AUTUMN BIRD MIGRATION STUDY 2023

SUEZ Wind Energy BOO Wind Power Plant 1.1. GW – SWE PLOTS 1 & 2

January 2024

DRAFT
REV-3

Client:

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

Prepared by:

Consultant	Contact details	Responsibilities
EcoConServ	12 El-Saleh Ayoub St., Zamalek Cairo, Egypt, 112111 Tel: + (2 02) 2735 9078 / 2736 4818 Fax: + (20 2) 2736 5397	• Analysis of field data • Report drafting
ECO Consult	Jude Centre, Salem Al-Hindawi Street, Shmeisani, Amman, Jordan Tel: 962 6 569 9769 Fax: 962 6 5697264 E-mail: info@ecoconsult.jo	
Safe Soar for Environmental Consultancy	Elkoom Elakhdar – Giza, Egypt 23 Borg Elmaamon St. – Mohamed Anwar El Sadat St. Tel: +201064666395 E-mail: safesoar@gmail.com	• Bird migration monitoring and data collection
Turnstone Ecology	Five Farthings, The Green, Great Bourton, OX17 1QH E-mail: info@turnstoneecology.co.uk	• Update of previous reports to produce 2023 analysis

Prepared for:

RCREEE - Regional Centre for Renewable Energies and Energy Efficiency
Hydro Power Building, Floor 7
Block 11, Piece 15, Melsa District
Ard el Golf, Nasr City, Cairo
Arab Republic of Egypt

Issue and Revision Record:

Template Code		QF-PM-01-15	**Template Revision No.**	REV - 1
Version	**Date**	**Description**	**Reviewed By**	**Approved by**
Rev 2	1 Jan 2024	Document Review, comment		

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LIST OF ACRONYMS

BOO	Build, Own, Operate
CRM	Collision Risk Model
EETC	Egyptian Electricity Transmission Company
ESIA	Environmental and Social Impact Assessment
GDP	Gross Domestic Product
GoE	Government of Egypt
GoS	Gulf of Suez
GW	Gigawatt
GZ	Gabal El Zeit
IRENA	International Renewable Energy Agency
ISES	Integrated Sustainable Energy Strategy
IUCN	International Union for Conservation of Nature
MSBs	Migratory Soaring Birds
NREA	New and Renewable Energy Authority
OP	Observation Points
QA	Quality Assurance
QC	Quality Control
RCREEE	Regional Centre for Renewable Energy and Energy Efficiency
RVRSF	Rift Valley - Red Sea Flyway
VP	Vantage Point

1 INTRODUCTION

1.1 Background

The energy sector is a key driver for the socio-economic development of Egypt, representing around 13% of current GDP and thus making economic growth in the country contingent upon the security and stability of energy supply. Since 2007, Egypt has experienced an energy supply deficit due to the rapid increase in energy consumption and the depletion of domestic oil and gas resources, shifting its position as a net hydrocarbon exporter for the last three decades to that of a net importer. This has brought a set of challenges to the energy sector, including electricity shortages, caused in part by the decline of domestic gas production, as natural gas is the main source of electricity, accompanied by highly subsidized energy prices, with negative financial implications for already dwindling government revenues.

In response, the Government of Egypt (GoE) has taken bold steps to adopt an energy diversification strategy with increased development of renewable energy and implementation of energy efficiency, including assertive rehabilitation and maintenance programs in the power sector (IRENA, 2018). To this extent, in 2013, the Arab Republic of Egypt (through the Ministry of Electricity and Renewable Energy) had developed and adopted the Integrated Sustainable Energy Strategy (ISES) 2015 – 2035, which provides an ambitious plan to increase the contribution of renewable energy to 20% of the electricity generated by the year 2022, of which 12% of wind power plants is foreseen, mostly in the Gulf of Suez (GoS) due to the wind characteristics in the area.

In that respect, the GoE issued the Renewable Energy Law (Decree Law 203/2014) to support the creation of a favourable economic environment for a significant increase in renewable energy investment in the country. The law sets the legal basis for the Build, Own and Operate (BOO) scheme to be implemented. Through the BOO mechanism, the Egyptian Electricity Transmission Company (EETC) invites private investors to submit their offers for solar and wind development projects, for specific capacities and the award will be made to that bidder with the lowest Kilowatt Hour (kWh) price. In addition, the GoE (through the New and Renewable Energy Authority (NREA)) provides the land for the investors. In accordance with this Law, the Egyptian Government has made land available for investors in the GoS to install wind power plants. Therefore, the Consortium is composed of ACWA Power Company and Hassan Allam Utilities B.V (hereafter referred to as 'the Developer') is proceeding with developing a project comprised of separate wind power plants with a combined capacity of 1,100MW Suez Wind Energy (SWE) under the BOO scheme[1].

The Regional Centre for Renewable Energy and Energy Efficiency (RCREEE) is managing the environmental process for the wind power plants on behalf of the Developer. RCREEE commissioned EcoConServ and ECO Consult with subcontractor (Safe Soar) for carrying out a bird migration monitoring (hereafter referred to as 'the Consultant'), to undertake Bird Migration Studies for the projects during spring 2022 and autumn 2022, and this report presents the results of these studies.

1.2 Location of the Projects and Components

The Projects: **Plot 1** (*also referred to as Gharb Bakr)* and **Plot 2** (*also referred to as Gebel-El-Zyat),* are located in the Red Sea Governorate of Egypt, at a rough distance of around 220km and 270km, respectively, to the southeast of the capital city of Cairo (Figure 1). The two Projects occupy a total combined area of 197.5 km^2

[1] The combined Project is comprised of two separate projects referred to as Plot 1 and Plot 2. Plot 1 and Plot 2 are located approximately 50km apart, therefore, biodiversity assessment and analysis has been undertaken (including the avifaunal assessment included in this report) separately. This report presents information on Plots 1 and 2 separately.

within the Rift Valley - Red Sea Flyway (RVRSF[2]). Plot 1 is located approximately 15km to the west of the town of Ras Ghareb, in the Gulf of Suez (GoS) and occupies an area of 145.3 km^2 (Figure 2). Plot 2 is located approximately 10k south of the settlement of Ras Shukeir in Gabal Zeit (GZ) with an area of 52.2 km^2 (Figure 2). At the time of the 2023 bird migration surveys, turbine layouts for Plot 1 and Plot 2 were not available.

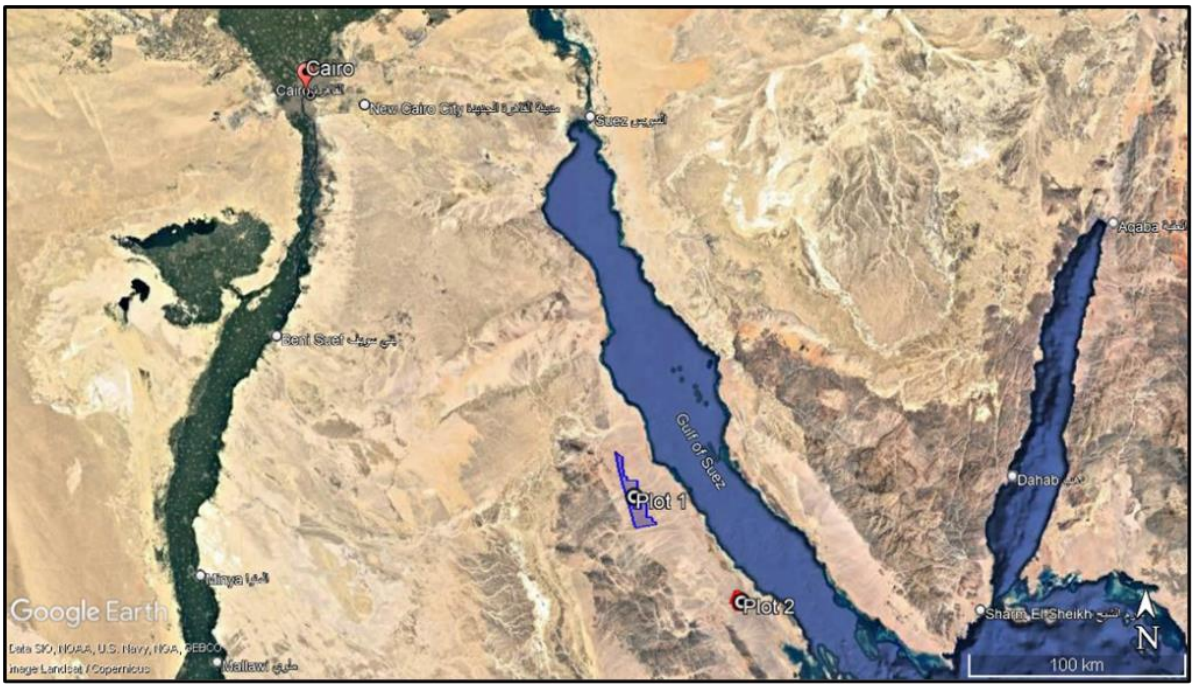


Figure 1: Project Sites in Relation to Cairo the Capital City of Egypt (plot 1: blue and plot 2:red)

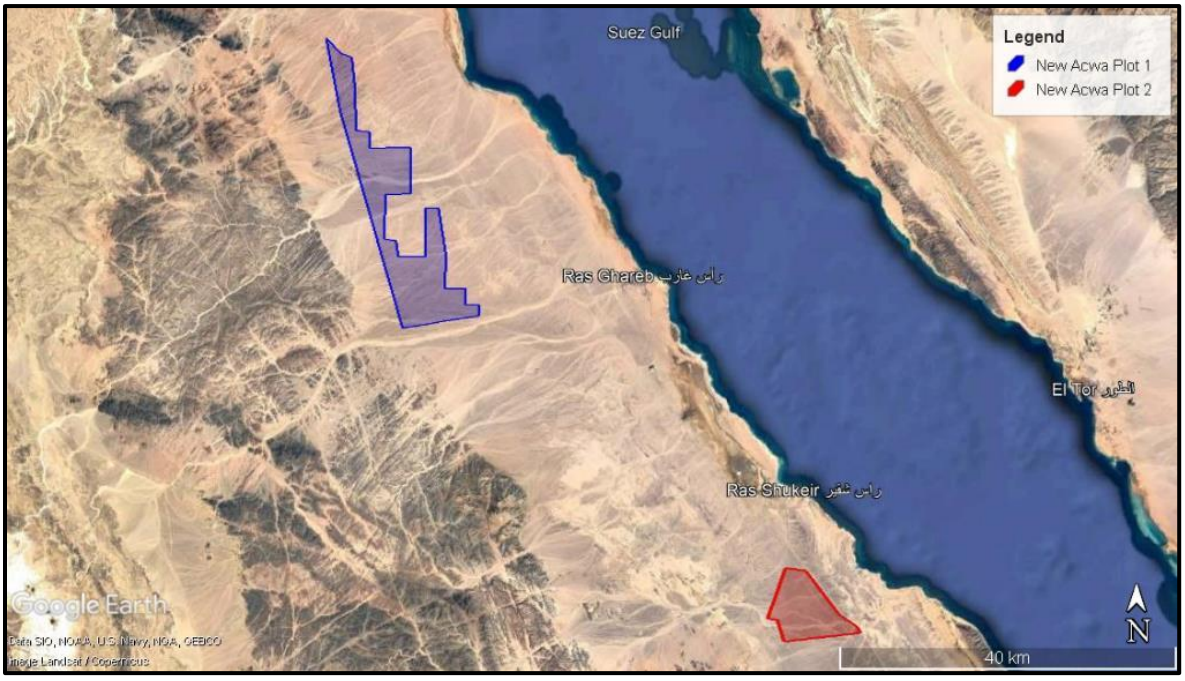


Figure 2: Project Sites (Plot 1 and 2)

[2] A map of the RVRSF along with requirements for Environmental Impact Assessment Guidelines for Wind Energy Developments in Egypt may be found in: Sarhan, Mahmoud & Uffe, Soerensen & Abdeldayem, Omar. (2013). Environmental Impact Assessment Guidelines for Wind Energy Developments in Egypt. 10.13140/RG.2.1.1867.6883.

2 OVERVIEW OF METHODOLOGY FOR AVI-FAUNA SURVEYS

2.1 Observation Point Assessment

According to the methodology outlined in the "Environmental Impact Assessment Guidelines and Monitoring Protocols for Wind Energy Development Projects along the RVRSF with a particular reference to wind energy in support of the conservation of Migratory Soaring Birds (MSBs)" (2013), the "Strategic Environmental and Social Impact Assessment (ESIA) for an Area of 300 km² of potential wind farms at the Gulf of Suez (2013)", and the methodology applied in the "Strategic and Cumulative Environmental and Social Assessment Active Turbine Management Program for Wind Power Projects in the Gulf of Suez (2019)", the assessment used specific pre-assigned Vantage Points (VPs) [also referred to as Observation Points (OPs)] in order to achieve the objectives of the monitoring.

The objective of the surveys was to provide an assessment of the use of the migratory and resident soaring birds in the project sites while providing a detailed analysis of the durations that these species use the project site and the elevations at which they are present. This helps understanding of the potential predicted impacts of the projects on bird species. This monitoring also highlighted any globally or regionally threatened species that are present and the frequency of their use of the sites.

2.1.1 Observation Hours and Timings

Unlike previous methodologies that undertook eight (8) hours of observations, the methodology for the avifauna assessment for these sites has been carried out in Autumn in line with the Spring surveys which used updated and expanded methods to ensure monitoring is undertaken to start *a minimum of 1-hour after sunrise until 1-hour before sunset.* This means around ten (10) hours (due to changes in sunrise-sunset timings) of monitoring per day at each OP was performed outside of Ramadan. During Ramadan monitoring was undertaken for eight (8) hours/day because of health and safety considerations for bird observers.

The bird survey team included a qualified backup team of observers at all times in case of any needs for any observer replacement to ensure the stability of maximum quality of observation time. In addition, the monitoring program provided survey coverage regardless of public holidays (e.g. Eid) or unexpected events. The only reason that entailed suspension of monitoring was any potential extremely serious situations which might affect health and safety impacts on observers (e.g. sandstorms).

OP's were covered by a single observer (i.e. for a total of nine (9) observers per day) that is qualified with adequate previous experience in avifaunal assessments for wind farms. Due to the large-scale nature of the sites, a rotational system was employed to provide the targeted temporal coverage, with each monitoring day divided into *morning* and *evening* shifts (5-6 hours each). Although in general a one (1)-hour break was provided between each two (2) observation periods (morning and evening observation period), the breaks were timed for periods when two observers were present to ensure the continuity of observations, i.e. the first observer takes a break for example from 1pm-2pm while the second observer keeps watching, then the second observer takes a break while the first observer is watching. The transportation of observers from the morning to the evening shift occurred during this one-hour break. Where significant bird activity was noted during a break of one observer survey effort was resumed during the flight to ensure full data coverage.

2.1.2 Vantage Point Selection

Autumn surveys were undertaken in line with the Spring 2023 surveys. A view-shed analysis was developed to determine the number of OPs required for each site. Each OP covered a view of 360 degrees extending for a maximum distance between 1.8 - 2.2 km[3]. This distance is considered the most suitable and sufficient for a qualified bird observer to identify birds to species level in good visibility conditions.

Turbine layouts were not finalised during the migration period, therefore the locations of the OP aimed to cover the entire project areas, resulting in eighteen (18) OPs for Plot 1, and nine (9) OPs for Plot 2 (Figure 3; Table 1).

The selection of the OPs for a monitoring day attempted to minimise the potential of double counting birds by ensuring no overlap of OPs selected for each survey day. For example, the OPs selected on Day 1 included OP1, OP3, OP5 and OP7, etc. each having (instead of OP1, OP2, OP3, etc.).

Some other key points that our methodology accounted for included the following:

- *Equal distribution of spatiotemporal effort*- the selected location of OPs and the shift system ensured equal distribution of spatiotemporal effort (equal distribution of observation points and observation time) across each project site.
- *Maximum study area coverage* - the OP selection was designed to provide as much coverage of buffer areas (i.e. areas located outside of the Project boundary) as possible to ensure to the greatest extent possible that alternative surrounding areas which could be utilized for turbine placement were surveyed, minimising the need to undertake new surveys to cover such areas, if required, in the future.

Table 1: Coordinates of OPs at each site (Plot 1 and 2)

OP	Latitude	Longitude	OP	Latitude	Longitude
Plot 1			**Plot 2**		
VP1	28.598820°	32.711800°	VP1	28.047967°	33.264053°
VP2	28.573960°	32.724990°	VP2	28.029219°	33.287277°
VP3	28.541430°	32.721890°	VP3	28.004803°	33.303428°
VP4	28.509620°	32.734230°	VP4	27.986955°	33.326338°
VP5	28.484060°	32.751430°	VP5	27.983198°	33.291307°
VP6	28.488637°	32.782984°	VP6	27.980825°	33.259443°
VP7	28.463896°	32.787319°	VP7	28.003991°	33.242739°
VP8	28.456060°	32.754130°	VP8	28.026864°	33.253451°
VP9	28.424400°	32.764750°	VP9	28.005845°	33.274209°
VP10	28.388200°	32.767620°			
VP11	28.416580°	32.821640°			
VP12	28.383350°	32.830305			
VP13	28.374200°	32.800240°			
VP14	28.354430°	32.788060°			
VP15	28.351698°	32.829276°			
VP16	28.326020°	32.799180°			
VP17	28.320520°	32.834290°			
VP18	28.333170°	32.866050°			

[3] Previous bird observation methods in the GoS included maximum viewsheds of 2.5km.

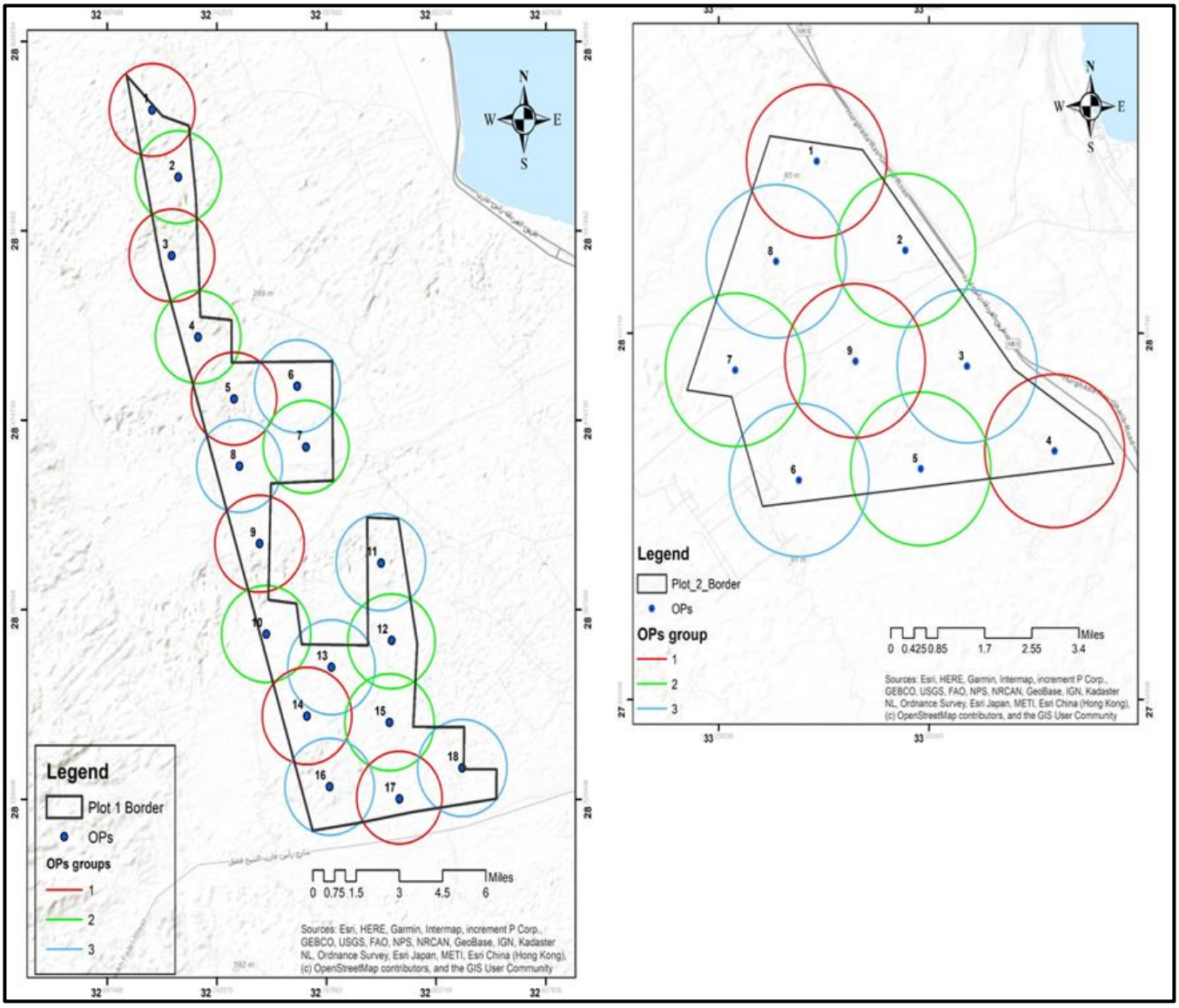


Figure 3: Location of Plots 1 and 2 and Distribution of Ops

2.1.3 Overall Team Management

Due to the huge project sites and number of required OPs, the methodology accounted for an approach that ensured optimal effectiveness and quality for the overall surveys. One (1) *Main Team Leader* was assigned for Plot 1 and Plot 2. He was not responsible for performing any observation/monitoring at OPs in any way or under any circumstance. His key roles and responsibilities included the following:

- Overall quality assurance/control on observer and observations undertaken
- Developing schedule for observers/OP
- Overall management of observers to include but not limited to assignment, daily checks on OP to ensure they are onsite, ensure observations are done and completed properly, ensure transitions from morning to evening OP is complete successfully considering rest periods, etc.
- Collection of data from observers and undertake quality control review

- Respond/resolve any issues within the site /observers
- Other

The Main Team Leader was assisted by two (2) onsite *Supportive Team Leaders* that were assigned OP areas and observer teams as applicable. The Supportive Team Leaders undertook monitoring at OPs but in parallel also supported the Main Team Leader in carrying out the duties identified above.

2.2 Data Collection

Data were recorded on spreadsheets. These spreadsheets were filled on a daily basis by the Bird Observers. Information on bird flight activity was collected from OPs. The recording of observations largely follows the methods described by Band et al. (2007[4]), which are summarized below.

Observers at OPs positioned themselves to minimize their effects on bird behaviour. Shelters were constructed for observers to protect them from weather, which also served to partially disguise observers on the landscape.

Before starting observations, cardinal directions (North, South, East and West) and landmarks of reference in the field were defined. To make this easier, and more consistent for observers a VP map showing location of, and distance to, landmarks (Figure 4) a physical north arrow (Figure 5) is present at each OP station.

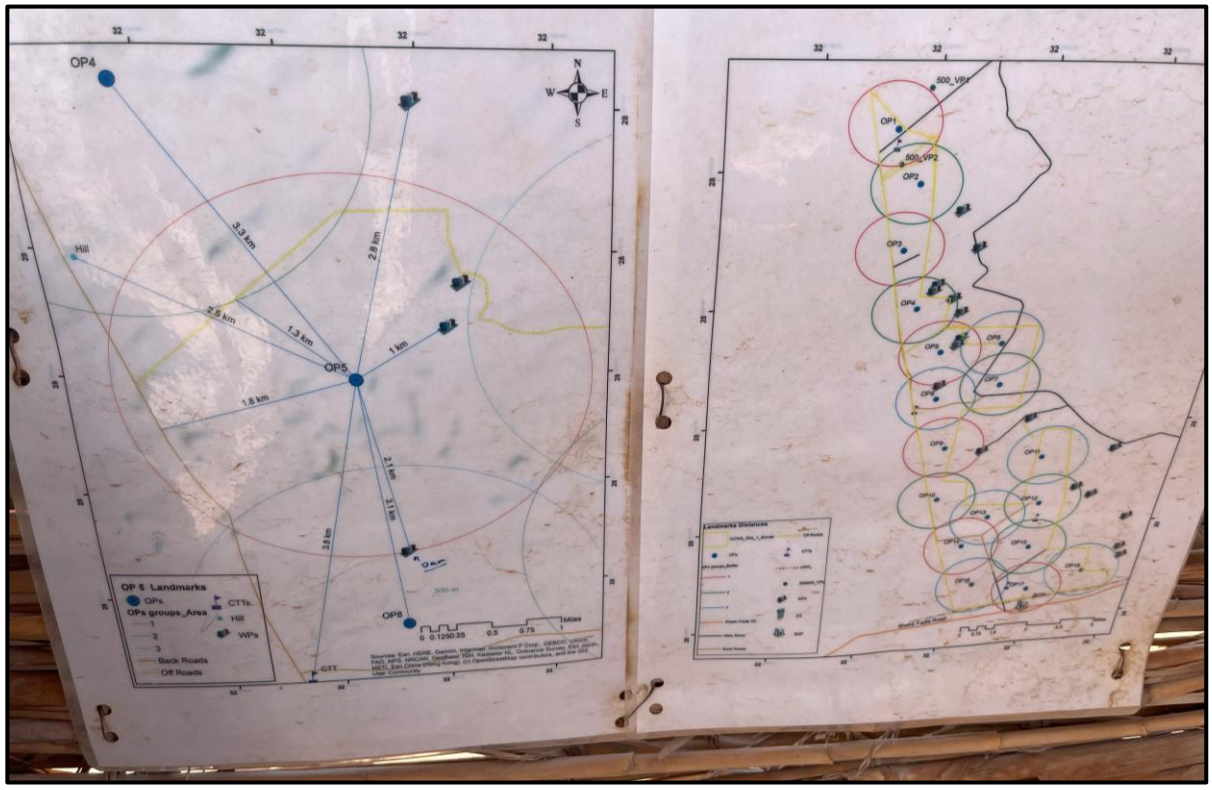


Figure 4: Example of landmark map at OP

[4] Band, W., Madders, M. & Whitfield, D.P. (2007) Developing field and analytical methods to assess avian collision risk at wind farms. In: de Lucas, M., Janss, G.F.E. & Ferrer, M. (Eds.) Birds and Wind Farms: Risk Assessment and Mitigation, pp 259-275. Quercus, Madrid.

Figure 5: Example of North Arrow at OP

Weather conditions (such as wind speed, wind direction, visibility, cloud cover and precipitation) were recorded at start time of monitoring activities. During observations, observers constantly scanned, using a combination of naked-eye and binoculars, covering the 360 degrees viewshed from each OP. If a target species[5] was detected, it was observed until it ceased flying or was lost from view[6]. For each observation of a target species, data collected included the following:

- The time the species was detected;
- The flight duration of the species to the nearest 15-second interval;
- Estimate of the bird's flight height above ground level at the point of first detection and thereafter at 15-second intervals, with flight heights classified based on *likely turbine specifications*[7], and;
- *Risk heights* - data collection covered various risk height bands to account for potential changes in turbine heights in the future. This minimises the need to repeat surveys if turbine changes occur. The following risk height bands were used: (i) 0-120m; (ii) 120m-150m; (iii) 150m-200m; (iv) 200-240m and (v) above 240m. Note that this adds an additional height band from surveys in 2022, which stopped at (iv) above 200m, and leads to some small differences in interpretation between the two years.

[5] For this monitoring target birds included all Migratory Soaring Birds (MSB) as well as other target species such as Globally Threatened bird species as determined based on the IUCN Red List (https://www.iucnredlist.org/). Accidental observations of passerines and non-target species were also recorded.

[6] It should be noted that Good International Industry Practice (GIIP) methods for Vantage Point (VP) surveys (classified here as OP surveys) commonly recommend 180 degree viewsheds. In the GoS, OP surveys commonly utilise 360 degree viewsheds. It should also be noted that GIIP for VP surveys includes flight path mapping of target species to allow for improved characterisation of spatial use of the project area and the surrounding area. Flight pat mapping was not performed for this monitoring, nor is it commonly utilised in the GoS for OP surveys and it is recommended that future OP surveys performed at these sites includes flight path mapping.

[7] Likely turbine specifications were determined by the project sponsor.

It is important to note that complete information on all records including the records detected outside the buffer radius around the OP were collected, this including number of birds and distance. Also, the distance between the detected record and the observer was documented on the datasheets. Flight direction as well as heights of all records was among the basic information collected. One data sheet for targeted species and another datasheet for accidental observations of passerines and non-targeted species were used (Appendix A).

Based on the biodiversity team's extensive experience in pre-construction surveys, the methodology was adjusted for data collection to reflect some key improvements on previous methodologies employed on all pre- and post-construction surveys performed by various consultants.

Such improvements were considered crucial and critical for the statistical analysis of the bird migration patterns. These included the following:

- *Ensure observations considered to be out of the Observation Point Radius recorded the number of birds and distances from observers.* This helps to analyse the detectability of observers for migratory birds. The longest distance from the observers the less probability of a bird being detected, also the probability of detection decreases for birds of smaller size.

- *Every project in the GoS utilises different monitoring times, either per season or per OP within a season.* For this reason, the analysis *is misleading if it uses raw bird counts* as the higher the amount of time spent monitoring is likely to result in higher probability to record more birds. Comparative analysis between and within projects have shown the significant relationship between bird counts and time of monitoring. Therefore, for certain analysis, a passage rate (birds/hour) is used.

- During Spring 2023 breaks were undertaken to ensure that observers remained focussed during the survey hours. However, during breaks if high migration was recorded this was noted on survey records. Whilst this moves away from the purest of survey methods it was believed to be appropriate given the fluctuating nature of migration and the importance of not missing crucial data. By incorporating any such data within the typical hours of survey (i.e. assuming no birds survey took place during breaks) a precautionary assessment of levels of bird activity is achieved in terms of overall flight activity through site.

  In previous years a precautionary approach to how gaps in hours at each OP was employed. However, given the spread of OP's, and the recording of incidences of double counting, it is considered that this would lead to an overly precautionary approach. Whilst neither approach is perfectly correct the assumption that all birds are recorded at one OP across site is considered to lead to a smaller likely error in overall flight activity. When a Collision Risk Model is used to assess collision risk in future work this impact will be factored out within the model and such data will be used to forecast individual species risk.

- *Correcting for flight height categorization* – In 2022 there was a disparity between the number of flight height bands used between seasons, and these were standaridzed to be 0-120m; 120-150m; 150-200m; over 200m. The proportion of time that each species spent within each flight height band was calculated by dividing the length of time in that band by the total time in all bands. This was repeated overall for the plot and season for each species, and separately for each vantage point. For the 2023 assessment the actual recorded bands were maintained for the majority of assessment as this provides better detail on flight activity. For comparative band risk analysis the same bands were also used as in 2022 to provide an appropriate comparison.

2.3 Study Design - Accounting for Roosting & Resting of Birds

Many birds must utilise roosting and resting sites during migration to/from overwintering and breeding ranges, and identifying roost sites/habitat features is an important aspect of migratory bird studies for proposed wind

energy projects within migratory flyways. MSB and other target species and groups exhibit different migratory strategies, and such strategies are also influenced by bottleneck sites, topography, weather, behaviour, and other factors which influence the location of roost and rest sites[8]. Migration timing, coupled with the condition of individual birds and their level of exhaustion during migration, can also influence the location of roosting or resting sites along migratory routes, especially in cases where long-distance over-water crossings are involved, such as across the Red Sea between the Sinai Peninsula and the western GoS coast, where the proposed sites are located. This can result in dynamic spatial use of an area for roosting/resting, even for the same species. For example: one flock of birds undertakes the over-water crossing at a similar time to another, but the first encounters more difficult conditions or requires rest earlier then the second. While the second group passes through an area during the daytime, the first group stops for rest and roosts overnight.

Therefore, the study design aimed to document and characterise the extent to which migratory soaring birds rested or roosted in the proposed project areas and the immediate surrounding areas using the following approach:

- *Recording resting/roosting birds during OP observations* - visible ground was scanned thoroughly for any birds, and any birds identified resting or roosting on the ground were documented using the appropriate data sheet.
- *Recording roosting/resting birds outside of OP surveys* – During travel to/from OPs or between OPs and within 2-km of the sites, observers recorded any resting or roosting migratory soaring birds. These observations were recorded on a data sheet and roosting/resting sites were mapped.

2.4 Study Design - Accounting for potential environmental constraints

Some MSB and target species may be attracted to particular landscape features as they migrate. Such features may be attractive because they provide a concentrated source of food, such as carcass dump sites for many raptor and vulture species or a water body (permanent or ephemeral) for storks. Such features have the potential to be routinely used by these species and/or serve as an *attractant* within the landscape, altering individual bird behaviour during migration, and/or concentrating bird flight activity to/from this feature. Such features could elevate long term risks to these target species if the projects are constructed and, therefore, may be considered potential environmental constraints when assessing risks as part of the planning and consenting process[9].

The Team Manager considered any nearby site-specific conditions that could influence the behaviour of those species which could make use them for feeding constituting a constraint or which may require further specific mitigation and mapped these features, which included:

- *Plot 1 dam-formed artificial pond* – the artificial pond (Latitude 28.465359° Longitude 32.750984°) was previously formed as a result of the accumulation of rainfall during the 2021/2022 overwinter rainy period which was impounded behind a dam. This feature has the potential to act as a source of attraction for some

[8] E.g. Porter (2006) stated: "In the case of birds of prey the vast majority will pass overhead and not stop unless to roost as most do not feed on migration. The species that do are mainly those which migrate on a broad front, notably the harriers and falcons (especially Lesser Kestrel and Red-footed Falcon), but these are not known to gather in any concentration at the bottleneck" and "Storks are known to gather to feed on migration if the habitat is suitable; similarly White Pelicans will congregate on lakes where fish are abundant".

[9] It should be noted that such environmental constraints should be considered in the context of both wind turbine and overhead electrical line siting.

migratory birds, particularly storks, pelicans and other waterbirds when water is present during the migration seasons.

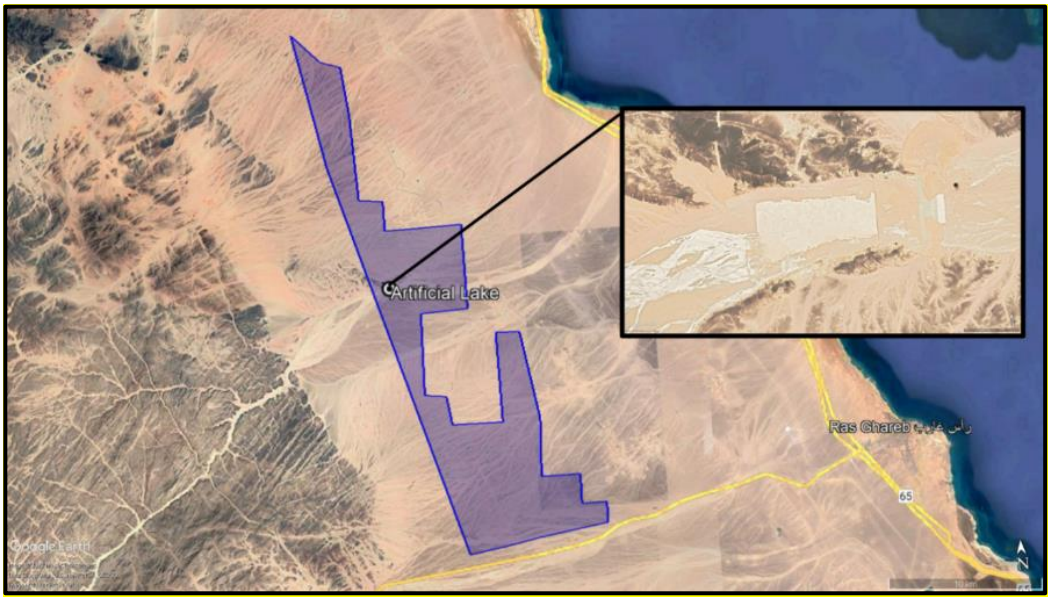
- *Plot 2 dumpsite* – this illegal dumpsite spread alongside the road to Wadi Dara is used for carcass disposal unofficially by livestock and poultry farms located within Wadi Dara. This feature has the potential to attract birds of prey and vultures throughout the year, and in particular during migration seasons, as birds stopover at this site for feeding/scavenging.

- *Plot 2 Wadi Dara* - poultry farms, the poultry processing facility, livestock farms, residences, landscaped vegetation and other features located in and around the community of Wadi Dara have the potential to attract migratory birds drawn to these landscape features for resting/roosting and/or feeding/scavenging. Wadi Dara is largely situated southwest of the Plot 2 boundary.

2 hour long survey visits were completed at these potential environmental constraints during the 2023 autumn migration season with one day missed due to poor weather conditions. Surveys completed during Autumn 2023 at the potential environmental constraints are summarised in Table 2.

Table 2: Summary of bird observation effort and approach for potential environmental constraints.

	Plot 1: dam/artificial pond	**Plot 2: dumpsite**	**Plot 2: Wadi Dara**
Survey method	Site Specific visits to the pond	Site specific visits to the dumpsite	Site specific visits to Wadi Dara
Autumn 2023 dates (from/to)	10 Aug – 10 Nov	10 Aug – 10 Nov	10 Aug – 10 Nov
Autumn 2023 number survey rounds	90 visits (daily through season)	90 visits (daily through season)	90 visits (daily through season)



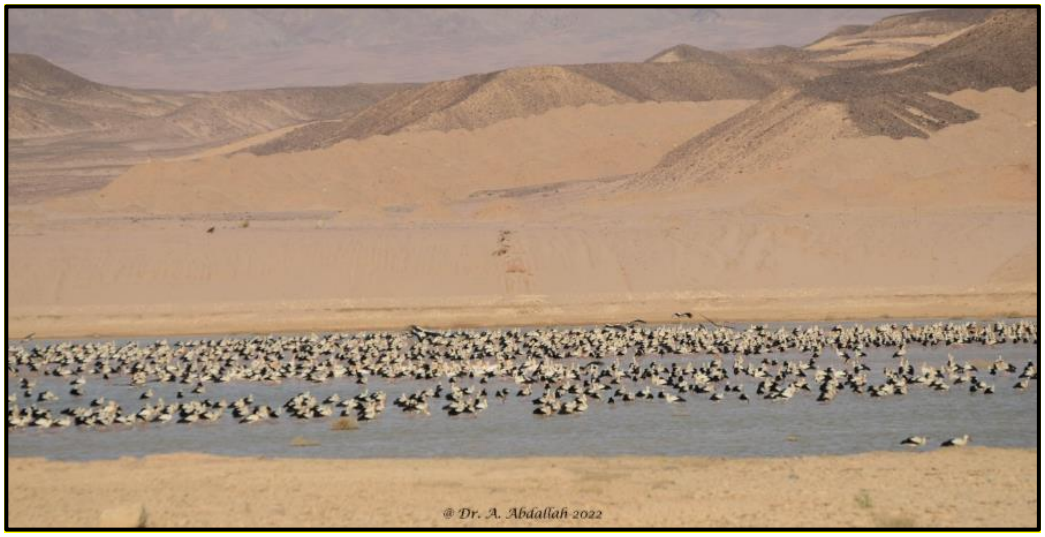


Figure 6: Location and photograph of the dam/artificial pond in Plot 1 during a previous rainy season

Figure 7: Location and photograph of the dry dam/artificial pond area in Plot 1 taken during 2023 when no water was present

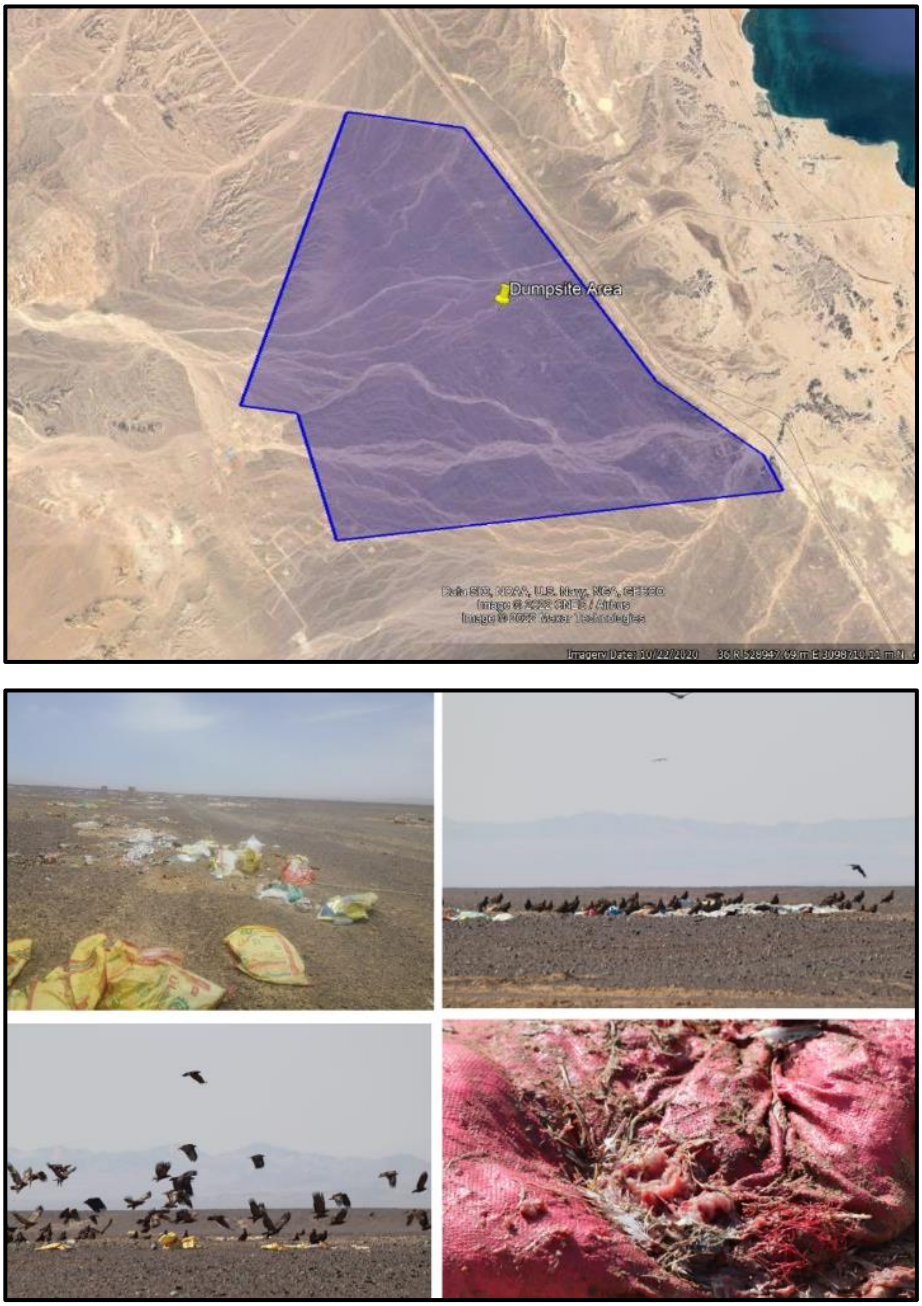


Figure 8: Location and photos of the dumpsite in Plot 2

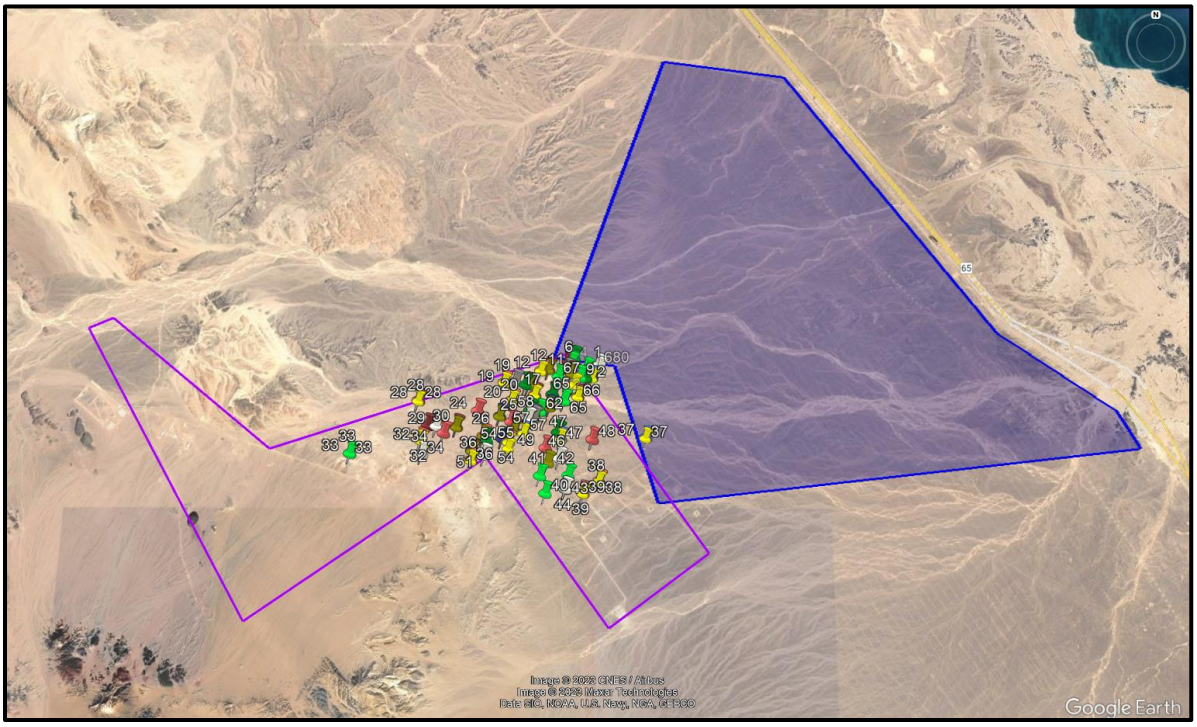


Figure 9: Location and photos of Wadi Dara located near Plot 2

2.4.1 Data Management and Quality Control (QC)/ Quality Assurance (QA)

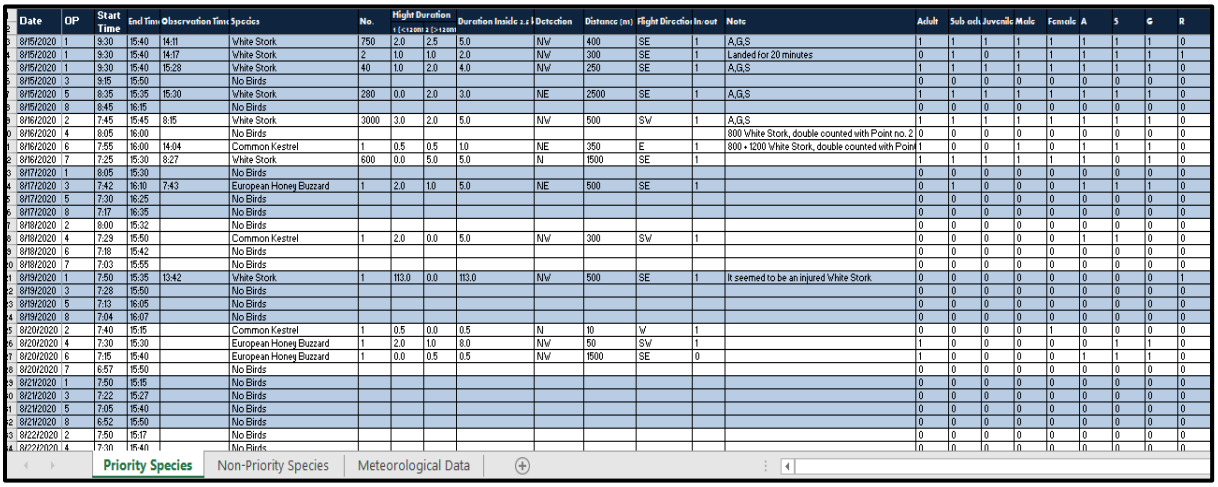
1. Each observer had sufficient data sheets throughout the migration season. Each observer filled out the sheets on a daily basis.

2. At the end of each day, each bird observer was required to thoroughly check the data sheet to ensure all inputs were included. In addition, at the end of each day, the observer performed a quality check to ensure the data is reasonable, factual, complete, accurate and representative. Any missing items were filled and any detected problems were resolved within the submitted data sheet.

3. Through random and periodical inspections, the Team Leader undertook inspections on submitted data sheet by Observers to ensure all required inputs were included in a reasonable, factual, complete, accurate and representative manner. Any missing items or problems were solved and explained accordingly with the observer responsible for filling the sheet. Any changes were documented for future reference.

4. The Team Leader designated one of the bird observers as a "Data Controller". The Data Controller was responsible for: (i) collection of the data sheets from the bird observer team on a daily basis; and (ii) entering the data into a master database (see example in figure below).

5. Upon completion of data entry for the day, the Team Leader reviewed the data and checked for Quality Control and Assurance purposes on the data including data entry errors. Any discrepancies were identified, highlighted and doubled checked with the Data Controller and bird observer accordingly to e.g., double counts of the same species/groups. Given the size of the project area the chance of having birds passing through several points successively is high. This exercise was performed on a daily basis. Changes were documented for future reference.



	Date	OP	Start Time	End Time	Observation Time	Species	No.	Flight Duration			Duration Inside 2 x 2	Detection	Distance (m)	Flight Direction	In-out	Note	Adult	Sub adult	Juvenile	Male	Female	A	S	G	R
								1 (<12min)	2 (>12min)																
3	8/15/2020	1	9:30	15:40	14:11	White Stork	750	2.0	2.5	5.0	NW	400	SE	1	A,G,S		1	1	1	1	1	1	1	1	0
4	8/15/2020	1	9:30	15:40	14:17	White Stork	2	1.0	1.0	2.0	NW	300	SE	1	Landed for 20 minutes		0	1	0	1	1	1	1	1	1
5	8/15/2020	1	9:30	15:40	15:28	White Stork	40	1.0	2.0	4.0	NW	250	SE	1	A,G,S		1	1	1	1	1	1	1	1	0
6	8/15/2020	3	9:15	15:50		No Birds											0	0	0	0	0	0	0	0	0
7	8/15/2020	5	8:35	15:35	15:30	White Stork	280	0.0	2.0	3.0	NE	2500	SE	1	A,G,S		1	1	1	1	1	1	1	1	0
8	8/15/2020	8	8:45	16:15		No Birds											0	0	0	0	0	0	0	0	0
9	8/16/2020	2	7:45	15:45	8:15	White Stork	3000	3.0	2.0	5.0	NW	500	SW	1	A,G,S		1	1	1	1	1	1	1	1	0
10	8/16/2020	4	8:05	16:00		No Birds										800 White Stork, double counted with Point no. 2	0	0	0	0	0	0	0	0	0
11	8/16/2020	6	7:55	16:00	14:04	Common Kestrel	1	0.5	0.5	1.0	NE	350	E	1	800 + 1200 White Stork, double counted with Point		1	0	0	1	0	1	1	1	0
12	8/16/2020	7	7:25	15:30	8:27	White Stork	600	0.0	5.0	5.0	N	1500	SE	1			1	1	1	1	1	1	0	1	0
13	8/17/2020	1	8:05	15:30		No Birds											0	0	0	0	0	0	0	0	0
14	8/17/2020	3	7:42	16:10	7:43	European Honey Buzzard	1	2.0	1.0	5.0	NE	500	SE	1			0	1	0	0	0	1	1	1	0
15	8/17/2020	5	7:30	16:25		No Birds											0	0	0	0	0	0	0	0	0
16	8/17/2020	8	7:17	16:35		No Birds											0	0	0	0	0	0	0	0	0
17	8/18/2020	2	8:00	15:32		No Birds											0	0	0	0	0	0	0	0	0
18	8/18/2020	4	7:29	15:50		Common Kestrel	1	2.0	0.0	5.0	NW	300	SW	1			0	0	0	0	0	1	1	0	0
19	8/18/2020	6	7:18	15:42		No Birds											0	0	0	0	0	0	0	0	0
20	8/18/2020	7	7:03	15:55		No Birds											0	0	0	0	0	0	0	0	0
21	8/19/2020	1	7:50	15:35	13:42	White Stork	1	113.0	0.0	113.0	NW	500	SE	1	It seemed to be an injured White Stork		0	0	0	0	0	0	0	0	1
22	8/19/2020	3	7:28	15:50		No Birds											0	0	0	0	0	0	0	0	0
23	8/19/2020	5	7:13	16:05		No Birds											0	0	0	0	0	0	0	0	0
24	8/19/2020	8	7:04	16:07		No Birds											0	0	0	0	0	0	0	0	0
25	8/20/2020	2	7:40	15:15		Common Kestrel	1	0.5	0.0	0.5	N	10	W	1			0	0	0	0	1	0	0	0	0
26	8/20/2020	4	7:30	15:30		European Honey Buzzard	1	2.0	1.0	8.0	NW	50	SW	1			1	0	0	0	0	0	1	1	0
27	8/20/2020	6	7:15	15:40		European Honey Buzzard	1	0.0	0.5	0.5	NW	1500	SE	0			1	0	0	0	0	1	1	1	0
28	8/20/2020	7	6:57	15:50		No Birds											0	0	0	0	0	0	0	0	0
29	8/21/2020	1	7:50	15:15		No Birds											0	0	0	0	0	0	0	0	0
30	8/21/2020	3	7:22	15:27		No Birds											0	0	0	0	0	0	0	0	0
31	8/21/2020	5	7:05	15:40		No Birds											0	0	0	0	0	0	0	0	0
32	8/21/2020	8	6:52	15:50		No Birds											0	0	0	0	0	0	0	0	0
33	8/22/2020	2	7:50	15:17		No Birds											0	0	0	0	0	0	0	0	0
34	8/22/2020	4	7:30	15:40		No Birds											0	0	0	0	0	0	0	0	0

Priority Species | Non-Priority Species | Meteorological Data

Figure 10: Master Database Template

2.5 Communication

All team members were provided with mobile phones including internet connection and WhatsApp phone application. The team in the field was in contact during the monitoring period via mobile phones and a dedicated WhatsApp group for immediate communication for any key issues to include for example: (i) follow up on the migrating flocks and individuals over the project area; (ii) avoiding double count of same flocks/individuals.

2.6 Required Resources and Equipment

Basic bird monitoring equipment was used throughout the period to include: binoculars, camera, and anemometer. Bird identification books/guides were available to observers especially during the periods of the junior training. For safety, vehicle/s remained onsite to ensure that the observers have access to first aid kits, water, and a transportation mean to the nearest medical care of any emergencies.

3 PLOT 1: RESULTS FOR AUTUMN 2023

3.1 Autumn 2023 Effort

The overall effort and effort per OP for Plot 1 during autumn 2023 is summarised in Table 3.

Table 3: Level of Effort during Avifaunal Assessments for Plot 1 during autumn 2023

Season /dates	OP	Monitoring time
Plot 1		
Autumn 2023 90 days (10 Aug–10 Nov)	OP-1	272 hr. 00 min
	OP-2	261 hr. 30 min.
	OP-3	271 hr. 30 min.
	OP-4	261 hr. 00 min.
	OP-5	272 hr. 00 min.
	OP-6	267 hr. 30 min.
	OP-7	261 hr. 30 min.
	OP-8	247 hr. 30 min.
	OP-9	266 hr. 00 min.
	OP-10	266 hr. 30 min.
	OP-11	266 hr. 30 min.
	OP-12	267 hr. 00 min.
	OP-13	267 hr. 30 min.
	OP-14	272 hr. 30 min.
	OP-15	260 hr. 30 min.
	OP-16	267 hr. 30 min.
	OP-17	266 hr. 00 min.
	OP-18	266 hr. 30 min.
	Total	**4,798 hr. 30 min.**

3.2 Observed Species Records and Individuals at Plot 1

For the reporting period, 23 MSB species were recorded with a total of 17,552 birds accounting for 626 records (Table 4). In addition, observers were not able to identify a total of 69 individuals and 53 records – those were classified as raptors or unidentified falcon, eagle, buzzard or harrier. Over 75% of the birds recorded belonged to only three (3) species; the White Stork, White Pelican and European Honey Buzzard. Only one species (White Stork) exceeded 8,000 individuals, while one species (European Honey Buzzard) exceeded 5,000 individuals, and White Pelican exceeded 1,000 individuals.

Four (4) of these species (Table 4) are globally threatened according to the IUCN Red List (https://www.iucnredlist.org/): including one (1) Endangered-EN (Steppe Eagle), and two (2) Vulnerable-VU species (Eastern Imperial Eagle and Sooty Falcon). In addition, one (1) species is Near Threatened-NT (Pallid Harrier). All the remaining MSB species observed were classified as Least Concern-LC.

Table 4: Summary of bird observation records during autumn 2023 at Plot 1.

Species Name	Conservation Status [10]	National Status	# individuals	# records
Black Kite *Milvus migrans*	Least Concern	Passage migrant	256	72
Booted Eagle *Hieraaetus pennatus*	Least Concern	Passage migrant	6	6
Common Crane *Grus grus*	Least Concern	Passage migrant	88	2
Common Kestrel *Falco tinnunculus*	Least Concern	Passage migrant	117	100
Eastern Imperial Eagle *Aquila heliaca*	Vulnerable	Passage migrant	1	1
Eurasian Hobby *Falco Subbuteo*	Least Concern	Passage migrant	1	1
Eurasian Sparrowhawk *Accipiter nisus*	Least Concern	Passage migrant	11	10
European Honey-buzzard *Pernis apivorus*	Least Concern	Passage migrant	5764	182
Lanner Falcon *Falco biarmicus*	Least Concern	Passage migrant	4	3
Lesser Spotted Eagle *Clanga pomarina*	Least Concern	Passage migrant	4	3
Levant Sparrowhawk Accipiter brevipes	Least Concern	Passage migrant	17	6
Long-legged Buzzard *Buteo rufinus*	Least Concern	Passage migrant / winter visitor	5	5
Montagu's Harrier *Circus pygargus*	Least Concern	Passage migrant	38	37
Osprey *Pandion haliaetus*	Least Concern	Passage migrant	3	3
Pallid Harrier *Circus macrourus*	Near Threatened	Passage migrant / winter visitor	27	27
Peregrine Falcon *Falco peregrinus*	Least concern	Passage migrant	2	2
Short-toed Snake-eagle *Circaetus gallicus*	Least Concern	Passage migrant / summer breeder	1	1

[10] EN: Endangered, VU: Vulnerable, NT: Near Threatened, LC: Least Concern

Species Name	Conservation Status [10]	National Status	# individuals	# records
Sooty Falcon *Falco concolor*	Vulnerable	Passage migrant / summer breeder	14	13
Steppe Buzzard *Buteo buteo vulpinus*	Least Concern	Passage migrant	168	64
Steppe Eagle *Aquila nipalensis*	Endangered	Passage migrant / Winter visitor	6	6
Western Marsh-harrier *Circus aeruginosus*	Least Concern	Passage migrant	77	58
White Pelican *Pelecanus onocorotalus*	Least Concern	Passage migrant	1978	16
White Stork *Ciconia ciconia*	Least Concern	Passage migrant	8964	8

3.3 Migration Patterns: Flocking behaviour

Flocking behaviour has a large influence on migratory patterns. There are species which migrate solitary or in small groups, whilst others form very large flocks. Both variables have implications for potential mitigation measures to reduce collision risk of operational wind turbine, as large flocks may cause a large number of fatalities in one single event compared to individuals flying alone. Table 7 presents the average flock size (individuals/group) for all species along with confidence intervals (± 95%), the number of records, and their minimum and the maximum values. European Honey Buzzard, White Pelican, and White Stork had the largest flock sizes and whilst Black Kite, Common Crane and Steppe Buzzard had lower flock sizes they were still above the remaining species. Generally, most of the remaining species were all estimated at less than 10 individuals per flock (group) with most being single birds.

Table 5: Mean group size (flock size), the 95% confidence intervals, number of records and maximum group size (all species had a minimum group size of 1) for Plot 1 in autumn 2023.

Species	Mean group	Conf. 95%	Conf. 95%	# records	# Maximum
Black Kite	3.20	1.18	5.22	221	76
Booted Eagle	1.00	1.00	1.00	27	1
Common Crane	44.00	-222.83	310.83	2	65
Falcon Species	1.13	0.98	1.27	46	2
Eurasian Hobby	1.00	1.00	1.00	1	1
European Honey Buzzard	31.50	23.43	39.57	772	350
Imperial Eagle	1.00	1.00	1.00	1	1
Kestrel	1.17	1.09	1.25	410	4
Lanner Falcon	1.25	0.45	2.05	10	2
Lesser Spotted Eagle	1.25	0.45	2.05	18	2
Levant Sparrowhawk	2.33	-0.12	4.79	21	7
Long-legged Buzzard	1.00	1.00	1.00	24	1

Species	Mean group	Conf. 95%	Conf. 95%	# records	# Maximum
Marsh Harrier	1.28	1.13	1.43	143	4
Montagu's Harrier	1.02	0.98	1.07	119	2
Osprey	1.00	1.00	1.00	10	1
Pallid Harrier	1.00	1.00	1.00	85	1
Peregrine Falcon	1.00	1.00	1.00	6	1
Raptor Species	1.40	1.05	1.75	44	3
Short-toed Eagle	1.00	1.00	1.00	3	1
Sooty Falcon	1.06	0.94	1.17	41	2
Sparrowhawk	1.08	0.90	1.27	60	2
Steppe Buzzard	2.46	1.67	3.25	261	25
Steppe Eagle	1.00	1.00	1.00	17	1
Unidentified Harrier	1.19	1.02	1.36	52	3
Unidentified Buzzard	1.00	1.00	1.00	5	1
White Pelican	110.32	-17.64	238.27	30	1200
White Stork	692.86	-96.90	1482.61	31	5000

3.4 Distribution of Groups and Species over Observation Points, including analysis of flight height

Spatial analysis of the distribution of bird groups and species observed per OP was perfomed using the time spent within each area to assess relative patterns of bird activity observed during the season. Time in this case was the time spent by flocks/registrations rather than all individuals as this provides a more realistic insight in to the likely requirements of shutdown of turbines during windfarm operation. Figures were produced for key groups and species alongside analysis of flight height distribution of observations to allow for side by side comparisons and more resolution for assessing patterns of flight activity. Groups assessed included: All MSB and target species including unidentified species; all birds of prey (including unidentified species), and; storks and pelicans.

It should be noted that spatial patterns of bird flight activity may vary from one year to another based on environmental, ecological or other factors.

Key findings from the 2023 autumn season at Plot 1, along with note on comparison to autumn season 2022, are summarised as follows:

3.4.1 Groups

6. In 2022, for all MSB and target species, including unidentified species, the highest extrapolated passage rates were highest in the northern half of the site, with the exception of OP10). During autumn 2023 OP7 showed the highest amount of activity, by time, of all MSB and target species flocks, including unidentified species. There was a fairly even distribution across the remainder of the OPs.

7. In 2022, for all birds of prey (excluding unidentified species), the northern half of the site had much higher extrapolated passage rates in comparison to the southern half of the site. In 2023 the highest amount of activity, by time, of all MSB and target species flocks, including unidentified species was through the southern portion of the centre of the site around OP's 12, 10 and 9, though relatively high rates were observed throughout the remainder of the site.

8. In 2022 for storks and pelicans, extrapolated passage rates were notably highest at OP10, with few southern OPs detecting birds from this species assemblage. During 2023 the highest amount of activity, by time, of all MSB and target species flocks, including unidentified species was through the centre of the site but fairly evenly distributed throughout.

3.4.2 Species

9. During autumn 2022, Black kites spent over 50% of their time at heights greater than 200m overall. The occurred throughout the site in relatively low numbers, with greater number of passages at OP4, 6 and 11 in more central latitudes. During 2023 the highest activity of this species in the southern part of the centre of site at OP's 10, 7 and 8. In Autumn 2023, Black Kite spent over 70% of their time over 300m, and 50% above 240m. Greatest numbers were recorded at OP 7, 10 and 17.

10. During 2022, Honey buzzard spent the majority of their time over 200m, with potentially greater proportions of time at higher altitudes in the northern areas of the site where there were also higher numbers of passages. In autumn 2023, Honey Buzzards were mostly above 200m, with the majority over 240m. Honey Buzzard were spread across the survey area however, OP 7 recorded the largest number of individuals by over 1000 birds.

11. During 2022 Levant sparrowhawks were recorded only at 3 Ops (6,7,16). Only fourteen Levant Sparrowhawks were recorded in autumn 2023, all above 200m. OP 7 recorded the highest number of individuals however sample sizes were not large enough to identify flight patterns.

12. During 2022 Imperial Eagles spent a very small proportion of time within the 0-120m band, with the majority spent at altitudes over 200m. Spatial patterns between VPs where this species was recorded are unclear; however, no individuals were noted north of OP5 (slightly north of the dam). During 2023 only one Imperial Eagle was noted, at OP6.

13. During both 2022 and spring 2023 Greater Spotted Eagle were recorded in small numbers, none were recorded during the autumn migration period in either 2022 or 2023.

14. During 2022 Steppe buzzards were recorded across the site, with little clear spatial patterns of occurrence; however, it appears that flight heights were lower towards the southern extent of the plot. In autumn 2023 higher activity was recorded in the central portions of site with the highest level of activity above 200m.

15. During 2022 Steppe Eagles were recorded at two OPs only (8, 15). During 2023 higher activity was recorded in the centre of the site and distributed with one or two individuals across the OPs. The highest level of activity generally above 200m however umbers of Steppe Eagle were generally low throughout the autumn migration period.

16. During 2022 White Pelicans spent the majority of time at heights greater than 200m, with highest passage rate at OP1, 3, and 15. Sample sizes were too low to investigate spatial variation in flight heights. During autumn 2023, there were over 1500 more individual White Pelicans noted, with the majority above 200m and a fairly even distribution across the OPs. A spike of 1330 birds was noted at OP12.

17. In autumn 2022, White storks were only recorded at Ops 2, 4,6, 10 and 18, with the majority of time flying at heights greater than 200m. During 2023 the highest activity was in the centre of the site, with no birds recorded south of OP10. Birds were mostly recorded above 240m, with the majority remaining recorded over 200m.

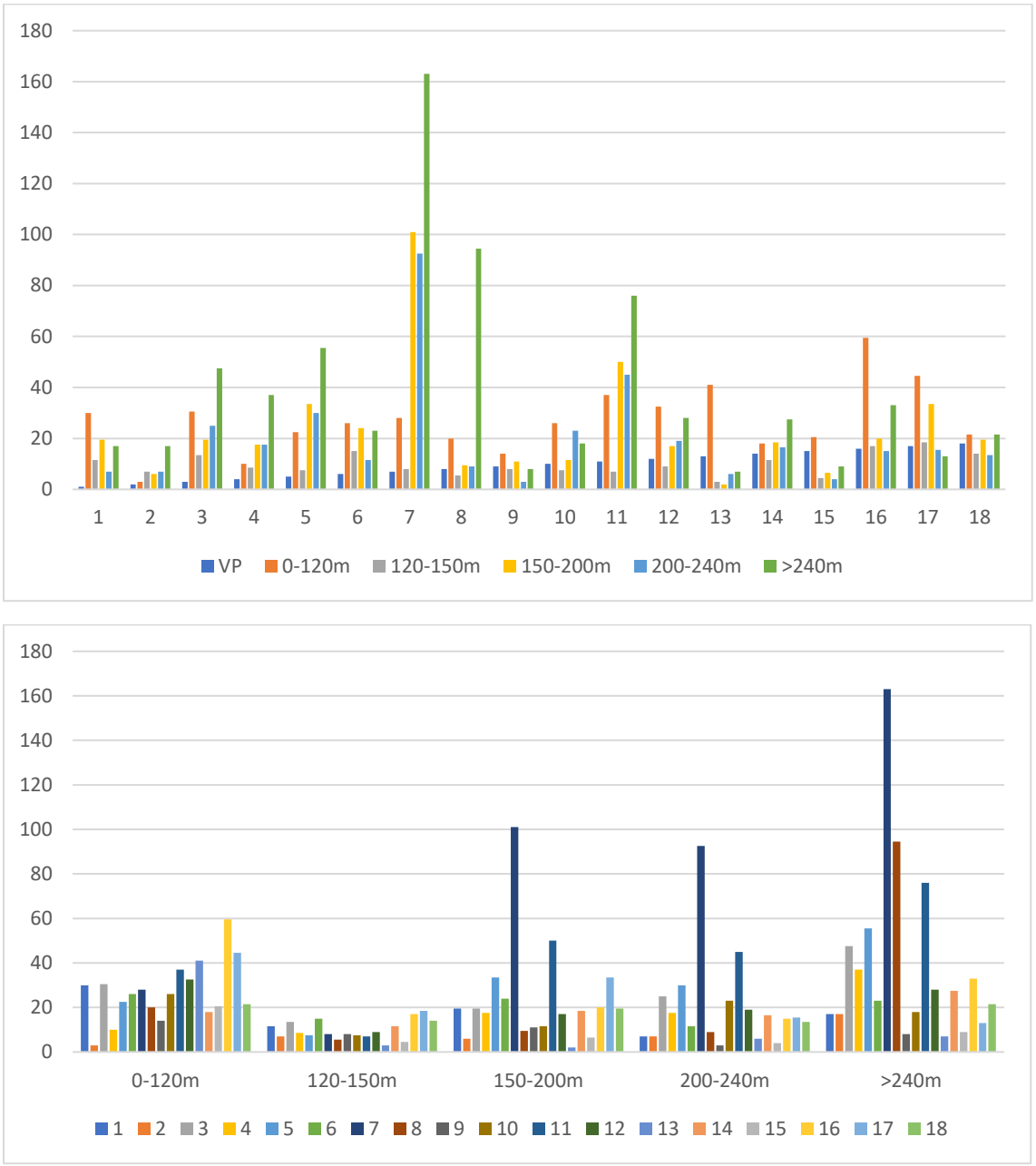


Figure 11: Time observed at flight height bands for all MSB and target bird species during autumn 2023 migration season at Plot 1. Shown by height band above and by VP below.

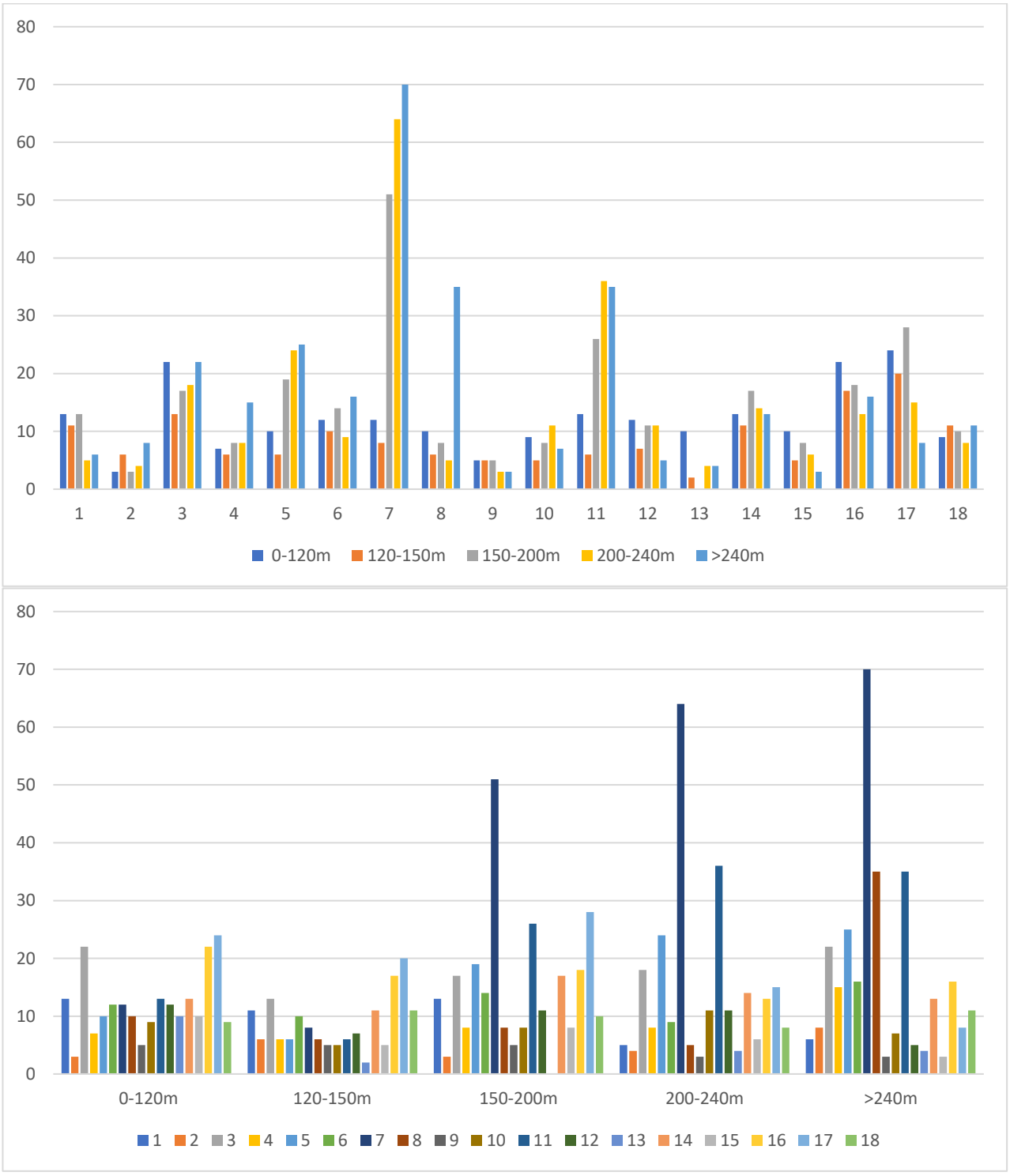
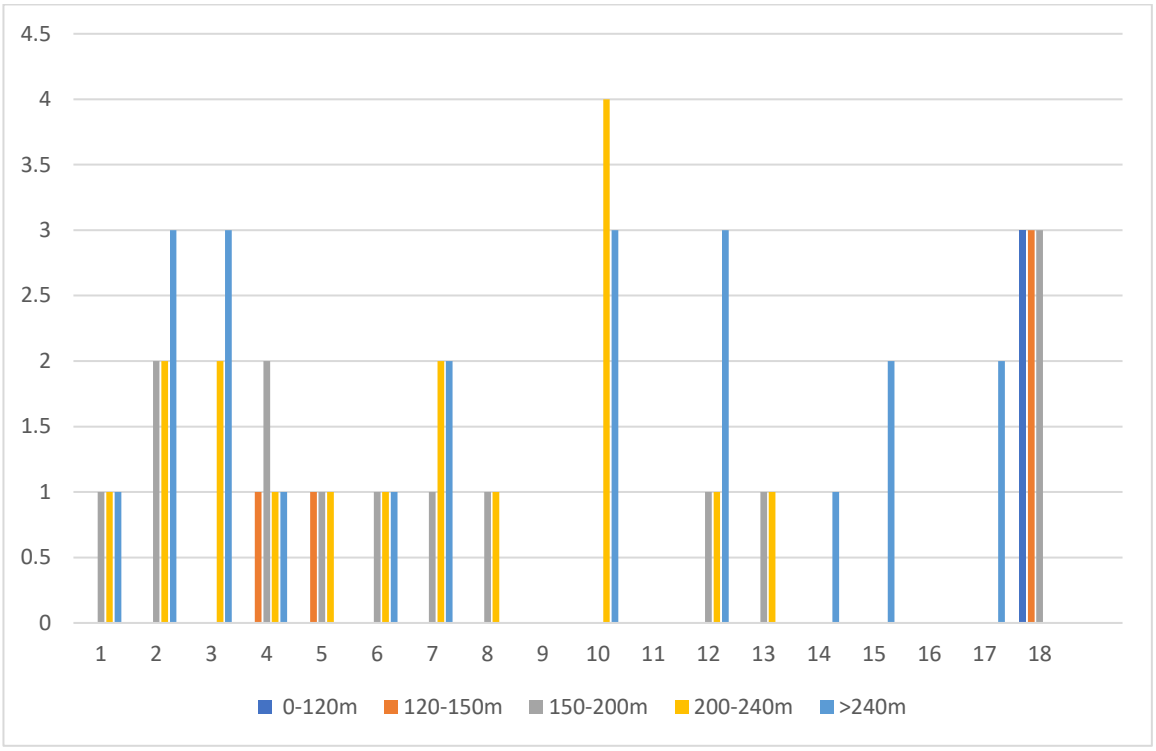


Figure 12: Time observed at flight height bands for all birds of prey during autumn 2023 migration season at Plot 1. Shown by height band above and by VP below.



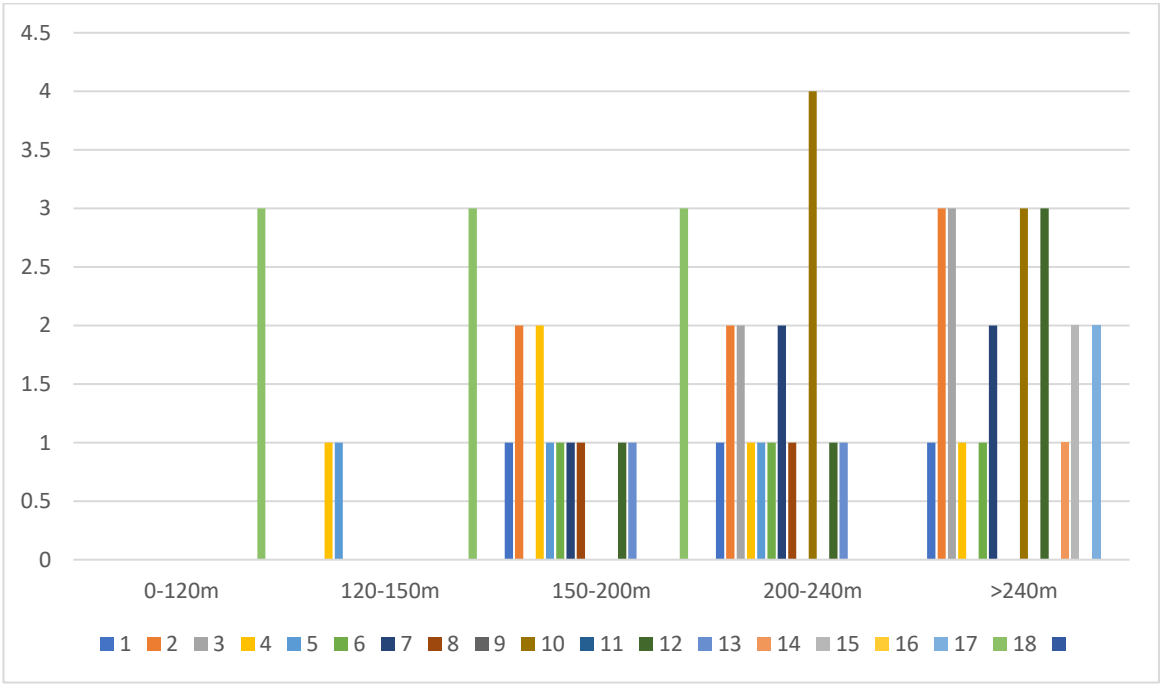


Figure 13: Time observed at flight height bands for all storks, cranes and pelicans during spring 2023 migration season at Plot 1. Shown by height band above and by VP below.

3.4.3 Flight height/bands

The client has not determined turbine specifications nor a turbine layout, therefore, Collision Risk Modelling (CRM) has not been undertaken at this time, and this report only describes patterns of activity at the flight height bands used during the OP surveys. Number and percentages of all target bird species observed (individuals) were

tabulated (Table 8) and plotted (figure below) to present proportion of the overall time spent within each height band, based on the data recorded at 15 second intervals during OP surveys.

Overall – for all species combined - the percentage of birds flying at risk height was 3% within the 150-m band and 15% within the 200-m band and 42% within the 250m band (Table 8). Overall this represents generally lower recorded flights than spring 2022. For species other than those with very low numbers of records, risk increases as the flight height band is increased with one exception; the Common Crane risk increased above 200m however still over 50% of flights are above 240m showing a high use of this band.

Table 6 : Numbers of birds recorded per species and birds at risk height for turbine tip heights of 150, 200 and 240 m at Plot 1 during autumn 2023.

Species	Total	At risk 150	At risk 150 %	At risk 200	At risk 200 %	At risk 240	At risk 240 %
Black Kite	272	44	16.17	224	82.35	241	88.60
Booted Eagle	6	0	0	1	16.67	3	50.00
Common Crane	88	0	0	65	73.86	65	73.86
Common Kestrel	158	53	33.54	94	59.49	111	70.25
Eurasian Sparrowhawk	13	2	15.38	6	46.15	7	53.84
European Honey Buzzard	5764	460	7.97	1604	27.82	4452	77.22
Hobby	1	1	100.00	1	100.00	1	100.00
Imperial Eagle	1	0	0	0	0	1	100.00
Lanner Falcon	4	0	0	0	0	0	0
Lesser Spotted Eagle	4	1	20	5	100	5	100
Levant Sparrowhawk	4	0	0	2	0	3	0
Long-legged Buzzard	5	3	50.00	4	66.66	4	66.66
Marsh Harrier	91	51	56.04	65	71.42	77	84.62
Montagu's Harrier	42	35	83.33	37	88.09	39	92.85
Osprey	4	0	0	4	100	4	100
Pallid Harrier	34	28	82.35	32	94.11	33	97.05
Short-toed Eagle	1	0	0	1	100	1	100
Sooty Falcon	19	18	96.74	19	100	19	100
Steppe Buzzard	175	37	21.14	114	65.14	126	72.00
Steppe Eagle	8	0	0	5	62.50	5	62.50

Species	Total	At risk 150	At risk 150 %	At risk 200	At risk 200 %	At risk 240	At risk 240 %
White Pelican	2096	290	13.83	713	34.02	713	34.02
White Stork	9700	232	2.39	2532	26.11	9696	99.95
Total	18525	1257	663.59	5531	1428.71	15609	1744.89
Falcon species	27	8	29.62	12	44.44	16	59.25
Unidentified buzzard	1	0	0	0	0	1	100
Unidentified harrier	38	24	63.15	29	76.13	35	92.10
Raptor Species	3	2	14.28	3	38.09	3	38.09
Total	69	35	107.07	49	158.85	60	289.45

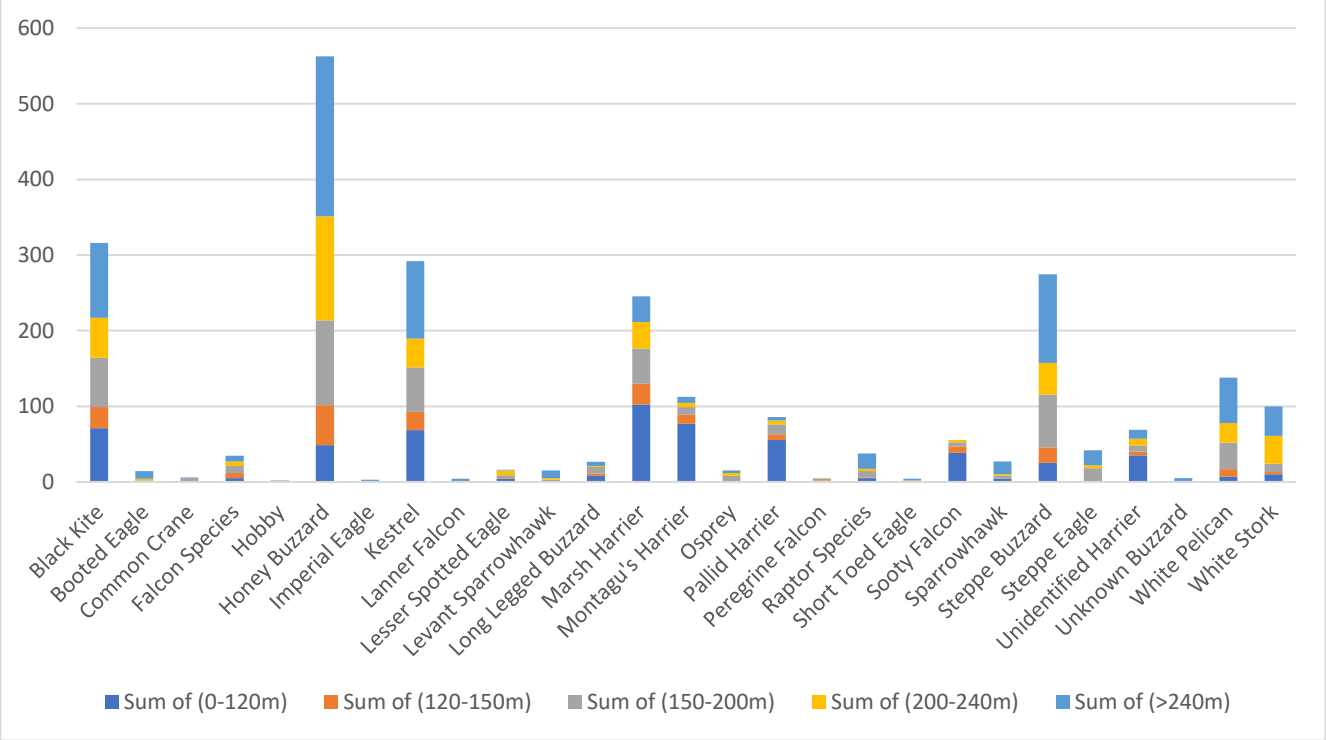


Figure 54: Proportion of time spent within flight height bands for selected species observed at Plot 1 during autumn 2023.

3.5 Temporal analysis – Weekly & Daily – Distribution of Records and Individuals

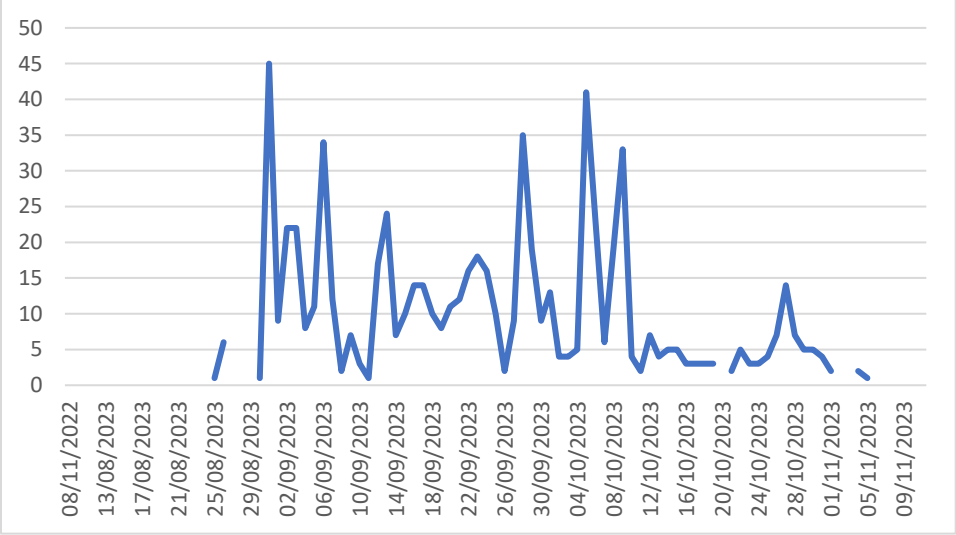
To assess temporal patterns of activity within the migration periods, passage rates per week of observation was analysed to shed light on the highest weekly periods of overall and species-specific migration patterns within the observation period. Cumulative migration activity was also assessed. In addition, the observations per hour

of the day for groups and species were assessed to assess daily patterns of activity to aid the assessment of which times of day experience the highest migration flight activity.

3.5.1 Groups

For all MSB and target birds in 2023 the Figure below illustrates low initial overall activity during August until a sharp increase in activity at the end of August. Following this peak activity spikes in migratory movements were recorded throughout September and October. In all years the early peak of activity is led by high levels of White Stork activity.

In respect to daily activity patterns, overall for all MSB and target species activity peaked between 08:00 and 09:00. Activity broadly decreased following this peak, with another spike in activity between 16:00 and 17:00 which is likely based around activity of birds associated with roosting behaviour at the start and end of the day. This contrasts with Spring 2023 results but matches previous from 2022 which showed there were two daily peaks in activity – one in the morning and another in the early afternoon, which coincides with the pattern observed in other similar seasonal migration monitoring studies completed in the region.



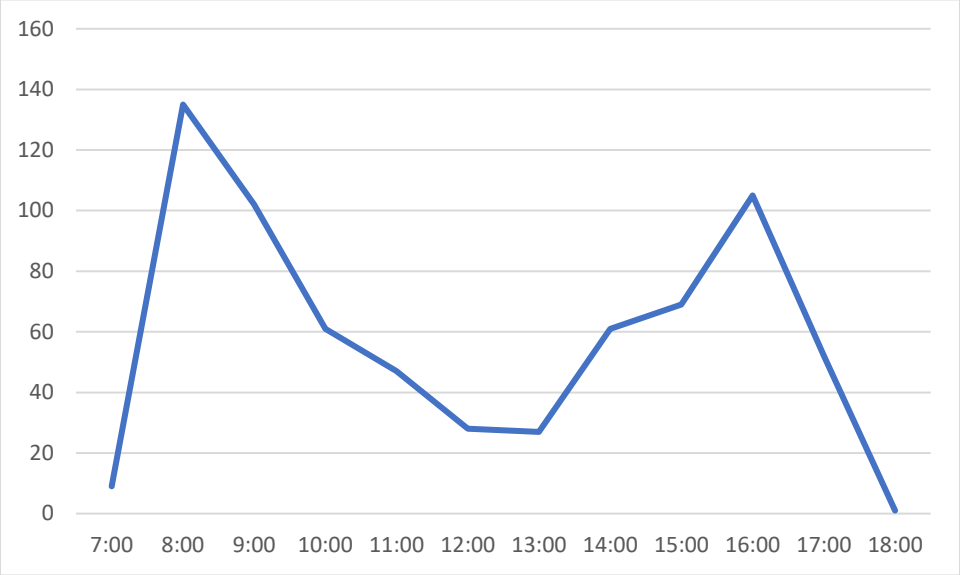


Figure 15: Temporal analysis of all MSB and target birds, excluding unidentified species, at Plot 1 during autumn 2023. Daily and hourly plots are included.

The number of birds was assessed for all birds of prey (figure below), showing intermittent peaks throughout the season. The peaks in August and September are attributed to high levels of White Pelican, White Stork and Steppe Buzzard activity, with peaks in August, September and a small peak in late October attributed to Honey Buzzard movements.

The majority of other species were recorded in low numbers across the survey period.

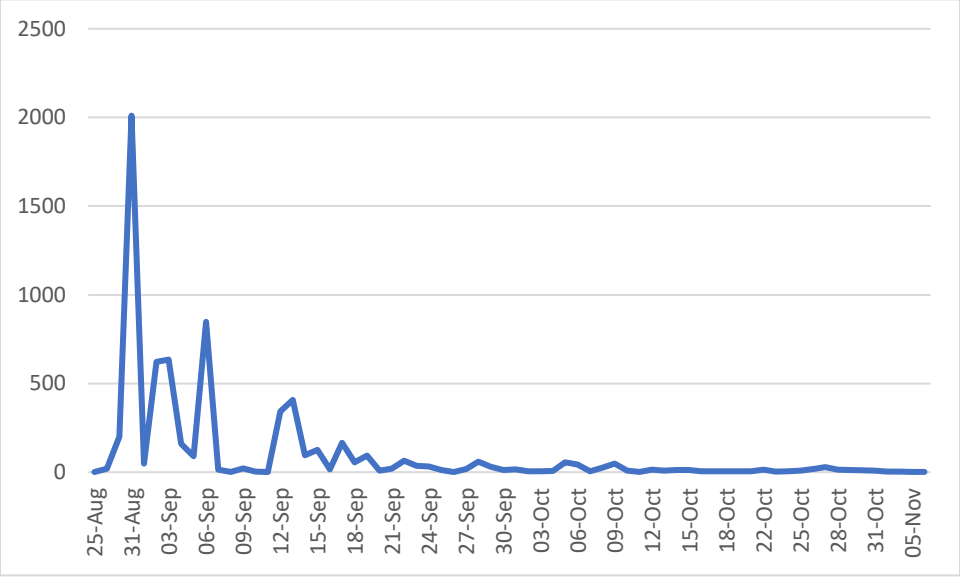


Figure 16: Birds of prey observed at Plot 1 during autumn 2023.

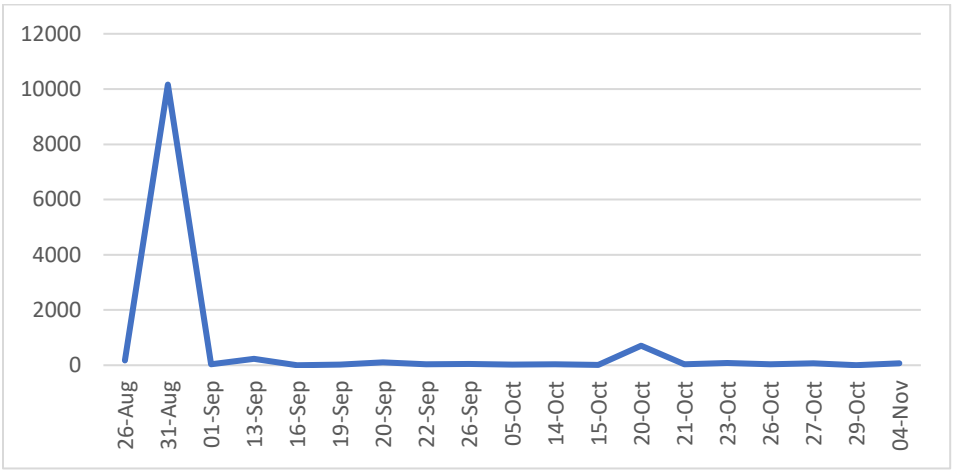
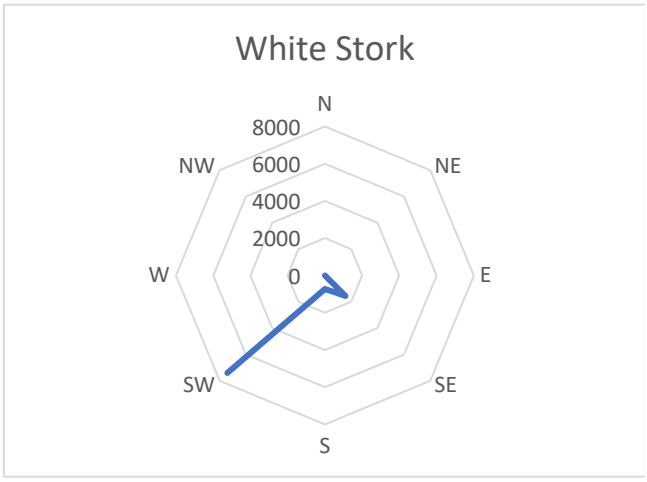


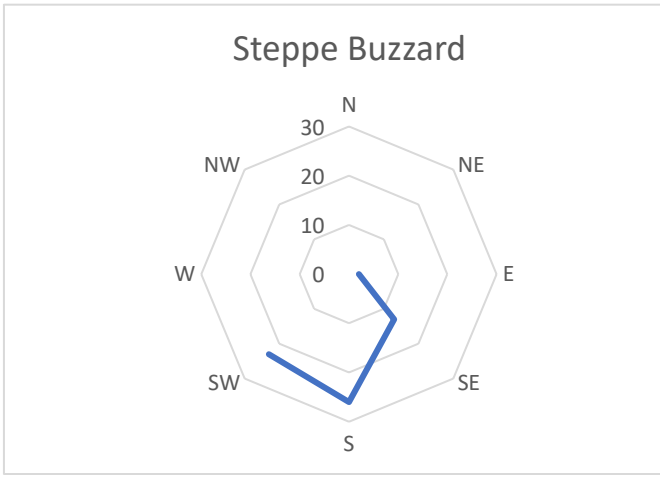
Figure 67: Stork, Crane and Pelican observed at Plot 1 during autumn 2023.

Harriers and Falcons were typically recorded in lower numbers such that analysis of their activity across the day or season provided less valuable clear results.

3.6 Flight direction

Prevailing flight direction during autumn 2023 or the five (4) most abundant MSB species (white stork, steppe buzzard, honey buzzard, and white pelican; cumulatively representing 97% of the observations made during the season) is shown in the figure below. There was a clear orientation for all five species to the southwest.





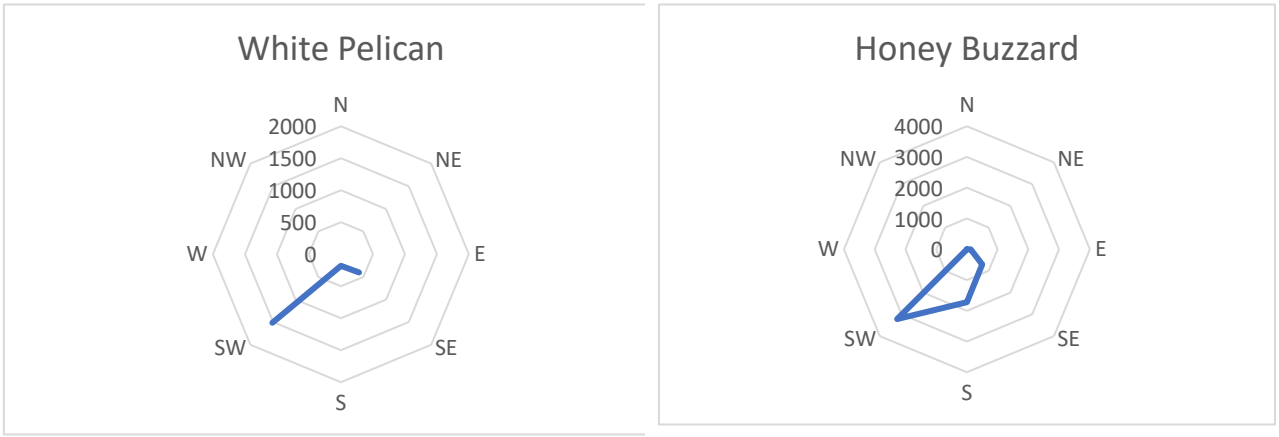


Figure 8: Observed flight direction of the five most abundant migratory soaring birds observed at Plot 1 during autumn 2023.

3.7 Bird observations at potential environmental constraint – artificial pond/dam

As noted no water was present in the dam location during autumn 2023. It is believed to hold water approximately once every 4 years. In autumn 2022, no water present and isolated obs of Red-footed falcon, Western MR and Osprey recorded. In autumn 2023, there was again, no water present with only isolated observations. No individuals were recorded at the dam location (e.g. on the ground) during 2023. The clear driver for this activity is the presence of water at the dam and so this is an influx that could happen around every 4 years depending upon weather conditions.

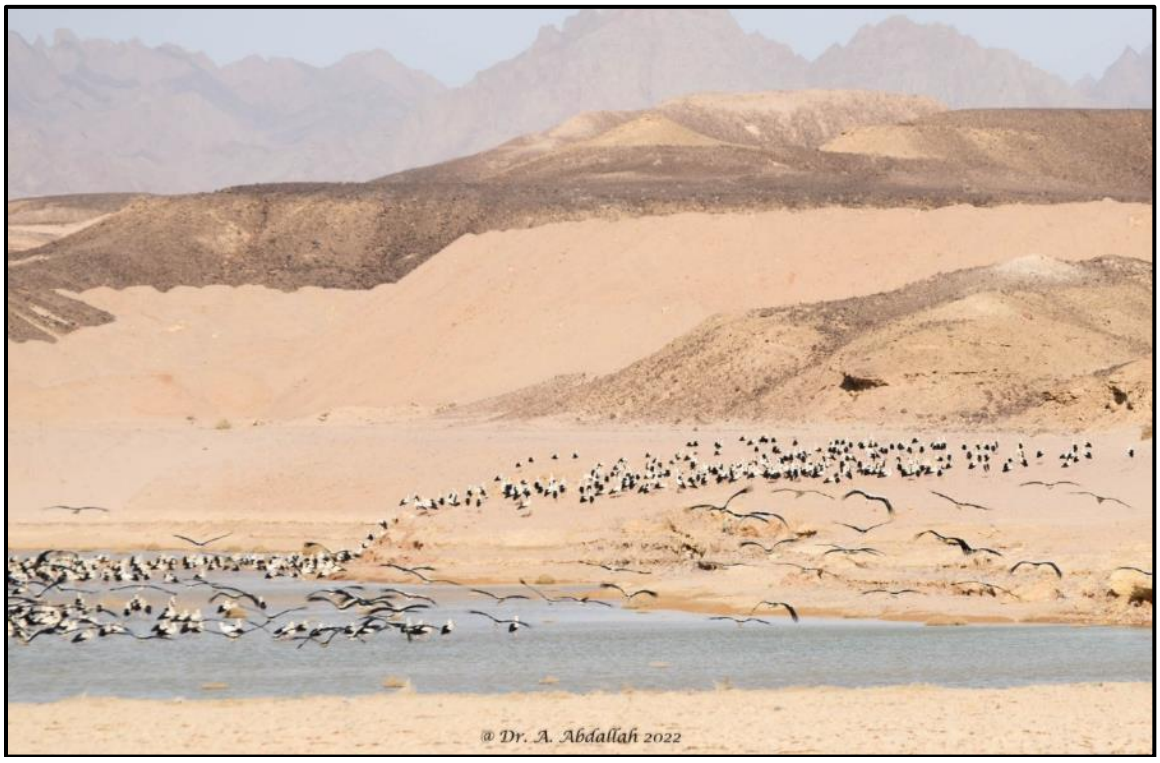


Figure 19: Photo of White Storks in the water and the surrouding area to the artificial pond/dam located within Plot 1 during spring 2022.

Table 7: Bird species, number of individuals and peak count/species recorded during surveys perfomed of the artificial pond/dam located within Plot 1 during autumn 2023.

Species	Peak Count	Total Count
Spur-winged Lapwing	1	1
Greylag Goose	3	3
Northern Pintail	1	1

4 PLOT 1: CONCLUSIONS AND RECOMMENDATIONS

1. The observation effort of the OP surveys at Plot 1 during both seasons was in line with GIIP for migratory bird studies and consistent with recommended methods used in Egypt.

2. The data collection, survey management, and data QA/QC procedures are considered to be of GIIP standards. The survey spatial coverage of the project areas and the immediate area around the site boundary was broadly considered good.

3. Daily effort at the site was increased for the 2022 migration studies and a comparative effort undertaken in 2023. Gaps in the available data for assessing risks to MSB and target species include: the absence of a WTG layout or model, precluding Collision Risk Modelling (CRM); the absence of information on project-associated overhead electrical transmission lines, precluding the characterisation of risk associated with this infrastructure component of the project. These gaps are recommended to be addressed prior to drafting the ESIA.

4. Inter-annual variation in the migration patterns of birds in the region is commonly documented during multi-annual migration studies performed at wind energy facilities. These variations include: the number of individuals recorded overall, and per species within seasons; the spatial patterns of activity within and near the proposed project area; the flight height characteristics of birds flying through the area, the temporal patterns of migration activity; the flight directions (typically minor, not major) of species and species assemblages; as well as resting and roosting activity. All of these aspects may be influenced by environmental and ecological factors at the site scale, the regional scale, the flyway scale or at the breeding and overwintering scales. As such, reliance on even two seasons worth of data collection to represent migratory bird activity and risk at a proposed wind project for the *proposed life* of the project may be misleading given the known possible shift in activity over time. However, the two years of extensive survey effort certainly provide a suitable level of background data to present the risks to birdlife at this proposed site within an ESIA.

5. The total number of individual birds and species recorded during the autumn 2023 season – 17,552 individuals of 23 species– are within the ranges reported and available to the authors at other wind energy studies performed in the region during previous years.

6. During 2023 species recorded included seven (4) globally threatened species according to the IUCN Red List (https://www.iucnredlist.org/), an increase from the 6 of 2022: including two (1) Endangered-EN (Steppe Eagle) and four (2) Vulnerable-VU species (Eastern Imperial Eagle and Sooty Falcon). In addition, one (1) species is Near Threatened-NT (Pallid Harrier). All the remaining MSB species observed were classified as Least Concern-LC

7. Spatial analysis of MSB and target bird activity and flight height data suggests that certain areas of Plot 1 experience higher migratory flight activity in comparison to other portions within each season for particular

species assemblages and the specific species analysed for this report. Whilst the centre of site appears to have a higher likely risk no portions of Plot 1 present low risk to MSB and target species in the 2023 seasons without the implementation of minimisation and mitigation strategies including shut down on demand. It is recommended that minimisation and mitigation approaches are developed for the site as part of the ESIA consistent with those developed for other nearby wind energy facilities.

8. The flight height analysis completed for this report indicates that broadly birds were recorded flying higher across site in 2023 than 2022. In autumn 2023, over 50% of records were above 240m and high numbers of birds in each year are a consideration for the requirements of mitigation. CRM was not performed for this report as no WTG model or layout is yet available. CRM is recommended to be completed as part of the ESIA.

9. A potential environmental constraint was documented at Plot 1 in the form of an artificial pond/dam site. This site was surveyed for part of the spring 2022 season and all of the spring and autumn 2023 seasons. The data recorded during these surveys strongly indicates that the site serves as an important stopover site for some MSB/target species in the spring when water is present, but not when water is absent. The presence of this stopover habitat within the project area increases the risk profile for the autumn migration period and the following recommendations were previously made. Whilst no water was recorded at this site in autumn 2023 it is considered appropriate that the recommendation of appropriate mitigation remains. For siting, the WTG layout should avoid any turbine in a 2 km radius around the site unless management measures are undertaken to remove the dam and prevent water from pooling in the artificial pond area. If the pooling water is removed, then the source of attraction for MSB and target species is likely to be eliminated. If the existing dam is removed, an alternate site for an artificial pond should be provided within the flyway but outside proposed or under-development wind energy facilities, as standing water features are critical features for many migratory birds.

10. Additional monitoring, avoidance, minimisation, and mitigation methods are recommended to be developed following the production of additional analyses described in this section, as well as the production of cumulative effects analysis and critical habitats assessment. It is recommended that such analysis account for both the wind energy facility, as well as for associated overhead electrical transmission lines.

5 PLOT 2: RESULTS FOR AUTUMN 2023

5.1 Autumn 2023 Effort

The overall effort and effort per OP for Plot 2 during autumn 2023 is summarised in Table 3.

Table 8: Level of Effort during Avifaunal Assessments for Plot 2 during autumn 2023

Season /dates	OP		Monitoring time
Plot 1			
Autumn 2023 92 days (10 August –10 November)		OP-1	274 hr. 00 min
		OP-2	274 hr. 00 min.
		OP-3	274 hr. 30 min.
		OP-4	274 hr. 30 min
		OP-5	274 hr. 30 min
		OP-6	274 hr. 30 min.
		OP-7	274 hr. 00 min.
		OP-8	274 hr. 30 min.
		OP-9	274 hr. 30 min.
	Total		**2,468 hr. 00 min.**

5.2 Observed Species Records and Individuals at Plot 2

For the reporting period, 22 MSB species were recorded with a total of 305,662 birds accounting for 802 records (Table 9). In addition, observers were not able to identify a total of 31 individuals and 29 records – those were classified as raptors or unidentified falcon, buzzard or harrier. Over 85% of the birds recorded belonged to only three species; the White Stork, White Pelican, and European Honey Buzzard with the majority of these being White Stork. Only one species (White Stork 276,489) exceeded 25,000 individuals, while White Pelican exceeded 20,000 individuals. European Honey Buzzard recorded over 8,000 individuals, while all other species did not exceed 250 individuals.

Four (4) of these species (Table 4) are globally threatened according to the IUCN Red List (https://www.iucnredlist.org/): including two (2) Endangered-EN (Steppe Eagle and the Egyptian Vulture), and one (1) Vulnerable-VU species (Sooty Falcon). In addition, one (1) species is Near Threatened-NT (Pallid Harrier). All the remaining MSB species observed were classified as Least Concern-LC.

Table 9: Summary of bird observation records during autumn 2023 at Plot 2.

Species Name	Conservation Status[11]	National Status	# individuals	# records
Black Kite *Milvus migrans*	Least Concern	Passage migrant	149	64
Black Stork *Ciconia nigra*	Least Concern	Passage migrant	73	11
Booted Eagle *Hieraaetus pennatus*	Least Concern	Passage migrant	17	14
Common Kestrel *Falco tinnunculus*	Least Concern	Passage migrant	17	16
Egyptian Vulture *Neophron percnopterus*	Endangered	Passage migrant	5	5
Eurasian Hobby *Falco Subbuteo*	Least Concern	Passage migrant	1	1
Eurasian Sparrowhawk *Accipiter nisus*	Least Concern	Passage migrant	1	1
European Honey-buzzard *Pernis apivorus*	Least Concern	Passage migrant	8714	274
Lanner Falcon *Falco biarmicus*	Least Concern	Passage migrant	1	1
Lesser Spotted Eagle *Clanga pomarina*	Least Concern	Passage migrant	2	2
Levant Sparrowhawk Accipiter brevipes	Least Concern	Passage migrant	1	1
Long-legged Buzzard *Buteo rufinus*	Least Concern	Passage migrant / winter visitor	1	1
Montagu's Harrier *Circus pygargus*	Least Concern	Passage migrant	16	14
Osprey	Least Concern	Passage migrant	2	2

[11] EN: Endangered, VU: Vulnerable, NT: Near Threatened, LC: Least Concern

Species Name	Conservation Status[11]	National Status	# individuals	# records
Pandion haliaetus				
Pallid Harrier *Circus macrourus*	Near Threatened	Passage migrant / winter visitor	11	10
Short-toed Snake-eagle *Circaetus gallicus*	Least Concern	Passage migrant / summer breeder	1	1
Sooty Falcon *Falco concolor*	Vulnerable	Passage migrant / summer breeder	4	4
Steppe Buzzard *Buteo buteo vulpinus*	Least Concern	Passage migrant	32	22
Steppe Eagle *Aquila nipalensis*	Endangered	Passage migrant / Winter visitor	27	17
Western Marsh-harrier *Circus aeruginosus*	Least Concern	Passage migrant	59	48
White Pelican *Pelecanus onocorotalus*	Least Concern	Passage migrant	20015	74
White Stork *Ciconia ciconia*	Least Concern	Passage migrant	276489	198

5.3 Migration Patterns: Flocking behaviour

Table 10 presents the average flock size (individuals/group) for all species along with confidence intervals (± 95%), the number of records, and their minimum and the maximum values. White Stork, White Pelican and Honey Buzzard had the largest flock sizes. Black Kite and Black Stork were the next highest group sizes. Generally, most of the remaining species were all estimated at around or less than 10 individuals per flock (group) with most being close to single birds. In autumn 2022 White Stork and White Pelican again had the larger sizes so this shows a continued pattern. Again overall, the eagles harriers and small falcons migrated in small groups.

Table 10: Mean group size (flock size), the 95% confidence intervals, number of records and maximum group size (all species had a minimum group size of 1) for Plot 2 in autumn 2023.

Species	Mean group	Conf. 0.95	Conf. 0.95	# records	# Maximum
Black Kite	2.29	1.73	2.86	288	13
Black Stork	6.64	6.39	6.88	32	26
Booted Eagle	1.21	-4.20	6.62	41	2
Egyptian Vulture	1.00	1.00	1.00	19	1
Falcon Species	1.33	-0.10	2.77	8	2

Hobby	1.00	1.00	1.00	18	1
European Honey Buzzard	31.92	25.57	38.27	1056	400
Kestrel	1.06	0.93	1.20	32	2
Lanner Falcon	1.00	1.00	1.00	1	1
Lesser Spotted Eagle	1.00	1.00	1.00	2	1
Levant Sparrowhawk	1.00	1.00	1.00	1	1
Long-legged Buzzard	1.00	1.00	1.00	2	1
Marsh Harrier	1.23	1.07	1.39	129	3
Montagu's Harrier	1.14	0.83	1.45	46	3
Osprey	1.00	1.00	1.00	2	1
Pallid Harrier	1.10	0.87	1.33	21	2
Raptor Species	1.00	1.00	1.00	4	1
Red-Footed Falcon	2.00	2.00	2.00	2	2
Short-toed Eagle	1.00	1.00	1.00	3	1
Sooty Falcon	1.00	1.00	1.00	6	1
Sparrowhawk	1.00	1.00	1.00	1	1
Steppe Buzzard	1.45	1.10	1.81	56	4
Steppe Eagle	1.59	1.14	2.04	47	4
Unidentified Eagle	1.00	1.00	1.00	6	1
Unidentified Harrier	1.00	1.00	1.00	37	1
White Pelican	270.47	179.29	361.66	144	2000
White Stork	1396.91	1106.49	1687.33	640	14000

5.4 Distribution of Groups and Species over Observation Points, including analysis of flight height

Spatial analysis of the distribution of bird groups and species observed per OP was perfomed using the time spent within each area to assess relative patterns of bird activity observed during the season. Time in this case was the time spent by flocks/registrations rather than all individuals as this provides a more realistic insight in to the likely requirements of shutdown of turbines during windfarm operation. Figures were produced for key groups and species alongside analysis of flight height distribution of observations to allow for side by side comparisons and more resolution for assessing patterns of flight activity. Groups assessed included: All MSB and target species including unidentified species; all birds of prey (including unidentified species), and; storks and pelicans.

It should be noted that spatial patterns of bird flight activity may vary from one year to another based on environmental, ecological or other factors.

Key findings from the 2023 autumn season at Plot 2, along with note on comparison to spring season 2022, are summarised as follows:

5.4.1 Groups

18. For all MSB and target species, including unidentified species, the highest extrapolated passage rates were at OP8 and 3, and relatively high passage observed at OP9, 6 and 4. During autumn 2022 OP's 8 and 3 showed highest activity showing similar pattern of spatial use of the site.

19. In 2022, for all birds of prey (excluding unidentified species), the western half of the site exhibited the highest extrapolated passage rates, with the highest rates observed at OP6, 8 and 9. In 2023 the highest amount of activity, by time, of all MSB and target species flocks, including unidentified species was through the western central section of the site (OP's 7, 8 and 9) showing a similar pattern.

20. In 2022 for storks and pelicans, extrapolated passage rates were highest at OP8 and 3, but overall, extrapolated rates were high throughout the project area. During 2023 the highest amount of activity, by time, of all MSB and target species flocks, including unidentified species was through the western centre of the site at OP's 7, 8 and 9 showing a slight change in key locations.

5.4.2 Species

21. In autumn 2022 Black kites spent the majority of time that they were observed above 150m. There were no clear spatial patterns, with the exception that all flights at OP4 were above 150m. During autumn 2023, recordings were fairly evenly distributed across this site, with a preference for the north and south. During this time Black Kite spent approximately 50% of their time over 240m, which contrasts with the previous year.

22. During 2022 Black storks spent very little time overall lower than 120m, with a large proportion of time spent above 200m – particularly in the south of the plot. During 2023 the higher use by this species was in the central east section (OPs 3 and 4). During autumn 2023, flight was spread between the three height bands.

23. In autumn 2022, Egyptian vultures were recorded in small numbers around the edge of the plot boundary. Due to the small numbers recorded it is difficult to determine whether this could be avoidance of an area to the west of the plot, or of the dump. The vast majority (~90%) of flight time was spent above 150m. In 2023 the flight was spread across the height bands. No clear spatial patterns were identified.

24. During autumn 2022, Honey buzzard spent over 75% of the time above 150m. There was no clear spatial pattern in occurrence. Activity in 2023 was highest on the western portion of site with OP's 14, 15 and 16 having the highest activity with the majority of activity above 150m. In autumn 2023, 1500 more Honey Buzzard were recorded across the survey area, with the highest count at OP8. The highest numbers were above 240m, however flights were still spread across height bands.

25. Only one record of Levant sparrowhawk was noted at OP8, with 50% of the time within 150-200m and 50% over 200m. In autumn 2023, only one Levant Sparrowhawk was recorded at OP9, which does not give enough data to understand flight patterns.

26. In autumn 2022, Marsh Harrier were recorded in small numbers across height bands. In autumn 2023, Marsh Harrier were again recorded across the Site, and at all height bands.

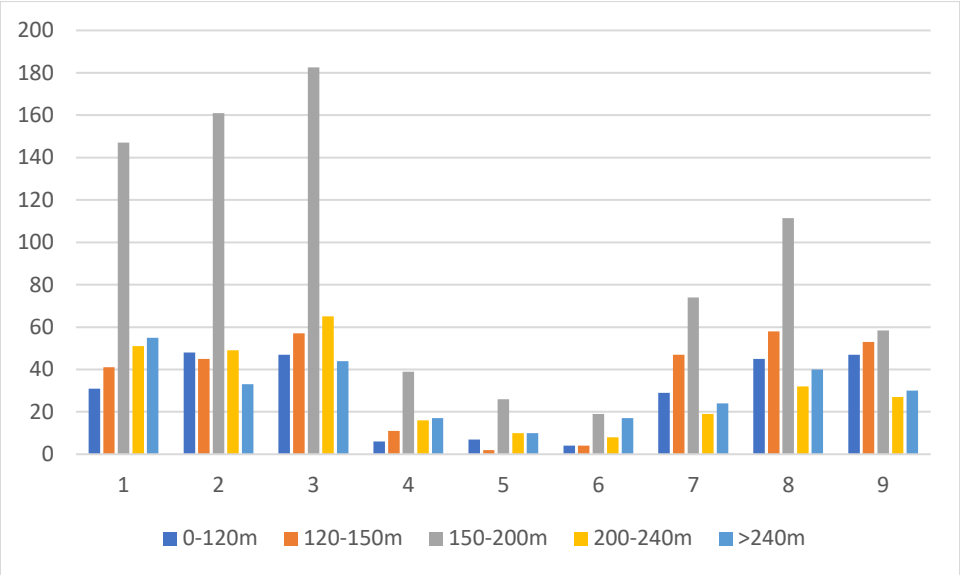
27. In autumn 2022, Approximately 75% of Steppe Buzzard flight time was at heights greater than 150m. Small sample sizes make spatial patterns difficult to decipher with confidence; however, all three OPs with flights within the 0-120m band were on the west side of the plot (OP6,7,8). In autumn 2023, Steppe Buzzard were recorded in small numbers, with over 75% above 200m. Steppe Buzzard were primarily recorded at OP2 and OP8.

28. In autumn 2022, Steppe eagles were not recorded within 0-120m heights. No clear spatial patterns were apparent; however, no observations were recorded from OP1 at the north extent. In autumn 2023, the majority of Steppe Eagle were recorded above 200m, however these were in small numbers with a fairly even distribution across the site.

29. In autumn 2022, White pelicans flew at lower heights (0-120m) a greater proportion of the time than other species except black kites which were present at this height relatively equally. It appears that this species

flies at greater heights at the southern extent of the plot. During autumn 2023 there was a preference for the centre west of site and there was a good spread of height bands used. There were approximately 5000 less White Pelicans recorded in autumn 2023 and these were recorded fairly evenly across the site OPs.

30. During 2022 White storks showed no clear spatial patterns – extrapolated passage rates were high throughout the OPs. During autumn 2023, there were around 13,000 less White Stork than the previous autumn. The highest activity was in the centre west of the site and a range of flight bands were used at these points. Activity was distributed across the site.



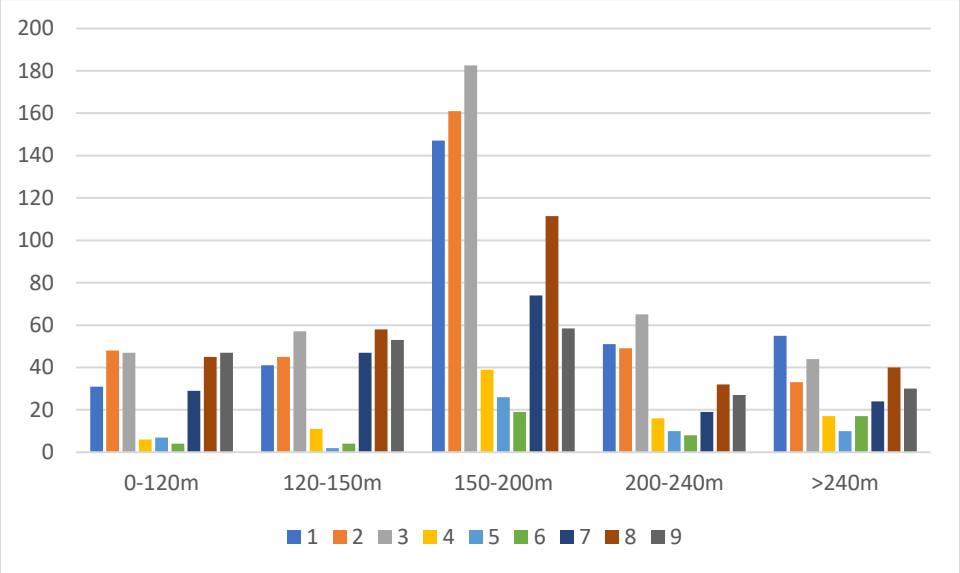


Figure 20: Time observed at flight height bands for all MSB and target bird species during autumn 2023 migration season at Plot 2. Shown by height band above and by VP below.

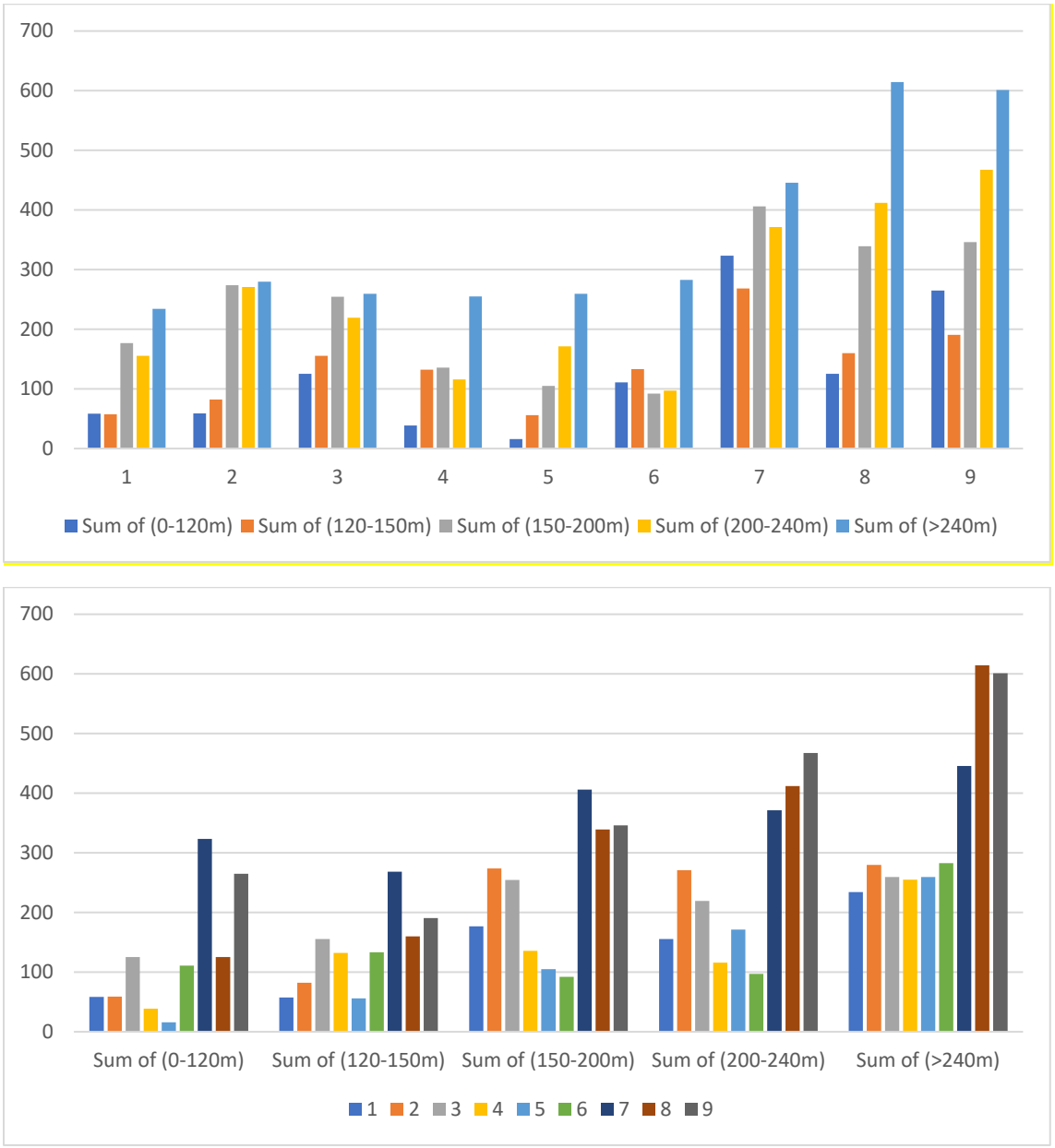


Figure 21: Time observed at flight height bands for all birds of prey during autumn 2023 migration season at Plot 2. Shown by height band above and by VP below.

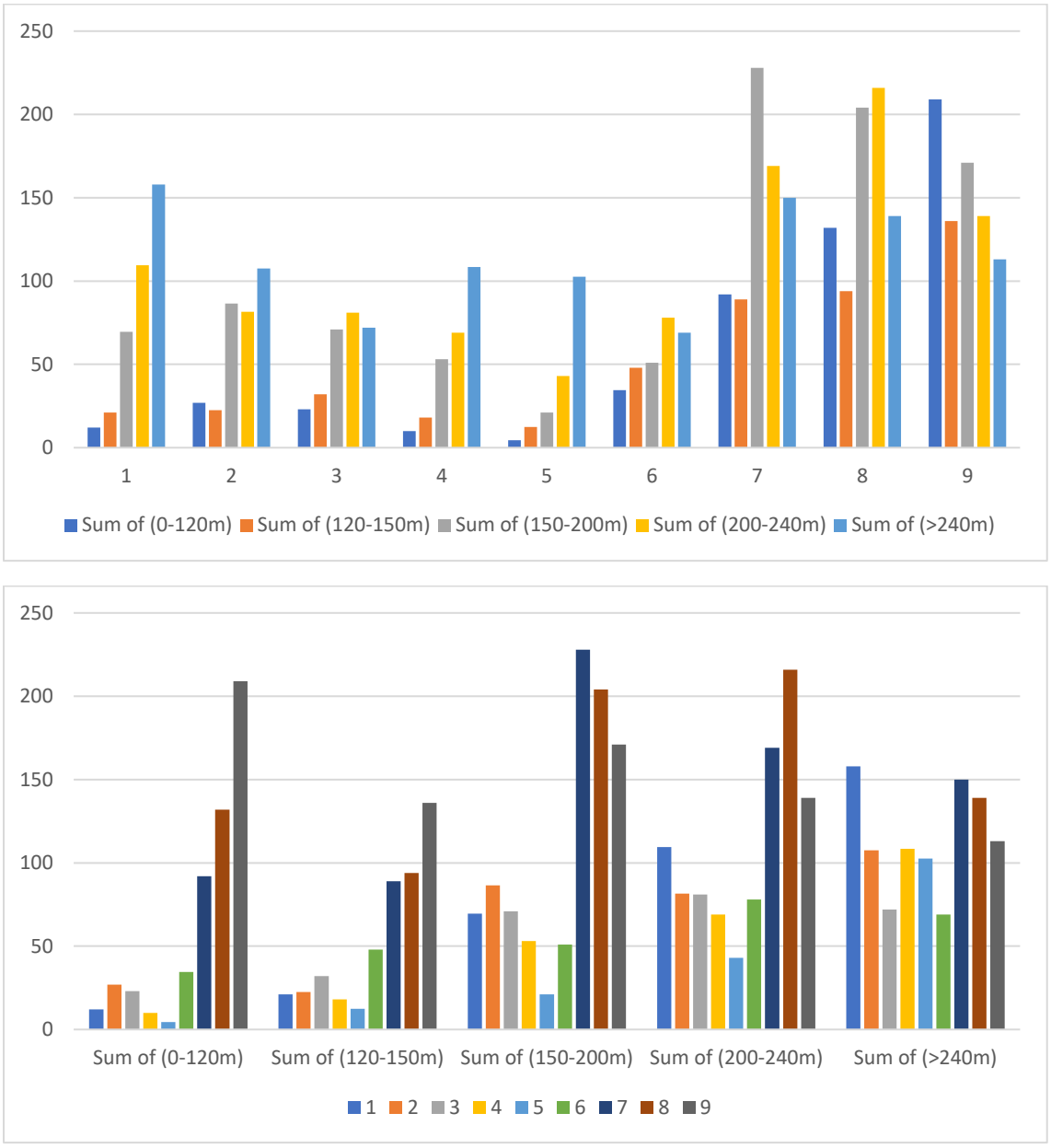


Figure 22: Time observed at flight height bands for all Cranes, Stork and Pelicans during autumn 2023 migration season at Plot 2. Shown by height band above and by VP below.

5.4.3 Flight height/bands

The client has not determined turbine specifications nor a turbine layout, therefore, Collision Risk Modelling (CRM) has not been undertaken at this time, and this report only describes patterns of activity at the flight height bands used during the OP surveys. Number and percentages of all target bird species observed (individuals) were tabulated (Table 8) and plotted (figure below) to present proportion of the overall time spent within each height band, based on the data recorded at 15 second intervals during OP surveys.

Overall – for all species combined - the percentage of birds flying at risk height was 29% within the 150-m band and 34% within the 200-m band and 37% within the 240m band (Table 8). This is much higher than the heights recorded in this season at Plot 1. Overall this represents generally higher recorded flights at lower altitude than

during spring 2023. For species other than those with very low numbers of records, risk increases as the flight height band is increased.

Table 11 : Numbers of birds recorded per species and birds at risk height for turbine tip heights of 150, 200 and 240 m at Plot 2 during autumn 2023.

Species	Total	At risk 150	At risk 150 %	At risk 200	At risk 200 %	At risk 240	At risk 240 %
Black Kite	234	39	16.66	88	37.60	107	45.72
Black Stork	181	59	32.59	60	33.14	62	34.25
Booted Eagle	19	2	10.52	7	36.84211	10	52.63
Common Kestrel	24	6	25	9	37.5	9	37.5
Egyptian Vulture	11	3	27.27	4	36.36364	4	36.36
European Honey Buzzard	16718	3027	18.10	5832	34.88456	7859	47.00
Hobby	3	1	33.33	1	33.33	1	33.33
Lanner Falcon	3	1	33.33	1	33.33	1	33.33
Lesser Spotted Eagle	3	1	33.33	1	33.33	1	33.33
Levant Sparrowhawk	3	1	33.33	1	33.33	1	33.33
Long-legged Buzzard	3	1	33.33	1	33.33	1	33.33
Marsh Harrier	149	45	30.20	51	34.22	53	35.57
Montagu's Harrier	31	8	25.80	11	35.48	12	38.70
Osprey	6	2	33.33	2	33.33	2	33.33
Pallid Harrier	26	6	23.02	9	34.61	11	42.30
Red-footed Falcon	6	2	33.33	2	33.33	2	33.33
Short-toed Eagle	2	0	0	1	50	1	50
Sooty Falcon	12	4	33.33	4	33.33	4	33.33
Steppe Buzzard	34	6	17.64	11	32.35	17	50
Steppe Eagle	38	4	10.52	15	39.47	19	50
White Pelican	48796	12931	26.50	17344	35.54	18521	37.95
White Stork	755049	226871	30.047	255224	33.80	272954	36.15
Total	821351	243020		278679		299652	

Falcon species	5	1	20.00	2	40.00	2	40.00
Unidentified eagle	2	0	0.00	1	50.00	1	50.00
Unidentified harrier	40	12	30.00	14	35.00	14	35.00
Total	47	13		17		17	

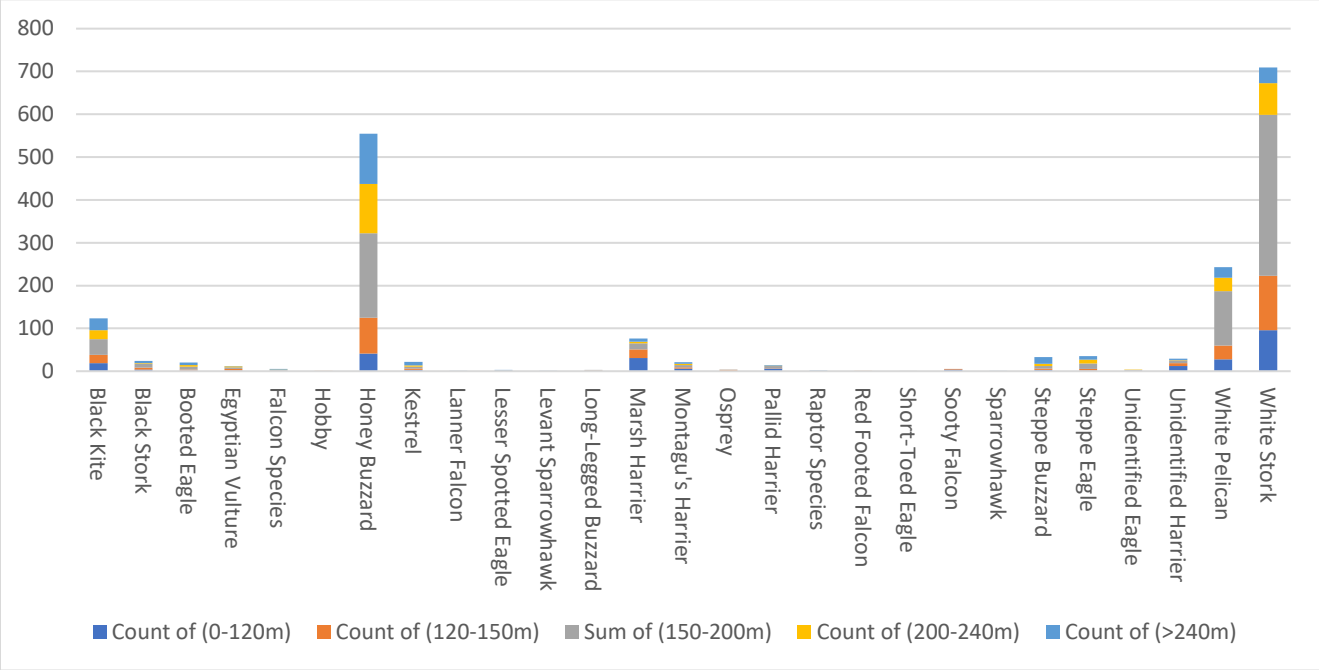


Figure 23: Proportion of time spent within flight height bands for selected species observed at Plot 2 during autumn 2023.

5.5 Temporal analysis – Weekly & Daily – Distribution of Records and Individuals

To assess temporal patterns of activity within the migration periods, passage rates per week of observation was analysed to shed light on the highest weekly periods of overall and species-specific migration patterns within the observation period. Cumulative migration activity was also assessed. In addition, the observations per hour of the day for groups and species were assessed to assess daily patterns of activity to aid the assessment of which times of day experience the highest migration flight activity.

5.5.1 Groups

For all MSB and target birds in 2023 the Figure below illustrates high initial activity in August and early September followed by intermittent small spikes throughout the migration season until mid-October. High peaks of activity are found around the end of August. During 2022 activity peaked at a similar time with highest peaks from early to mid-August. In both years the early peak of activity is lead by high levels of White Stork activity (which was represented again in the waterbird specific analysis).

In respect to daily activity patterns, overall for all MSB and target species activity peaked between 14:00 and 16:00. Activity broadly increased and decreased either side of this peak with steady numbers throughout the day, and low numbers in the early morning and evening. This is similar to 2022, which had an increase in activity post 13:00, and dropping again at 17:00.

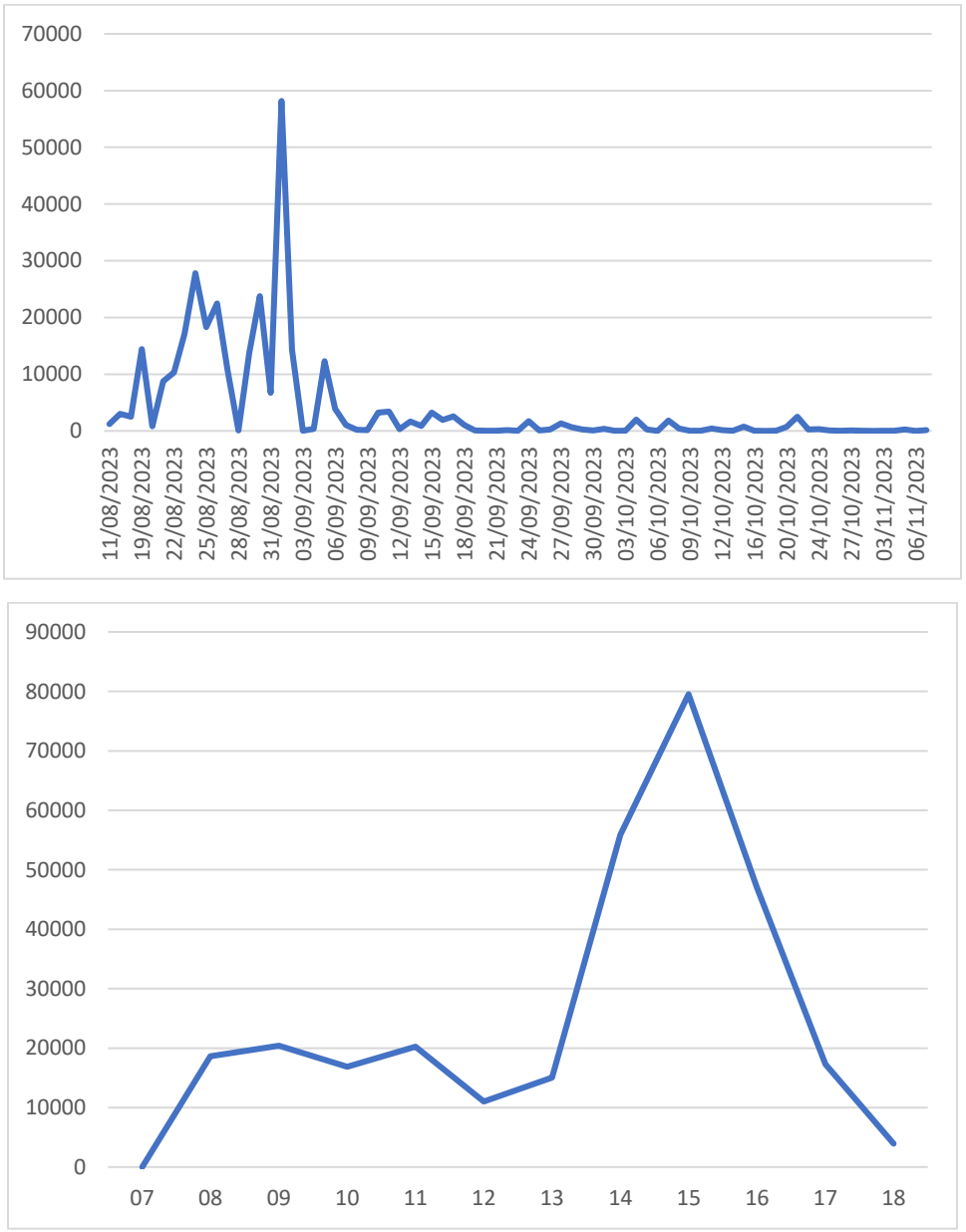


Figure 24: Temporal analysis of all MSB and target birds, excluding unidentified species, at Plot 2 during spring 2023. Daily and hourly plots are included.

The number of birds was assessed for all birds of prey (figure below), high activity at the start of the season. The peaks are mostly attributed to high levels of Steppe and Honey Buzzard.

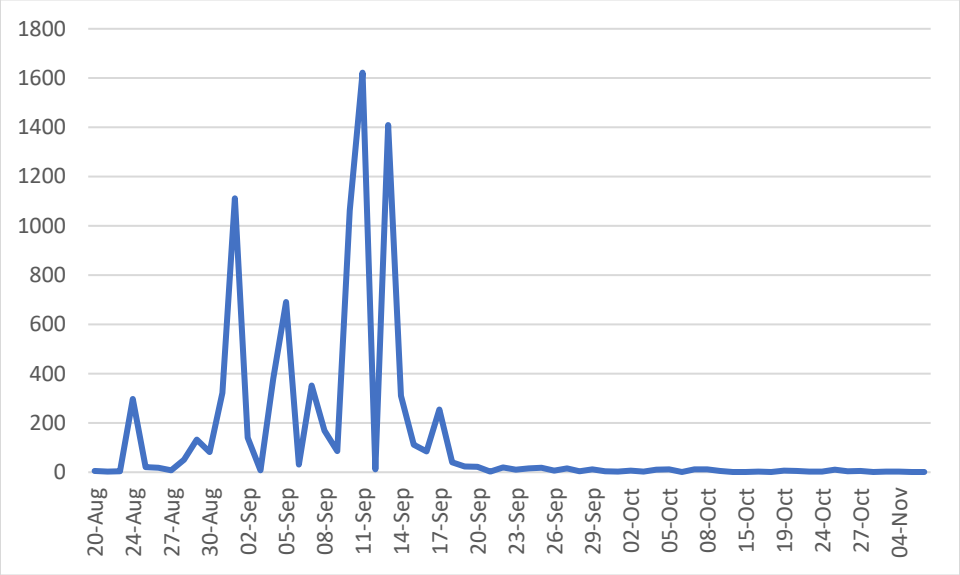


Figure 75: Birds of prey observed at Plot 2 during autumn 2023.

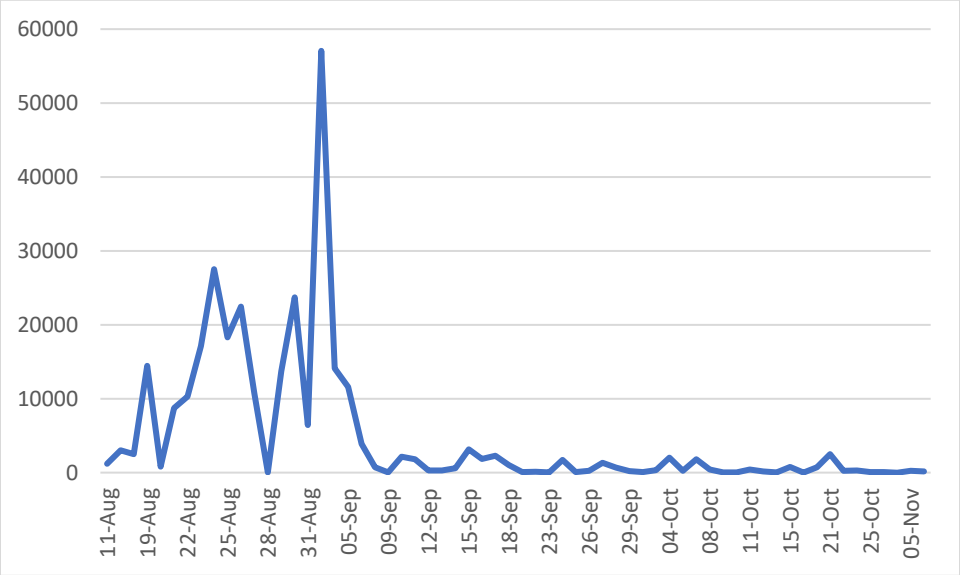


Figure 26: Stork, Crane and Pelican observed at Plot 1 during autumn 2023.

Harriers and Falcons were typically recorded in lower numbers such that analysis of their activity across the day or season provided less valuable clear results.

5.6 Flight direction

Prevailing flight direction during autumn 2023 for the three (3) most abundant MSB species (white stork, white pelican and honey buzzard) showed a clear orientation for all five species flying south or south-west. This aligns with the autumn 2022 data.

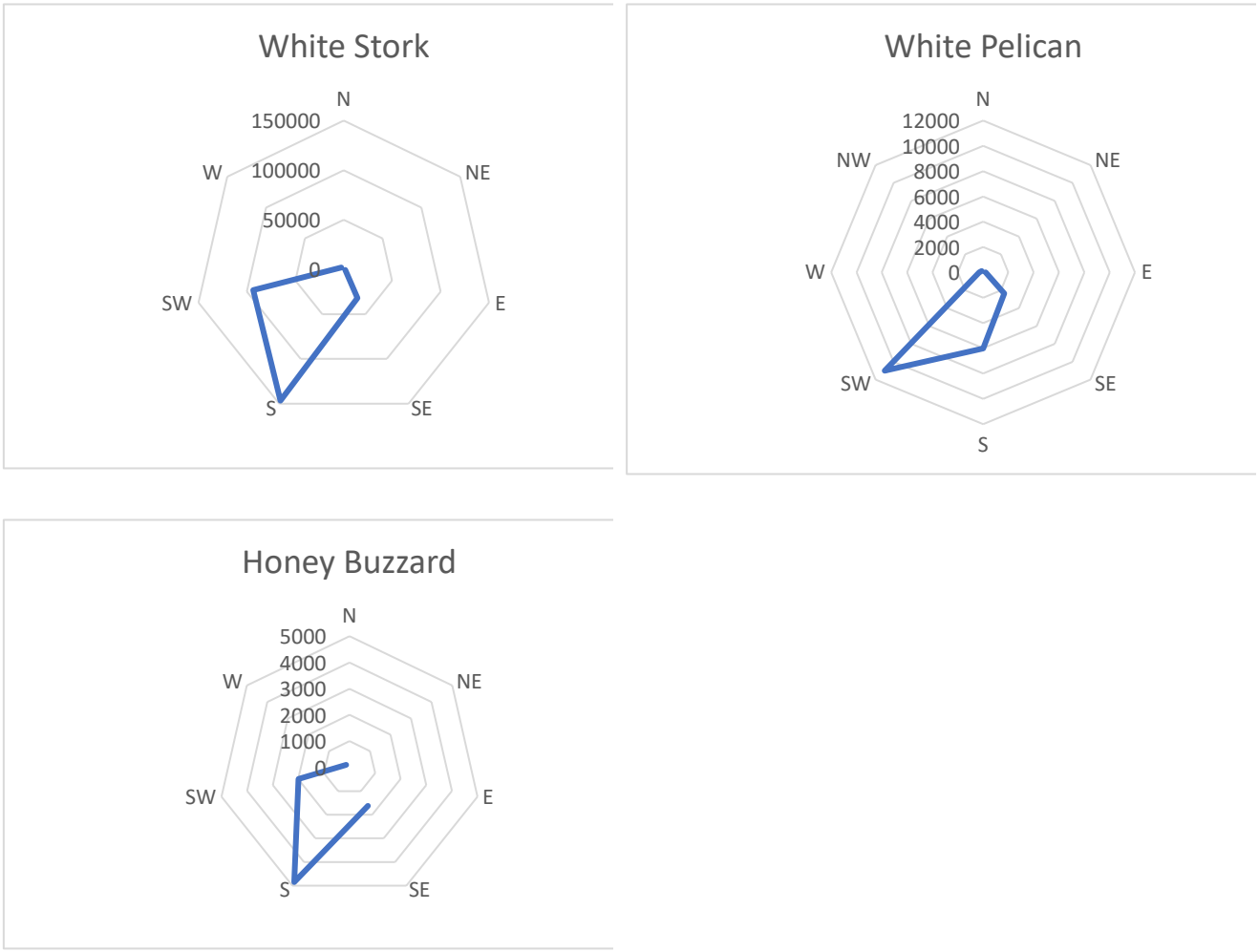


Figure 27: Observed flight direction of the three most abundant migratory soaring birds observed at Plot 2 during autumn 2023.

5.7 Bird observations at potential environmental constraint – dump site

One species of MSB, Steppe Eagle was recorded throughout the monitoring undertaken of the carcass dump site (figure below). The only species recorded at the location in autumn 2022 was White Stork (2422 birds) however none were recorded in 2023 and this is likely to do with the lack of water at the nearby dam site. During autumn 2023, 58 registrations of Steppe Eagle were noted with a peak count of six birds. Raptor use of the site is of great concern, given these species are foraging on carcass remains disposed of at the site from poultry and livestock farms located at Wadi Dara (figure below).

During Spring 2023 approximately 4,000 Steppe Eagle were recorded at this location and it is important to note that since Spring surveys were undertaken the site is no longer used as a carcass dump site with waste taken routinely elsewhere and no dumping (or associated use by raptors) noted later in the year. The numbers recorded during Autumn 23 show the continued need to monitor the site for dumping and bird activity however show a great reduction from Spring 2022 following remedial action with dumping waste.

Table 12: Numbers of birds recorded per species and peak count of eac hspecies at the dump site during autumn 2023.

Species	Total Count	Peak Count
Steppe Eagle	**58**	**6**
Barn Swallow	23	20
White Wagtail	116	16
Brown-necked Reven	873	104
Short-toed lark	3	3
Desert Lark	19	2
Crowned Sandgrouse	64	8
Rock Dove	113	20

Figure 28: Photos of birds present and carcass remains disposed at the dump site located within Plot 2 during spring 2022.

6 PLOT 2: CONCLUSIONS AND RECOMMENDATIONS

1. The observation effort of the OP surveys at Plot 2 during both seasons was in line with GIIP for migratory bird studies and consistent with recommended methods used in Egypt.

2. The data collection, survey management, and data QA/QC procedures are considered to be of GIIP standards. The survey spatial coverage of the project areas and the immediate area around the site boundary was considered good.

3. Daily effort at the site was increased for the 2022 migration studies and a comparative effort undertaken in 2023. Gaps in the available data for assessing risks to MSB and target species include: the absence of a WTG layout or model, precluding Collision Risk Modelling (CRM); the absence of information on project-associated overhead electrical transmission lines, precluding the characterisation of risk associated with this

infrastructure component of the project. These gaps are recommended to be addressed prior to drafting the ESIA

4. Inter-annual variation in the migration patterns of birds in the region is commonly documented during multi-annual migration studies performed at wind energy facilities. These variations include: the number of individuals recorded overall, and per species within seasons; the spatial patterns of activity within and near the proposed project area; the flight height characteristics of birds flying through the area, the temporal patterns of migration activity; the flight directions (typically minor, not major) of species and species assemblages; as well as resting and roosting activity. All of these aspects may be influenced by environmental and ecological factors at the site scale, the regional scale, the flyway scale or at the breeding and overwintering scales. As such, reliance on even two seasons worth of data collection to represent migratory bird activity and risk at a proposed wind project for the proposed life of the project may be misleading given the known possible shift in activity over time. However, the two years of extensive survey effort certainly provide a suitable level of background data to present the risks to birdlife at this proposed site within an ESIA.

5. The total number of individual birds and species recorded during the 2023 season – 305,662 individuals of 22 species – are considered as *high* when compared to other projects in the vicinity. The number of birds recorded during Autumn 2023 is comparable to Autumn 2022 showing the site is of consistently high use. This is perhaps not surprising given the location of the site with respect to the Gebel El Zeit IBA.

6. During autumn 2023 four (4) of the recorded species were globally threatened according to the IUCN Red List (https://www.iucnredlist.org/): including two (2) Endangered-EN (Steppe Eagle and the Egyptian Vulture), and one (1) Vulnerable-VU species (Sooty Falcon). In addition, one (1) species is Near Threatened-NT (Pallid Harrier).

11. Spatial analysis of MSB and target bird activity and flight height data suggest that certain areas of Plot 2 experience higher migratory flight activity in comparison to other portions within each season for particular species assemblages and the specific species analysed for this report. For all MSB and target species, including unidentified species, the highest extrapolated passage rates were at OP's 7, 8 and 9 in the centre and west of the site in 2023. It is considered that there are no particular features within the site that are driving the migration pattern and it is likely that changes in distribution will continue during the lifetime of the project. It is also important to note that no portions of Plot 2 present low risk to MSB and target species in either 2022 or 2023 seasons without the implementation of minimisation and mitigation strategies including shut down on demand. It is recommended that minimisation and mitigation approaches are developed for the site as part of the ESIA consistent with those developed for other nearby wind energy facilities.

7. During 2022 the flight height analysis completed indicated that substantially more MSB and target bird species activity occurs at 200-m compared to 150-m. This is true again of 2023 however generally higher flight heights were recorded. CRM was not performed for this report as no WTG model or layout is yet available however this will be performed as part of the ESIA.

8. Temporal analysis of the activity patterns observed in autumn 2023 showed a peak of activity around 14:00 to 16:00 which corresponds with that of autumn 2022.

9. A potential environmental constraint was documented at Plot 2 in the form of a carcass dump site. This site was surveyed for all of the 2023 season. The data recorded during these surveys strongly indicates that the site serves as an important stopover site for some birds of prey and for White Storks. The total lack of White Stork activity at the carcass dump site is likely to correlate to the absence of water at the dam site. It is important to note that the feeding site has now been removed and waste is being taken elsewhere which

will remove this potential risk factor from consideration within the ESIA. Monitoring of the location remains appropriate to ensure that dumping of carcasses does not resume.

10. Additional monitoring, avoidance, minimisation, and mitigation methods are recommended to be developed following the production of additional analyses described in this section, as well as the production of cumulative effects analysis and critical habitats assessment. It is recommended that such analysis account for both the wind energy facility, as well as for associated overhead electrical transmission lines.