review to determine the primary reasons why a threshold was exceeded; and,
- Review the effectiveness of existing mitigation; and,
- Determine whether a revised mitigation strategy is required.

Possible options for revised mitigation may be extending the temporal period of shut-down, increasing the number of observers, additional observer training, etc.

3.5.3.1 Periodic review of the CEA

An additional form of adaptive management is the periodic review of the CEA. This is necessary because increased information from the study area and elsewhere along the flyway may increase or decrease the risk to priority bird VECs or add new ones. Information which may change includes the Red List status of birds, improved flyway population estimates and study area data (and hence knowledge of the proportion passing through the study area), and changes in the understanding of likelihood of effect. Key parameters will be evaluated annually to determine whether the risk assessment for any bird VECs needs updating.

3.6 Step 5 – Identify a mitigation and monitoring approach for priority bird VECs

The broad mitigation and monitoring actions that the Project will undertake or support to address their contribution to the cumulative effects from wind farm developments to priority bird VECs, is presented in Section 6.

4 The Cumulative Assessment framework for other vertebrates

4.1 Overview of the framework for other terrestrial species

The framework for non-volant vertebrate species (i.e. mammals and reptiles) has two objectives: to identify species at highest risk from the potential cumulative effects of developments in the study area, and to propose mitigation, monitoring and other management activities if species are identified to be at risk. This framework comprises a four-step process (Figure 3):

- **Step 1:** Develop a preliminary list of mammal and reptile species potentially at risk from developments in the study area, because they are known or predicted to occur in the study area (see Section 4.2);

- **Step 2:** Determine the relative *sensitivity* of each species, being a combination of the following:
    - *Vulnerability* of the species; and
    - *Relative Importance* of the species in relation to the appropriate UoA, i.e. the extent of occurrence (EOO) for each terrestrial species within Egyptian national boundaries (see Section 4.3).

Species which were determined to have negligible *sensitivity* were dropped from analysis before proceeding to Step 3.

- **Step 3:** Determine the *overall risk* to each species from the cumulative effects of wind farm developments within the study area, being a combination of the:
    - *Sensitivity* of the species, as identified in Step 2; and
    - Cumulative *likelihood of effect* (LoE) rating for each species (see Section 4.4).

Species with an *overall risk* of Major or Moderate were considered as priority VECs for the project.

- **Step 4:** Propose a range of mitigation, monitoring and management actions for priority mammal and reptile VECs to, if necessary, minimise collision risk for bats, habitat loss for other terrestrial vertebrates, and to inform any adaptive management responses (see Section 6).

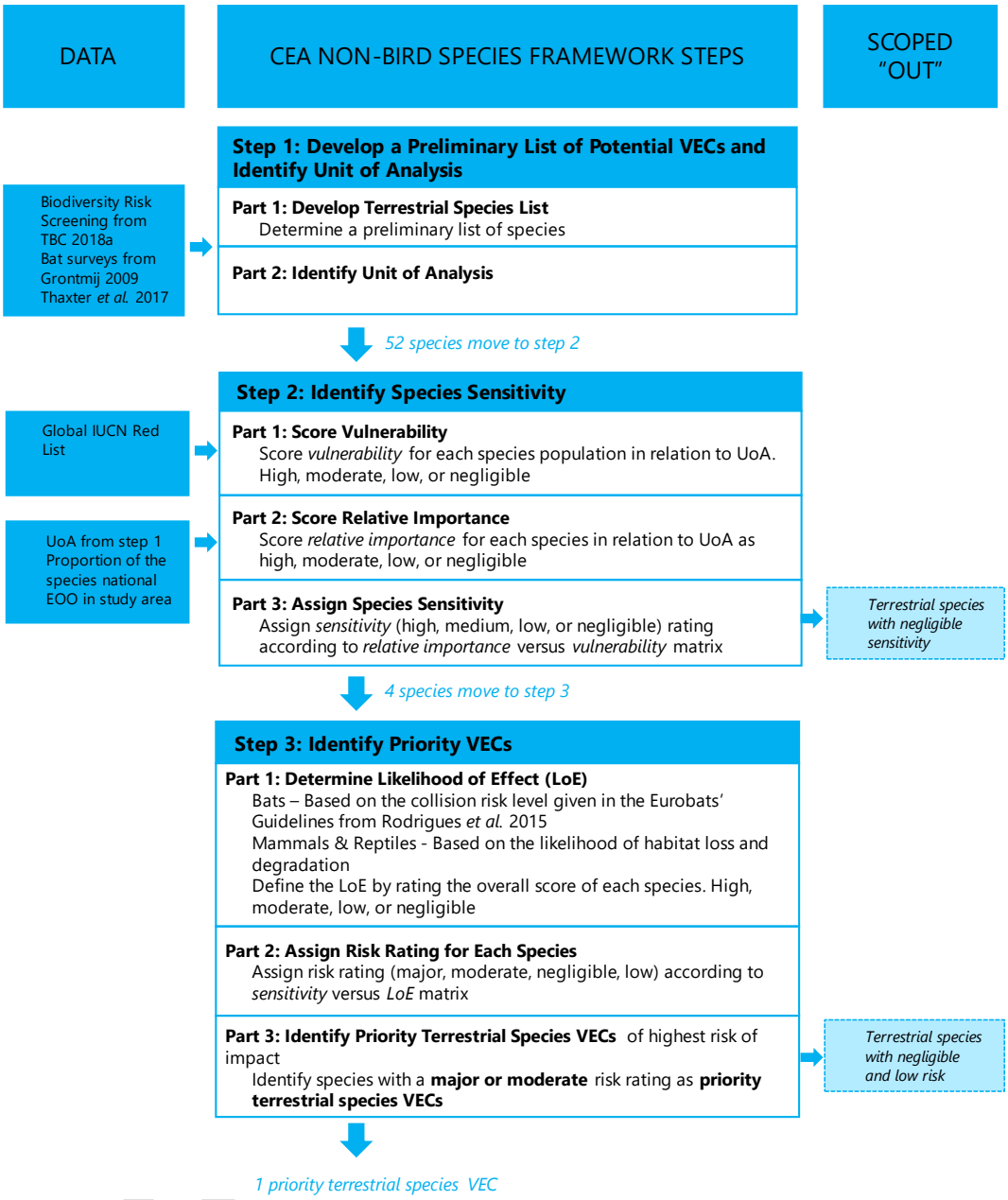

Figure 3. Process to identify priority non-bird species VECs

4.2 Step 1 – Develop the non-bird species list and identify the Unit of Analysis

The purpose of Step 1 is to identify all non-bird vertebrate species that could potentially be at risk from the cumulative effects of impacts from actions in the study area and to determine a relevant UoA by which any effects on each species should be considered.

4.2.1 Methods

A list of mammal and reptile species predicted to be present in the study area were extracted from IBAT. For bats, this was cross-checked with species listed in the field surveys for the adjacent SWE site and the Italgen Gabal El-Zeit 320 MW EIA study in 2010 (Grontmij & EcoConServ 2010; EcoConServ *et al.* 2024e).

The UoA was identified based on a review of any available information on terrestrial species populations in Egypt and the wider Middle East region. The UoA identified for mammals and reptile species was the species' EOO within Egyptian national boundaries, based on IUCN global species distribution maps (IUCN 2024). Due to limited baseline data no population estimates of any species known or likely to occur in the study area could be derived for the purpose of this analysis. Therefore, terrestrial species EOO in Egypt served as the best available information to be used for this study. Following the Lekela North Ras Gharib CEA (TBC 2019), Nubian Ibex and Dorcas Gazelle did not proceed to step 2 as they no long occur regularly in the study area.

4.2.2 Results

A list of 25 mammal species and 27 reptile species, were identified as occurring, or potentially occurring in the project area (Appendix 3).

4.3 Step 2 – Identify species sensitivity

The purpose of Step 2 is to determine the *sensitivity* of each species identified in Step 1 based on its *vulnerability* of the species at the international and regional scale and the *relative importance* of the study area to the species.

4.3.1 Methods

The *sensitivity* of each species takes into account a combination of two components:

- **Vulnerability** of the species using IUCN threat categories (IUCN 2024) and, for mammals, the National (Egyptian) threat categories (Basuony *et al.* 2010). The rating system is summarised in Table 16.
- **Relative importance** of the study area in relation to the UoA was identified for each species. This was calculated using the equation below with the rating system summarised in Table 17.

$$\frac{Species\ EOO\ in\ study\ area}{Species\ EOO\ in\ Egypt\ (UoA)} \times 100 = Relative\ Importance\ (\%)$$

While the range of three bat species, the Botta's Serotine (*Eptesicus bottae)*, Desert Pipistrelle (*Hypsugo ariel*) and Rüppel's Pipistrelle (*Pipistrellus rueppellii*), were not predicted to overlap with the study area, bat surveys (TBC *unpub. data.*) have indicated that these species are likely to be found within the study area. Thus, a conservative approach was adopted for the calculation

of *relative importance* by using the entire extent of the study area as the 'Species' EOO in the study area' following the equation given above.

The *sensitivity* of the species was subsequently assigned based on a matrix (Table 18) that accounts for the combined *vulnerability* and *relative importance* ratings for each species. Terrestrial species with a negligible sensitivity did not progress to Step 3.

Table 16. Vulnerability rating criteria for non-bird vertebrate species

Vulnerability	IUCN Global Red List of Threatened Species*
Negligible	LC on IUCN Global Red List, or LC on the National Red List of mammals
Low	NT or DD on IUCN Global Red List, or NT on the National Red List of mammals
Moderate	VU on IUCN Global Red List, or VU on the National Red List of mammals
High	CR or EN on IUCN Global Red List, or CR/EN on the National Red List of mammals
* LC – Least Concern, NT – Near Threatened, VU – Vulnerable, EN – Endangered, CR – Critically Endangered	

Table 17. Relative importance rating criteria for non-bird vertebrate species

Relative Importance	Percentage of Species EOO present within Study Area
Negligible	≤ 1%
Low	>1% and ≤ 5%
Moderate	>5% and ≤10%
High	>10%

Table 18. Sensitivity matrix for non-bird vertebrate species

Sensitivity		Relative Importance			
		Negligible	Low	Moderate	High
Vulnerability	Negligible	Negligible	Negligible	Low	Low
	Low	Negligible	Low	Low	Medium
	Moderate	Low	Low	Medium	High
	High	Low	Medium	High	High

4.3.2 Results

Of the 52 species analysed in Step 2, two species have a *sensitivity* rating of medium and five species had a *sensitivity* rating of low (Table 19). All other mammal and reptile species had a negligible rating and are not considered in subsequent steps (Appendix 3).

Table 19. Summary of rankings assigned at Step 2 for terrestrial species with a ranking above negligible.

Species	Scientific name	Vulnerability			Relative importance				Sensitivity
		IUCN Red List	National Red List	Score	Egyptian range (km^2)	Study area (km^2)	% of range in study area	Score	
Botta's Serotine	*Eptesicus bottae*	LC	VU	Moderate	16,200	1,386	8.6	Moderate	Medium
Desert Pipistrelle	*Hypsugo ariel*	DD	VU	Moderate	14,100	1,386	9.8	Moderate	Medium
Rüppel's Pipistrelle	*Pipistrellus rueppellii*	LC	VU	Moderate	250,005	1,386	0.6	Negligible	Low
Greater Mouse-tailed Bat	*Rhinopoma microphyllum*	LC	VU	Moderate	608,347	1,386	0.2	Negligible	Low
Blanford's Fox	*Vulpes cana*	LC	VU	Moderate	75541	1,386	1.8	Low	Low
Rough Bent-toed Gecko	*Cyrtopodion scabrum*	LC	-	Negligible	21,183	1,386	6.5	Moderate	Low
Egyptian Spiny-tailed Lizard	*Uromastyx aegyptia*	VU	-	Moderate	69,382	1,386	2.0	Low	Low

Table 20. Details of scores allocated to the non-bird vertebrate species identified as priority terrestrial species VECs

Species	Scientific name	Sensitivity	Collision risk	LoE	Overall risk
Botta's Serotine	*Eptesicus bottae*	Medium	Medium	Medium	Moderate
Desert Pipistrelle	*Hypsugo ariel*	Medium	High	High	Major
Rüppel's Pipistrelle	*Pipistrellus rueppellii*	Low	High	High	Moderate
Greater Mouse-tailed Bat	*Rhinopoma microphyllum*	Low	Unknown	Low	Minor
Blanford's Fox	*Vulpes cana*	Low	NA	Low	Minor
Rough Bent-toed Gecko	*Cyrtopodion scabrum*	Low	NA	Medium	Minor
Egyptian Spiny-tailed Lizard	*Uromastyx aegyptia*	Low	NA	Low	Minor

4.4 Step 3 – Conduct the ecological risk assessment and identify priority non-bird vertebrate species VECs

The purpose of Step 3 is to identify priority non-bird vertebrate species VECs from the seven species carried through from Step 2, i.e. the four bat species, Botta's Serotine, Desert Pipistrelle, Rüppel's Pipistrelle, Greater Mouse-tailed Bat, Blanford's Fox and the two reptiles, Rough Bent-toed Gecko and Egyptian Spiny–tailed Lizard. This was carried out by combining each species' *sensitivity* rating with an estimate of site-specific risk, i.e. the *Likelihood of effect* (LoE), to identify species that were most at risk from potential adverse effects of the wind developments in the study area.

4.4.1 Methods

4.4.1.1 LoE for bat species

The LoE for each bat species was identified using the level of collision risk in Eurobats' *Guidelines for consideration of bats in wind farm projects – Revision 2014* (Rodrigues *et al.* 2015) (Table 21) and further informed by global collision rates given in Thaxter *et. al* (2017), as there was no available information on the collision risk of bat species in the study area or at the country or regional level.

4.4.1.2 LoE for terrestrial species

The LoE for the Blanford's Fox and two reptiles was based on the likelihood of habitat loss and degradation occurring from the cumulative effects of the potential wind farm developments in the study area (Table 22). The LoE rating was decided based on expert knowledge of the CEA team on the likely effects that are expected to occur from these developments.

4.4.1.3 Overall risk rating for non-birds

The LoE rating was then combined with the *sensitivity* rating from Step 2 to derive an *overall risk* rating (Table 23). Species which had an *overall risk* of major or moderate were considered priority VECs for the study area.

Table 21. LoE rating criteria for bat species

LoE Rating	Level of Bat Collision Risk (based on Eurobats' Guideline)
Negligible	Species and/or genus with low level of collision risk
Low	Species and/or genus with unknown level of collision risk
Medium	Species and/or genus with medium level of collision risk
High	Species and/or genus with high level of collision risk

Table 22. LoE rating criteria for terrestrial species

LoE Rating	Criteria
Negligible	Negligible risk from habitat loss and degradation due to the cumulative effects of the developments.
Low	Low risk from habitat loss and degradation due to the cumulative effects of the developments.
Medium	Medium risk from habitat loss and degradation due to the cumulative effects of the developments.
High	High risk from habitat loss and degradation due to the cumulative effects of the developments.

Table 23. Overall project risk matrix for non-bird vertebrate species

Overall risk		LoE			
		Negligible	Low	Medium	High
Sensitivity	Low	Negligible	Minor	Minor	Moderate
	Medium	Minor	Minor	Moderate	Major
	High	Minor	Moderate	Major	Major

4.4.2 Results

Of the seven non-bird species carried through from Step 2, the Desert Pipistrelle is identified to have an *overall risk* rating of major and the Botta's Serotine and Rüppel's Pipistrelle are identified as having on *overall risk* rating of moderate (Table 20). These three bat species are considered priority VECs for the study area

For Banford's Fox, a LoE of Low was applied as while a small area of suitable habitat will be lost under project infrastructure, if this species behaves as other *Vulpes* ssp., it is unlikely to avoid areas around turbines or other infrastructure, and their prey base is also unlikely to change with the presence of the projects. For the Egyptian Spiny-tailed Lizard a LoE of 'Low' was applied as there is evidence that burrows can be avoided during construction and translocation of the species is possible (M. Ezat, *pers. comm.*). While this species did not qualify as a priority VEC it has been identified as a PBF in the Project's Critical Habitat Assessment (TBC 2024). The LoE for the Rough Bent-toed Gecko was considered as 'Medium' as it is unlikely that similar avoidance of important habitat for this species is possible, however the overall project risk for this species was considered low.

4.5 Step 5 – Identify a potential mitigation and monitoring approach for priority terrestrial VECs

The broad mitigation and monitoring actions that Scatec will undertake or support to address their contribution to the cumulative effects from wind farm developments to priority terrestrial species VECs, is presented in Section 6.

5 The Cumulative Assessment for ecosystems

A subjective approach to identifying priority ecosystem VECs has been followed as data on land cover in the study area is limited and a quantitative approach was not feasible. Additionally, there has been no Red List Assessment of Ecosystems within Egypt. In this context, the approach was to review what features in the landscape are likely to be valued as important for supporting the biodiversity of the region.

The project area is not considered to contain particularly unique or highly threatened ecosystems (discussed further in the CHA: TBC 2024). The Project area lies in the Red Sea Coastal Desert Ecoregion (Dinerstein *et al.* 2017) in an area of sand and gravel plains crossed by several shallow wadis (valleys and canyons), consisting primarily of bare ground with very scattered low-growing vegetation (EcoConsult & EcoConServ 2023). Satellite imagery shows rocky outcrops in the Project area (GoogleEarth imagery, viewed 01 December 2024), however, no caves (potential bat roosting sites) were identified in baseline surveys for the Project (EcoConsult & EcoConServ 2023).

Vegetation in the eastern desert region, in which the Project occurs, is largely restricted to salt marshes (sabkhas, which do not occur in the Project area: TBC 2024) and wadis (Ministry State of Environment Affairs 2014). The presence of wadis has been confirmed in the Project area, and most vegetation in this area occurs in the wadis (EcoConServ & EcoConsult 2023). Wadis are known to have biodiversity value in their own right, and are also known to support mammal and reptile species in the Project area (EcoConServ & EcoConsult 2023). They are also of potential importance for other priority VECs, e.g. bats are likely to use wadis for foraging when they flood intermittently with water (Korine *et al.* 2016). Wadis are therefore considered a priority ecosystem VECs.

6 The mitigation and monitoring approach for priority VECs

This section establishes the broad mitigation and monitoring actions that will be adopted by Scatec for their project, and actions that Scatec will undertake or support to address their contribution to the cumulative effects to priority VECs from wind farm developments in the study area. These mitigation and monitoring actions focus on the 13 bird VECs, as identified in this document, and will also deliver benefits for other bird species passing through the wind farms. Recommendations are also listed for mitigating and monitoring impacts to the three bat VECs and avoiding impacts to the wadi priority ecosystem VEC. In all cases, mitigation and monitoring actions will follow GIIP. The mitigation and monitoring approach will focus on two areas:

- **On-site mitigation and monitoring methods,** to minimise collision risk, validate the effectiveness of the proposed mitigation methods once they have been implemented, allow estimation of residual impacts and provide information to allow adaptive management of the monitoring and mitigation implemented; and,

- **Collaborative efforts with other wind farm entities,** to minimise the cumulative effects of all the proposed wind farm developments in the study area.

By adopting the proposed approach, Scatec will be able to reduce its impact as far as practicable for the identified VECs, adhering to an approach that will facilitate alignment with PS6/PR6/ESS4, and particularly be pursuing a goal of No Net Loss. By doing this, Scatec sets a benchmark for other wind projects in the study area and provides an example of successful best-practice implementation for others to follow. A co-ordinated approach to mitigation, particularly migration monitoring and turbine shutdown would be beneficial to Scatec and all other wind projects in the study area. By adopting a single shutdown protocol across the whole study area and sharing real-time survey data, individual project operational costs and risks to birds can be reduced through optimized and coordinated use of field observers across multiple projects.

Table 24. Suggested Mitigation and Monitoring Actions for the Project

Action	Measure	Description	Key objective	Responsible entity	Time frame	Target VEC
On-site mitigation actions						
1	Development of appropriate protocols for mitigation and monitoring	All actions require clear and detailed protocols that can be followed by survey teams and project management: this information should be included in the relevant Project documents. Protocols should align with industry good-practice guidelines and be designed by specialists experienced in assessing biodiversity risk at wind farm developments.	Ensure that all actions are undertaken in a consistent manner and collect appropriate data to make decisions.	Scatec	Approved protocols at least three months prior to commencement of operation	Birds, bats and habitats
2	Monitoring of priority bird VECs	Monitoring the numbers, activities and flight paths of priority bird VECs within the wind farm is vital to inform mitigation actions. Birds must be monitored by trained and experienced field observers, and monitoring effort should cover the whole operational turbine area. The principal aim of monitoring is to initiate shut-down on demand protocols (see Action 3), to avoid collisions of priority birds with turbine blades. Additional aims are to record the numbers of priority bird VECs in the wind farm, determine flight paths and height, and to observe collisions or near misses (if or when these occur). **Focus:** monitoring should focus on priority bird VECs, with data recorded on other bird species as time allows. Unidentified species should precautionarily be considered priority bird VECs until proven otherwise. **Method**: monitoring should primarily use a series of pre-identified Vantage Points, the number and location of which will be dictated by	(i) To ensure that shut-down on demand protocols can be initiated with sufficient time to minimize bird collisions (ii) to allow for informed adaptive management decisions to be made	Scatec	In place prior to commencement of operation, with monitoring for the life of the project	Birds

Action	Measure	Description	Key objective	Responsible entity	Time frame	Target VEC
		local topography, turbine layout and activity patterns of priority bird VECs. **Observers**: should be experienced with identifying all priority bird VECs, and sufficiently knowledgeable about the goals of the project to alter methods if conditions warrant (e.g. move VPs if bird movement patterns change). **Effort**: as all priority bird VECs are migratory in the study area, monitoring must occur for the full spring and autumn migration periods, with start and end dates robustly justified (noting that the timing of migration varies considerably between species). Monitoring must also occur at all times of day when birds are known to be active. Reduced effort may be required outside of these periods and should be regularly reviewed as to its relevance. **Records**: observers must use standard data forms to record all observations, to allow for improvements to the methods and analysis of approach / responses in cases where collisions occur.				
3	Shut-down on demand	When field observers identify flight paths of priority bird VECs that are likely to result in collision, they must initiate a temporary shutdown of one or more turbines until the birds are no longer at risk, at which time the turbines can be restarted. This approach is a well-established method for minimizing the risk to birds of colliding with rotating wind turbine blades. Shut-down on demand may also be triggered by other events not involving VECs, as defined in site-specific management plans.	To minimize the number of collisions between priority bird VECs and wind turbines.	Scatec	Protocols and tested system in place prior to commencement of operation, with the system operational for the life of the project.	Birds

Action	Measure	Description	Key objective	Responsible entity	Time frame	Target VEC
		Protocols will be established under Action 1, and will include the conditions for initiating and recording: • 'Near-miss incidents' (i.e. those situations where there was a failure to shut-down in a high-risk situation to a priority bird VECs; • Elevated risk situations (i.e. periods when environmental or other conditions result in specific or general risk to priority birds.); • Shutdown and resumption of operation, required communications between field observers and wind farm operator; and, • Information to record in the event a shutdown occurs (both outcomes for the bird(s) involved and the operator's actions). When one or more individuals of a priority bird VEC are observed, the field observer should consider shutdown of specific turbines based on their judgment considering the following parameters: • Height at which bird is flying relative to the turbine risk height; • Likely flight path, flight pattern, and behavior of bird; and, • Distance from bird to turbine. Automated shut-down on demand system options (e.g. radar, camera) should be explored, but should only supplement field-based observers for at least three years until such approaches have been demonstrated to work effectively in this situation.				

Action	Measure	Description	Key objective	Responsible entity	Time frame	Target VEC
4	Installation of wildlife-friendly Project power lines	Many bird species are known to collide with power lines (particularly high-voltage lines) and there is some evidence to suggest that both a) flight diverters, and b) line configuration might lessen this risk. The configuration (type and spacing) of bird flight diverters and alignment (height, number and spacing) of wires should be based on GIIP where available, and be informed by robust evidence of effective deployment at existing wind power projects in comparable environments.	To minimize the number of collisions between priority bird VECs with Project power lines	Scatec	During power line erection, with ongoing maintenance for the life of the project	Birds
5	Micro-siting and alignment of turbines	Turbines should be micro-sited to provide the maximum gap between turbines, or turbine arrays, especially along the axes of likely migration routes. This approach is recommended with precaution as the ability of species to navigate through a wind farm is poorly understood. Micro-siting should also be used to avoid areas containing habitat VEC (i.e. wadis).	(i) Allow priority bird VECs to pass through the wind farm (ii) to avoid impacts to terrestrial and habitat VECs	Scatec	In the project design phase	Birds and habitats
6	Carcass surveys – turbines	This involves regular surveys of the area beneath turbines to detect carcasses from birds and bats that have collided with turbine blades. Protocols for these searches, including frequency, number of turbines searched and the search area under each turbine will be determined under Action 1, and will be based on industry good-practice.	To determine the level of observed fatalities due to collisions with turbines at the wind farm site.	Scatec	On-going for at least the first three years of operation, then reassessed, but likely needed for the life of the project	Birds and bats

Action	Measure	Description	Key objective	Responsible entity	Time frame	Target VEC
7	Carcass surveys – powerlines	The Project will conduct regular surveys under Project power lines to determine the levels of mortality from birds and bats colliding with lines. Collisions with power lines are a known source of mortality for many bird species. Protocols for these searches, including frequency and the search area will be determined under Action 1.	To determine the level of observed fatalities due to collisions with power lines at the wind farm site.	Scatec	On-going for at least the first three years of operation, then reassessed, but likely needed for the life of the project	Birds and bats
8	Carcass correction factor determination	Correction factors need to be applied to convert the observed carcasses under turbines and power lines to an estimate of actual mortality, as some carcasses will be removed prior to carcass surveys occurring (carcass removal bias), and searchers will not detect all carcasses present (searcher efficiency bias). These approaches are standard good-practice for wind farms, and if designed correctly, both trials can be conducted concurrently. Carcasses used should be as similar as possible to the type of expected fatalities to mimic real conditions. Experiments should be planned and led by someone familiar with the approaches, but the searchers used in the searcher efficiency trials should be those who will undertake the carcass surveys (Action 6 and Action 7). The number and distribution of carcasses used will depend on the habitat types and topography within the wind farm site. Analysis of resulting data should be through an established method: the Generalised Fatality Estimator developed by the USGS is recommended.	To provide species specific bird and bat fatality estimates 'corrected' for carcasses not found during fatality search surveys.	Scatec	During both spring and autumn migration periods for two years, then reassessment. Can begin prior to commencement of operation.	Birds and bats

Action	Measure	Description	Key objective	Responsible entity	Time frame	Target VEC
9	Review to improve monitoring and mitigation effectiveness	Periodic reviews of Actions 1, 2, 4-8, 10-11 will be undertaken to improve the effectiveness of monitoring and mitigation actions. This will include: **Immediate** review of process in the event of a recorded mortality for a priority bird or bat VEC, to recommend what, if any, additional actions may be implemented to further reduce collision risk. **Quarterly** review of carcass survey results and effectiveness of shut-down on demand protocols. **Bi-annual** review of monitoring data, following the end of each bird migration season. **Annual** review of carcass correction factor determination and all bird monitoring and responses for the Project. If thresholds are triggered, this annual review must recommend additional mitigation measures that must be adopted during future monitoring.	Adaptive management to reduce risk	Scatec	On-going from start of construction	Birds and bats
10	Avoid construction in wadis	Impacts to priority ecosystem VECs will be avoided during construction. All wadis will be mapped and infrastructure sited to avoid them.	Impact avoidance.	Scatec	Pre-construction	Wadis
11	Avoid and minimize impacts to Egyptian Spiny-tailed Lizard	The lizard is not a priority VEC but is a PBF (*sensu* PR6, as identified in TBC 2024) and impacts need to be reduced as far as is practicable by: Mapping and avoiding burrows during construction; and,	Impact avoidance.	Lekela	Pre-construction, construction and operations	

Action	Measure	Description	Key objective	Responsible entity	Time frame	Target VEC
		Driver training and awareness to ensure vehicles stay on demarcated roads and drivers avoid road fatalities.				
Scatec contribution to minimizing cumulative effects						
12	Data sharing	Scatec will make annual summaries data of its monitoring, including all fatality data, and mitigation efforts publicly available to support baseline knowledge, increase transparency and understanding of the work being undertaken. Scatec will also share raw data and relevant information in real time / monthly with other developers within the Project area to improve cumulative actions.	Maximise the knowledge base in the region. Provide examples of best-practice for other operators to follow	Scatec	Periodically for the life of the project	Birds, bats and habitats
13	Joint training of observers	Scatec will contribute to the joint training of a pool of skilled bird observers who are able to carry out baseline and monitoring surveys throughout the study area, and adjacent Important Bird Area	Ensure comparable observer standards are maintained across all project sites.	All / other	On-going, with establishment prior to commencement of operation	Birds
14	Coordination of observer networks	Scatec will co-ordinate with other developers in the Project area to site observer networks where these can be of greatest benefit. Scatec will also establish protocols so that shut-down on demand can be initiated by observers from adjacent projects, where flight paths are well known.	Maximise the benefits from an extended observer network	Scatec	On-going, with establishment prior to commencement of operation	Birds

Action	Measure	Description	Key objective	Responsible entity	Time frame	Target VEC
15	Discussion forum	Facilitate / support an annual biodiversity workshop / conference for all wind farms in the Project area, to facilitate knowledge exchange, share experiences and plan cumulative actions.	Improve regional knowledge of priority bird VECs and improve wind farm operations	All / Scatec	Annually	All
Other actions						
A	Prepare and follow a Biodiversity Action Plan (BAP)	Overarching Project plan to guide the mitigation of biodiversity impacts. The BAP should summarise anticipated impacts, demonstrate how the Project will apply the mitigation hierarchy, and forecast how the Project will achieve at least no net loss for the VECs and other priority biodiversity. This would include a review of collision risk models to determine what, if any, residual impacts remain after the application of mitigation actions. If collision risk models indicate that such impacts do may remain, this will also need to include a plan for compensating or offsetting residual impacts on priority biodiversity.	Support the implementation of mitigation measures and deliver NNL[13] / NG to priority bird VECs	Scatec	Must be implemented prior to operations commencing	Birds, bats and habitats

[13] Following the Tafila Region Wind Power Projects CEA (IFC 2017), priority VECs in the CEA would be considered the focus of NNL in the project area.

7 Next steps

To maximise the effectiveness of this CEA, the following actions are required:

1. Provide the current draft of this document to stakeholders for review. Relevant stakeholders include but are not limited to: government agencies (e.g. NREA), RCREEE, other wind farm developers, lenders and relevant NGOs (e.g. Nature Conservation Egypt, BirdLife International, etc.). Comments, corrections and requests for additional information must be sought from stakeholders. Where appropriate the analysis will be revised based on their feedback;
2. Share the findings of the cumulative effects analysis with any other parties doing, or likely to do, similar work in Egypt; and,
3. Provide the final Cumulative Effects Analysis to developers, regulators and other relevant stakeholders in the Gulf of Suez.

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Appendix 1: Detailed results for steps 1-3 for bird VECs

Appendix 1 provided in the embedded excel workbook.

Bird VECs: Appendix 1.xlsx

Appendix 3: Non-bird VECs at Step 2

Scientific name	Common name	IUCN status	National status (mammals)	Vulnerability	Egypt EOO	Study area	% in area	Relative importance	Sensitivity
Acanthodactylus boskianus	Bosc's Fringe-toed Lizard	LC		Negligible	819762	1386	0.17	Negligible	Negligible
Acanthodactylus scutellatus		LC		Negligible	890173	1386	0.16	Negligible	Negligible
Acomys cahirinus	Cairo Spiny Mouse	LC	LC	Negligible	939457	1386	0.15	Negligible	Negligible
Acomys russatus	Golden Spiny Mouse	LC	LC	Negligible	114326	1386	1.21	Low	Negligible
Agama spinosa	Spiny Agama	LC		Negligible	63409	1386	2.19	Low	Negligible
Asellia tridens	Geoffroy's Trident Leaf-nosed Bat	LC	LC	Negligible	985919	1386	0.14	Negligible	Negligible
Canis lupaster	African Wolf	LC	LC	Negligible	968108	1386	0.14	Negligible	Negligible
Cerastes cerastes	Desert Horned Viper	LC		Negligible	971726	1386	0.14	Negligible	Negligible
Cerastes vipera	Sahara Sand Viper	LC		Negligible	729340	1386	0.19	Negligible	Negligible
Chalcides ocellatus	Ocellated Skink	LC		Negligible	903705	1386	0.15	Negligible	Negligible
Cyrtopodion scabrum	Rough Bent-toed Gecko	LC		Negligible	21183	1386	6.54	Moderate	Low
Echis coloratus		LC		Negligible	210452	1386	0.66	Negligible	Negligible
Eptesicus bottae	Botta's Serotine	LC	VU	Moderate	16200	1386	8.56	Moderate	Medium
Felis lybica	Afro-Asiatic Wildcat	LC	LC	Negligible	199002	1386	0.70	Negligible	Negligible
Gerbillus gerbillus	Lesser Egyptian Gerbil	LC	LC	Negligible	967188	1386	0.14	Negligible	Negligible
Gerbillus henleyi	Pygmy Gerbil	LC	LC	Negligible	253933	1386	0.55	Negligible	Negligible
Gerbillus pyramidum	Greater Egyptian Gerbil	LC	LC	Negligible	713126	1386	0.19	Negligible	Negligible
Hemidactylus turcicus	Turkish Gecko	LC		Negligible	172093	1386	0.81	Negligible	Negligible
Herpestes ichneumon	Egyptian Mongoose	LC	LC	Negligible	450969	1386	0.31	Negligible	Negligible
Hyaena hyaena	Striped Hyaena	NT	LC	Low	985642	1386	0.14	Negligible	Negligible
Hypsugo ariel	Desert Pipistrelle	DD	VU	Moderate	14100	1386	9.83	Moderate	Medium

Scientific name	Common name	IUCN status	National status (mammals)	Vulnerability	Egypt EOO	Study area	% in area	Relative importance	Sensitivity
Jaculus jaculus	Lesser Egyptian Jerboa	LC	LC	Negligible	959716	1386	0.14	Negligible	Negligible
Lepus capensis	Cape Hare	LC	LC	Negligible	422748	1386	0.33	Negligible	Negligible
Lytorhynchus diadema	Crowned Leaf-nosed Snake	LC		Negligible	964285	1386	0.14	Negligible	Negligible
Malpolon moilensis	Moila Snake	LC		Negligible	961014	1386	0.14	Negligible	Negligible
Meriones crassus	Sundevall's Jird	LC	LC	Negligible	831908	1386	0.17	Negligible	Negligible
Mesalina guttulata	Small-spotted Desert Racer	LC		Negligible	779956	1386	0.18	Negligible	Negligible
Mesalina olivieri		LC		Negligible	210787	1386	0.66	Negligible	Negligible
Mesalina rubropunctata	Red-spotted Desert Racer	LC		Negligible	908184	1386	0.15	Negligible	Negligible
Pipistrellus rueppellii	Rüppel's Pipistrelle	LC	VU	Moderate	250005	1386	0.56	Negligible	Low
Pipistrellus kuhlii	Kuhl's Pipistrelle	LC	LC	Negligible	250005	1386	0.56	Negligible	Negligible
Platyceps saharicus		LC		Negligible	247073	1386	0.56	Negligible	Negligible
Procavia capensis	Rock Hyrax	LC	LC	Negligible	272889	1386	0.51	Negligible	Negligible
Psammophis aegyptius	Saharan Sand Snake	LC		Negligible	879938	1386	0.16	Negligible	Negligible
Psammophis schokari	Forskål's Sand Snake	LC		Negligible	961077	1386	0.14	Negligible	Negligible
Pseudotrapelus chlodnickii		LC		Negligible	631767	1386	0.22	Negligible	Negligible
Ptyodactylus guttatus	Fan-footed Gecko	LC		Negligible	628639	1386	0.22	Negligible	Negligible
Ptyodactylus hasselquistii		LC		Negligible	168006	1386	0.82	Negligible	Negligible
Rattus rattus	House Rat	LC	-	Negligible	474636	1386	0.29	Negligible	Negligible
Rhinopoma cystops	Egyptian Mouse-tailed Bat	LC	LC	Negligible	486754	1386	0.29	Negligible	Negligible
Rhinopoma hardwickii	Lesser Mouse-tailed Bat	LC	-	Negligible	978842	1386	0.14	Negligible	Negligible
Rhinopoma microphyllum	Greater Mouse-tailed Bat	LC	VU	Moderate	608347	1386	0.23	Negligible	Low
Sekeetamys calurus	Bushy-tailed Jird	LC	LC	Negligible	152394	1386	0.91	Negligible	Negligible
Spalerosophis diadema	Diadem Snake	LC		Negligible	985635	1386	0.14	Negligible	Negligible
Stenodactylus petrii	Anderson's Short-fingered Gecko	LC		Negligible	928317	1386	0.15	Negligible	Negligible

Scientific name	Common name	IUCN status	National status (mammals)	Vulnerability	Egypt EOO	Study area	% in area	Relative importance	Sensitivity
Stenodactylus sthenodactylus	Elegant Gecko	LC		Negligible	953468	1386	0.15	Negligible	Negligible
Trapelus mutabilis		LC		Negligible	109133	1386	1.27	Low	Negligible
Tropiocolotes steudneri	Algerian Sand Gecko	LC		Negligible	795530	1386	0.17	Negligible	Negligible
Uromastyx aegyptia	Egyptian Spiny-tailed Lizard	VU		Moderate	130082	1386	1.07	Low	Low
Varanus griseus	Desert Monitor	LC		Negligible	735910	1386	0.19	Negligible	Negligible
Vulpes cana	Blanford's Fox	LC	VU	Moderate	75541	1386	1.84	Low	Low
Vulpes rueppellii	Rüppell's Fox	LC	LC	Negligible	915546	1386	0.15	Negligible	Negligible