Appendix 1: Interim Offset feasibility study

IMPORTANT NOTE: the SUEZ Wind Energy BOO Wind Power Plant 1.1. GW – SWE South (PLOT 2) Wind Farm Project (this Project) and the Scatec Wind Farm have agreed to investigate feasibility of a shared set of offset actions, aiming to comply with the respective net gain (NG) and no net loss (NNL) goals for the two neighbouring projects in the Gulf of Suez. While details on the relative levels of gains required for each project still need to be finalized, the offset options analysed in the present Offset Feasibility Study have in considered the cumulative NG or NNL species goals from both projects.

1 Introduction

This Appendix is the Interim Offset Feasibility Study (OFS) for the SUEZ Wind Energy BOO Wind Power Plant 1.1. GW – SWE South (PLOT 2) Wind Farm (the Project), which is being developed in alignment with International Finance Corporation (IFC) Performance Standards (PS), including Performance Standard 6 (PS6) on Biodiversity and Natural Living Resources (IFC 2012) , and European Bank for Reconstruction and Development (EBRD) Performance Requirement 6 (PR6) on Biodiversity Conservation and Sustainable Management of Living Natural Resources (EBRD 2020). The Project has previously completed a Critical Habitat Assessment (CHA) (EcoConServ *et al.* 2024b) which determined that the Project was in an area of Critical Habitat (CH) for ten species of birds: Levant Sparrowhawk *Accipiter brevipes*, Steppe Eagle *Aquila nipalensis*, Eastern Imperial Eagle *Aquila heliaca*, Eurasian (Steppe) Buzzard *Buteo buteo vulpinus*, White Stork *Ciconia ciconia*, Black Stork *Ciconia nigra*, Common Crane *Grus grus*, Egyptian Vulture *Neophron percnopterus*, Great White Pelican *Pelecanus onocrotalus* and European Honey-buzzard *Pernis apivorus*. Additionally, the Project CHA (EcoConServ *et al.* 2024b) classified two species, the Egyptian Spiny-tailed Lizard *Uromastyx aegyptia* and the Greater Spotted Eagle *Clanga clanga* as Priority Biodiversity Features (PBFs) while a Cumulative Effects Analysis (CEA) (EcoConServ *et al.* 2024b), identified 14 priority Valued Environmental Components (VECs), of which three species had not been listed as CH or PBF: Booted Eagle *Hieraaetus pennatus*, Pallid Harrier *Circus macrourus* and Black Kite *Milvus migrans*.

The Biodiversity Action Plan (BAP) for the Project determined that offsets would be required to compensate for significant residual impacts to i) CH-qualifying features to meet a Net Gain (NG) target, in compliance with IFC PS6; and ii) PBFs to meet a No Net Loss (NNL) target, as required by EBRD PR6. For the remaining three priority VECs, the Project mitigation strategy also aims a NNL target. Acceptable impact thresholds for all species have been calculated in the Project's CEA (EcoConServ *et al.* 2024b).

This document describes four main offset options (plus four additional options - see Section 4. Additional offset options) that have been identified for delivering the project's NNL / NG targets for each of the 14 priority bird species (see Table 1 in the BAP). Offset options were identified through TBC's knowledge of ongoing or previous conservation projects for the target species, supplemented with informal discussions with experts and a review of regional and national avian conservation organizations. A full list of organisations and individuals consulted is included in

Table 1. This OFS assumes that SUEZ Wind Energy will propose, in agreement with Lenders, a final set of offset options and the level of contribution for implementation.

Table 1. Stakeholders contacted relevant to the implementation of offsets and the engagement status for each up to 04 December 2024.

Stakeholder (country)	Contact	Current engagement status	Offset option (countries)
Nature Conservation Egypt - NCE (Egypt)	REDACTED	Exchange of emails since 25/11/2024; waiting for NCE / BirdLife International to resolve their position on whether to engage with wind projects planned within the Gebel el Zeit IBA.	Overhead Transmission Lines (OHTL) retrofitting (Egypt) Anti-illegal hunting/capture program (Egypt)
Raptor and wildlife researcher, author of publications on the impacts of OHTLs (Kazakhstan)	REDACTED	Exchange of emails since 21/11/2024; high-level proposal prepared, including budget estimate	OHTL retrofitting (Kazakhstan)
Royal Society for the Conservation of Nature - RSCN (Jordan)	REDACTED	Exchange of emails since 26/11/2024; meeting on 02/12/2024	OHTL retrofitting (Jordan) Anti-illegal hunting/capture program (Jordan, Middle East)
Raptor and wildlife researcher, author of publications on the impacts of illegal hunting of birds (Jordan)	REDACTED	Contacted through LinkedIn on 26/11/2024; meeting to be scheduled	Anti-illegal hunting/capture program (Jordan, Middle East)
Ornithological Society of the Middle East, the Caucasus and Central Asia - OSME (Middle East)	https://osme.org/	Contacted through OSME website on 27/11/2024; no response obtained	Anti-illegal hunting/capture program (Middle East)

Stakeholder (country)	Contact	Current engagement status	Offset option (countries)
Environment Protection Society - KEPS (Kuwait)	info@keps.org.kw	Contacted on 27/11/2024; no response obtained	Anti-illegal hunting/capture program (Kuwait, Middle East)
Hierofalcon Research Group, Coordinator of International Single Species Action Plan for the Sooty Falcon 2024-2036 (Italy)	REDACTED	Exchange of emails since 27/11/2024; meeting on 03/12/2024	Support to conservation actions identified in the Single Species Action Plan for the Sooty Falcon 2024-2036 (Middle East)
Tour du Valat (France)	secretariat@tourduvalat.org	Contacted on 27/11/2024; no response obtained	Habitat improvement and threat reduction for Great White Pelicans (Balkans)
SABUKO – BirdLife Georgia (Georgia)	REDACTED	Exchange of emails since 28/11/2024; meeting to be scheduled to 1st week of December	Anti-illegal hunting/capture program (Georgia)
BirdLife Malta (Malta)	REDACTED	Exchange of emails since 28/11/2024; meeting on 04/12/2024	Anti-illegal hunting/capture program (Malta and Egypt)

2 Screening of offset options

Given the number of biodiversity features with either a NG or NNL target commitment, a range of potential offset projects will be required to be supported by the Project to meet its commitments under the BAP. A high-level set of conceptual offset options are presented in the BAP (see Section 8.5 of that document). These initial options were further explored for their

potential to deliver the required gains and feasibility (both political and technical[1]), through engagement with the Client, key stakeholders, implementation partners and lenders.

The different options investigated are described in detail in the sections below. The following aspects are presented under each offset:

1. Target feature(s) or coverage of the action (i.e. how many of the target species the action covers);
2. Context;
3. Proposed area for the offset;
4. Actions to be implemented for the offset;
5. Key implementing partners and other relevant stakeholders;
6. Demonstrable biodiversity gain (i.e., an assessment of whether the option likely provides an increase to the target species' population, whether there is a clear link between the action and a gain, and the level of quantification possible for the action);
7. The political feasibility of the option (i.e., an assessment of whether the option is likely to be credible and acceptable to all stakeholders (the client, Lenders, Government, conservation organisations);
8. Implementation risk (i.e., an assessment of whether there are likely to be any technical or other risk to achieving biodiversity gains linked to the option); and,
9. Other benefits (i.e. some options will have benefits to only the target species, while others will have broader benefits).

Relevant criteria, chosen to represent the major trade-offs, have been given a score (scale 1-5), with lower scores indicating areas of higher risk that the offset will not deliver the intended outcome of a NG/NNL for the relevant feature. Summary scores for the four primary options considered are provided in Table 2. At this stage, these scores are not summed or comparable across options, as actions and desired outcomes are different for each option, and it is likely that the whole set of presented offset options will need to be implemented to attain the overall species goals for the Project. Additional four offset options, for which detailed information was not currently available, should also be considered in a final version of the Offset Feasibility Study (see Section 4. Additional offset options).

[1] Note that financial feasibility was not considered at this stage, as accurate costs are unknown for most projects.

Table 2. Scoring for each of the four offset options for the SUEZ Wind Energy BOO Wind Power Plant 1.1. GW – SWE South (PLOT 2) Wind Farm.

Offset	Target biodiversity	Demonstrable gain	Political feasibility	Implementation risk	Other benefits
Retrofitting power lines in Kazakhstan	4	5	4	5	4
Retrofitting power lines in Egypt	5	4	2	4	4
Retrofitting power lines in Jordan	4	5	5	5	4
Program against illegal hunting/capture in the Middle East	5	4	4	2	4

3 Evaluation of potential offset options

3.1 Retrofitting power lines in Kazakhstan

Target biodiversity: *Steppe Eagle, Eastern Imperial Eagle, Steppe Buzzard, secondary benefits to Short-toed Eagle, Black Kite, Long-legged Buzzard, Red-footed Falcon and Saker Falcon.* **Score: 4.**

3.1.1 Context

Electrocutions on 6-10 kV power lines is one the most impactful threats to raptors in Kazakhstan (Dwyer *et al.* 2023). In spite of existing legislation to prevent negative impacts from electricity infrastructure on wild birds, law enforcement to restrict the operation of bird-hazardous power lines is poor (Pulikova *et al.* 2023), and electrocution is seen as one of the main causes of the significant decrease of e.g. Steppe Eagles in the country (Dwyer *et al.* 2023). Surveys conducted recently (2022–202) by ACBK (BirdLife International partner in Kazakhstan) and BRCC (Biodiversity Research and Conservation Center) confirmed the high electrocution risk on several power lines in the main Steppe Eagle breeding population cores in Western and Central Kazakhstan, with up to 44 Steppe Eagles electrocuted per 10 km in some sections (ACBK 2024). Electrocution also affects other soaring birds in Kazakhstan steppes, including Eastern Imperial Eagle, Steppe Buzzard, Short-toed Eagle, Black Kite, Long-legged Buzzard, Red-footed Falcon and Saker Falcon (Dwyer *et al.* 2023). Mortality of the same and/or other raptor species due to collisions with power lines also occurs in the same areas but but is probably underestimated or unreported (Dwyer *et al.* 2023).

3.1.2 Offset implementation areas

The areas proposed for implementation of this offset are located in the west Kazakhstan and the Aktobe regions of Kazakhstan, where high numbers of raptors have been found electrocuted and there is relatively good knowledge on the distribution of fatality hotspots (Dwyer *et al.* 2023).

3.1.3 Offset actions

This offset would involve installing bird-protection devices on pre-identified sections of the most dangerous 6-10 kV power lines for birds, where the mortality rate of Steppe Eagles is highest (30-50 individuals/10 km per year). In total, *c.* 10 km of power lines would be equipped to achieve the expected required gains for the different target species (see Section 3.1.5 Demonstrable biodiversity gain).

BRCC would collaborate closely with the energy company operating the power lines, purchasing the required bird-protection devices, identifying the implementation sections, and supervising their application. Bird-protection devices may consist of crossarm configurations that minimise electrocution risk, insulating elements and/or deterrent devices (following Martín Martín *et al.* 2022).

Although there are several providers of such bird-protection devices, those manufactured by Russian companies AVIS or Eco-NIOKR are proposed, as the most hazardous power lines in Kazakhstan are those inherited from the USSR times, for which there is no national production of bird-protection devices.

Fatality monitoring of the retrofitted power lines would be conducted during the following years to assess the efficiency of the mitigation measure and quantify the gains generated from the action to the different target species.

3.1.4 Key partners

The key implementation partners for this offset are BRCC and the a Kazak researcher, with wide experience on the power lines-raptor conflict in Kazakhstan. The national companies operating the power lines to be retrofitted would necessarily be involved as well.

3.1.5 Demonstrable biodiversity gain

Retrofitting of power lines through adequate insulation of exposed wiring, or the installation of anti-perching or safe-perching structures can be extremely efficient in avoiding electrocution mortality (Martín Martín *et al.* 2022). Therefore, retrofitting actions in power lines identified as raptor mortality hotspots in Kazakhstan have a great potential to decrease significantly non-natural mortality for several species, with the consequent associated population gains.

The effectiveness of insulation or deterrent devices in reducing bird fatalities by electrocution can be at least 80% (up to 99%; Martín Martín *et al.* 2022), provided that good quality equipment is used, and adequate maintenance and/or replacement is operated. Therefore, the installation of the bird-protection devices along a total of *c.* 10 km of power lines in the proposed implementation area (where Steppe Eagles mortality due to electrocution reaches 30-50 individuals/10 km per year) can avoid the mortality of a minimum of 24-40 Steppe Eagles per year.

Although the available species-specific fatality rates per km are not so accurate for other species of raptor in the same region, it is very likely that this power line retrofitting offset action would also generate gains for all or some of the following priority species: Eastern Imperial Eagle, Greater Spotted Eagle, Short-toed Eagle, Black Kite, Steppe Buzzard, Long-legged Buzzard and Saker Falcon. It should be noted that fatality rates are lower for many of these species than for Steppe Eagle, and so larger lengths of line would need to be retrofitted to achieve the same amount of gain.

The measurement of resulting gains from this offset action should be based on fatality monitoring along the intervened power lines and the comparison of obtained results with those from pre-retrofitting monitoring.

Score: 5

3.1.6 Politically feasible

Although the Environmental Code of Kazakhstan requires that "when installing, designing, constructing, operating, repairing, reconstructing and modernising electrical networks, measures must be developed and implemented to prevent the death of birds", enforcement of this has been poor to date. Yet, a number of projects and initiatives have been organised by national NGOs – namely by BRCC[2] and ACBK[3] - together with different ministries, energy companies and other stakeholders to define the best approaches to tackle bird fatalities in power lines in Kazakhstan. Therefore, no political opposition or constraints are envisaged respecting a significant expansion of those actions and the implementation of the proposed offset actions.

Score: 4

[2] https://www.brcc.kz/en/projects-and-plans/death-of-birds-on-power-lines/

[3] https://www.acbk.kz/article/default/view?id=660

3.1.7 Implementation risk

No significant implementation risks are identified, as power lines retrofitting procedures are relatively standard and bird-protection equipment is commercially available.

Score: 5

3.1.8 Other benefits

The retrofitting of power lines in the proposed sensitive area would likely result also in moderate benefits for other raptors species that are not listed as priorities in the Project BAP but have also been found electrocuted in the surveys conducted in the area to date, including Golden Eagle, Common Kestrel, and other Falconiformes (falcons) and Strigiformes (owls) (Dwyer *et al.* 2023).

Score: 4

3.2 Retrofitting power lines in Egypt

IMPORTANT NOTE: while this option is included in this Appendix, whether it is available to the Project as an offset potentially depends on the outcome of NCE and Birdlife International internal discussions regarding their position on engaging with Projects which occur in IBAs and which have impacts to IBA trigger species.

Target biodiversity: *White Stork, Black Stork, Great White Pelican, Common Crane, European Honey Buzzard, Black Kite, Steppe Buzzard, secondary benefits potentially to all the remaining priority species.* **Score: 5.**

3.2.1 Context

Nature Conservation Egypt (NCE; BirdLife International partner in Egypt) conducted fatality surveys along *c.* 276 km of power lines in the Gulf of Suez region between 2019 and 2021, to access the existing impacts on migratory soaring birds from the existing electricity grid infrastructure. These surveys resulted in the finding of 333 bird carcasses, of at least 28 different species, due to collisions with the power lines. A large majority (87%) of these fatalities involved soaring birds, with storks, particularly the White Stork, representing 47.4% of the total. Black Stork, Great White Pelican, Common Crane and European Honey Buzzard were also amongst the most represented species (NCE *unpub. data*). For the most impacted species, annual bird mortality per 10 km in the surveyed power lines varied between 0.13 individuals (for White Stork, Great White Pelican and Common Crane in the Sinai region) to 3.75 individuals (for White Stork in the western margin of the Gulf of Suez) (NCE *unpub. data*).

With the financial support of BirdLife International, NCE is cooperating with EETC (the Egyptian Electricity Transmission Company) to retrofit 25 km of a hazardous transmission line in Sinai, by installing adequate anti-collision devices (Bird Flight Diverters – BFDs) along the line.

NCE is also working together with EETC for the retrofitting of another 16 km on the western side of the Gulf of Suez, as part of offset targets associated to the development of two wind farms in Gabal el Zeit region. An additional 100 km have been identified by NCE has of high risk for migratory soaring birds collision in the Gulf of Suez, and therefore where retrofitting could significantly decrease fatalities (Khaled El Noby *pers. comm.*).

3.2.2 Offset implementation areas

The exact location in Egypt of the power line sections where retrofitting should be implemented to attain the Project offset targets needs to be identified in subsequent conversations with NCE.

3.2.3 Offset actions

This offset would consist of the installation of BFDs along an appropriate length of transmission power lines that would result in the expected reduction of species-specific fatalities needed to attain the offset targets for the Project.

This action would be conducted by NCE in close cooperation with EETC and under the same type of existing framework agreement that is associated with the above-mentioned ongoing retrofitting actions.

Fatality monitoring of the retrofitted power lines would be conducted during the following years to assess the efficiency of the mitigation measure and the gains generated to the different target species.

3.2.4 Key partners

The key implementation partners for this offset are NCE and EETC. It is not known if the Project could work with EETC directly if NCE / Birdlife decide not to engage.

3.2.5 Demonstrable biodiversity gain

BFDs are commonly recommended as the most important mitigation measure to reduce bird collisions in existing high voltage power lines, with an average effectiveness of 50% (Bernardino *et al.* 2019).

The present fatality rates at the power lines proposed for retrofitting have not been shared by NCE at this stage. However, it is likely that the retrofitting of sections showing a higher number of fatalities along the pre-identified 100 km would result in a marked decrease in fatalities of several priority species, contributing significantly to the species offsets goals required from the Project.

The measurement of resulting gains from this offset action should be based on fatality monitoring along the intervened power lines and the comparison of obtained results with those from pre-retrofitting monitoring.

Score: 4

3.2.6 Politically feasible

NCE has already been collaborating with EETC in the retrofitting of other power lines where a high number of bird fatalities occurred, and therefore no constraints are envisaged respecting an expansion of those actions.

Importantly, however, NCE, as part of the BirdLife International partnership, shows a deep concern about the expansion of wind energy projects within the Gabal el Zayt Important Bird Area (IBA), where both the SUEZ Wind Energy BOO Wind Power Plant 1.1. GW – SWE South (PLOT 2) Wind Farm and the Scatec projects are planned to be installed. Consequently, and until a process of ongoing discussion and evaluation within the BirdLife International partnership is finalised, NCE could not commit to get involved in the implementation of this offset option in the future. It is not known if the Project could work with EETC directly if NCE / Birdlife decide not to engage.

Score: 2.

3.2.7 Implementation risk

No significant implementation risks are identified, as power lines retrofitting using BFDs follows standard procedures, BFDs are commercially available, and this type of actions is already being implemented in different stretches of the Egyptian transmission and distribution grid.

Score: 4.

3.2.8 Other benefits

A significant expansion of the retrofitting of power lines along the Rift Valley/Red Sea Flyway in Egypt would likely result also in moderate benefits for a variety of migratory and non-migratory bird species.

Score: 4.

3.3 Retrofitting power lines in Jordan

Target biodiversity: *Egyptian Vulture, Steppe Eagle, White Stork, Black Kite, secondary benefits to Short-toed Eagle, Black Stork and potentially to all the remaining priority species.* **Score: 4.**

3.3.1 Context

A study led by the Royal Society for the Conservation of Nature (RSCN; BirdLife International partner in Jordan) along 161 km of power lines in the north and south of Jordan and with surveys conducted three migratory seasons (spring and autumn 2019 and autumn 2021) revealed 215 electrocuted birds from nine species (Qaneer & Demerdzhiev 2023). The most common victim (197 individuals) was the White Stork, whereas 1 to 6 individuals of different raptor species (Short-toed Eagle, Black Kite, Steppe Eagle, Egyptian Vulture, Peregrine Falcon and Golden Eagle, by decreasing order of importance) were also found. Other incidental observations from the same areas also reported the presence of Black Stork in electrocutions (RSCN 2020).

As a result of these survey efforts, at least 250 poles causing a high number of electrocutions were identified, especially close to stopover sites used by White Storks during migration (RSCN 2020b). RSCN and Irbid Electricity Company (IDECO) signed an MoU aiming at facilitating the cooperation between the two institutions to provide a joint framework that guides the implementation of powerlines and transformers insulation projects along the flyways of migratory birds. Through the EU-funded "Egyptian Vulture New LIFE" project RSCN purchased insulation materials that were used to retrofit the most hazardous poles (RSCN 2022). RSCN also signed MoUs with the remaining electricity companies in the country and cooperates with them to identify the power lines and poles that represent higher electrocution risk to birds and need further retrofitting actions (Tareq Qaneer pers. comm.).

3.3.2 Offset implementation areas

The existing information on bird electrocution impacts in Jordan results from relatively limited systematic survey efforts conducted so far (Qaneer & Demerdzhiev 2023). However, in other areas in the country it is likely that impacts of similar magnitude occur in power lines without adequate insulation and poorly designed regarding bird protection. The exact areas/power lines where this offset action should be implemented need to be further accessed with RSCN, aiming to maximize the gains for the Project priority species.

3.3.3 Offset actions

This offset would involve equipping with bird-protection devices (safe crossarm configurations, insulating elements and/or deterrent devices; Martín Martín *et al.* 2022) pre-identified sections associated with a high number of electrocutions. The number of power line poles to be retrofitted would depend on measured current fatality rates, targeting the expected reduction of species-specific fatalities needed to attain the offset targets for the Project.

This action would be conducted by RSCN in close cooperation with the three national electricity companies with whom MoUs have already been established.

Fatality monitoring of the retrofitted power lines would be conducted during the following years to assess the efficiency of the mitigation measure and the gains generated to the different target species.

3.3.4 Key partners

The key implementation partners for this offset are RSCN and the three electricity companies in Jordan.

3.3.5 Demonstrable biodiversity gain

Adequate insulation of exposed wiring, or the installation of anti-perching or safe-perching structures can be extremely efficient in avoiding electrocution mortality (Martín Martín *et al.* 2022). Therefore, the retrofitting of high-risk power line sections/poles can significantly reduce bird mortality. This was also the case in some of the high-fatality poles in northern Jordan, where fatalities were reduced to zero after retrofitting (Tareq Qaaner *pers. comm.*).

Although species-specific fatality rates are not available for the power line sections that would be retrofitted as part of this offset, it is very likely that it would generate significant gains for White Stork and measurable gains also for other priority species, including Egyptian Vulture, Steppe Eagle, Black Kite, Short-toed Eagle and Black Stork.

The measurement of resulting gains from this offset action should be based on fatality monitoring along the intervened power lines and the comparison of obtained results with those from pre-retrofitting monitoring.

Score: 5

3.3.6 Politically feasible

RSCN has established MoUs with the three national electricity companies in Jordan which would facilitate the development of the proposed power line retrofitting in any region of the country. Furthermore, RSCN has developed a national guideline regarding powerlines and bird protection, that was submitted to the Ministry of Environment for legal approval. Also, a regional training curriculum was developed by RSCN to protect birds from the danger of electrocution, and a specialized training was held for electricity companies and relevant stakeholders (RSCN 2022). These previous actions confirm the high reputation that RSCN has among the relevant national stakeholders and therefore no political opposition or constraints are envisaged respecting the implementation of the offset.

Score: 5

3.3.7 Implementation risk

No significant implementation risks are identified, as power lines retrofitting procedures are relatively standard and bird-protection equipment is commercially available.

Score: 5

3.3.8 Other benefits

The proposed retrofitting of power lines would likely result also in moderate benefits for other raptors species that are not listed as priorities in the Project BAP (e.g. Golden Eagle and Peregrine Falcon), as well as for non-raptor species (e.g. Little Egret, Brown-necked Raven) that have also been found electrocuted in surveys conducted in Jordan to date (Qaneer & Demerdzhiev 2023).

Score: 4

3.4 Programme against illegal hunting/capture in the Middle East

Target biodiversity: *Steppe Eagle, Eastern Imperial Eagle, Greater Spotted Eagle, Steppe Buzzard, European Honey Buzzard, Short-toed Eagle, Black Kite, Long-legged Buzzard, Booted Eagle, Pallid Harrier, Levant Sparrowhawk, Red-footed Falcon, Saker Falcon, White stork, Black Stork and Common Crane. Secondary benefits to other non-priority soaring birds.* **Score: 5.**

3.4.1 Context

The hunting and/or capture of migratory birds is a long-lasting tradition in North Africa and the Middle East. Traditionally using basic hunting techniques and minimal tools, hunting practices have become nowadays more widespread and intensive, based on technological developments and a growing market for illegally captured birds (NCE 2018). Illegal hunting impacts a huge number and variety of migratory bird species, including raptors and other soaring birds. A study conducted by NCE under the Responsible Hunting Programme (RHP) initiative along Egypt's northern Mediterranean coast estimated that more than 13 raptors were captured per day and over 72 raptors were sold per day in markets in the region during the annual autumn migration (NCE 2018).

Brochet *et al.* (2019) also estimated that at least 1.7–4.6 million (best estimate: 3.2 million) birds of at least 413 species, including 3,300–11,700 raptors, may be killed or taken illegally each year in the Arabian Peninsula, Iran and Iraq. Other research conducted in the West Bank/Palestine (Handal *et al.* 2021) and Jordan (Eid & Handal 2018; RSCN 2019) confirmed that several raptors, storks and cranes are regularly hunted or traded in the region.

3.4.2 Offset implementation areas

The programme against illegal hunting/capture in the Middle East would aim to cover several countries in the region, particularly those where well-structured partners could support its implementation: Egypt, Jordan, Kuwait, possibly expanding to other countries (e.g. Iraq).

3.4.3 Offset actions

This programme would include the development of a wide range of actions in the different implementation countries across the Middle East region, including:

- Training and support of rangers' teams and law enforcement agencies to increase vigilance and implementation of relevant environmental laws on illegal hunting/trade;
- Development and roll-out of awareness campaigns targeting hunters, local communities involved in illegal hunting and trade, and general public;
- Support of teams, installations and equipment for the seizing and recovery of illegally captured birds; and.
- Development of social support programs to identify and provide alternative income or livelihood options (e.g. ecotourism).

3.4.4 Key partners

Key implementation partners for developing the Programme against illegal hunting/capture would be required in each of the countries involved. This would potentially include: NCE (Egypt), RSCN (Jordan), KEPS (Environment Protection Society, BirdLife International partner in Kuwait) and possibly OSME (Ornithological Society of the Middle East, the Caucasus and Central Asia). Also, the government agencies responsible of law enforcement in the different countries (e.g. EEAA - Egyptian Environmental Affair Agency, in Egypt) would need to be involved.

3.4.5 Demonstrable biodiversity gain

The reduction of Illegal hunting and trade by local communities or organized groups is very challenging and demands the involvement of multiple stakeholders (e.g. NGOs, Government institutions) and at different levels (national law enforcement agencies, local communities, social media). Yet, an investment in law enforcement, rangers training, monitoring of physical and digital markets and awareness campaigns has already apparently resulted in some reduction of that type of environmental crime in Jordan (Tareq Qaneer *pers. comm.*).

While the overall effectiveness of any program against illegal hunting/capture would be challenging to estimate, it could be expected that even a relatively low success would represent a significant contribution to the offset targets of the Project in terms of number of individuals saved, given the magnitude of the impacts from illegal hunting and trade. Regarding the Project priority species, the available data indicate that, at the very least:

- 7 European Honey Buzzards are sold in markets in northern Egypt every autumn (NCE 2018) (and an undetermined number in Iraq; Raza, et al. 2011);
- 7-14 Steppe Buzzards are sold in markets in northern Egypt every autumn (NCE 2018) (and an undetermined number in Iraq; Raza, et al. 2011); and 2 individuals/year are hunted in Jordan ((Eid & Handal 2018);
- 18-39 Long-legged Buzzards are sold in markets in northern Egypt every autumn (NCE 2018); and 2 individuals/year are hunted in Jordan (Eid & Handal 2018);
- Up to 4 Black Kites are sold in markets in northern Egypt every autumn (NCE 2018);
- Up to 71 Short-toed Eagles are sold in markets in northern Egypt every autumn (NCE 2018);
- Up to 7 Booted Eagles are sold in markets in northern Egypt every autumn (NCE 2018);
- 10-125 Eastern Imperial Eagles are hunted every year in the Arabian Peninsula, especially in Qatar (Brochet et al. 2019);
- 1 Steppe Eagle/year is hunted in Jordan (Eid & Handal 2018);
- 100-312 Greater Spotted Eagles are hunted every year in the Arabian Peninsula, especially in Qatar (Brochet et al. 2019);
- Up to 4 Levant Sparrowhawks are sold in markets in northern Egypt every autumn (NCE 2018);
- 4 Pallid Harriers are sold in markets in northern Egypt every autumn (NCE 2018);
- 56-92 Red-footed Falcons are sold in markets in northern Egypt every autumn (NCE 2018);
- An undetermined number of Saker Falcons is captured every year in Iraq (Raza, et al. 2011) and Jordan (Khoury *et al.* 2020);
- 4 White Storks/year are hunted in Jordan ((Eid & Handal 2018);
- 1 Black Stork/year is hunted in Jordan (Eid & Handal 2018); and,
- 30 Common Cranes/year are hunted in Jordan ((Eid & Handal 2018).

The measurement of resulting gains from this offset action should be based on tracking the number of illegal traps (e.g. (NCE 2018) and the trend in numbers of birds being sold in physical and digital markets (e.g. Eid & Handal 2018, NCE 2018), and on the comparison of obtained results with those from previous years.

Score: 4

3.4.6 Politically feasible

Previous work has been conducted in different countries, that shows an existing collaboration between potential implementation partners for this offset and the national government authorities responsible for law enforcement respecting illegal hunting and trade of birds. This is the case in e.g. Egypt, where NCE conducted surveys on the hunting and trapping of migratory birds along Egypt's Northern Mediterranean coast for 3 years, in cooperation with EEAA and working closely with the involved local communities (it is worth noting that some extent of trapping and capturing of migratory birds is legally permitted in the region, and that a large number of households is involved in this activity) (NCE 2018). Also, in Jordan RSCN has been

working closely with the main national environmental and law enforcement agencies, such as the environmental police unit (Rangers), to protect biodiversity and fight illegal hunting (e.g. RSCN 2019b). As such, no political opposition or constraints are envisaged respecting a significant expansion of actions against illegal hunting or trade of birds in the Middle East.

Score: 4

3.4.7 Implementation risk

While this offset seems not to present political challenges, it is likely that the development of the proposed actions would face some degree of social resistance and objection within local communities. The Program implementation requires a high level of engagement with local communities and law enforcement agencies and staff, and the ability to mainstream biodiversity aspects across to uninterested (or opposing) audiences.

Additionally, metrics to measure accurately the effectiveness of the Programme against illegal hunting/capture may be difficult to identify, as impacts from illegal hunting may tend to be increasingly more difficult to access as the Program implementation progresses.

Score: 2

3.4.8 Other benefits

The proposed Programme against illegal hunting/capture would very likely result in moderate-high benefits for the wide range of other soaring birds and non-soaring birds hunted or captured illegally every year across the Middle East.

Score: 4

4 Additional offset options

A number of additional offset options have been identified and may be needed for the Project to comply with their NG and NNL requirements. For most of these options, a meeting with the main lead of the conservation project has not taken place (see Table 1), and detailed information is still being gathered. Therefore, a more comprehensive assessment of such options would be included in the final version of this Offset Feasibility Study. The additional offset options, and respective lead stakeholder (see also Table 1), are:

- Implementation of conservation actions in breeding colonies of Sooty Falcon in Egypt/Middle East / Giovanni Leonardi, Coordinator of the International Single Species Action Plan for the Sooty Falcon 2024-2036;
- Habitat improvement and reduction of anthropogenic threats to the Great White Pelican in the Balkans / Tour du Valat;
- Programme against illegal hunting/capture in Georgia / SABUKO; and,

- Programme against illegal hunting/capture in Malta / BirdLife Malta.

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