Samarkand I Solar PV and BESS Project

Republic of Uzbekistan

Critical Habitat Assessment (CHA)

April 2025, v1.7

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LIST OF ABBREVIATIONS

ABBREVIATION	MEANING
ADB	Asian Development Bank
AoI	Area of Influence
AZE	Alliance for Zero Extinction
BESS	Battery Energy Storage System
BMEP	Biodiversity Monitoring and Evaluation Programme
CHA	Critical Habitat Assessment
CO	Collapsed, IUCN Red List of Ecosystems Category
CR	Critically Endangered, IUCN Red List of Threatened Species Category
DD	Data Deficient, IUCN Red List of Threatened Species Category
EAAA	Ecologically Appropriate Area of Analysis
EBRD	European Bank for Reconstruction and Development
EOO	Extent of Occurrence
EN	Endangered, IUCN Red List of Threatened Species Category
IBA	Important Bird Areas
IFC	International Finance Corporation
IUCN	International Union for Conservation of Nature
JBIC	Japan Bank for International Cooperation
KBA	Key Biodiversity Areas
LC	Least Concern, IUCN Red List of Threatened Species Category
NG	Net Gain
NNL	No Net Loss
NT	Near Threatened, IUCN Red List of Threatened Species Category
OHTL	Overhead Transmission Line
PBF	Priority Biodiversity Feature
PR	Performance Requirement
PS	Performance Standard
RDB	Red Data Book
SAC	Special Areas of Conservation
SPA	Special Protection Areas
SBV	Significant Biodiversity Value
VP	Vantage Point
VU	Vulnerable, IUCN Red List of Threatened Species Category

1 INTRODUCTION

1.1 Project Background

Uzbekistan is amongst the fastest growing economies in the Central Asian region, with a steady demand for energy. In 2018, the country's power consumption reached 50 million TWh, and the domestic demand for power is projected to rise at an annual rate of 4%, due to continued population growth and industrial expansion.

On 19 March 2023, the Ministry of Energy and National Electric Grid Joint Stock Company of Uzbekistan (NEGU) entered into a Power Purchase Agreement (PPA) with ACWA Power (hereinafter Project Developer), for the implementation of the Samarkand I Solar PV and BESS Project, which includes the development and operation of the following project facilities:

- 100 MW Photo-Voltaic (PV) power plant
- 400 MW PV power plant
- Nurobod (500 MWh) Battery Energy Storage System (BESS) with underground interconnection cable
- 4.9-km Overhead Transmission Line (OTL)
- 70-km OTL
- Two 11-km OTLs constituting a Loop-In-Loop-Out (LILO) interconnection
- Two 13-km OTLs constituting a Loop-In-Loop-Out (LILO) interconnection

In the same period, a parallel PPA was established with the Project Developer, for the implementation of the Samarkand II Solar PV and BESS Project, which includes the development and operation of the following project facilities:

- 500 MW PV power plant
- Nurobod sub-station
- 70-km OTL
- 350-km OTL
- Karakul (500 MWh) BESS with underground interconnection cable (220 kV)

As shown in the maps below, the majority of the power generation and storage facilities planned under the projects are located in Nurobod District, Samarkand Region.

The interconnection facilities constituting the projects, which include an electrical sub-station and multiple overhead and underground powerlines are also concentrated in Nurobod District. The OTLs largely radiate from the Nurobod sub-station, towards the grid.

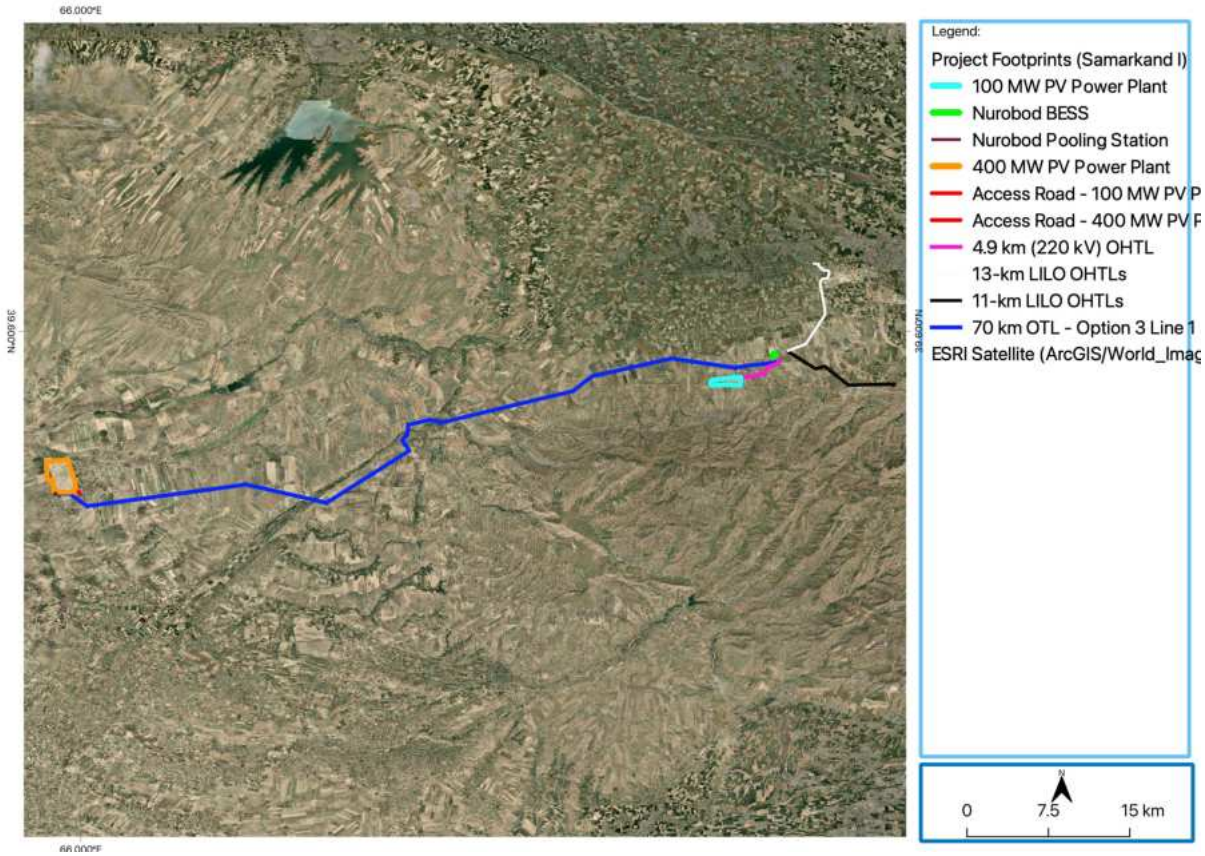

Figure 1-1 Samarkand I project facilities planned in Samarkand Region

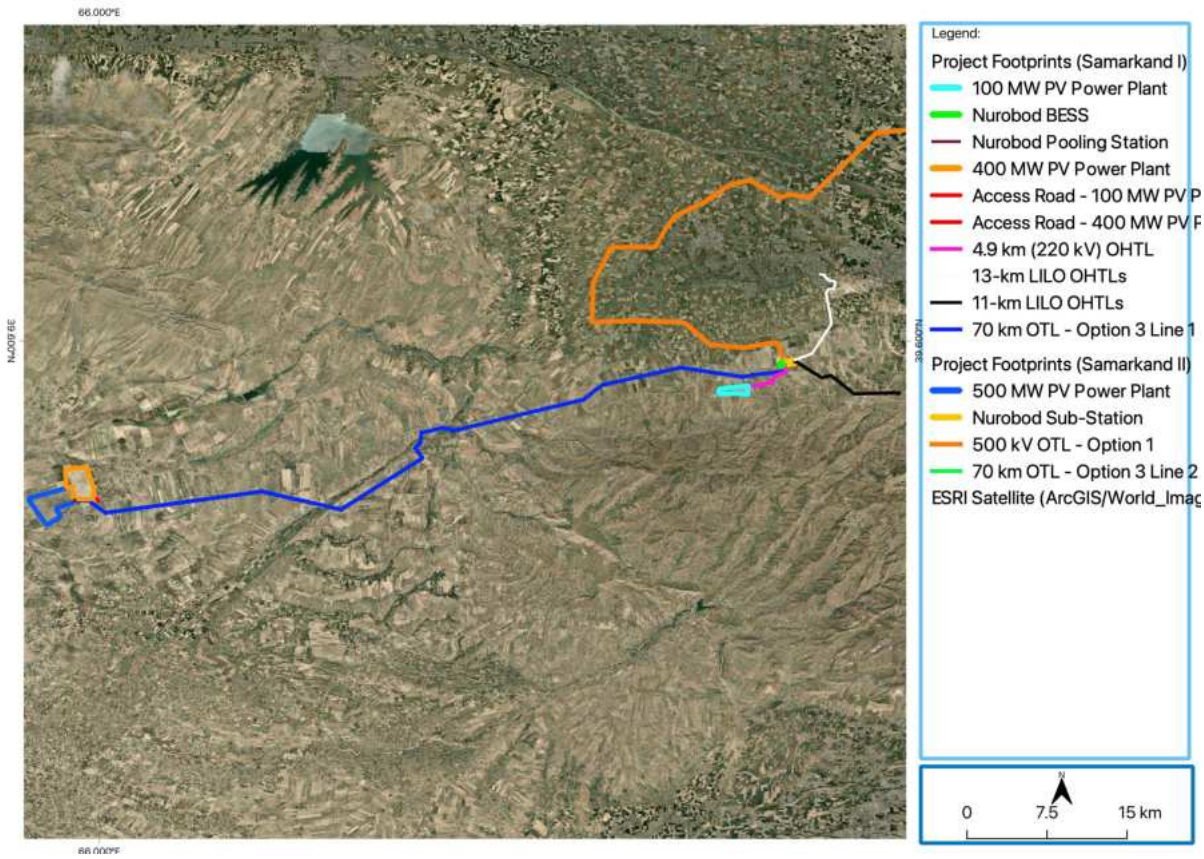

Figure 1-2 Additional facilities planned under the Samarkand II project

In preparation for the Project, the Project Developer is seeking international financing from Development Finance Institutions (DFIs) including the Asian Development Bank (ADB), European Bank for Reconstruction and Development (EBRD), International Finance Corporation (IFC), and Japan Bank for International Cooperation (JBIC) (hereinafter Project Lenders).

Accordingly, 5 Capitals (hereinafter the Consultant) has been assigned to undertake an Environmental and Social Impact Assessment (ESIA) study for the Project, in line with E&S performance standards stipulated by the Project Lenders. With regard to the identification, assessment and management of potential impacts on biodiversity, the ESIA process includes a Critical Habitat Assessment (CHA).

1.2 Purpose and Scope of Report

The general purpose of the CHA is to identify species and habitats of conservation concern in the Project's ecological Areas of Influence (AoI).

This report provides the results of detailed baseline studies (encompassing desktop review, relevant stakeholder engagement, and field survey work) to assess the conservation

importance of species and ecosystems against the ADB SPS, EBRD PR 6 and IFC PS 6 criteria for the identification of Critical Habitats (CHs) and Priority Biodiversity Feature (PBF) or Significant Biodiversity Value (SBV) habitats.

> **Note:** The Critical Habitat Assessment (CHA) for the Samarkand I and II solar PV and BESS Projects was carried out on a cumulative, holistic basis, in instances where facilities from different projects have common locations and coincident implementation timeframes.
>
> While project-specific CHA and ESIA studies have been developed, to enable separate Environmental and Social Due Diligence (ESDD) for the Projects' respective lender consortiums, a combined analysis (accounting for both projects) has been adopted where potential impacts from these projects fall within the same EAAA (i.e., areas of influence co-occurring within the same habitat).
>
> For sections where the CHA analysis encompasses both the Samarkand I and Samarkand II solar PV and BESS projects, the analytical discussion should be reviewed with reference to the project scope outline provided in Section 1.1 of this Report.

1.3 Critical Habitat

1.3.1 Habitat Designations

As per IFC PS 6 (2012) and associated GN (2019):

Habitats can be divided into natural habitats (which are land and water areas where the biological communities are formed largely by native plant and animal species, and where human activity has not essentially modified the area's primary ecological functions) and modified habitats (where there has been apparent alteration of the natural habitat, often with the introduction of alien species of plants and animals, such as agricultural areas). Both types of habitat can support important biodiversity at all levels, including endemic or threatened species.

Critical habitat is a subset of both natural and modified habitat that deserves particular attention. Critical habitat includes areas with high biodiversity value, including habitat required for the survival of critically endangered or endangered species; areas having special significance for endemic or restricted-range species; sites that are critical for the survival of migratory species; areas supporting globally significant concentrations or numbers of individuals of congregatory species; areas with unique assemblages of species or which are

associated with key evolutionary processes or provide key ecosystem services; and areas having biodiversity of significant social, economic or cultural importance to local communities.

1.3.2 Determining Critical Habitat

As per IFC PS 6 (2012) and associated GN (2019):

Critical habitats are areas of high biodiversity value that include at least one or more of the five values specified in paragraph 16 of Performance Standard 6 and/or other recognized high biodiversity values. There is no one criterion that is more important than any other for making critical habitat designations or for determining compliance with Performance Standard 6. For ease of reference, these values are referred to as "critical habitat criteria" for the remainder of this document. Each criterion is described in detail in paragraphs GN70–GN83. Critical habitat criteria are as follows and should form the basis of any critical habitat assessment:

The below provides an overview of all applicable criteria as per IFC, EBRD and ADB:

- IFC PS6 Criterion 1: Critically Endangered and Endangered Species /// ADB criterion "habitat required for the survival of critically endangered or endangered species";
- IFC PS6 Criterion 2: Endemic and Restricted-range Species /// ADB criterion "areas with special significance for endemic or restricted-range species";
- IFC PS6 Criterion 3: Migratory and Congregatory Species /// ADB criteria "sites that are critical for the survival of migratory species" and "areas supporting globally significant concentrations or numbers of individuals of congregatory species";
- IFC PS6 Criterion 4: Highly Threatened or Unique Ecosystems
- IFC PS6 Criterion 5: Key Evolutionary Processes /// ADB criterion "areas with unique assemblages of species that are associated with key evolutionary processes or provide key ecosystem services";
- EBRD PR6 Criterion(i): Highly threatened or unique ecosystems /// IFC PS6 Criterion 4: Highly Threatened or Unique Ecosystems
- EBRD PR6 Criterion (ii): Habitats of significant importance to endangered or critically endangered species /// IFC PS6 Criterion 1: Critically Endangered and Endangered Species
- EBRD PR6 Criterion (iii) Habitats of significant importance to endemic or geographically restricted species and sub-species /// IFC PS6 Criterion 2: Endemic and Restricted-range Species
- EBRD PR6 Criterion (iv) Habitats supporting globally significant concentrations of migratory or congregatory species /// IFC PS6 Criterion 3: Migratory and Congregatory Species
- EBRD PR6 Criterion (v) Areas associated with key evolutionary processes /// IFC PS6 Criterion 5: Key Evolutionary Processes

- Additionally, ADB criterion "areas with biodiversity that has significant social, cultural or economic importance to local communities"; and
- ADB criterion "Critical habitat is a subset of both natural and modified habitat. Critical habitat includes areas with high biodiversity value, including habitat required for the survival of critically endangered or endangered species; areas having special significance for endemic or restricted-range species; sites that are critical for the survival of migratory species; areas supporting globally significant concentrations or numbers of individuals of congregatory species; areas with unique assemblages of species or that are associated with key evolutionary processes or provide key ecosystem services; and areas having biodiversity of significant social, economic, or cultural importance to local communities. Critical habitats include those areas either legally protected or officially proposed for protection, such as areas that meet the criteria of the Word Conservation Union classification, the Ramsar List of Wetlands of International Importance, and the United Nations Educational, Scientific, and Cultural Organization's world natural heritage sites"

Projects that are located within internationally and/or nationally recognized areas of high biodiversity value may require a critical habitat assessment. Examples include the following:

• Areas that meet the criteria of the IUCN's Protected Area Categories Ia, Ib and II.

• Key Biodiversity Areas (KBAs), GN10 which encompass Important Bird and Biodiversity Areas (IBAs).

Quantitative and qualitative thresholds are provided in IFC PS 6 which determine if criticality is met for any particular criterion.

1.3.3 Critical Habitat Assessment Process

On the broad scale, the overall process of a CHA can be divided into three main stages:

1. CHA Screening – identify the study area (potentially affected landscape/seascape/ecosystem) & conduct a desktop study of literature review and stakeholder consultation to obtain an understanding of biodiversity within the landscape from the perspective of all relevant stakeholders. This also informs the scoping of primary data collection (surveys and monitoring) requirements.
2. Data Collection – physical field data collection as well as engagement with relevant expert stakeholders to collate all the requisite data that will support the assessment.
3. Critical Habitat Assessment – biodiversity values of the site assessed against critical habitat criteria and thresholds at an appropriate ecological scale, as defined in GN59. By carrying out these steps, the client should be in a position to determine if the project is located in a critical habitat based on identified high biodiversity values. This determination is independent of the project type, impacts or its mitigation strategy.

The following chapter presents the methodology and findings of the CHA Screening Stage.

2 CHA SCREENING

2.1 Methodology

A desktop-based screening exercise was undertaken as the initial step to identify a preliminary list of potentially sensitive biodiversity features.

The outcome of the CHA Screening will narrow down the species/features of concern that will need further assessment, both in the ESIA as well as in the CHA against thresholds. This step also allows for the determination of the appropriate level of field survey effort that may be required to provide sufficient information for the ESIA and CHA, and thus should be undertaken during the ESIA Scoping phase (or as early as possible).

2.1.1 Define the Study Area

An overarching Study Area was first defined, looking from a regional scale. As the project is a solar farm, and the area supports a broad front of migratory bird activity during specific times of the year, a buffer of approximately 50km was added around the project footprint to generate the study (screening) area polygon below.

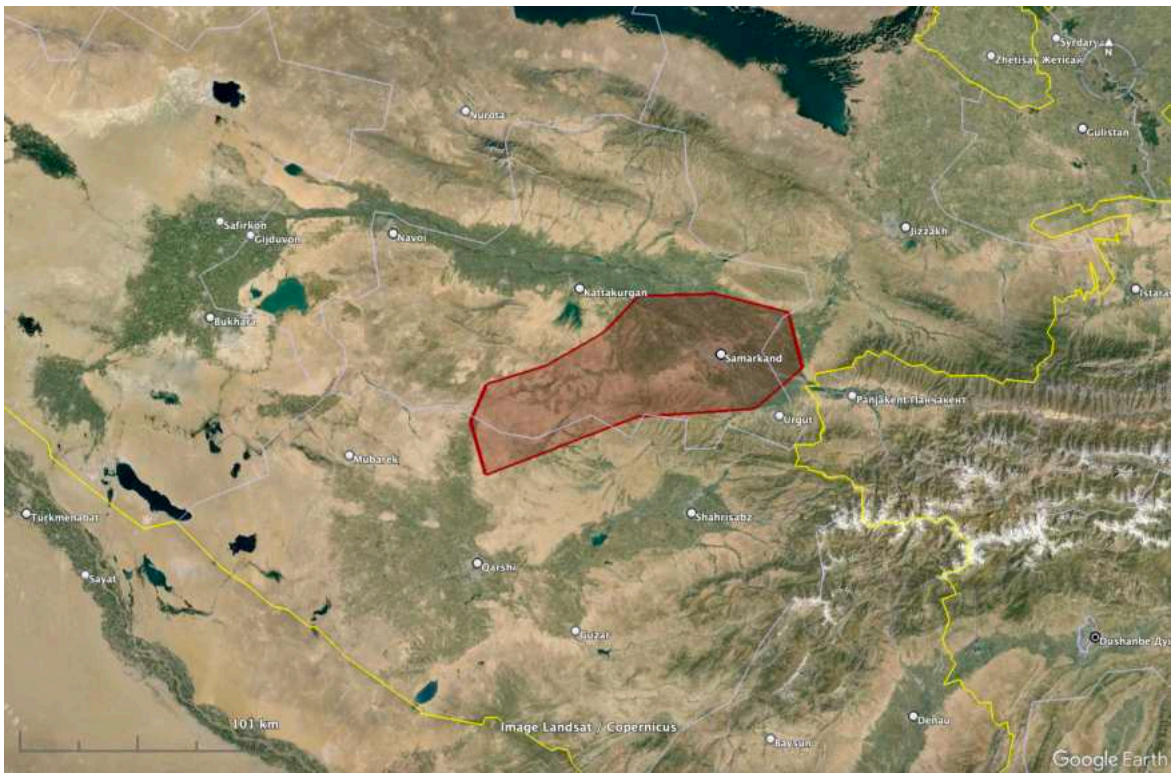

Figure 2-1 Study Area

2.1.2 Desktop Review and Scoping

Once the study area is delineated, the scoping process begins.

A list of all species from the IUCN Red List and, where relevant, categorized ecosystems from the Red List of Ecosystems is generated by cross-referencing the Study Area with known spatial distributions from the IUCN Global database. This list of all possible species/ecosystems (biodiversity features) is then supplemented by a review of Key Biodiversity Areas (and other recognised biodiversity areas of importance), national or regional level Red Lists / Red Data Books, contextual connectivity of flyways and habitats across the landscape, and any other verified sources of available existing ecological information. Migratory bird species lists are obtained from Birdlife International and other reputable public sources and databases.

At this stage, a set of **CHA Screening Tables** has been created with a full list of species that should be further investigated under specific criterion, and whose known range may overlap with the project AoI. Each species is assessed to determine the likelihood of its presence based on habitat requirements compared to the known habitat types within the Project AoI.

As a precautionary stance, even if a species is screened out, it may be deemed necessary to later consult expert stakeholders and survey results and revisit those species before the CHA is completed, especially if a species is recorded during field surveys.

The final **CHA Screening Tables** list all identified species/elements as to why it was screened in for further assessment or screened out due to unsuitable habitat or other available information indicating lack of regular presence.

The culmination of Scoping results in an understanding of the biodiversity elements of concern, current gaps in knowledge, and the appropriate field surveying methods (and/or secondary information gathering from stakeholders, etc) that will be required in order to:

(i) provide appropriate levels of detail to ascertain if any CH thresholds are surpassed and;

(ii) allow the biodiversity impact assessment within the ESIA to be conducted accordingly.

2.2 Results

2.2.1 Desktop Screening

A desktop-based screening exercise was undertaken as the preliminary step to review what is considered as potentially sensitive biodiversity features.

2.2.1.1 SPECIES

The CHA desktop-based screening exercise included all taxa. The scoping process determined the likelihood of occurrence in the study area and potential for triggering criticality as per IFC PS6 Critical Habitat criteria.

The CHA screening was comprehensive, covering all potential taxa to ensure no significant biodiversity feature was overlooked. Beyond the relatively long catalogue of bird and bat species, reptiles, non-volant mammals, fish, and flora (and relevant habitats) were also included in the CHA screening.

Initially, a total of forty species were identified as potential elements of concern, predominantly Avifauna and Chiroptera (Bats). This included 17 bird species, 19 insectivorous bat species, two ichthyofauna species, one herptile and one plant. With the exclusion of volant mammals i.e., insectivorous bat species, no IUCN Red Listed mammals or insects have been identified as biodiversity features of concern with the potential to trigger criticality under any of the CH criteria.

The CHA screening review, including species-specific rationale for exclusion out of subsequent CHA, is presented in Annex A of this Report.

Table 2-1 Species Screened In for further investigation in the CHA

No.	Family	Species	Common Name	IUCN Red List	National UZRDB	Criterion
1	Aves	*Aegypius monachus*	Cinereous Vulture	NT	NT	EBRD PR 6 Criterion 4; IFC PS 6 Criterion 3
2	Aves	*Anser erythropus*	Lesser White-fronted Goose	VU	VU	EBRD PR 6 Criteria 2 & 4; IFC PS 6 Criteria 1 & 3
3	Aves	*Aquila heliaca*	Eastern Imperial Eagle	VU	VU	EBRD PR 6 Criteria 2 & 4; IFC PS 6 Criteria 1 & 3
4	Aves	*Aquila nipalensis*	Steppe Eagle	EN	VU	EBRD PR 6 Criteria 2 & 4; IFC PS 6 Criteria 1 & 3
5	Aves	*Chlamydotis macqueenii*	Asian Houbara	VU	VU	EBRD PR 6 Criteria 2 & 4; IFC PS 6 Criteria 1 & 3
6	Aves	*Clanga clanga*	Greater Spotted Eagle	VU	VU	EBRD PR 6 Criteria 2 & 4; IFC PS 6 Criteria 1 & 3
7	Aves	*Columba eversmanni*	Yellow-eyed Pigeon	VU	VU	EBRD PR 6 Criterion 2; IFC PS 6 Criterion 1
8	Aves	*Falco cherrug*	Saker Falcon	EN	EN	EBRD PR 6 Criteria 2 & 4;

No.	Family	Species	Common name	IUCN Red List	National UZRDB	Criterion
						IFC PS 6 Criteria 1 & 3
9	Aves	*Haliaeetus leucoryphus*	Pallas's Fish-eagle	EN	EN	EBRD PR 6 Criteria 2 & 4; IFC PS 6 Criteria 1 & 3
10	Aves	*Marmaronetta angustirostris*	Marbled Teal	NT	EN	EBRD PR 6 Criteria 2 & 4; IFC PS 6 Criteria 1 & 3
11	Aves	*Neophron percnopterus*	Egyptian Vulture	EN	VU	EBRD PR 6 Criterion 2; IFC PS 6 Criterion 1
12	Aves	*Otis tarda*	Great Bustard	EN	CR	EBRD PR 6 Criteria 2 & 4; IFC PS 6 Criteria 1 & 3
13	Aves	*Oxyura leucocephala*	White-headed Duck	EN	EN	EBRD PR 6 Criteria 2 & 4; IFC PS 6 Criteria 1 & 3
14	Aves	*Pelecanus crispus*	Dalmatian Pelican	NT	EN	EBRD PR 6 Criteria 2 & 4; IFC PS 6 Criteria 1 & 3
15	Aves	*Streptopelia turtur*	European Turtle-Dove	VU	VU	EBRD PR 6 Criteria 2 & 4; IFC PS 6 Criteria 1 & 3
16	Aves	*Tetrax tetrax*	Little Bustard	NT	VU	EBRD PR 6 Criteria 2 & 4; IFC PS 6 Criteria 1 & 3
17	Aves	*Vanellus gregarius*	Sociable Lapwing	CR	-	EBRD PR 6 Criteria 2 & 4; IFC PS 6 Criteria 1 & 3
18	Chiroptera	*Barbastella leucomelas*	Asian (Eastern) Barbastelle	LC	-	EBRD PR 6 Criterion 4; IFC PS 6 Criterion 3
19	Chiroptera	Eptesicus gobiensis	Gobi Big Brown Bat	LC	-	EBRD PR 6 Criterion 4; IFC PS 6 Criterion 3
20	Chiroptera	*Eptesicus ognevi*	Ognev's Serotine	LC	-	EBRD PR 6 Criterion 4; IFC PS 6 Criterion 3
21	Chiroptera	*Eptesicus serotinus*	Serotine Bat	LC	-	EBRD PR 6 Criterion 4; IFC PS 6 Criterion 3

No.	Family	Species	Common name	IUCN red list	National UZRDB	Criterion
22	Chiroptera	*Hypsugo savii*	Savi's Pipistrelle	LC	-	EBRD PR 6 Criterion 4; IFC PS 6 Criterion 3
23	Chiroptera	*Myotis blythii*	Lesser Mouse-eared Myotis	LC	-	EBRD PR 6 Criterion 4; IFC PS 6 Criterion 3
24	Chiroptera	*Myotis bucharensis*	Bokhara Whiskered Bat	DD	CR	EBRD PR 6 Criteria 2,3 & 4; IFC PS 6 Criteria 1, 2 and 3
25	Chiroptera	*Myotis emarginatus*	Geoffroy's Bat	LC	-	EBRD PR 6 Criterion 4; IFC PS 6 Criterion 3
26	Chiroptera	*Myotis nipalensis*	Nepal Myotis	LC		EBRD PR 6 Criterion 4; IFC PS 6 Criterion 3
27	Chiroptera	*Nyctalus noctula*	Common Noctule	LC	-	EBRD PR 6 Criterion 4; IFC PS 6 Criterion 3
28	Chiroptera	*Otonycteris leucophaea*	Turkestani Long-eared Bat	LC	2(VU:R)	EBRD PR 6 Criterion 4; IFC PS 6 Criterion 3
29	Chiroptera	*Pipistrellus aladdin*	Turkestan Pipistrelle	DD	-	EBRD PR 6 Criterion 4; IFC PS 6 Criterion 3
30	Chiroptera	*Pipistrellus pipistrellus*	Common Pipistrelle	LC	-	EBRD PR 6 Criterion 4; IFC PS 6 Criterion 3
31	Chiroptera	*Plecotus strelkovi*	Strelkov's Long-eared Bat	LC	-	EBRD PR 6 Criterion 4; IFC PS 6 Criterion 3
32	Chiroptera	*Rhinolophus bocharicus*	Bokhara horseshoe bat	LC	-	EBRD PR 6 Criterion 4; IFC PS 6 Criterion 3
33	Chiroptera	*Rhinolophus ferrumequinum*	Greater Horseshoe Bat	LC	-	EBRD PR 6 Criterion 4; IFC PS 6 Criterion 3
34	Chiroptera	*Rhinolophus hipposideros*	Lesser Horseshoe Bat	LC	2(VU:D)	EBRD PR 6 Criterion 4; IFC PS 6 Criterion 3
35	Chiroptera	Tadarida teniotis	European Free-tailed Bat	LC	2(VU:R)	EBRD PR 6 Criterion 4; IFC PS 6 Criterion 3
36	Chiroptera	*Vespertilio murinus*	Particoloured Bat	LC	-	EBRD PR 6 Criterion 4; IFC PS 6 Criterion 3

No.	Family	Species	Common name	IUCN red list	National UZRDB	Criterion
37	Herpetofauna	*Testudo horsfieldii*	Central Asian Tortoise/Russian Tortoise	VU	VU	EBRD PR 6 Criterion 2; IFC PS 6 Criterion 1
38	Ichtyofauna	*Cyprinus carpio*	Eurasian Carp	VU	-	EBRD PR 6 Criterion 2; IFC PS 6 Criterion 1
39	Ichtyofauna	*Luciobarbus brachycephalus*	Aral Barbel	VU	EN	EBRD PR 6 Criterion 2; IFC PS 6 Criterion 1
40	Mustelidae	*Vormela peregusna*	Marbled Polecat	VU	VU	EBRD PR 6 Criterion 2; IFC PS 6 Criterion 1

2.2.1.2 Ecosystems

2.2.1.2.1 Protected areas

In addition, screening-stage reviews confirmed that the project footprint does not overlap with any existing or proposed protected areas. Protected areas within a screening area of 50-km around the project sites are described in the table below.

Table 2-2 Protected areas in the CHA screening (study) area around the project sites

Sn	Protected Area	Distance from Nearest Project Site	Total Area (Hectares)	IUCN Management Category
1	Mubarek State Wildlife Sanctuary	4 km West of the 400 MW PV plant site and adjacent OTL routes	264,000 Ha	Category IV
2	Nurobod State Wildlife Sanctuary	21 km West of the 400 MW PV plant site and adjacent OTL routes	138,733 Ha	Category IV

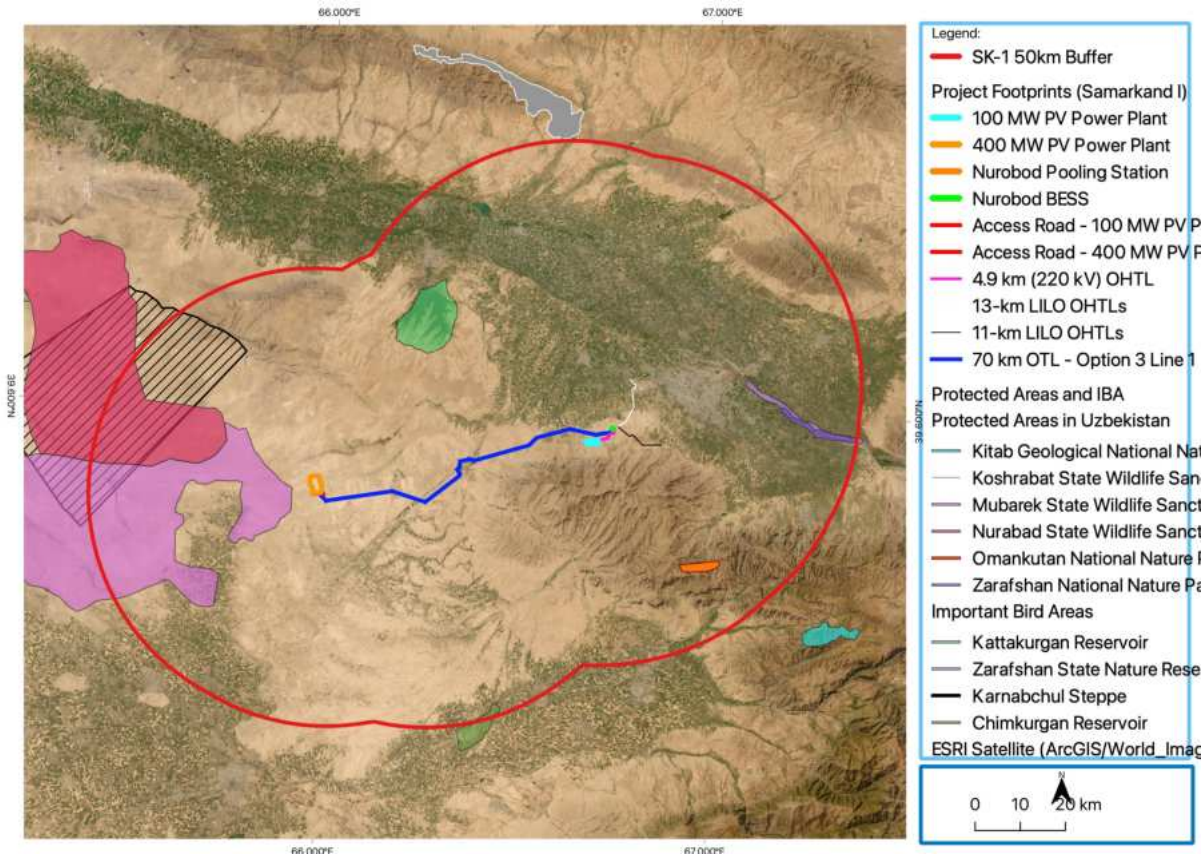

Figure 2-2 **Protected areas and IBAs within 50 km of the project sites**

These sanctuaries are currently not included or designated as CR or EN ecosystems on the IUCN Red List of Ecosystems, and they do not meet the Category I or II criteria for the IUCN's management framework for protected areas. Furthermore, consultations with the regional khokimiyat at the time of this assessment indicated that plans are underway to redesignate this conservation area as a controlled hunting area, and no other wildlife management initiatives have been recently implemented by the Ministry of Ecology in this area. Consequently, this PA is unlikely to meet the thresholds required to qualify as highly threatened and/or unique ecosystems as per Criterion 4 of IFC PS6.

At the time of this assessment, the Ministry of Ecology state office did not provide a response to a questionnaire regarding (i) biodiversity values considered in the designation of the Mubarek and Nurobod wildlife sanctuaries, and (ii) the population of the species with potential to trigger habitat criticality in these protected areas. Upon review of secondary (published) information, there were no records of regularly occurring, high[1] and/or endemic populations

[1] Exceeding criticality thresholds by different CHA criteria in the IFC PS 6 and EBRD PR 6.

of screened-in species in these sanctuaries. Therefore, ESIA- and CHA-related desk reviews and consultations did not provide any initial information to determine criticality of species in the sanctuary, on the basis of the IFC criteria 1, 2 and 3 (and EBRD criteria 2,3 and 4).

Notwithstanding the initial analysis undertaken at the CHA screening stage, one of the subsequent baseline surveys [2] implemented for breeding birds screened into the CHA indicated a large[3] congregation of Little bustards on the Eastern edge of the Mubarek wildlife sanctuary. On this basis, assuming (with precaution) that the sanctuary consists of a fairly homogenous suitable habitat for the Little bustard, the Mubarek state wildlife sanctuary, in its entirety, is considered to be a pre-existing critical habitat. However, as elaborated in Section 6.2.10 of this Report, the Project will impact on a limited portion of this Little bustard critical habitat, which overlaps with the Project's Area of Influence (AoI) and EAAA for the species.

2.2.1.2.2 Important Bird Areas (IBAs)

The CHA screening area overlaps a total of three IBAs, which represent potentially affected KBAs. These areas are described in the table below.

Table 2-3 IBAs and KBAs in the CHA screening (study) area around the project sites

SN	IBA/ KBA	DISTANCE FROM NEAREST PROJECT SITE	TOTAL AREA (HECTARES)	IBA QUALIFYING SPECIES SCREENED INTO THE CHA
1	Karnabchul Steppe IBA	30 km North-West of the 400 MW PV plant site and adjacent OTL routes	170,953	- Lesser White-fronted Goose (*Anser erythropus*) - Cinereous Vulture (*Aegypius monachus*) - Asian houbara (*Chlamydotis undulata*)
2	Kattakurgon IBA	25 km North of the OTL routes and adjacent 400 MW PV plant	14,355	- N/A; None of the species screened into the CHA.
3	Zarafshan IBA	23 km North of the OTL routes and adjacent 400 MW PV plant	3,245	- Greater Spotted Eagle (*Clanga clanga*)

[2] Spring-time point-count survey for breeding birds.
[3] Exceeding criticality threshold by the IFC PS 6 criterion 3 and EBRD PR 6 criterion 4.

With regard to the CHA IFC criterion 4 (EBRD criterion 1), these IBAs/ KBAs are currently not included or designated as CR or EN ecosystems on the IUCN Red List of Ecosystems.

With regard to the CHA IFC criteria 1,2 and 3 (EBRD criteria 2,3 and 4), the potential criticality of the IBA/KBA habitats is dependent on the species-specific Areas of Influence (AoI), rather than a uniform CHA screening area. The CHA analysis of these areas in respect of these criteria is therefore covered in the individual assessment of relevant qualifying species in Section 6 of this Report.

2.2.2 Stakeholder Information

To further refine the scoping exercise, desktop derived secondary data, survey results and guidance from local experts was used to ensure all species were appropriately considered.

Two ichthyofauna species listed as Vulnerable on the IUCN Red List were originally identified as potential elements of concern, however further stakeholder engagement with an ichthyologist familiar with the Syrdayra and Zaravshan river systems has confirmed that these species are not present within the reaches of the Syrdarya and Zaravshan rivers, located within the project AoI.

3 CHA METHODOLOGY

3.1 CHA Criteria

The concept of Critical Habitat is widely utilized and the principles for protection of critical habitat widely applied by DFIs. A specific screening and assessment process is undertaken to identify if any CH criteria are triggered by the project. This requires scoping to assess potential species candidates for triggering CH, and subsequently using information obtained from surveys, secondary sources, and stakeholders to extrapolate a population estimate for the individual species/species group's "Ecologically Appropriate Area of Analysis" which may in many cases be overlapping but not 100% aligned with a project impacts' Area of Influence. If any extrapolated population estimates (extrapolated from existing information across the qualified EAAA) meet the appropriate CH thresholds, then CH will have been triggered.

The below provides an overview of all applicable criteria as per IFC, EBRD and ADB:

- IFC PS6 Criterion 1: Critically Endangered and Endangered Species /// ADB criterion "habitat required for the survival of critically endangered or endangered species"
- IFC PS6 Criterion 2: Endemic and Restricted-range Species /// ADB criterion "areas with special significance for endemic or restricted-range species"
- IFC PS6 Criterion 3: Migratory and Congregatory Species /// ADB criteria "sites that are critical for the survival of migratory species" and "areas supporting globally significant concentrations or numbers of individuals of congregatory species"
- IFC PS6 Criterion 4: Highly Threatened or Unique Ecosystems
- IFC PS6 Criterion 5: Key Evolutionary Processes /// ADB criterion "areas with unique assemblages of species that are associated with key evolutionary processes or provide key ecosystem services"
- EBRD PR6 Criterion(i): Highly threatened or unique ecosystems /// IFC PS6 Criterion 4: Highly Threatened or Unique Ecosystems
- EBRD PR6 Criterion (ii): Habitats of significant importance to endangered or critically endangered species /// IFC PS6 Criterion 1: Critically Endangered and Endangered Species
- EBRD PR6 Criterion (iii) Habitats of significant importance to endemic or geographically restricted species and sub-species /// IFC PS6 Criterion 2: Endemic and Restricted-range Species
- EBRD PR6 Criterion (iv) Habitats supporting globally significant concentrations of migratory or congregatory species /// IFC PS6 Criterion 3: Migratory and Congregatory Species

- EBRD PR6 Criterion (v) Areas associated with key evolutionary processes /// IFC PS6 Criterion 5: Key Evolutionary Processes
- Additionally, ADB criterion "areas with biodiversity that has significant social, cultural or economic importance to local communities"; and
- ADB criterion "Critical habitat is a subset of both natural and modified habitat. Critical habitat includes areas with high biodiversity value, including habitat required for the survival of critically endangered or endangered species; areas having special significance for endemic or restricted-range species; sites that are critical for the survival of migratory species; areas supporting globally significant concentrations or numbers of individuals of congregatory species; areas with unique assemblages of species or that are associated with key evolutionary processes or provide key ecosystem services; and areas having biodiversity of significant social, economic, or cultural importance to local communities. Critical habitats include those areas either legally protected or officially proposed for protection, such as areas that meet the criteria of the World Conservation Union classification, the Ramsar List of Wetlands of International Importance, and the United Nations Educational, Scientific, and Cultural Organization's world natural heritage sites"

Some of the CH criteria listed above have quantitative thresholds associated with them, defined in lender policy, while others can only be assessed using more qualitative evaluation of the criterion.

3.1.1 Critical Habitat Criteria and Associated Thresholds

Some of the CH criteria listed above have quantitative thresholds associated with them, defined in lender policy, while others can only be assessed using more qualitative evaluation of the criterion. Refer to the IFC PS 6 2019 for the quantitative thresholds for each criterion.

3.1.2 Significant Biodiversity Values

Natural habitat and species may still be of elevated concern even if critical thresholds are not met. Significant Biodiversity Values (SBVs) may include species of conservation concern (for example, species that are threatened, legally protected, or otherwise identified as important by stakeholders) and ecological features in the landscape that are important to stakeholders. SBVs may occur in natural or modified habitat.

3.1.3 Priority Biodiversity Features

Even if they do not meet any of the CH criteria, some sensitive ecological features of the study area that may be affected by the project may be considered "Priority Biodiversity Features," defined by EBRD as biodiversity elements (habitats, features or species) that are considered sensitive, but not as much as those triggering CH.

CH triggers a Net Gain requirement while PBF trigger a No Net Loss mitigation standard under EBRD PR6, and hence require careful consideration during project assessment and mitigation planning. The scope of the present analysis was to identify not only any biodiversity features triggering criticality under any of the pertinent CH criteria, but also to identify all PBF potentially impacted by the Project as well.

EBRD have outlined the following criteria for the classification of PBF:

- PBF Criterion (i): Threatened habitats
- PBF Criterion (ii): Vulnerable species
- PBF Criterion (iii): Significant biodiversity features identified by a broad set of stakeholders or governments (such as KBA or IBA)
- PBF Criterion (iv): Ecological structure and functions needed to maintain the viability of priority biodiversity features.

3.1.4 Critical Habitat Criteria and Associated Thresholds

Some of the CH criteria listed above have quantitative thresholds associated with them, defined in lender policy, while others can only be assessed using more qualitative evaluation of the criterion. In the present section, biodiversity features potentially affected by the Project are assessed against the quantitative thresholds associated with some of the CH criteria.

The specific criteria and associated quantitative thresholds evaluated (where applicable) consist of the following:

Thresholds for EBRD CH Criterion i (Highly threatened or unique ecosystems) are the following:

a) EAAA[4] that is ≥5% of global extent of an ecosystem type with IUCN status of Endangered (EN) or Critically Endangered (CR); and
b) EAAA that is an ecosystem determined to be of high priority for conservation by national or regional systematic conservation planning.

Thresholds for EBRD CH Criterion ii (Habitats of significant importance to endangered or critically endangered species) are the following:

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

[4] The Ecologically Appropriate Area of Analysis is an area defined on a species-specific (or feature-specific) basis. The concept of an EAAA is to ensure that when the thresholds are being applied, the full extent of the species population is being considered / full area of a connected ecosystem, and not only an approximation of the number that may be found within the project area itself or direct area of influence.

b) Areas that support globally significant population of an IUCN Red-listed Vulnerable (VU) species, the loss of which would result in the change of the IUCN Red List status to EN or CR, meets the threshold (a) above; and

c) EAAA that contains important concentrations of a nationally or regionally listed EN or CR species.

Thresholds for EBRD CH Criterion iii (Habitats of significant importance to endemic or geographically restricted species and sub-species) is the following:

d) EAAA that regularly holds ≥ 10% of global population AND ≥ 10 reproductive units of a species.

Thresholds for Criterion iv (Habitats supporting globally significant concentrations of migratory or congregatory species) are the following:

e) EAAA that sustains, on a cyclical or otherwise regular basis, ≥ 1 percent of the global population at any point of the species' lifecycle; and

f) EAAA that predictably supports ≥10 percent of global population during periods of environmental stress.

EBRD CH Criterion v (Areas associated with key evolutionary processes) does not have a set of associated quantitative thresholds. The qualitative (expert-based) basis for evaluating this criterion is the following:

g) Areas with landscape features that might be associated with particular evolutionary processes evolutionary processes or populations of species that are especially distinct and may be of special conservation concern given their distinct evolutionary history. For example:
   - Isolated lakes or mountaintops
   - Populations of species listed as priorities by the Edge of Existence Programme.

EBRD CH Criterion vi (Ecological functions that are vital to maintaining the viability of biodiversity features) also does not have a set of associated quantitative thresholds. The qualitative (expert-based) basis for evaluating this criterion is the following:

h) Ecological functions without which critical biodiversity features could not exist. For example:
   - Riparian zones and rivers
   - Dispersal or migration corridors
   - Hydrological regimes
   - Seasonal refuges or food sources
   - Keystone or habitat-forming species

3.1.5 Priority Biodiversity Feature Criteria Thresholds

A biodiversity feature will be determined to be a PBF if the minimum thresholds of any single criterion are met. The below are as per EBRD PR 6 and associated Guidance Note 6.

Thresholds for PBF criterion i (Threatened habitats) are the following:

a) EAAA includes habitat type listed in Annex 1 of EU Habitats Directive or Resolution 4 of Bern Convention (for member states)
b) EAAA that is < 5% of the global extent of an ecosystem type with IUCN status of CR or EN

Thresholds for PBF criterion ii (Vulnerable species) are the following:

a) EAAA that supports < 0.5% of global population OR < 5 reproductive units of a CR or EN species.
b) EAAA supports a VU species
c) EAAA that supports regularly occurring nationally or regionally listed EN or CR species
d) EAAA that holds regularly occurring range-restricted species
e) EAAA identified as recognized national or international process as important for migratory birds (esp. wetlands)

PBF Criterion iii and iv do not have quantitative thresholds. As per EBRD PR6 GN6, the assessment for these criteria must rely upon expert judgement.

3.2 Ecologically Appropriate Area of Analysis

The Ecologically Appropriate Area of Analysis (EAAA) is a concept that was introduced with the 2019 revision of IFC PS6, and is currently considered by IFC, and ADB as the basis for spatial delimitation of the area of analysis for the purpose of performing CHA.

Unlike other "area of influence" concepts, the EAAA concept is species-specific. Therefore, differently configured EAAA may be drawn for different species for the same project, based on the species' differing ecological characteristics, especially habitat preference and movement patterns. EAAA considered for CHA should not be confused with other spatial delineations of the Project area, or Project's area of influence for other purposes elsewhere within the Project's ESIA and other documentation (for example, the AoI considered for the evaluation of noise impacts)[5].

[5] The Project Study Area as determined during CHA Screening outlines the total spatial area within which potential species distribution overlaps are examined utilizing global databases.

The Area of Influence is specific to impacts. For example, the AoI for noise impacts on fauna may be inclusive of the noise-generating activity footprint and a 500m buffer; whilst the AoI for Habitat Fragmentation impact may be much

The EAAA for a particular species or species group encompasses the total area within which the species or species group may be impacted by the Project. The EAAA is based on habitat configurations, locations of ecological features, and the typical home range of species.

The EAAA has been delineated for species and species-groups for which the possibility of criticality must be examined. The estimated population of the entire EAAA is used as the basis to determine if criticality has been met, in relation to the quantitative thresholds associated with some of the CH criteria, as described above.

3.2.1 Defining EAAA

Defining the EAAA is an integral step in determining criticality. The critical thresholds must be measured against the population of the species present within the "EAAA", which on a practical level roughly translates into the full range covered by members of a population regularly utilizing or occurring within a particular area.

Therefore, to determine EAAA and assess criticality, the following steps must be followed:

1. Determine the largest Area of Influence for the species based on the project's identified impacts and the species' ecology (habitat affiliation, dispersal, displacement etc.). This would be considered to encompass all populations of a species expected to potentially interact with the site and be impacted by the project.
2. Determine the likely home range inhabited by members of the species population which utilize the area of influence. This is based on mobility and habitat distribution.
3. Map the EAAA by taking the area of influence, adding the decided buffer, and mapping based on contiguous habitat (if there is a strong habitat preference/need).
4. The next step is calculating the estimated population present within the EAAA (where quantification is possible) and comparing these ratios to the thresholds for determination of criticality status. This can be done using population extrapolations where sufficient baseline data is available and a global population is known; or by using Extent of Occurrence where the size of the EAAA is compared to the size of the global EOO.

This is a relatively straight-forward concept when considering residential, sedentary populations. For example, for a terrestrial species with limited mobility and specific habitat

more broad, encompassing a wider region than the impacting activity itself. The impact-specific AoIs are discussed in relation to impacts and receptors within the ESIA.

requirements, the largest applicable area of influence would amount to the full construction footprint (as the primary concern is direct loss and disturbance during construction). Based on this, the home range regularly occupied by the population probably does not exceed a specified buffer around the project boundaries. The size of the most appropriate buffer for a given species can be estimated on the basis of the species' dispersal ecology (home range size). The EAAA would be considered as the project boundaries (equivalent to the AoI in this case) plus the determined ecological buffer.

However, the entire project footprint need not be considered as part of the EAAA if a portion of that footprint contains habitat unsuitable for the species. This type of restriction of the EAAA is especially important when areal coverage of a species is used as proxy for population size, as extrapolation of the population of a species occurring within a Project's EAAA based on the entire acreage of the Project footprint would result in a significant exaggeration if only a small portion of the Project's footprint is utilised by the species. The number of individuals making up the population within that EAAA in relation to the global population of the species (or the areal coverage of the species EAAA in relation to the species global Extent of Occurrence (EOO) would then be compared to the critical thresholds.

For species with extremely large home ranges, long-ranging nomadic species, and/or migratory species, this approach is difficult to utilize. For example, migrant waterbirds may be impacted on a large scale by the project as a result of macro-avoidance resulting in habitat fragmentation or migration route impacts, during the operation of the project. Or, long-distance migrant species which are at risk of collision may be on a migratory journey of hundreds of thousands of kilometres.

If we are to apply the concept of ascertaining the entire home range of the long-distance migratory species that pass through the area of influence then this 'EAAA' in this case could easily become an entire geographical region.

It is recognized that the EAAA is intended as a project specific concept, and therefore it is not intended to span multiple continents, or very large regional scale area, e.g., to cover the entire ranges of individual long-distance migratory birds. With migratory birds, CHA generally follows the IUCN KBA standard, emphasizing areas that function as significant migratory stopover sites and/or bottleneck, with EAAA delineated to include the Project footprint plus a reasonable buffer based on the scale of the species' typical daily foraging movements, rather than its entire migratory route.

Each species analysis section includes the reasoning followed to ascertain the EAAA, the likely population within the EAAA (where it can be estimated), and the final assessment of criticality.

The following summarizes the general framework/starting point used to assign EAAA for various taxa, (most will have a more specific species-dependent EAAA assigned and explained):

- For bats, (unless otherwise specified for a species-specific rationale) the EAAA has been set as the footprint of the project site, including a buffer of up to 20km. This would be considered to encompass the area regularly traversed by the majority of sedentary bats that may utilize the site.
- For flora, (unless otherwise specified for a species-specific rationale) the EAAA has been defined on the basis of suitable substrate/ habitat conditions where it has been recorded in the footprint of the project site, including a buffer of up to 10km.
- For tortoises and reptiles, the EAAA has been set as the footprint of the project site, including a buffer of up to 10km. This would be considered to encompass the area regularly traversed by the majority of tortoises that may utilize the site.
- For migratory birds: The EAAA is a difficult concept to apply to long-range migratory species, as encompassing the full geographic range of such species would result in extremely large population extrapolations. Instead, CHA generally follows the IUCN KBA standard, emphasizing areas that function as significant migratory stopover sites and/or bottlenecks with EAAAs delineated to include the Project footprint plus a reasonable buffer based on the scale of the species' typical daily or foraging movements, rather than its entire migratory route.
- For breeding/resident birds: The total EAAA for breeding birds has been applied as all connected suitable habitat overlapping with the project footprint as well as within a reasonable buffer (the buffer is based on the breeding ecology or typical localized home range of the species and may include recognition of localized foraging or hunting movements). This should provide an adequate accounting of birds likely to regularly utilize the project area during respective breeding seasons.

3.3 Analysing and Assessing

The final stage of the CHA process is the analysis of the collated data to prepare a rationale for why or why not a species population within the EAAA would qualify as triggering criticality under any of the relevant criteria. This can include a review of information such as baseline findings, habitat preferences, distribution, seasonality, reported population, previous records, known migration routes, known stopover or otherwise important locations within the region, and any information known about breeding and migratory behaviour relevant to the area.

4 ASSESSMENT

4.1 Overview of Study Area

4.1.1 Geographical and climatic overview

Eastern Uzbekistan, where the project is primarily located, contrasts sharply with the arid deserts of the country's western and central parts. The area is predominantly characterized by its semi-arid climate, with significant seasonal variations that influence the ecological dynamics of the region. Summers are typically hot and dry, with temperatures soaring up to 40°C, making it the driest period of the year. In contrast, the winter months from November to January see temperatures dipping below freezing, accompanied by higher precipitation levels, which are crucial for maintaining the local ecosystems during the dry spells.

The region's geography is marked by significant mountain ranges such as the Tian Shan near Tashkent, extending eastward for about 2,900 km, and the smaller Nuratau mountains northwest of Samarkand. These mountains are not only pivotal in defining the area's climate by blocking or channelling air masses but also serve as critical habitats for a myriad of species.

4.1.2 Key Biodiversity Areas

A number of Key Biodiversity Areas (KBAs) are located within a 50km radius of the project site.

A review of the Datazone on BirdLife.org shows a number of Key Biodiversity Areas (KBAs)/Important Bird Areas (IBAs) are located within 50-100km radius of the proposed site.

Tuzkan Lake UZ035

Summary | Text account | Data table and detailed info | Map | Reference and further resources

IBA Justification

The site was identified as important in 2006 because it was regularly supporting significant populations of the species listed below, meeting ('triggering') IBA criteria.

Populations meeting IBA criteria ('trigger species') at the site:

Species	Red List[1]	Season	Year(s)	Size	IBA criteria
Greylag Goose *Anser anser*	LC	winter	2009	4,014 individuals	A4i
Ruddy Shelduck *Tadorna ferruginea*	LC	winter	2003	7-15,304 adults	A4i
Ferruginous Duck *Aythya nyroca*	NT	breeding	2006	5-146 adults	A1
Great Crested Grebe *Podiceps cristatus*	LC	winter	2003-2006	9-571 adults	A4i
Black-necked Grebe *Podiceps nigricollis*	LC	winter	2003-2004	157-1,034 adults	A4i
Common Coot *Fulica atra*	LC	winter	2003-2006	487-22,867 adults	A4i
Common Crane *Grus grus*	LC	winter	2003-2006	848 individuals	A4i
Dalmatian Pelican *Pelecanus crispus*	NT	winter	2003-2006	3-111 adults	A1, A4i
Pygmy Cormorant *Microcarbo pygmaeus*	LC	winter	2003-2006	495-894 adults	A4i
Great Cormorant *Phalacrocorax carbo*	LC	winter	2003	52-13,573 adults	A4i
Asian Dowitcher *Limnodromus semipalmatus*	NT	passage	2006	6 adults	A1
Cinereous Vulture *Aegypius monachus*	NT	non-breeding	2003	4 adults	A1
Pallas's Fish-eagle *Haliaeetus leucoryphus*	EN	winter	2004	6 adults	A1
A4iii *Species group - waterbirds*	n/a	winter	2003-2004	26,047-61,582 individuals	A4iii

1. The current IUCN Red List category. The category at the time of the IBA criteria assessment (2006) may differ.

BirdLife International (2024) Important Bird Area factsheet: Tuzkan Lake. Downloaded from https://datazone.birdlife.org/site/factsheet/tuzkan-lake-iba-uzbekistan on 08/08/2024.

Tuzkan Lake IBA/KBA is of note as records of Pallas's Fish-eagle, Dalmatian Pelican are listed as trigger species; both of which will be assessed.

Arnasay Lake System UZ030

Summary | Text account | Data table and detailed info | Map | Reference and further resources

IBA Justification

The site was identified as important in 2016 because it was regularly supporting significant populations of the species listed below, meeting ('triggering') IBA criteria.

Populations meeting IBA criteria ('trigger species') at the site:

Species	Red List[1]	Season	Year(s)	Size	IBA criteria
Northern Lapwing *Vanellus vanellus*	NT	breeding	2016	14-51 individuals	A1

1. The current IUCN Red List category. The category at the time of the IBA criteria assessment (2016) may differ.

BirdLife International (2024) Important Bird Area factsheet: Arnasay Lake System. Downloaded from https://datazone.birdlife.org/site/factsheet/arnasay-lake-system-iba-uzbekistan on 08/08/2024.

Zarafshan State Nature Reserve — UZ039

Summary | Text account | Data table and detailed info | Map | Reference and further resources

IBA Justification

The site was identified as important in 2008 because it was regularly supporting significant populations of the species listed below, meeting ('triggering') IBA criteria.

Populations meeting IBA criteria ('trigger species') at the site:

Species	Red List[1]	Season	Year(s)	Size	IBA criteria
Egyptian Nightjar *Caprimulgus aegyptius*	LC	breeding	2007	1 individuals	A3
Black-crowned Night-heron *Nycticorax nycticorax*	LC	breeding	1976-2006	50-1,000 individuals	A4i
Pallid Scops-owl *Otus brucei*	LC	breeding	2006-2007	20 individuals	A3
Greater Spotted Eagle *Clanga clanga*	VU	passage	2004	15 individuals	A1
European Roller *Coracias garrulus*	LC	breeding	2002-2007	60 individuals	A1
White-winged Woodpecker *Dendrocopos leucopterus*	LC	resident	2002-2007	10 breeding pairs	A3
Great Tit *Parus major*	LC	resident	2002-2009	20-27 breeding pairs	A3
Red-headed Bunting *Emberiza bruniceps*	LC	breeding	2007	1 individuals	A3

1. The current IUCN Red List category. The category at the time of the IBA criteria assessment (2008) may differ.

BirdLife International (2024) Important Bird Area factsheet: Zarafshan State Nature Reserve. Downloaded from https://datazone.birdlife.org/site/factsheet/zarafshan-state-nature-reserve-iba-uzbekistan on 08/08/2024.

Zarafshan State Nature Reserve IBA/KBA is of note as records of Greater Spotted Eagle is listed as a trigger species; which will be assessed.

Kattakurgan Reservoir — UZ038

Summary | Text account | Data table and detailed info | Map | Reference and further resources

IBA Justification

The site was identified as important in 2017 because it was regularly supporting significant populations of the species listed below, meeting ('triggering') IBA criteria.

Populations meeting IBA criteria ('trigger species') at the site:

Species	Red List[1]	Season	Year(s)	Size	IBA criteria
Common Pochard *Aythya ferina*	VU	winter	2011-2017	5-93 individuals	A1

1. The current IUCN Red List category. The category at the time of the IBA criteria assessment (2017) may differ.

BirdLife International (2024) Important Bird Area factsheet: Kattakurgan Reservoir. Downloaded from https://datazone.birdlife.org/site/factsheet/kattakurgan-reservoir-iba-uzbekistan on 08/08/2024.

Additionally, the following IBA/KBAs are within a 100km radius:

Nuratau Range UZ037

Summary | Text account | Data table and detailed info | Map | Reference and further resources

IBA Justification

The site was identified as important in 2006 because it was regularly supporting significant populations of the species listed below, meeting ('triggering') IBA criteria.

Populations meeting IBA criteria ('trigger species') at the site:

Species	Red List[1]	Season	Year(s)	Size	IBA criteria
Egyptian Vulture *Neophron percnopterus*	EN	breeding	2003-2004	5-10 breeding pairs	A1
Cinereous Vulture *Aegypius monachus*	NT	breeding	2006	90 individuals	A1, A4ii
Saker Falcon *Falco cherrug*	EN	breeding	2004	2 adults	A1
Eastern Rock Nuthatch *Sitta tephronota*	LC	resident	2006	abundant	A3
White-throated Robin *Irania gutturalis*	LC	breeding	2006	common	A3
Variable Wheatear *Oenanthe picata*	LC	breeding	2006	uncommon	A3
White-capped Bunting *Emberiza stewarti*	LC	breeding	2006	uncommon	A3

1. The current IUCN Red List category. The category at the time of the IBA criteria assessment (2006) may differ.

BirdLife International (2024) Important Bird Area factsheet: Nuratau Range. Downloaded from https://datazone.birdlife.org/site/factsheet/nuratau-range-iba-uzbekistan on 08/08/2024.

Nuratau Range Conservation Area is of note as records of Egyptian Vulture and Saker Falcon are listed as trigger species; both of which will be assessed.

Sarmysh Nature Park UZ013

Summary | Text account | Data table and detailed info | Map | Reference and further resources

IBA Justification

The site was identified as important in 2007 because it was regularly supporting significant populations of the species listed below, meeting ('triggering') IBA criteria.

Populations meeting IBA criteria ('trigger species') at the site:

Species	Red List[1]	Season	Year(s)	Size	IBA criteria
European Roller *Coracias garrulus*	LC	breeding	2007	62-86 individuals	A1
Eastern Rock Nuthatch *Sitta tephronota*	LC	resident	2007	150-250 individuals	A3
Variable Wheatear *Oenanthe picata*	LC	breeding	2007	30-50 individuals	A3
Finsch's Wheatear *Oenanthe finschii*	LC	breeding	2007	400-700 individuals	A3
Grey-necked Bunting *Emberiza buchanani*	LC	breeding	2007	600-1,200 individuals	A3

1. The current IUCN Red List category. The category at the time of the IBA criteria assessment (2007) may differ.

BirdLife International (2024) Important Bird Area factsheet: Sarmysh Nature Park. Downloaded from https://datazone.birdlife.org/site/factsheet/sarmysh-nature-park-iba-uzbekistan on 08/08/2024.

Northern shore of Aydarkul Lake UZ029

Summary | Text account | Data table and detailed info | Map | Reference and further resources

IBA Justification

The site was identified as important in 2008 because it was regularly supporting significant populations of the species listed below, meeting ('triggering') IBA criteria.

Populations meeting IBA criteria ('trigger species') at the site:

Species	Red List[1]	Season	Year(s)	Size	IBA criteria
White-headed Duck *Oxyura leucocephala*	EN	winter	2004	8 individuals	A1
Greylag Goose *Anser anser*	LC	winter	2000-2007	794-6,091 individuals	A4i
Red-crested Pochard *Netta rufina*	LC	winter	1997-2007	560-2,500 individuals	A4i
Ferruginous Duck *Aythya nyroca*	NT	winter	2000-2007	33-295 individuals	A1
Gadwall *Mareca strepera*	LC	winter	1997-2007	350-2,800 individuals	A4i
Mallard *Anas platyrhynchos*	LC	winter	1997-2007	1,500-8,750 individuals	A4i
Great Crested Grebe *Podiceps cristatus*	LC	passage	1997-2007	260-350 individuals	A4i
Pallas's Sandgrouse *Syrrhaptes paradoxus*	LC	breeding	2007	181 individuals	A3
Egyptian Nightjar *Caprimulgus aegyptius*	LC	breeding	1997-2002	8 individuals	A3
Common Coot *Fulica atra*	LC	winter	2000-2007	31,522-189,181 individuals	A4i
Asian Houbara *Chlamydotis macqueenii*	VU	breeding	1997-2007	4-41 individuals	A1, A3
Great White Egret *Ardea alba*	LC	winter	2000-2007	186-6,011 individuals	A4i
Dalmatian Pelican *Pelecanus crispus*	NT	winter	2000-2007	9-107 individuals	A1, A4i
Great White Pelican *Pelecanus onocrotalus*	LC	passage	1997-2007	38-400 individuals	A4i
Pygmy Cormorant *Microcarbo pygmaeus*	LC	winter	1997-2007	500-2,500 individuals	A4i
Great Cormorant *Phalacrocorax carbo*	LC	resident	2000-2007	1,551-7,076 individuals	A4i
Brown-necked Raven *Corvus ruficollis*	LC	breeding	1997-2007	max 8 individuals	A3
Great Tit *Parus major*	LC	resident	1997-2007	92 individuals	A3
Streaked Scrub-warbler *Scotocerca inquieta*	LC	resident	1997-2002	13 individuals	A3
Asian Desert Warbler *Curruca nana*	LC	breeding	1997-2002	57 individuals	A3
Desert Finch *Rhodospiza obsoleta*	LC	breeding	2007	145 individuals	A3
Red-headed Bunting *Emberiza bruniceps*	LC	breeding	1997-2002	60 individuals	A3
A4iii *Species group - waterbirds*	n/a	winter	2000-2007	24,782-192,658 individuals	A4iii

1. The current IUCN Red List category. The category at the time of the IBA criteria assessment (2008) may differ.

BirdLife International (2024) Important Bird Area factsheet: Northern shore of Aydarkul Lake. Downloaded from https://datazone.birdlife.org/site/factsheet/northern-shore-of-aydarkul-lake-iba-uzbekistan on 08/08/2024.

Northern Shore of Aydarkul Lake is of note as records of White-headed Duck, Asian Houbara, and Dalmatian Pelican are all listed as trigger species; all of which will be assessed.

Further details will be discussed in the assessment and analysis portion of the report where data of the IBAs/KBAs are utilized in the decision-making process of determining criticality. This section serves to provide an overview only.

4.2 Approach to CHA

The CHA was undertaken in accordance with the methodology outlined in preceding sections. We have separated the analysis narrative by taxa instead of by criteria because both CH and SBV/PBF criteria have been examined.

Criteria pertaining to ecosystems, key evolutionary processes, and ecosystem function are not mentioned in the subsequent sections, as the CHA Screening did not find any potential

features/elements that needed to be further investigated (no habitats/ecosystems on the Red List or otherwise considered as extremely sensitive).

5 ASSESSMENT

The CHA was undertaken in accordance with the methodology outlined in preceding sections. We have separated the analysis narrative by taxa instead of by criteria because both CH criteria have been examined.

Criteria pertaining to ecosystems, key evolutionary processes, and ecosystem function are not mentioned in the subsequent sections, as the CHA Screening did not find any potential features/elements that needed to be further investigated (no habitats/ecosystems on the Red List or otherwise considered as extremely sensitive).

6 AVIFAUNA

Eleven bird species were identified during CHA Screening that pertain to the CH criteria for threatened species, and potentially migratory/congregating species:

- IFC PS6 Criterion 1: Critically Endangered and Endangered Species
- IFC PS6 Criterion 3: Migratory and Congregatory Species
- EBRD PR6 Criterion (ii): Habitats of significant importance to endangered or critically endangered species /// IFC PS6 Criterion 1: Critically Endangered and Endangered Species
- EBRD PR6 Criterion (iv) Habitats supporting globally significant concentrations of migratory or congregatory species /// IFC PS6 Criterion 3: Migratory and Congregatory Species

6.1 Bird Baseline Survey Method

The landscape of the Project area supports a range of habitats and species, some of which are globally threatened, nationally protected and/or may be particularly sensitive to the impacts of the Project facilities. For this reason, a multi-level approach to avifauna surveys was undertaken to characterise the avifauna communities present at the sites and specifically target species or groups likely to be most impacted. The surveys undertaken are as follows:

- Spring and Autumn Migration Vantage Point Surveys
- Raptor Nest Search
- Asian Houbara Surveys
- Wintering Bird Surveys with a focus on Great Bustard populations

6.1.1 Migration Vantage Point Survey Methodology

Migration Vantage Point (VP) surveys were conducted in Spring and Autumn to capture key avifauna migration periods in the region, post-breeding season. The surveys were conducted between 13th September to 12th November 2023 (Autumn migration), and again between 28th February and 30th April 2024 (Spring migration).

The VP survey methods followed the guidelines outlined by Scottish Natural Heritage (SNH) in 2017 for bird assessments, except for elements specifically related to collision risk modelling for wind farms.

> **SNH Guidance - Assessment and mitigation of impacts of power lines and guyed meteorological masts on birds:** "Depending on the scale of the development, it may not be necessary to undertake VP watches along the whole length of the route corridor. VP observations should focus on sensitive sites and areas used by target species."

Due to logistical and navigation constraints along the mutual development corridor for the Samarkand I and II PV and BESS Projects, the VP survey involved an informed, purposive sampling approach, which is described in the project ESIA.

> **IFC PS 6 GN 59:** "For some wide-ranging species, critical habitat may be informed by areas of aggregation, recruitment, or other specific habitat features of importance to the species."

These surveys aimed to monitor bird species within the survey area, gathering data on their presence, behaviour, and abundance. Binoculars (at or over 8x magnification) and a 300mm Digital camera 300mm were used to observe and document avifauna species.

A total of six VP locations (VP14-VP19) were selected to cover elements of the Project facilities and associated OHTLs, as detailed in the table below.

Table 6-1 Vantage Point Locations Sampled during Avifauna Migration Surveys

VP	Project Facility	Co-ordinates	Location Description	Survey Hours
VP14	70km OHTL footprint	39.69826 66.552972	Agro-landscape	7 days, 20 hours per VP per season.
VP15	Nurobod BESS	39.577843 66.742028	Sazagan_1. Clay desert	7 days, 20 hours per VP per season.
VP16	70-km OHTL	39.532496 66.509101	Clay hills with rain fed fields	7 days, 20 hours per VP per season.
VP17	70-km OHTL	39.431038 66.131799	Djam-1. Clay hills with rain fed fields	7 days, 20 hours per VP per season.
VP18	70-km OHTL	39.427017 65.976201	Tym. Clay desert. Solar site	7 days, 20 hours per VP per season.
VP19	11-km OHTL	39.579068 66.79814	Clayed foothills	7 days, 20 hours per VP per season.

The 70km and 4.9km OHTLs are surrounded by several Important Bird Areas (IBA's). Whilst these areas range from 25km to 50km away, they support several migratory species which would likely pass over the OHTL site.

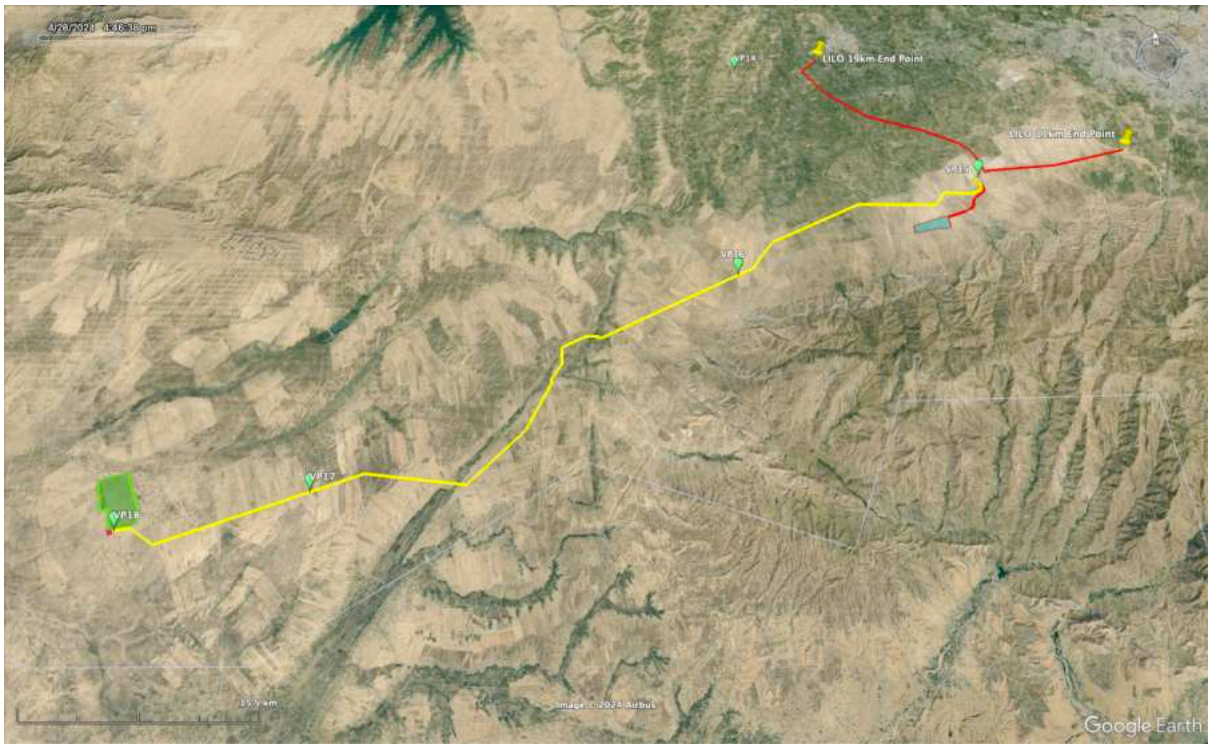

Figure 6-1 Map of Vantage Point Locations surveyed during Migration Surveys

6.1.2 Raptor Nest Search Methodology

The raptor nest survey was conducted in accordance with the raptor/vulture nesting (RVN) methodology, developed based on Good International Industry Practice (REF?). This methodology aims to characterise the potential for the Project to adversely impact the nesting/breeding activity of the targeted species.

The survey was conducted by a local expert between April 26th – 28th 2024 and covered the main Project Facilities and OHTL's including a 5km buffer from the Project footprint. This footprint and buffer zone was considered the "core" area for the raptor nest survey. Within this area, a total of 15 locations were determined to be suitable habitats for raptor nests and observed during surveys, shown on the figure below.

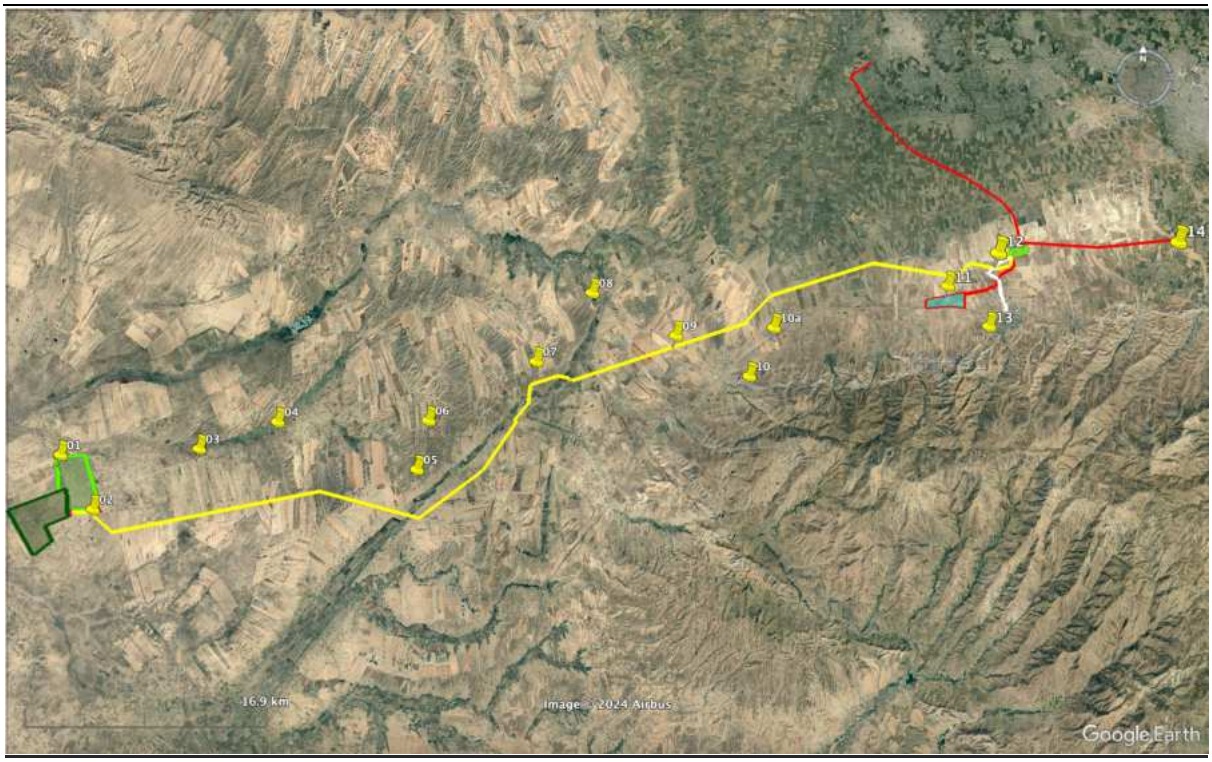

Figure 6-2 Map of Locations surveyed during Raptor Nest search

6.1.3 Asian Houbara Survey Methodology

The methodology implemented for this survey effort consisted of spring season point counts, following a method that has been developed by Houbara researchers in Uzbekistan, and taking advantage of the visual and acoustic observability of males' courtship displays, as Houbara are shy and difficult to see at other times of year. During the peak courtship season in Uzbekistan (March–May) displaying males (and also floating males) are conspicuous and can be apparent from long distances. This provides an opportunity for male population assessments with a relatively high degree of accuracy (Koshkin et al, 2016a).

Houbara point count surveys were conducted within the project area and surroundings, during the optimal period, March 20-21 and March 29, 2024.

Surveyors with good knowledge of the region identified the most suitable survey locations. The following figure shows the locations of points used for surveying.

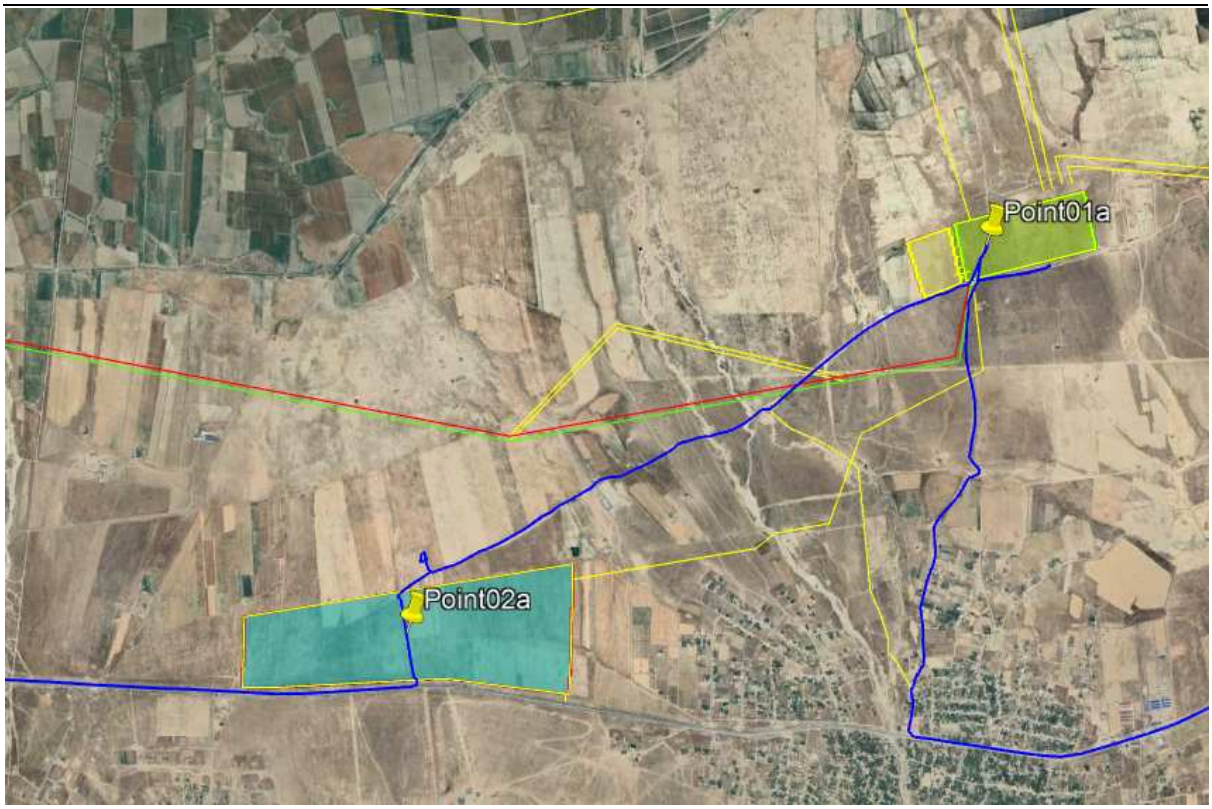

Figure 6-3 Survey point location in Nurabad BESS and SS and 100 MW Solar

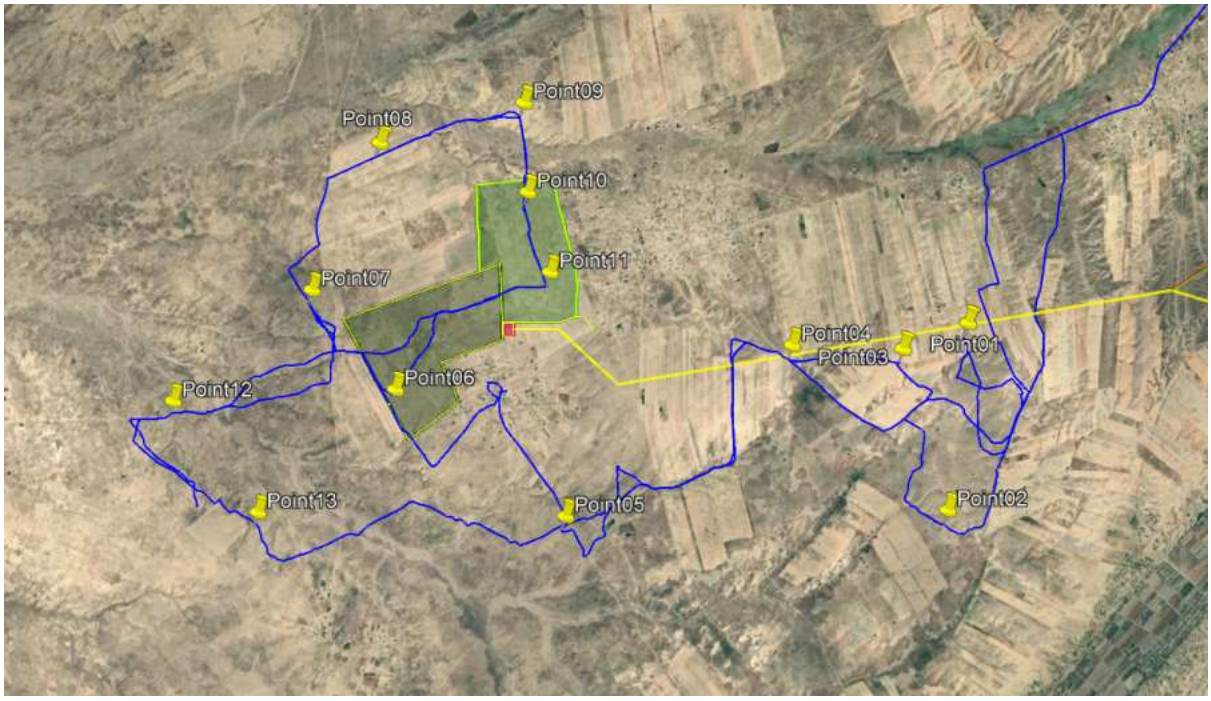

Figure 6-4 Survey point locations in Nurabad BESS and SS and 100 MW Solar

Optical instruments – binoculars Nikon x8, telescope x60 Swarowski and laser rangefinder, compass were used. Birds were registered on video and photo with mobile phone using dj-scoping and a Nikon D20 digital camera with a 300mm lens.

All surveys were conducted by Valentin Soldatov, who has extensive previous experience conducting Houbara surveys using this same methodology. Each point count survey lasted 20-30 minutes and was undertaken by a single observer during the period of peak male display activity, i.e. within 3 h after sunrise or 2 h before sunset (Combreau and Launay 1996). The weather conditions during survey period were generally good for counts, however at 10 sites conditions were insufficient due to high winds. Surveys were repeated at these sites when weather conditions were more optimal.

Table 6-2 Breeding bird survey point locations

POINT	N	E	1ST ROUND	2ND ROUND	NOTES
Point01a	39.575788	66.743553	20/03/2024		territory is non suitable for breeding A houbara
Point02a	39.546636	66.686862	20/03/2024		territory is non suitable for breeding A houbara
Point01	39.425704	66.112718	20/03/2024		territory is non suitable for breeding A houbara
Point02	39.381274	66.106821	20/03/2024		territory is non suitable for breeding A houbara
Point03	39.419487	66.092786	21/03/2024		territory is non suitable for breeding A houbara
Point04	39.420208	66.058907	21/03/2024	29/03/2024	
Point05	39.379254	65.989839	21/03/2024	29/03/2024	
Point06	39.409087	65.937431	21/03/2024	29/03/2024	
Point07	39.432394	65.912392	21/03/2024	29/03/2024	
Point08	39.4676	65.932175	21/03/2024	29/03/2024	
Point09	39.477331	65.97628	21/03/2024	29/03/2024	
Point10	39.456114	65.977649	21/03/2024	29/03/2024	
Point11	39.437161	65.984657	21/03/2024	29/03/2024	
Point12	39.405917	65.869277	21/03/2024	29/03/2024	
Point13	39.379658	65.895582	21/03/2024	29/03/2024	

6.2 Species Assessments

6.2.1 Egyptian Vulture

The Egyptian Vulture (*Neophron percnopterus*) is a native breeder and possible passage migrant in much of Uzbekistan. It is listed as Endangered (EN) on the Global IUCN Red List and Vulnerable (VU) in the National Uzbekistan Red Data Book.

The CHA Screening exercise found that this species should be further investigated in the CHA against the **IFC PS 6 Criteria 1 & 3 / EBRD PR 6 Criteria 2 & 4.**

6.2.1.1 ECOLOGY & CONSERVATION

The species inhabits extensive open areas mainly in dry or arid regions, although sometimes around fringe areas of wet or cold climates; steppe, desert, scrub, pastures and fields of cereals; requires rocky sites for nesting. Range greatly affected by species' dependence on livestock and human waste for food.

Northern breeders conduct long-distance intercontinental migrations, leaving breeding grounds in mid Sept to mid Oct/Nov, returning in Feb–Apr/May (Botha et al 2017). Numbers passing migration watchpoints are usually small.

This species typically nests on ledges or in caves on cliffs (Sarà and Di Vittorio 2003), crags and rocky outcrops, but occasionally in large trees, electricity pylons (Naoroji 2006) and exceptionally on the ground (Gangoso and Palacios 2005).

It forages in lowland and montane regions over open, often arid, country, and also scavenges at human settlements. It has a broad diet including carrion, tortoises, organic waste, insects, young vertebrates, eggs and even faeces (Margalida *et al.* 2012, Dobrev *et al*. 2015, 2016).

Usually solitary, individuals congregate at feeding sites, such as rubbish tips, or vulture restaurants (i.e. supplementary feeding stations), and form roosts of non-breeding birds (Ceballos and Donázar 1990).

Poisoning is the most important threat to this species. This is usually accidental through the ingestion of wildlife that have been intentionally poisoned. Hunting and electrocution/collision with powerlines are also significant threats to the species.

6.2.1.2 DISTRIBUTION

Egyptian Vultures have a broad distribution across Central Asia, Europe and Africa. The species is a breeding resident in Uzbekistan but may also occur as a passage migrant (Burnside et al 2023).

It has an extremely large EOO of 50,100,000 km^2.

A very preliminary estimate of the global population size is 12,400-36,000 mature individuals (BirdLife, 2021). In 2010 it was estimated that the population in Uzbekistan numbers 135 breeding pairs (Kashkarov & Lanovenko 2011).

Satellite tracking has been carried out to assess migratory routes of Egyptian Vultures in Uzbekistan. These have shown individuals tracked from breeding sites in the Qashqadaryo region, south of Samarkand, moving South to India.

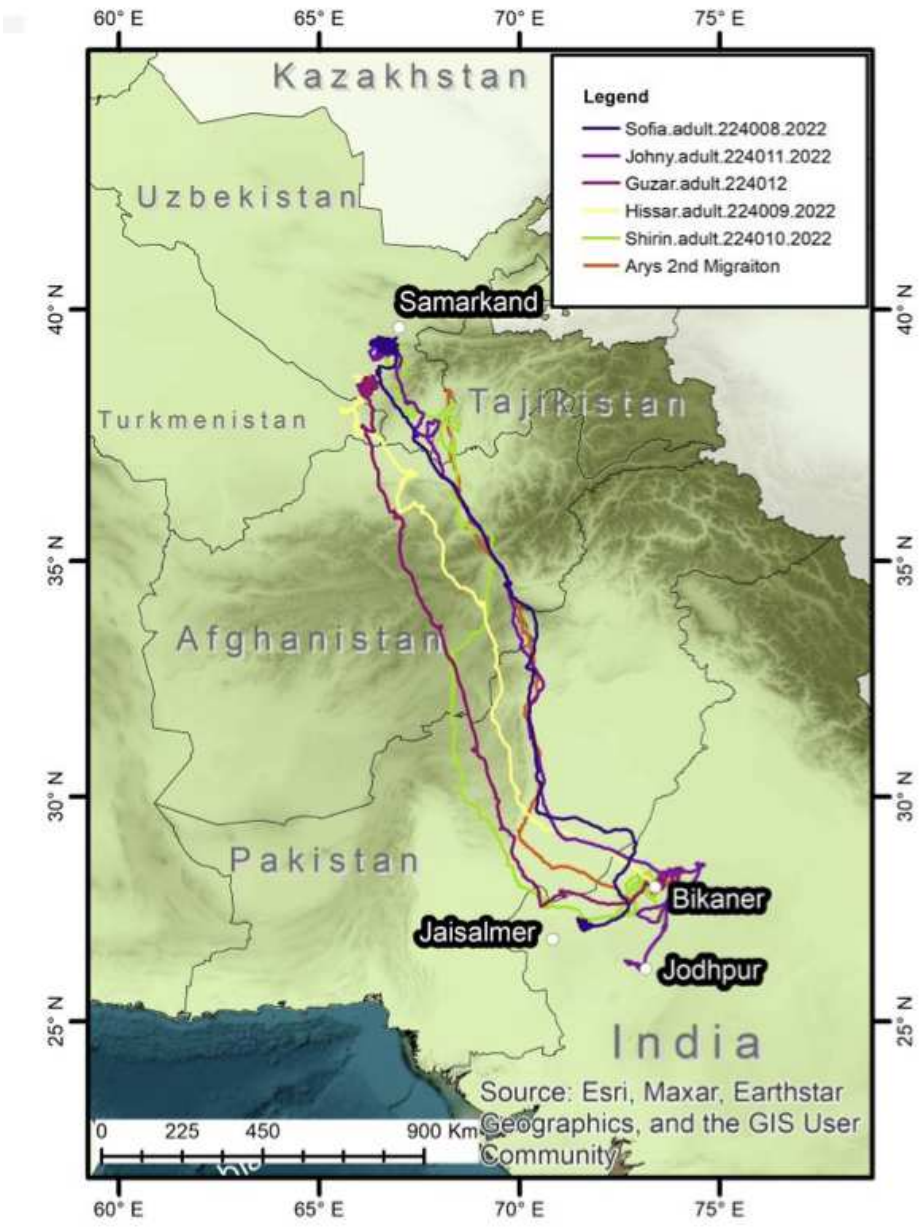

Figure 6-5 Autumn 2022 migration routes of 6 sub-adult Egyptian Vultures from Central Asia to India[6]

The following figures show the distribution of Egyptian Vultures in Uzbekistan and globally.

[6] Burnside, R. J., Ten, A., Soldatov, V. and Dobrev, V. 2023. Identifying migration routes and wintering sites of Egyptian Vultures breeding in Uzbekistan. Project Report 2022/23.

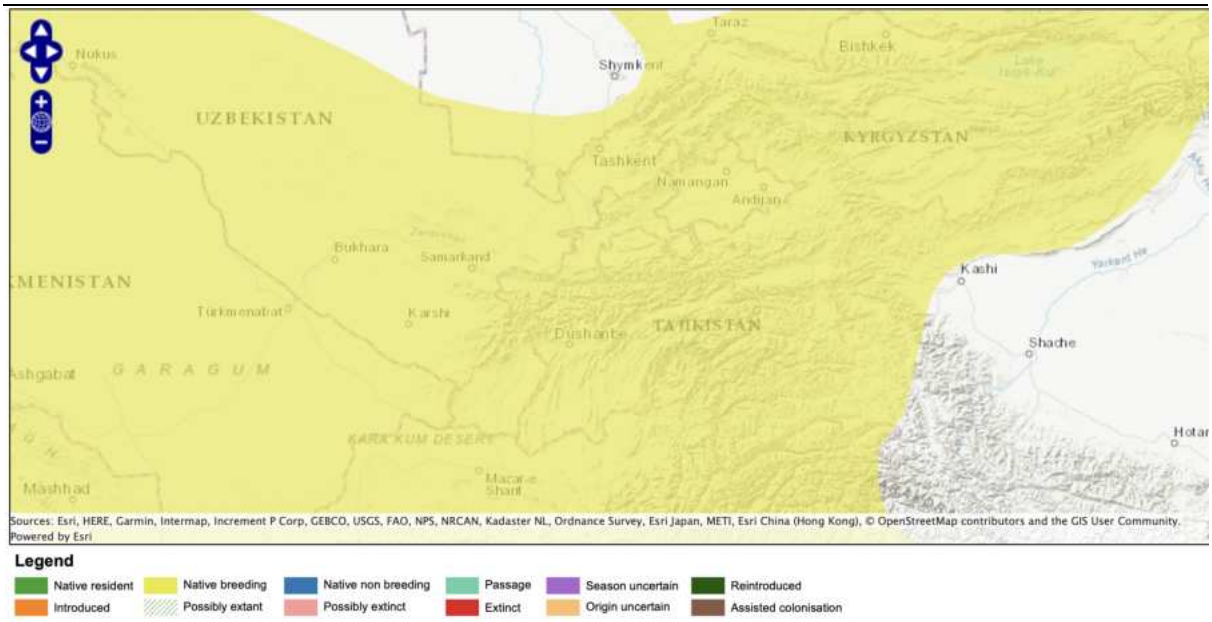

Figure 6-6 Geographic Distribution of Egyptian Vulture within Uzbekistan [7]

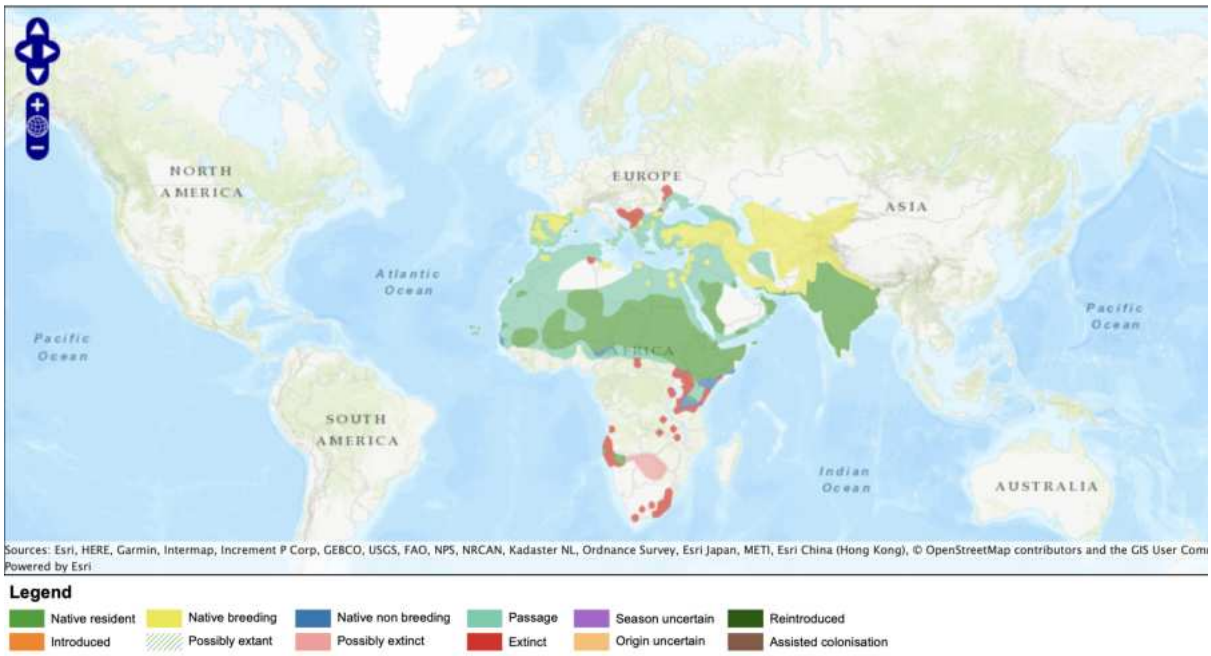

Figure 6-7 Geographic Distribution of the Egyptian Vulture

[7] BirdLife International (2024) Species factsheet: *Neophron percnopterus*. Downloaded from https://datazone.birdlife.org/species/factsheet/egyptian-vulture-neophron-percnopterus on 02/05/2024

6.2.1.3 BASELINE SURVEY RESULTS

In the Autumn VP surveying undertaken during September-November, **one observation** of this species was recorded along the 70km OHTL (VP17).

Three observations of this species were recorded migrating during the Spring VP survey: two observations near the Nurobad BESS facility (VP15) and one along the 70km OHTL (VP16).

6.2.1.4 ANALYSIS

6.2.1.4.1 EAAA

The total EAAA for resident breeding birds is applied as all suitable breeding habitat that overlaps the project footprint and exists within a reasonable buffer from the project footprint, determined by species specific ecology.

The Egyptian Vulture requires rocky sites for nesting, typically nesting on ledges or in caves on cliffs crags and rocky outcrops, but occasionally in large trees and electricity pylons. It forages in lowland and montane regions over open, often arid, country, although sometimes around fringe areas of wet or cold climates; steppe, desert, scrub, pastures and fields of cereals; and also scavenges at human settlements.

A 25 km buffer from the project footprint was applied based on the known home range of a breeding populations in Spain. [8] This area was then further extended to encompass the abovementioned surrounding suitable foraging habitats as well as the mountainous areas (potential breeding habitat) that extends towards the north, south and east of the project site. This should provide an adequate accounting of the population of birds likely to regularly utilize the project area.

The resulting EAAA been mapped in the following figure.

[8] López-López, P., García-Ripollés, C. and Urios, V. (2014), Food predictability determines space use of endangered vultures: implications for management of supplementary feeding. Ecological Applications, 24: 938-949. https://doi.org/10.1890/13-2000.1

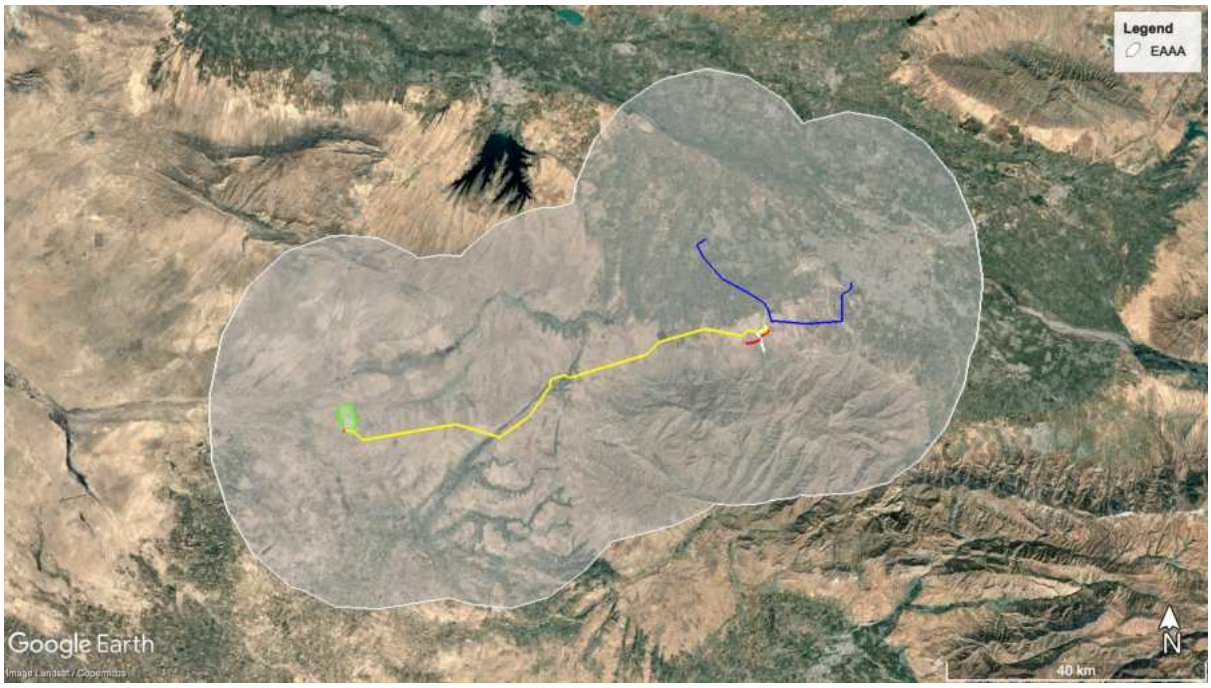

Figure 6-8 EAAA and potential habitats for the Egyptian Vulture in the PV plant site

6.2.1.4.2 Criticality

The global population of this species is estimated to range from 18,600-54,000 individuals[9]. Taking a precautionary approach, the lower range is used to apply the thresholds.

Under IFC **Criterion 1**, the threshold for Endangered (EN) species is 0.5% of the global population, therefore the 0.5% criticality threshold would be 93 individuals.

Under IFC **Criterion 3**, the threshold is 1% of the global population using the EAAA on a regular/cyclical basis during migrations. This would amount to 186 individuals.

A total of 4 observations of Egyptian Vulture were recorded at 3 Vantage Points during the baseline studies spanning across Autumn and Spring migration seasons indicating species presence in the EAAA. Furthermore, no nests were recorded during the raptor nest survey.

Egyptian Vulture is not listed as a breeding species or a trigger species in the surrounding IBAs. There are no breeding hotspots in the EAA. Although this is not a quantitative extrapolation, the context and the relatively low number of observations indicates that this species likely does

[9] BirdLife International. 2021. Neophron percnopterus. The IUCN Red List of Threatened Species 2021: e.T22695180A205187871. https://dx.doi.org/10.2305/IUCN.UK.2021-3.RLTS.T22695180A205187871.en

not have an EAAA population comprising of more than 93 individuals and the population recorded by the baseline studies is unlikely to increase by approximately 23 times, as required to reach this threshold and therefore does not trigger criticality under **Criteria 1 or 3**.

Therefore, this species does not trigger CH status but is considered a Significant Biodiversity Value (SBV) and Priority Biodiversity Feature (PBF) due to its IUCN Endangered (EN) designation and Vulnerable (VU) in the National Uzbekistan Red Data Book.

Due to its EN status, No Net Loss is required, ensuring no significant residual impact that could lead to a material change in the population. The ESIA will address this via the biodiversity impact assessment, mitigation program and residual significance analysis.

6.2.2 Cinereous Vulture

The Cinereous Vulture (*Aegypius monachus*) is a native resident and possible passage migrant in much of Uzbekistan and is listed as Near Threatened (NT) on the Global IUCN Red List. It is also listed as Near Threatened (NT) in the National Uzbekistan Red Data Book.

The CHA Screening exercise found that this species should be further investigated in the CHA against the **IFC Criterion 3 / EBRD Criterion 4.**

6.2.2.1 ECOLOGY & CONSERVATION

The Cinereous Vulture feeds on vertebrate carrion although has been known to hunt small live mammals. Generally their movements tend to follow sheep and cattle. This species forages solitarily and the estimated height above ground during foraging is generally below 175m. In Asia this species forages over steppe, high-elevation grassland and the steep slopes of hills and mountains.

This species is typically monogamous however breeding trios have been recorded. It congregates in loose colonies although some pairs do breed alone. This species is territorial at nesting sites and can be aggressive towards conspecifics. The courtship flights occur at the colony.

This species has a prolonged breeding season. It nests on trees, rocks, cliffs, slopes, bushes and low shrubs. In East Asia this species tend to nest on trees, rocky outcrops and cliffs. Aerial displays occur from December until February. Egg laying is between February and early May and the incubation periods lasts 50-68 days. Hatching occurs from mid-March through May with fledging during August and September.

Migration occurs in autumn, mainly in October and November. Northbound movement takes place in March, April and early May. The migrants are seemingly juveniles or immatures. In East

Asia the vultures from Mongolia migrates southeast and crossed northeast China and North Korea to winter in South Korea, northeast China and southeast Siberia.

This species is affected by habitat loss and degradation across their range, as well as climate change. Furthermore nestlings are affected by man-made fires and this species are also affected by illegal shooting and trapping, poisoning from pesticides and other contaminants as well as collision with stationary/moving objects such as wind turbines and power lines.

6.2.2.2 DISTRIBUTION

This species is widely distributed although it is patchy and stretches across the southern Palearctic including southern Europe, North Africa, the Middle East, and Central, East and South Asia. [10]

The breeding range extends from Iberia to Mongolia and China. In the East this vulture breeds in Iran, Pakistan, Afghanistan, Kazakhstan, Turkmenistan, Tajikistan, Kyrgyzstan and Uzbekistan, where it breeds in the western Tien Shan and Pamir-Alay Mountains.

In the breeding ranges, this species shows a great variation in habitat preferences. It ranges from open oak forests, montane pine forests, mountain plateaux and forested slopes, steppe, semi-deserts, open montane juniper woodland and semi-arid alpine meadows and grasslands.

In the non-breeding range, this species prefers various open/dry habitats, mainly barren or sparsely vegetated ones that include grassland, closed shrubland, woody savanna, pen shrubland, steppe, plains, desert areas, arid and semi-arid steppe, marshland mixed with shrubland, pastureland, pine forest and sandy areas.

In Central Asia it breeds in low-or mid-elevation mountains or hills near open habitats, and on montane slopes near open plateaux at higher elevations. Other breeding habitats include higher-elevation slopes with pistachios, almonds and junipers as well as in canyons.[11]

It has an extremely large EOO of 22,400,000 km^2.

The global population is estimated to be roughly 8,400 – 11,400 pairs which equates to 16,800-22,800 mature individuals or roughly 25,200-34,200 individuals

The following figures show the distribution of Cinereous Vultures in Uzbekistan and globally.

[10] Salvador, A. (2024). Cinereous Vulture (Aegypius monachus), version 3.0. In Birds of the World (G. M. Kirwan and B. K. Keeney, Editors). Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.cinvul1.03

[11] Sklyarenko, S. L., and T. Katzner (2012). The Black Vulture Aegypius monachus in central Asia. In The Black Vulture: Status, Conservation and Studies. Proceedings of the First International Symposium on the Black Vulture Aegypius monachus (Cordoba, Spain, 21–23 October 2004) (P. M. Dobado and R. Arenas, Editors), Consejería de Medio Ambiente, Junta de Andalucía, Córdoba, Spain. pp. 136–144.

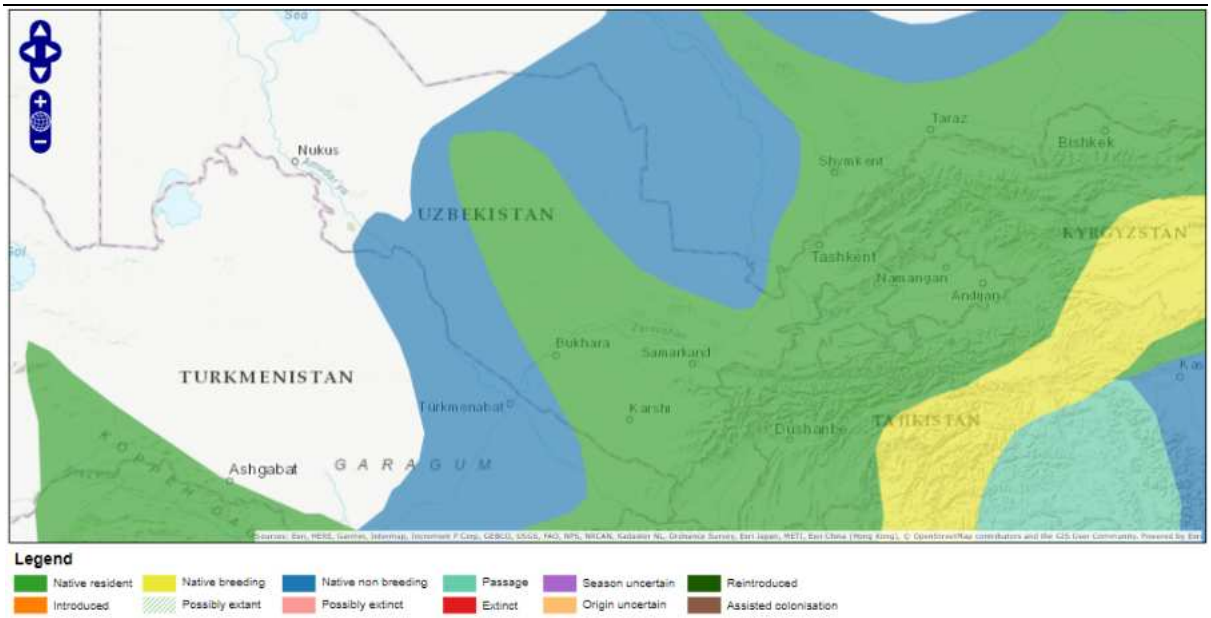

Figure 6-9 Geographic Distribution of Cinereous Vulture within Uzbekistan [12]

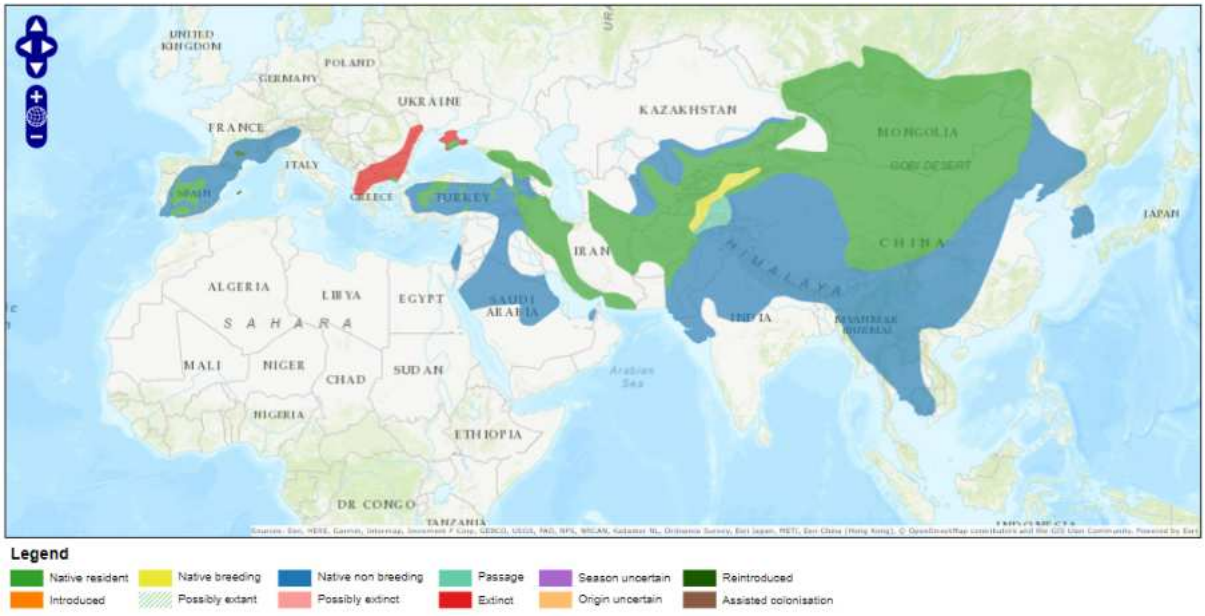

Figure 6-10 Geographic Distribution of the Cinereous Vulture

6.2.2.3 BASELINE SURVEY RESULTS

In the Autumn VP surveying undertaken during September-November, **one observation** of this species was recorded along the 70km OHTL (VP16).

[12] BirdLife International (2024) Species factsheet: Cinereous Vulture *Aegypius monachus*. Downloaded from https://datazone.birdlife.org/species/factsheet/cinereous-vulture-aegypius-monachus on 28/08/2024.

6.2.2.4 ANALYSIS

6.2.2.4.1 EAAA

The total EAAA for resident breeding birds is applied as all suitable breeding habitat that overlaps the project footprint and exists within a reasonable buffer from the project footprint, determined by species specific ecology.

The Cinereous Vulture requires steppe, high-elevation grassland and steep slopes of hills and mountains and tend to nest on trees, rocky outcrops, cliffs and montane slopes near high elevation plateaux. Based on a population in Iberia, the home range of this species can vary from 9-138 km if the individuals are breeding or non-breeding.[13] Therefore, a 25km buffer was applied to the footprint and was then further extended to include adjacent mountainous habitat. This should provide an adequate accounting of the population of birds likely to regularly utilize the project area.

The resulting EAAA has been mapped in the following figure.

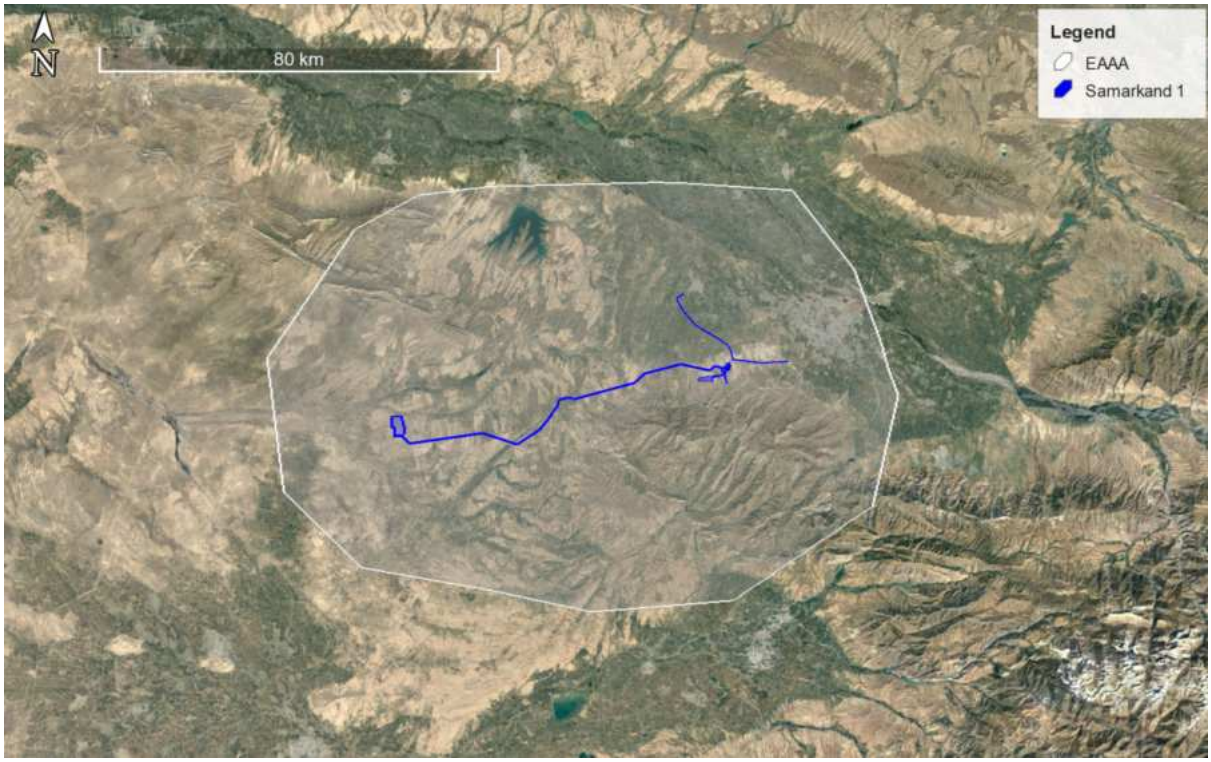

Figure 6-11 EAAA and potential habitats for the Cinereous Vulture in the PV plant site

[13] Jorge García-Macía, Ernesto Álvarez, Manuel Galán, Juan José Iglesias-Lebrija, Marc Gálvez, Gerard Plana, Núria Vallverdú, Vicente Urios, Home range variability and philopatry in Cinereous vultures (Aegypius monachus) breeding in Iberia, Avian Research, Volume 14, 2023, 100134, ISSN 2053-7166, https://doi.org/10.1016/j.avrs.2023.100134.

6.2.2.4.2 Criticality

The global population of this species is estimated to range from 25,200-34,200 individuals. Taking a precautionary approach, the lower range is used to apply the thresholds.

Under the IFC **Criterion 3**, the threshold for Endangered (EN) species is 1% of the global population, therefore the 1% criticality threshold would be 252 individuals.

A total of 1 observation of Cinereous Vulture were recorded during the baseline studies spanning across Autumn and Spring migration seasons indicating species presence in the EAAA. No nests were recorded during the raptor nest survey.

This species is listed as a trigger species for Tuzkan Lake and Nuratau Range IBA/KBA, where the species is known to be a non-breeding as well as a breeding resident respectively. Tuzkan Lake is approximately 122km from the project footprint and 4 non-breeding adults were observed there in 2003. For Nuratau Range, which is approximately 85 km from the project footprint, 90 breeding individuals were observed in 2006. Although this is not a quantitative extrapolation, the context indicates that this species likely does not have an EAAA population of more than 252 individuals. Therefore, CH is not triggered under Criterion 3.

Furthermore, given the status of these species they will also not be considered as SBVs or PBFs, although they will be assessed as Sensitive Receptors in the respective Samarkand project ESIAs.

6.2.3 Steppe Eagle

The Steppe Eagle (*Aquila nipalensis*) is a passage migrant and winter visitor in much of Uzbekistan and is listed as Endangered (EN) on the Global IUCN Red List. It is also listed as Vulnerable (VU) in the National Uzbekistan Red Data Book.

The CHA Screening exercise found that this species should be further investigated in the CHA against the **IFC PS 6 Criteria 1 & 3 / EBRD PR 6 Criteria 2 & 4**.

6.2.3.1 Ecology & Conservation

The Steppe Eagle inhabits extensive open areas such as steppes, deserts, scrublands, and agricultural fields, often in dry or arid regions but sometimes near wet or cold climates. It requires rocky sites for nesting and its range is influenced by its reliance on livestock and human waste for food.

Migration is a significant aspect of its life cycle, with northern breeders undergoing long-distance intercontinental migrations. They depart from their breeding grounds from mid-September to mid-November, returning from February to April or May. While in Uzbekistan, these eagles are observed mainly during these migration periods

Nesting typically occurs on cliffs, ledges, or in caves, and less commonly on large trees, electricity pylons, or exceptionally on the ground. The Steppe Eagle forages over open, often arid landscapes and scavenges near human settlements. Its diet is varied, including carrion, insects, small vertebrates, and organic waste.

In Uzbekistan, Steppe Eagles are solitary but may gather at feeding sites such as rubbish tips or supplementary feeding stations. Poisoning, primarily from ingesting carrion contaminated with toxins, poses the greatest threat to their survival. Additionally, hunting and fatal interactions with power lines are significant concerns in the region.

6.2.3.2 DISTRIBUTION

Steppe Eagles have a broad distribution across Central Asia, Eastern Europe, and parts of Africa. In Uzbekistan, the species primarily occurs as a passage migrant, utilizing the country's extensive steppes and desert regions during its migratory periods. This pattern aligns with its migration from northern breeding grounds to southern wintering areas, making Uzbekistan an important corridor in its annual migration cycle.

It has a very large EOO of 12,600,000 km^2.

The global population size is estimated at 50,000-75,000 mature individuals or 78,042-110,193 individuals (BirdLife, 2021)with the whole population represented by < 37,000 pairs (Karyakin et al. 2016).

The Steppe Eagle inhabits extensive open areas such as steppes, deserts, scrublands, and agricultural fields, often in dry or arid regions but sometimes near wet or cold climates. Its range is influenced by its reliance on livestock and human waste for food. Steppe Eagles utilize the region of Samarkand as a key route during their extensive migratory journeys. This area's landscape, characterized by open and semi-arid environments, provides essential habitat conditions that support the eagles. Samarkand offers critical resting sites and abundant feeding opportunities, which are vital for the energy-intensive migration process. These features make Samarkand a strategic stopover that facilitates the seasonal movement of Steppe Eagles between their northern breeding areas and southern wintering grounds. However, specific and detailed local data on their migration patterns in Samarkand remain relatively under documented in the literature.

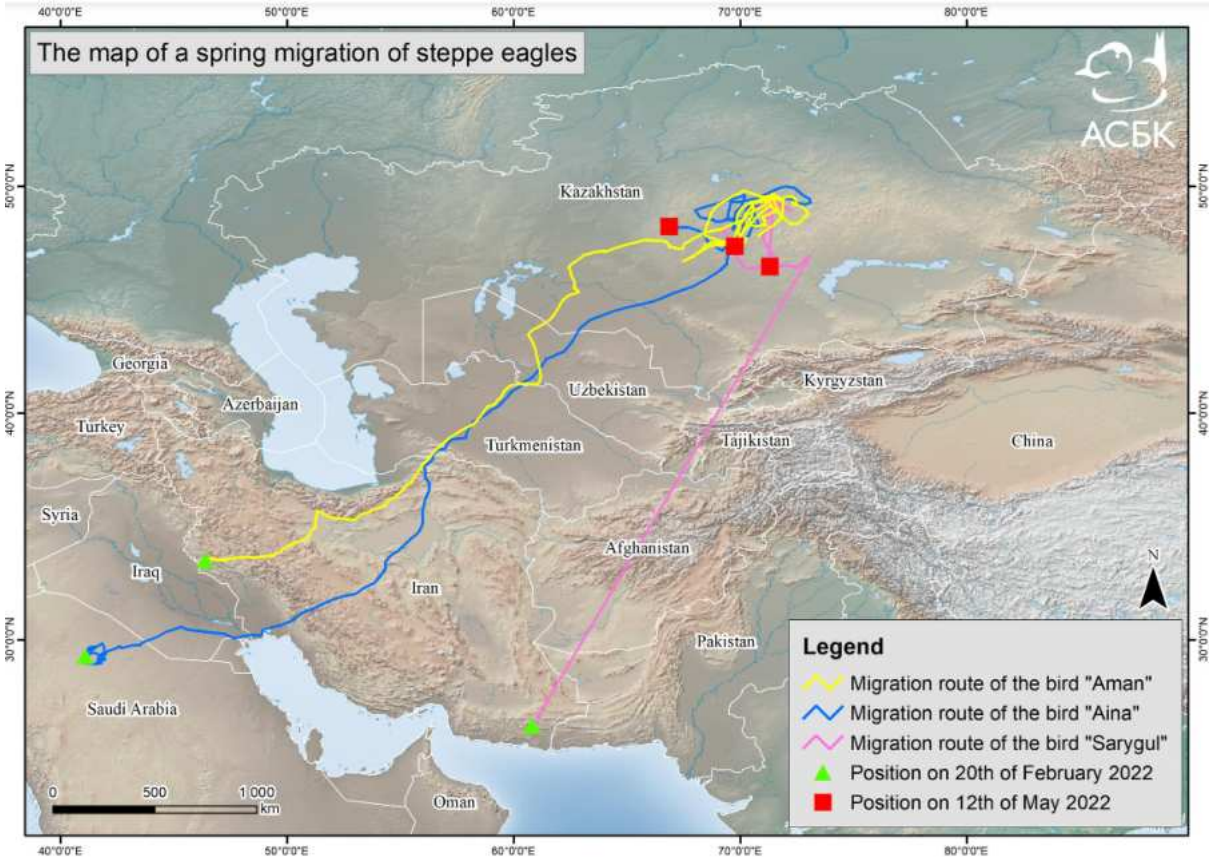

Figure 6-12 Spring 2021 migration routes of 3 sub-adult Steppe Eagle tagged in Central Kazakhstan in 2018 [14]

The above figure depicts the migration paths and winter locations of three Steppe Eagles tagged in Central Kazakhstan in 2018. Aman and Sarygul wintered in Iran, while Aina was in Saudi Arabia. They started their return journey to Kazakhstan on February 20th, traversing Iran, Turkmenistan, and Uzbekistan. Aman crossed into Kazakhstan on March 3, and Aina on March 20. Sarygul's data was temporarily lost but has resumed; all are now in Karaganda, their natal region

The following figures show the distribution of the Steppe Eagle in Uzbekistan and globally.

[14] Association for the Conservation of Biodiversity of Kazakhstan (2021) Map of a spring migration of steppe eagles. Available at: https://www.facebook.com/photo/?fbid=5154174388007530&set=a.202354996522852&locale=hi_IN

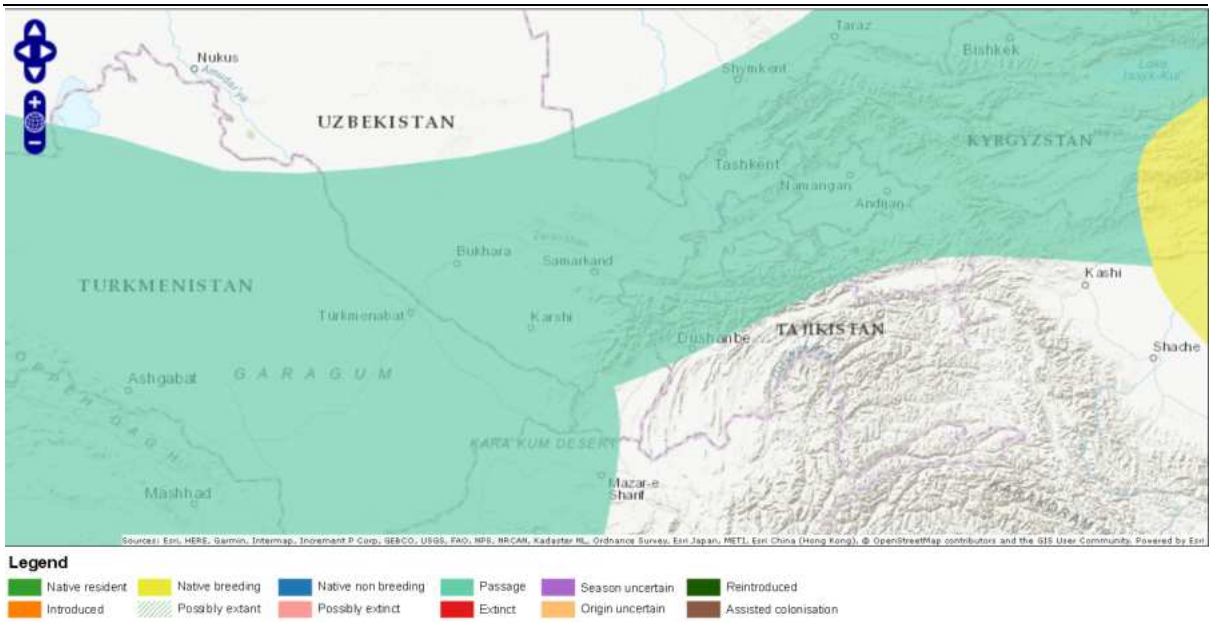

Figure 6-13 Geographic Distribution of Steppe Eagle within Uzbekistan[15]

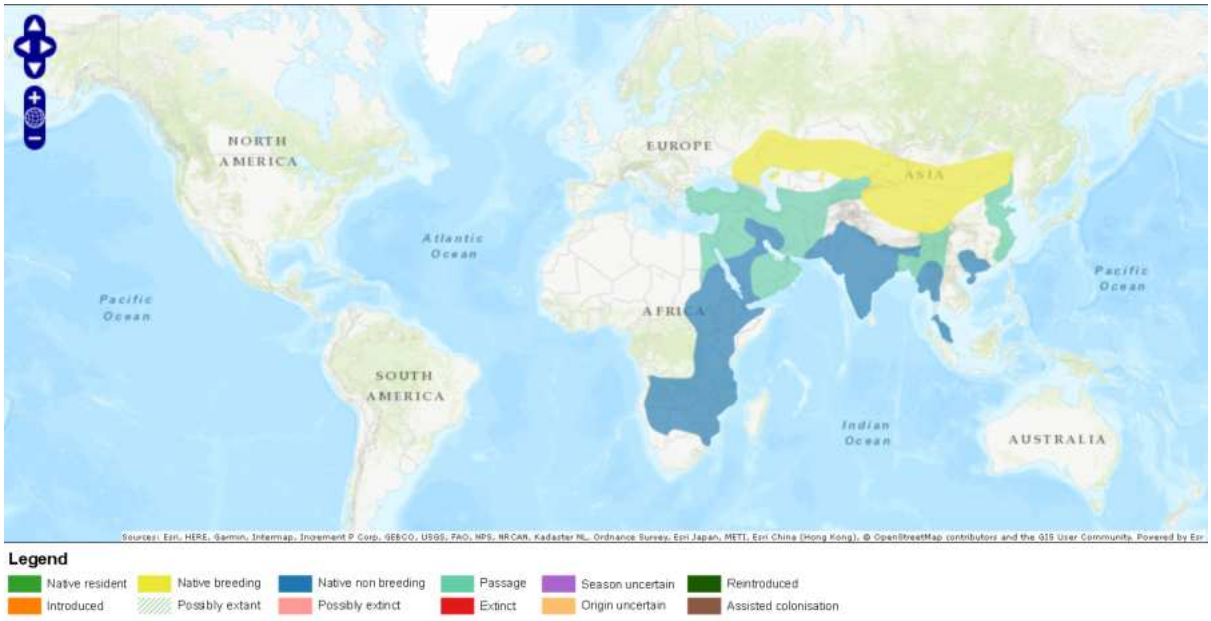

Figure 6-14 Geographic Distribution of Steppe Eagle within Uzbekistan

6.2.3.3 BASELINE SURVEY RESULTS

Five observations of this species were recorded during Autumn VP surveying undertaken between September and November 2023, at VP's 15, 16 and 17.

[15] BirdLife International (2024) Species factsheet: *Neophron percnopterus*. Downloaded from https://datazone.birdlife.org/species/factsheet/egyptian-vulture-neophron-percnopterus on 02/05/2024

In subsequent Spring VP surveys in 2024, **four observations** of this species were recorded at VP's 16, 18, and 19.

6.2.3.4 ANALYSIS

6.2.3.4.1 EAAA

The EAAA is a difficult concept to apply to long-range migratory species, as encompassing the full geographic range of such species would result in extremely large population extrapolations. With migratory birds, CHA generally follows the IUCN KBA standard, emphasizing areas that function as significant migratory stopover sites and/or bottleneck, with EAAA delineated to include the Project component(s) footprint plus a reasonable buffer based on the scale of the species' typical daily foraging movements, rather than its entire migratory route.

The mean documented home range width for the Steppe eagle is about 100 km[16]. Nevertheless, as smaller reported range distances range between 2 km and 30 km, the home range in the context of the Project's AoI has been limited to 50 km. On this basis, a 50-km wide AoI buffer was applied to the PV plant and BESS footprint, with regard to potential loss of suitable habitat.

Likewise, the AoI of the 70-km OTL was defined as a precautionary, 50-km buffer around the longitudinal span of the OTL route, where collision-related mortality is likely to occur. The delineation of the EAAA is therefore a progressive process, which draws on literature surveys, field reconnaissance, subsequent habitat mapping surveys, and the outcomes of dedicated baseline surveys to validate and quantify the occurrence of this species in habitats that coincide with the AoI buffer.

[16] Meyburg B et al. 2012. Steppe Eagle migration strategies – revealed by satellite telemetry. British Birds 105, September 2012, 506–519.

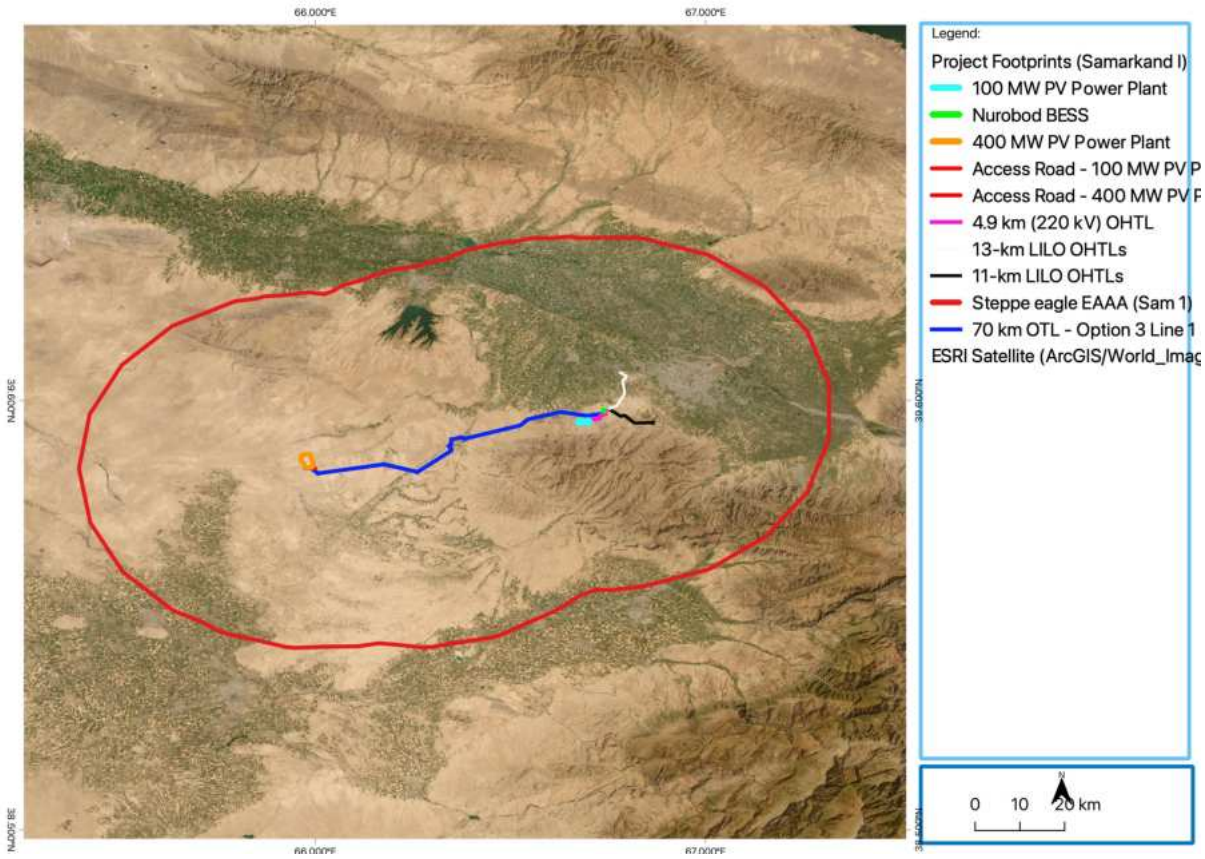

Figure 6-15 Area of Influence and EAAA for the Steppe eagle in relation to the project footprint

The species has been shown to occur within a range of habitats, some of which are well-represented within the broad AoI. The outcomes of the VP surveys confirmed that a fairly regular occurrence of the Steppe eagle is widespread within the AoI, with observations noted at all three vantage points in the Autumn and Spring migration seasons. The all-encompassing, initial EAAA was therefore maintained for subsequent CH and PBF assessment on the basis of recorded (resident) populations.

Figure 6-16 EAAA and potential habitats for the Steppe Eagle in the PV plant site

6.2.3.4.2 Criticality

The global population of this species is estimated to range from 78,042-110,193 individuals. Taking a precautionary approach, the lower range is used to apply the thresholds.

Under the IFC **Criterion 1**, the threshold for Endangered (EN) species is 0.5% of the global population, therefore the 0.5% criticality threshold would be 390 individuals.

Under the IFC **Criterion 3**, the threshold is 1% of the global population using the EAAA on a regular/cyclical basis during migrations. This would amount to 780 individuals.

A total of 9 observations of this species were recorded at 5 Vantage Points during baseline studies spanning across Autumn and Spring migration seasons indicating species presence within the EAAA. Based on the known migratory corridors for this species, the existence of such areas within the EAAA cannot be ruled out, given the limited coverage of prior surveys. However, high-potential vantage points were strategically selected based on expert consultations and habitat assessments, ensuring that key areas for potential aggregation were adequately surveyed. Despite this, no congregation areas, roosting sites, migration bottlenecks, or nesting sites were identified. While survey limitations exist, the absence of recorded hotspots in both project-specific data and secondary literature suggests that the EAAA is unlikely to support a functionally significant aggregation of the species. Although this is not a quantitative extrapolation, the context indicates that this species likely does not have an EAAA population of more than 390 individuals.

Therefore, this species does not trigger CH status but is considered a Significant Biodiversity Value (SBV) and Priority Biodiversity Feature (PBF) due to its IUCN Endangered (EN) designation and Vulnerable (VU) in the National Uzbekistan Red Data Book.

Due to its EN status, No Net Reduction is required, ensuring no significant residual impact that could lead to a material change in the population. The ESIA will address this via the biodiversity impact assessment, mitigation program and residual significance analysis.

6.2.4 Eastern Imperial Eagle

The Eastern Imperial Eagle (*Aquila heliaca*) is a passage migrant in Uzbekistan, listed as Vulnerable (VU) species on the IUCN Global Red List, and Vulnerable (VU) in the Uzbekistan National Red Data Book.

The CHA Screening exercise found that this species should be further investigated in the CHA against **IFC PS 6 Criteria 1 & 3 / EBRD PR 6 Criteria 2 & 4**.

6.2.4.1 Ecology

This is a lowland species that has been pushed to higher altitudes by persecution and habitat loss in Europe. Eastern populations breed in natural steppe and agricultural habitats but migrate South for winter. Wetlands are apparently preferred on the wintering grounds (Meyburg and Kirwan, 2020.

The species is mostly migratory, leaving breeding areas mid Sept to mid Oct/Nov, returning in Feb–Apr/May. Numbers passing migration watchpoints usually small.

Its main diet is small to medium-sized mammals (Handrinos and Akriotis 1997) but may eat larger prey (e.g. foxes and sheep) birds, including domestic chickens, and reptiles. Prey caught mainly on ground by perch hunting or by soaring, and pair members often hunt co-operatively.

Birds are usually seen singly or in pairs, with small groups sometimes forming on migration or at sources of food or water (Ferguson-Lees and Christie 2001). In exceptional cases large groups of up to 200 have been known to form on autumn migration (Snow and Perrins 1998).

Breeding sites are threatened primarily by intensive forestry, a shortage of large indigenous trees in the lowlands and the presence of humans (Karyakin 2011; M. Horváth in litt. 2016). Other threats include loss of feeding habitats, prey shortages, nest robbing and illegal trade, shooting, poisoning and collisions with vehicles. An average of c.450 Eastern Imperial Eagles were killed by powerlines during the 2009 breeding season in the Altai region – 25% of the total population of the region (Karyakin et al. 2009).

6.2.4.2 DISTRIBUTION

The species is known to breed from Central and Eastern Europe continuously East through Russia, Mongolia and Kazakhstan. It may breed in Uzbekistan, but this has not been confirmed. It is migratory, and uses Uzbekistan as a wintering site, as well as passing over the region during migrations from Kazakhastan to the Middle East (Poessel et al 2018). Satellite tracking has eluded to some winter site faithfulness (Meyburg and Meyburg, 2011).

Figure 6-17 Migration routes of Eastern Imperial Eagles captured in Kazakhstan [17]

It has a large EOO of 14,900,000 km^2.

Currently the population has been estimated at 2,500-3,800 mature individuals. Recent estimates from Russia and Kazakhstan suggest the global population is much higher, but these estimates have been criticised (BirdLife, 2019).

The figures below show the species distribution.

[17] Poessel, S. A., Bragin, E. A., Sharpe, P. B., Garcelon, D. K., Bartoszuk, K., & Katzner, T. E. (2018). Movements and landscape use of Eastern Imperial Eagles Aquila heliaca in Central Asia. Bird Study, 65(2), 208–218. https://doi.org/10.1080/00063657.2018.1447907

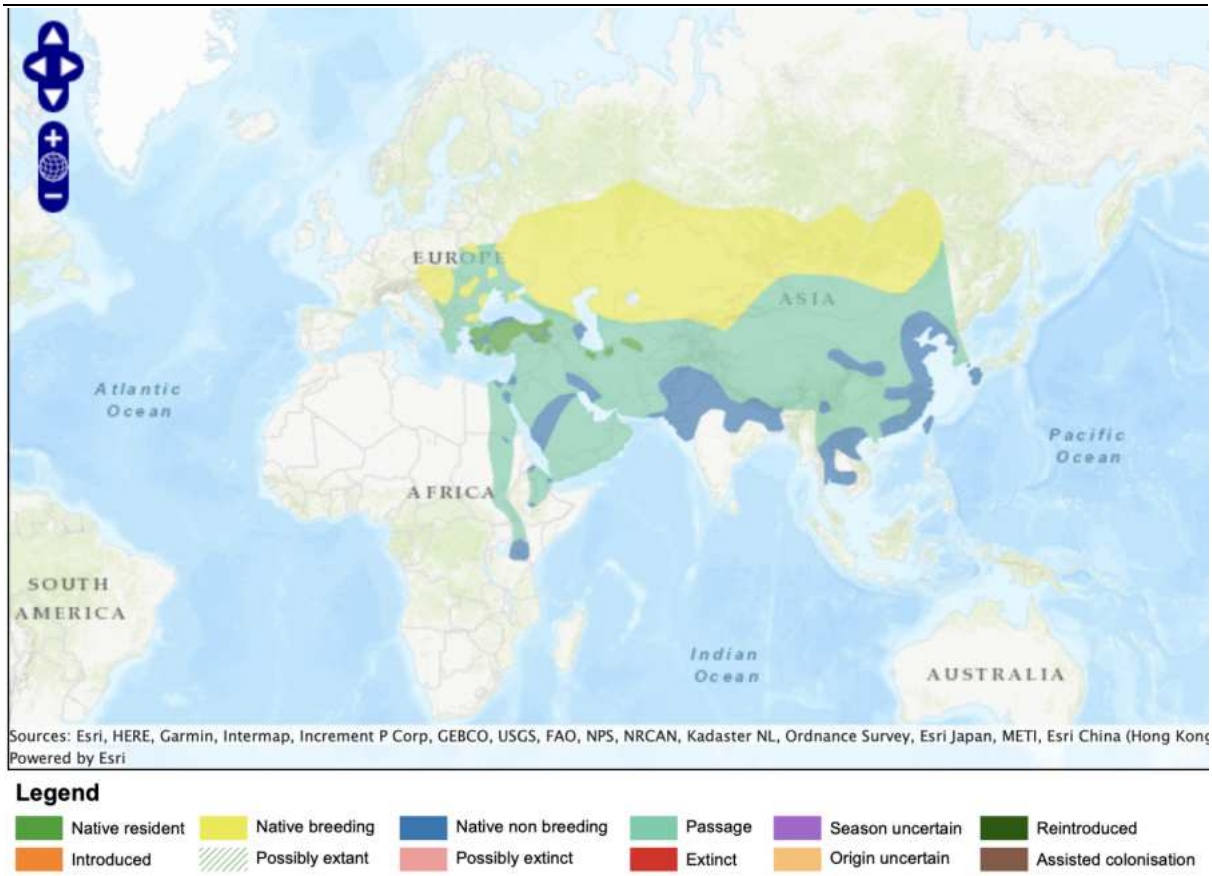

Figure 6-18 Distribution Map of Eastern Imperial Eagle [18]

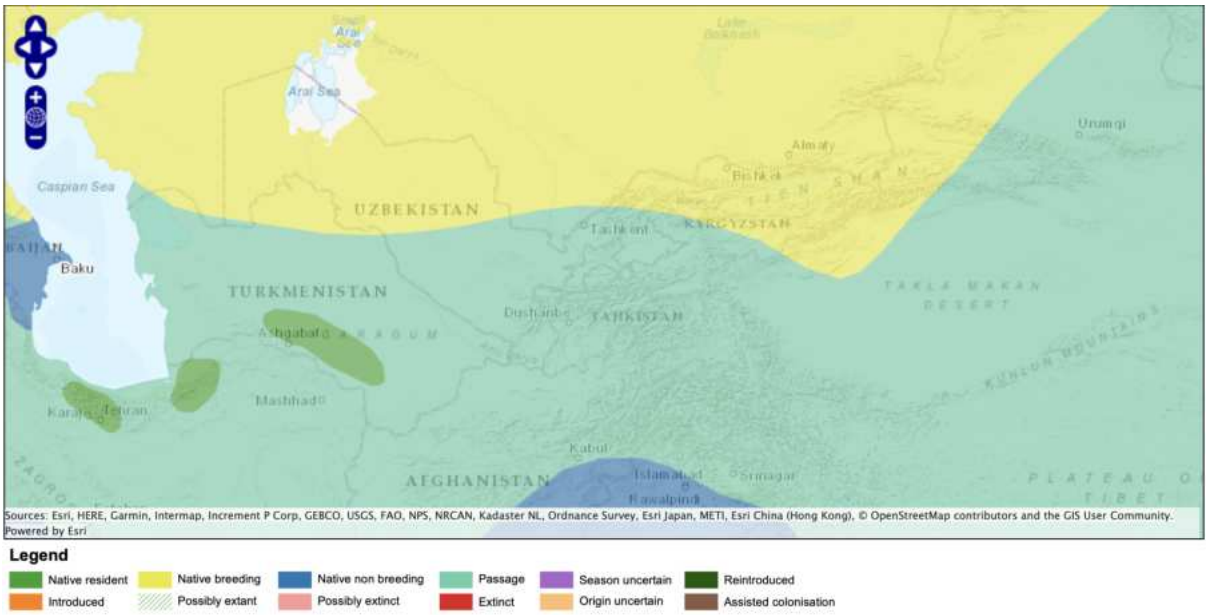

Figure 6-19 Distribution Map of Eastern Imperial Eagle

[18] BirdLife International (2024) Species factsheet: Aquila heliaca. Downloaded fromhttps://datazone.birdlife.org/species/factsheet/eastern-imperial-eagle-aquila-heliaca on 24/04/2024.

6.2.4.3 BASELINE SURVEY RESULTS

Two observations of this species were recorded during the Spring migration surveys conducted between March and April 2024. One individual was observed along the proposed 70km OHTL (VP16, approximately 3km from Sarikul) and one along the proposed 11km LILO (VP19).

In subsequent VP surveying undertaken during September-November 2023, **one observation** of this species was recorded, again along the 70km OHTL (VP16).

6.2.4.4 ANALYSIS

6.2.4.4.1 EAAA

The EAAA is a difficult concept to apply to long-range migratory species, as encompassing the full geographic range of such species would result in extremely large population extrapolations. With migratory birds, CHA generally follows the IUCN KBA standard, emphasizing areas that function as significant migratory stopover sites and/or bottleneck, with EAAA delineated to include the Project component(s) footprint plus a reasonable buffer based on the scale of the species' typical daily foraging movements, rather than its entire migratory route.

The dominant habitat types used during migration includes agricultural areas, bare areas and sparsely vegetated areas. The wintering daily movement (during stopover) has been measured at approximately 20km distance in a day.[19] The EAAA is applied as all of the above-mentioned suitable habitats within the project boundaries as well as within a buffer of 20km around the project footprint.

The resulting EAAA has been mapped in the following figure.

[19] Poessel, S. A., Bragin, E. A., Sharpe, P. B., Garcelon, D. K., Bartoszuk, K., & Katzner, T. E. (2018). Movements and landscape use of Eastern Imperial Eagles Aquila heliaca in Central Asia. Bird Study, 65(2), 208–218. https://doi.org/10.1080/00063657.2018.1447907

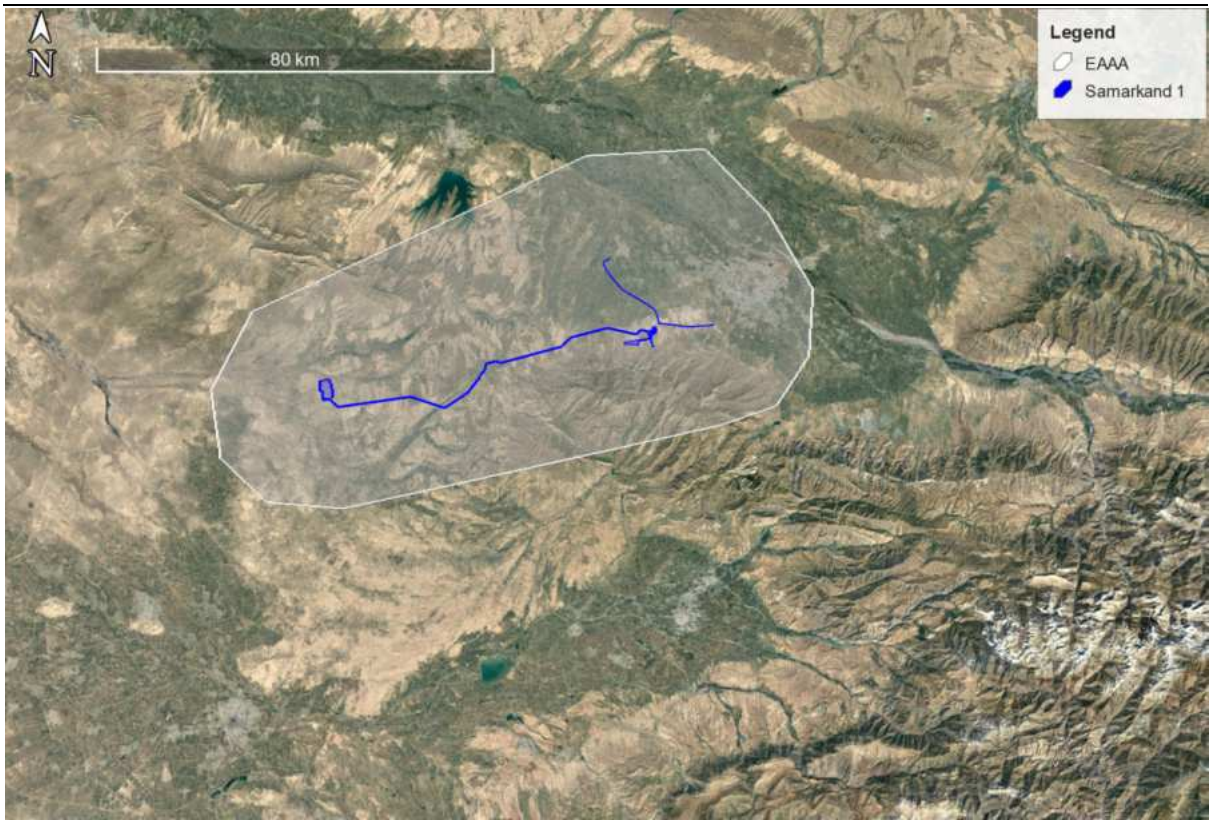

Figure 6-20 EAAA and potential habitats for the Eastern Imperial Eagle in the PV plant site

6.2.4.4.2 Criticality

The global population of this species is estimated to range from 3,500-15000 individuals. Taking a precautionary approach, the lower range is used to apply the thresholds.

Under **IFC Criterion 1**, the threshold for VU species is EAAAs that support a globally important concentration of the global population such that the loss of the EAAA population would result in uplisting to CR/EN status and meet the quantitative thresholds of Criterion 1.

Under **IFC Criterion 3**, the threshold is 1% of the global population using the EAAA on a regular/cyclical basis during migrations. This would amount to 35 individuals.

A total of 3 observations of this species were recorded at 2 Vantage Points during the baseline studies spanning across Autumn and Spring migration seasons indicating species presence within the EAAA.

Based on the known migratory corridors for this species, it is unlikely that such areas exist within the EAAA. In addition, high-potential vantage points were strategically selected based on expert consultations and habitat assessments, ensuring that key areas for potential aggregation were adequately surveyed. Despite this, no congregation areas, roosting sites, migration bottlenecks, or nesting sites were identified. In accordance with IFC PS6 GN6, critical

habitat for wide-ranging species like raptors is determined by areas of aggregation, recruitment, or other functionally important habitat features. Based on the findings of the baseline surveys, secondary information, and expert consultations, the EAAA is unlikely to support a functionally significant aggregation of the species. Although this is not a quantitative extrapolation, the context indicates that this species likely does not have an EAAA population of more than 35 individuals nor does the EAAA population contain an important concentration the loss of which would trigger uplisting to CR/EN status. Therefore, CH is not triggered under Criteria 3 or Criterion 1.

Although this species does not trigger CH status, it is considered a Significant Biodiversity Value and Priority Biodiversity Feature (PBF) due to its Vulnerable (VU) designated conservation status on IUCN and in the National Uzbekistan Red Data Book.

The ESIA will address impacts on this species as a Sensitive Receptor, via the biodiversity impact assessment, mitigation program and residual significance analysis.

6.2.5 Greater Spotted Eagle

The Greater Spotted Eagle (*Clanga clanga*) is a passage migrant in Uzbekistan, listed as Endangered (EN) species on the IUCN Global Red List, and Vulnerable (VU) in the Uzbekistan National Red Data Book.

The CHA Screening exercise found that this species should be further investigated in the CHA against **IFC PS 6 Criteria 1 & 3 / EBRD PR 6 Criteria 2 & 4.**

6.2.5.1 ECOLOGY

The species inhabits large wet forests bordering humid meadows, bogs, marshes and other wetlands including mangroves (Rasmussen and Anderton, 2005) occasionally on mudflats associated with large rivers and estuaries, probably mainly in winter (Khan, 2005). Visits paddyfields and rubbish dumps, especially in winter (Rasmussen and Anderton 2005), and other man-made habitats such as sewage farms, reservoirs and irrigated cultivation (Lobley, 2007).

It is a migratory species, with birds leaving their breeding grounds in October/November to returning North in February to March (del Hoyo et al. 1994). Birds migrate on a broad front, tending to pass in singles, twos and threes with the occasional larger group (Ferguson-Lees and Christie 2001).

It feeds on unretrieved quarry, small mammals, waterbirds, frogs and snakes, hunting over swamps, wet meadows and, in Europe, over extensively managed agricultural land (A. Lõhmus in litt. 1999); birds soar to c.100 m high when hunting.

Hybridisation is a major threat to this species, with strong evidence of inter breeding with the Lesser Spotted Eagle, *Clanga pomarina* (Bergmanis et al. 1997; Lõhmus and Väli 2001; Dombrovski 2002; Vali et al. 2010). Habitat destruction poses a significant threat, as do forestry operations causing disturbance, as birds are intolerant of human presence in their territories (Maciorowski et al. 2014). Wintering habitats are also being lost (P. D. Round in litt. 2016). On migration and at wintering grounds, electrocution, collision with wind turbines, shooting and poisoning are major causes of mortality (Perlman and Granit 2012; Maciorowski et al. 2014).

6.2.5.2 DISTRIBUTION

This species occupies a fragmented range, breeding primarily in Eastern Europe and the Northern regions of Central Asia (Meyburg et al. 1999; Keller et al. 2020). Passage or wintering birds occur in small numbers over a vast area, including Uzbekistan. During migration the Greater Spotted Eagle uses paddy fields and rubbish dumps, also other man-made or man-modified habitats such as sewage farms, reservoirs and irrigated cultivation.

The figure below shows a migratory route for Greater Spotted Eagle from Kazakhstan to Pakistan through Eastern Uzbekistan, with a stopover that appears to be just West of Samarkand.

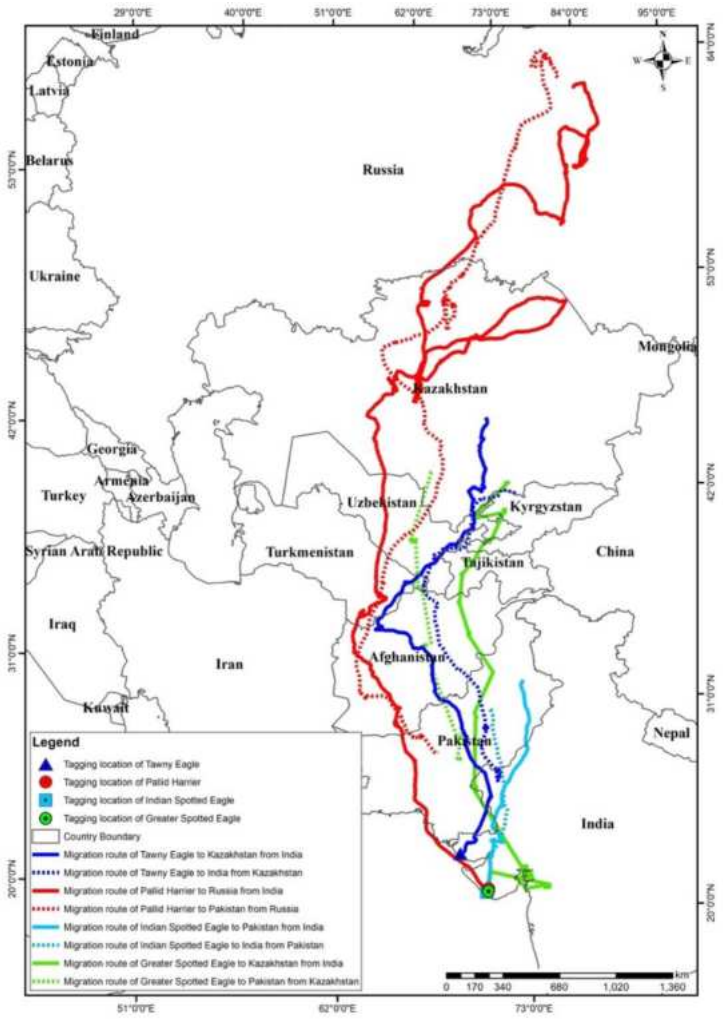

Figure 6-21 Migratory routes of raptor species through Central Asia. Green tracks indicate Greater Spotted Eagle routes [20]

The species has an EOO of 15,300,000km^2.

Based on European population estimates (1,900-2,500 equating to 25-49% of the global range) a very preliminary estimate of the global population size is 3,900-10,000 mature individuals. There is very little data available on population sizes further east in the species' range.

The figures below show the species distribution.

[20] Ram, M., Sahu, A., Tikadar, S., Gadhavi, D., Rather, T. A., Jhala, L., and Zala, Y. (2022) Home Ranges and Migration Routes of Four Threatened Raptors in Central Asia: Preliminary Results. Birds, 3, 293–305. https://doi.org/10.3390/birds3030020

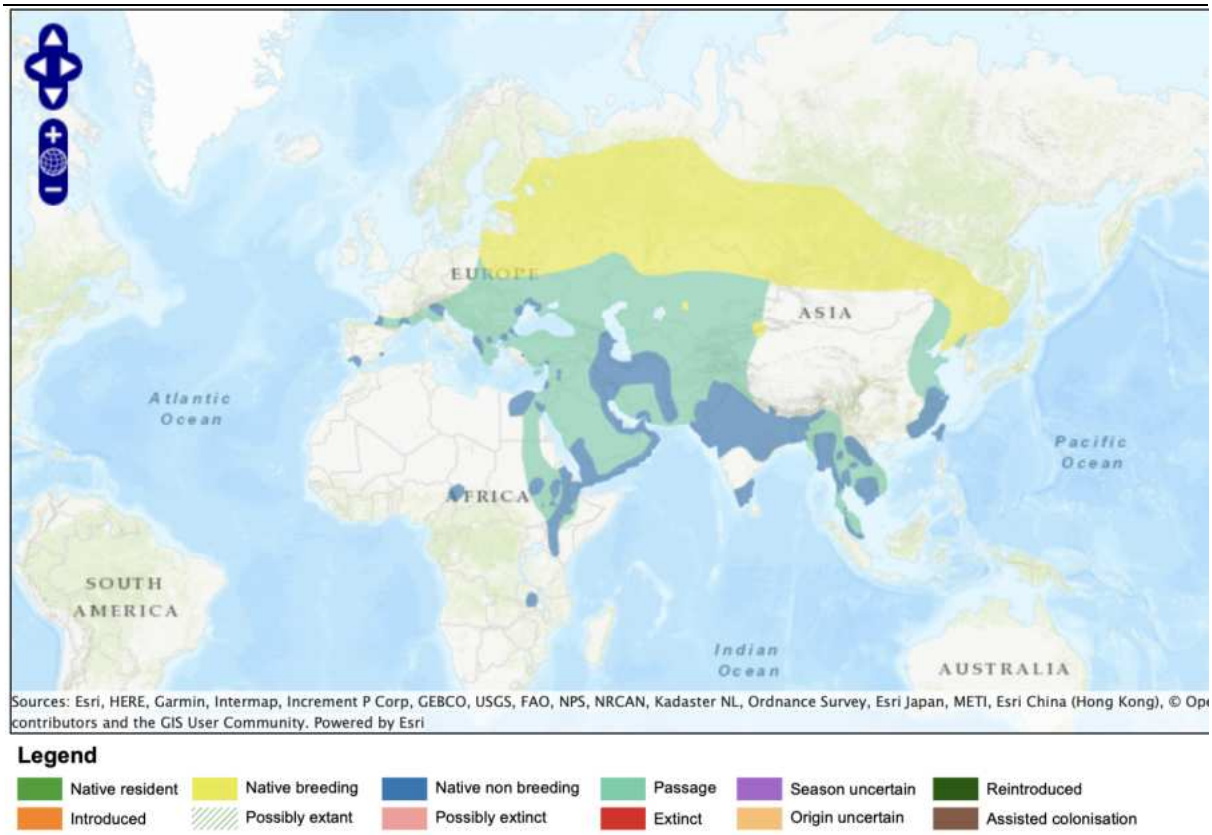

Figure 6-22 Distribution Map of Greater Spotted Eagle [21]

[21] BirdLife International (2024) Species factsheet: *Clanga clanga*. Downloaded from https://datazone.birdlife.org/species/factsheet/greater-spotted-eagle-clanga-clanga on 24/04/2024.

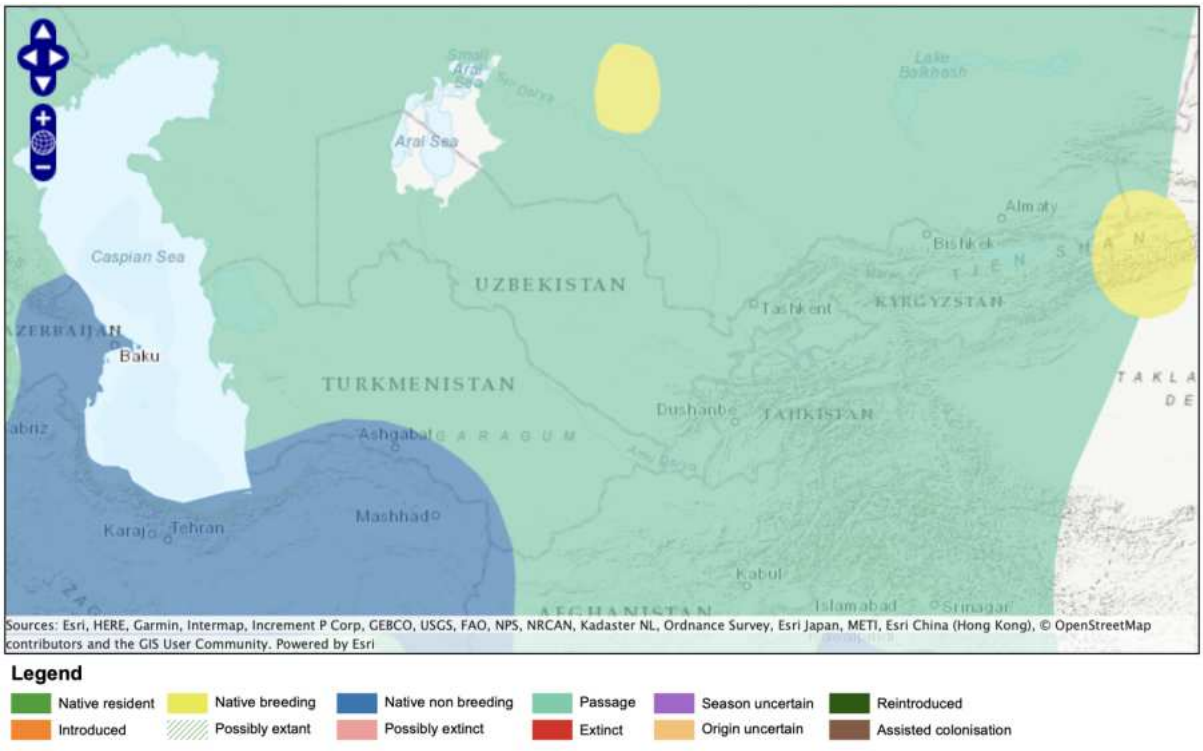

Figure 6-23 Distribution Map of Greater Spotted Eagle

6.2.5.3 BASELINE SURVEY RESULTS

This species was not recorded within the Project area during any of the baseline surveys conducted in 2023 and 2024.

A single observation of this species was recorded at VP13 during subsequent Spring migration surveys carried out between February and May 2024. VP 13 is in an area adjacent to the project.

6.2.5.4 ANALYSIS

6.2.5.4.1 EAAA

The EAAA is a difficult concept to apply to long-range migratory species, as encompassing the full geographic range of such species would result in extremely large population extrapolations. With migratory birds, CHA generally follows the IUCN KBA standard, emphasizing areas that function as significant migratory stopover sites and/or bottleneck, with EAAA delineated to include the Project component(s) footprint plus a reasonable buffer

based on the scale of the species' typical daily foraging movements, rather than its entire migratory route.

The mean documented home range width for the Greater spotted eagle is about 100 km[22]. Nevertheless, as smaller reported range distances range between 23 km and 49 km, the home range in the context of the Project's AoI has been limited to 50 km. On this basis, a 50-km wide AoI buffer was applied to the PV plant and BESS footprint, with regard to potential loss of suitable habitat.

Likewise, the AoI of 70-km OTL was defined as a precautionary, 50-km buffer around the longitudinal span of the OTL route, where collision-related mortality is likely to occur. The delineation of the EAAA is therefore a progressive process, which draws on literature surveys, field reconnaissance, subsequent habitat mapping surveys, and the outcomes of dedicated baseline surveys to validate and quantify the occurrence of this species in habitats that coincide with the AoI buffer.

[22] Meyburg B et al. 2012. Steppe Eagle migration strategies – revealed by satellite telemetry. British Birds 105, September 2012, 506–519.

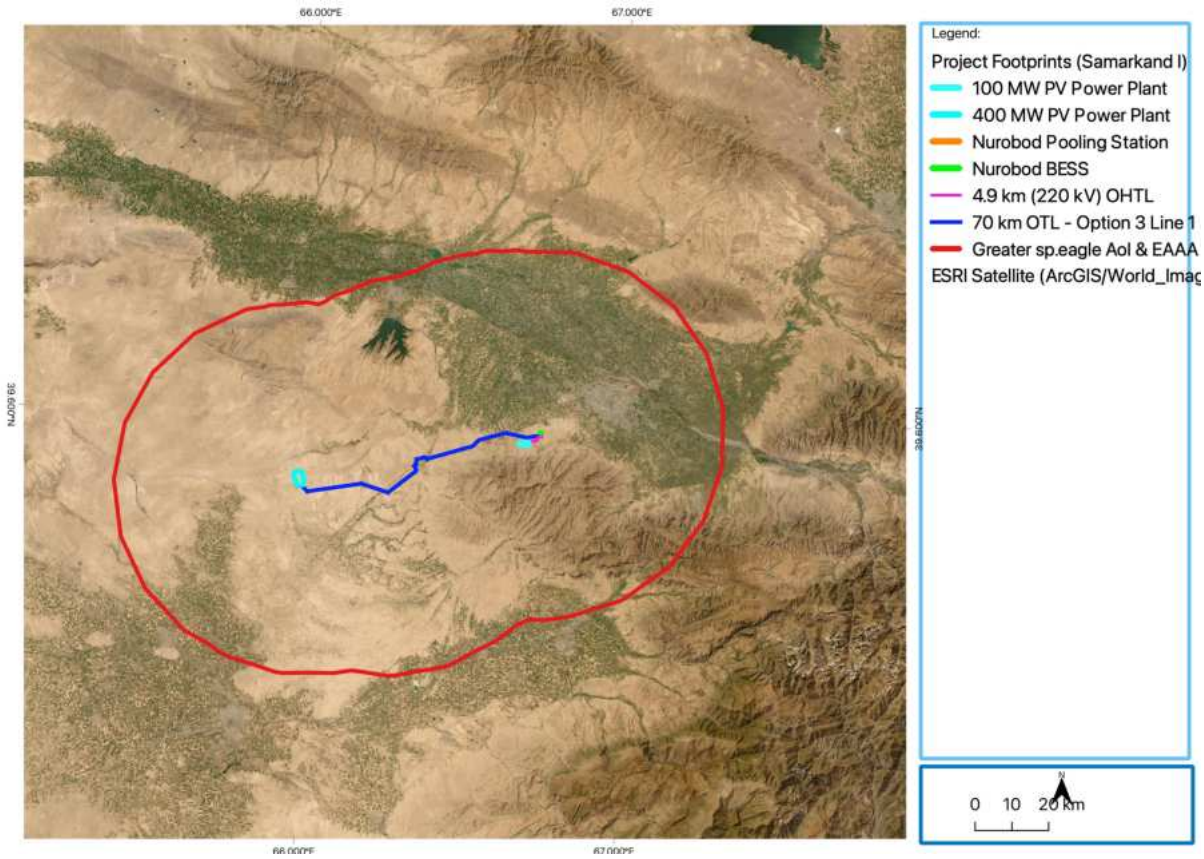

Figure 6-24 Area of Influence and EAAA for the Greater spotted eagle in relation to the project footprint

The species has been shown to occur within a range of habitats, some of which are well-represented within the broad AoI. The outcomes of the VP surveys did not confirm a regular occurrence of the species within the AoI, with no sightings made at all three vantage points in the Autumn and Spring migration seasons. The all-encompassing, initial EAAA was therefore maintained for subsequent CH and PBF assessment on the basis of recorded (resident) populations.

6.2.5.4.2 Criticality

The global population of this species is estimated to range from 3,900-10,000 mature individuals. Taking a precautionary approach, the lower range is used to apply the thresholds.

Under IFC **Criterion 1**, the threshold for VU species is EAAAs that support a globally important concentration of the global population such that the loss of the EAAA population would result in uplisting to CR/EN status and meet the quantitative thresholds of Criterion 1.

Under IFC **Criterion 3**, the threshold is 1% of the global population using the EAAA on a regular/cyclical basis during migrations. This would amount to 39 individuals.

To date, one observation of this species was made during baseline studies spanning across Autumn and Spring migration seasons.

Among the 41 IBAs nearby the 50km buffer around the project footprint, Greater Spotted Eagle is listed as a trigger species for Dalverzin State Forestry and Hunting Management Area and Zaravshan State Nature Reserve. 15 individuals were recorded on passage in 2005 in the Zaravshan Reserve located 20km from the project while 3-9 adults were recorded in the winter of 2006 in the Dalverzin area located approximately 225 km from the project footprint. Given that zero observations of this species were recorded during the baseline surveys and that only a few individuals were recorded across a span of 2 years in the EAAA, it is not likely that that the EAAA population comprises of more of 39 individuals nor does the EAAA population contain an important concentration the loss of which would trigger uplisting to CR/EN status. Therefore, CH is not triggered under Criterion 3 and Criterion 1.

Due to the VU status on the IUCN Red List and Uzbekistan Red Data Book, it is considered as an SBV/ PBF for the Main Facilities component(s) of the Samarkand 1 project. The ESIA will address this via the biodiversity impact assessment, mitigation program and residual significance analysis.

6.2.6 Pallas's Fish-Eagle

The Pallas's Fish-Eagle (*Haliaeetus leucoryphus*) is a migrant in much of Uzbekistan. It is listed as Endangered (EN) on the Global IUCN Red List and Endangered (EN) in the National Uzbekistan Red Data Book.

The CHA Screening exercise found that this species should be further investigated in the CHA against **IFC PS 6 Criteria 1 & 3 / EBRD PR 6 Criteria 2 & 4.**

6.2.6.1 Ecology

Pallas's Fish-Eagle favours extensive wetland habitats, including lakes, rivers, and floodplains, from lowlands to areas around 5,000m altitude. These areas provide ample fishing opportunities and suitable conditions for nesting. The species is often found in environments that maintain a balance between open water and vegetative cover, which is crucial for both feeding and breeding.

The breeding season for the Pallas's Fish-Eagle typically begins in early spring, with nesting sites commonly located in large trees near water bodies. During this period, the species lays 1-3 eggs per breeding season, with both parents actively involved in incubation and caring for the young. Breeding occurs from September to February in northern India and Myanmar (BirdLife International 2001), while in Bangladesh, the species returns to nest sites in late August (Sourav et al. 2011).

As its name suggests, the Pallas's Fish-Eagle predominantly feeds on fish. However, its diet can also include waterfowl and small mammals, adapting based on availability and environmental conditions. The eagle employs a powerful and skilled hunting technique, often swooping down to snatch prey directly from the water.

This eagle species is territorial during the breeding season, often seen patrolling water bodies to defend its fishing grounds. Outside of breeding, Pallas's Fish-Eagles may be observed either alone or in pairs, rarely forming larger groups.

Major threats to the Pallas's Fish-Eagle include habitat degradation through the alteration of wetland areas, pollution of water bodies which impacts fish populations, and direct disturbance from human activity. Additionally, the illegal trade of birds and their eggs poses a significant risk to population stability.

Conservation efforts for the Pallas's Fish-Eagle focus on protecting wetland habitats and ensuring sustainable fish populations. Environmental education and stricter enforcement of wildlife protection laws are also critical to mitigating the impacts of human disturbance and illegal trade.

6.2.6.2 DISTRIBUTION

The Pallas's Fish-Eagle is distributed across a broad area, stretching from Kazakhstan and Mongolia through to parts of South Asia, including Bangladesh and Northern India. The species is largely resident throughout its range, though some northern populations may move short distances southward during the harshest winter months.

The EOO of resident/breeding population of Pallas's Fish-eagle is 1,740,000 km^2 (Birdlife Datazone, 2024).

Based on available surveys and data, the population of this species is estimated to be below 2,500 mature individuals (M. Steele, 2017), placing it within the range of 1,000 to 2,499 mature individuals. It is regarded as a single migratory population rather than consisting of isolated subpopulations (M. Steele, 2017).

The following figures shows the geographical range of this species.

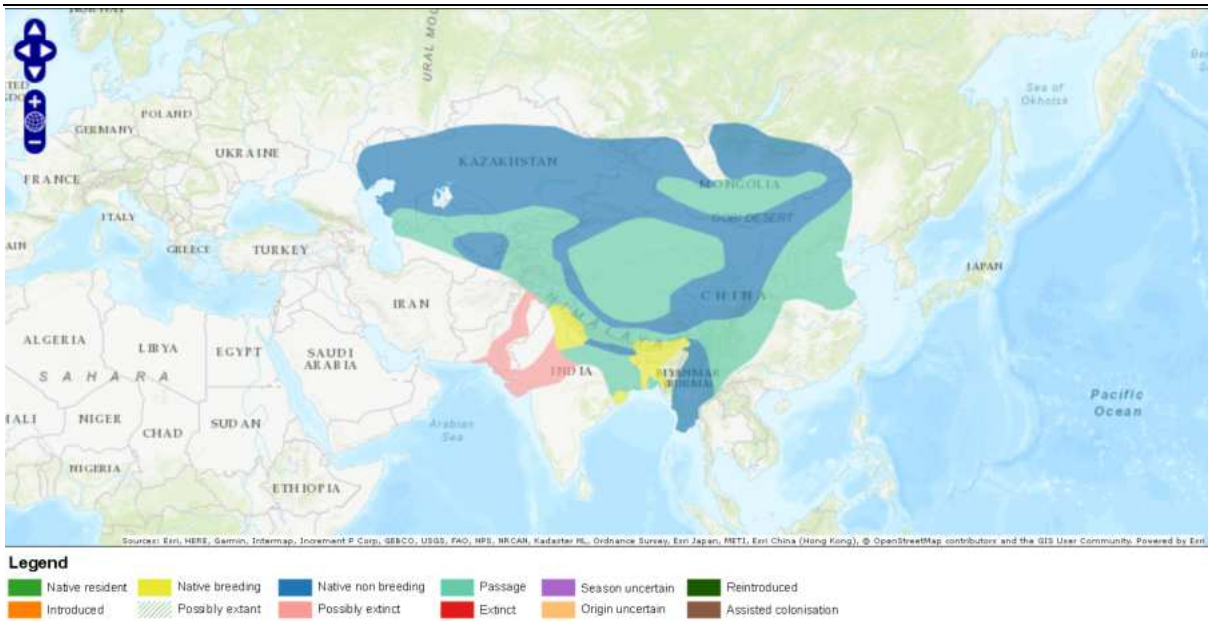

Figure 6-25 Geographical Distribution of Pallas's Fish-eagle [23]

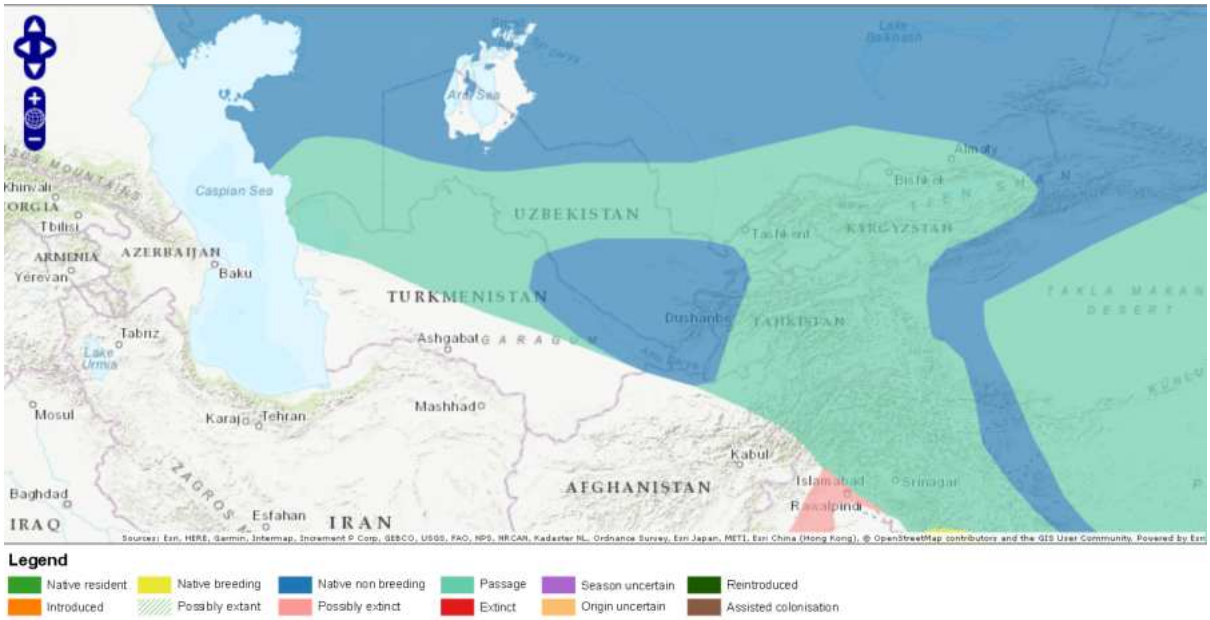

Figure 6-26 Geographical Distribution of Pallas's Fish-eagle

Recent studies and re-evaluations of historical data have significantly reshaped our understanding of the breeding patterns of this species. Previously believed to be a migratory breeder north of the Himalayas, especially in Mongolia, with a resident population in the Indian subcontinent, recent surveys in Mongolia from 2005 to 2009 and subsequent studies from 2012

[23] BirdLife International (2024) Species factsheet: Haliaeetus leucoryphus. Downloaded from https://datazone.birdlife.org/species/factsheet/pallass-fish-eagle-haliaeetus-leucoryphus on 29/04/2024.

to 2015 found no evidence of breeding at 13 of 21 historically known sites (Gilbert et al. 2014)[24]. Current evidence suggests a shift in breeding range, with the species primarily breeding in northern India, particularly in Assam and Uttarakhand, as well as in Bangladesh and Myanmar. During the non-breeding season (May to September), the species disperses north of the Himalayas to Kazakhstan, Russia, and Mongolia. The breeding status in Afghanistan is uncertain, and historical breeding in central China is questioned due to incongruent records with the breeding season and lack of nest documentation. Telemetry studies corroborate these findings, demonstrating connectivity between populations in India and Mongolia (M. Steele, 2017).

Furthermore, recent satellite tracking of three individuals unveiled extensive seasonal migrations spanning over 4,000 km from India to Mongolia and Russia. Notably, these tracked birds exhibited the remarkable ability to fly directly over the Himalayas at altitudes surpassing 6,000 m (M. Steele, 2017).

6.2.6.3 BASELINE SURVEY RESULTS

This species was not recorded within the Project area during any of the baseline surveys conducted in 2023 and 2024.

6.2.6.4 ANALYSIS

The Pallas's Fish-Eagle favors extensive wetland habitats, including lakes, rivers, and floodplains which present ample feeding opportunities. Pallas's Fish Eagle is listed as a trigger species for Tuzkan in Uzbekistan since 6 adults were recorded during the winter of 2004. This site is located approximately 120 km from the project footprint and is 107,732 ha in size. Habitat suitability for this species specifically indicate requirement for extensive wetlands of which there are none within the project AoI (considered as areas within a 20km buffer from the project footprint for birds due to habitat displacement). Furthermore, consultations with regional ornithologists confirm that it is unlikely to observe this species in the project AoI due to lack of suitable habitat.

Therefore, due to the unlikelihood of presence in the project AoI, an EAAA cannot be applied as a result of which CH will be not further assessed for this species. However, given the status of this species, if were to be observed during future monitoring efforts it would be assessed under the framework of adaptive management.

[24] Gilbert, M., Tingay, R., Losolmaa, J,. Sureda, N., Gilbert, C., Batmunkh, D. and Gombobaatar, S. 2014. Distribution and status of the Pallas's Fish Eagle Haliaeetus leucoryphus in Mongolia: a cause for conservation concern? Bird Conservation International 24: 379-388.

6.2.7 Saker Falcon

The Saker Falcon (*Falco cherrug*) is listed as Endangered (EN) on the Global IUCN Red List and Endangered (EN) in the national Uzbekistan Red Data Book, due to a rapid population decline.

The CHA Screening exercise found that this species should be further investigated in the CHA against **IFC PS 6 Criteria 1 & 3 / EBRD PR 6 Criteria 2 & 4.**

6.2.7.1 ECOLOGY

The Saker Falcon thrives in expansive open environments such as steppes and semi-desert areas, which facilitate its hunting across wide territories. Adapted for hunting close to the ground in open terrain, it combines rapid acceleration with high maneuverability, specializing in capturing mid-sized diurnal terrestrial rodents like ground squirrels (Spermophilus) that inhabit grassy landscapes, including desert edges, semi-deserts, steppes, agricultural fields, and arid montane areas. During the breeding season, this species nests on cliffs, in tree hollows, and may also use old nests of other large birds. Its ability to adapt to modified landscapes is notable, provided there are adequate hunting grounds available.

The breeding season for Saker Falcons commences in early spring, during which they typically lay between 3 to 5 eggs per clutch, although occasionally the number may range from 2 to 6. The eggs are primarily incubated by the female, while the male is responsible for provisioning food. Chicks generally fledge by late summer. Saker Falcons adapt various nesting sites, including copses, cliffs, and occasionally even the ground, often utilizing old nests of other birds. Clutch size and breeding success can vary depending on environmental conditions, particularly in regions where prey, such as rodents, experience population fluctuations (Ferguson-Lees and Christie 2001).

Saker Falcons predominantly hunt rodents and small birds, engaging in high-speed aerial pursuits to capture their prey in flight. Their diet is highly adaptable and varies significantly with the availability of prey species within their environment. In certain regions, especially those near water bodies and in urban settings, Saker Falcons have shifted their primary prey from rodents to birds, including domestic pigeons, particularly in parts of Europe (Snow and Perrins 1998).

Saker Falcons are known for their territorial behaviour during the breeding season but may gather in loose flocks for migration. These birds are formidable fliers, engaging in high-speed aerial hunts. While their social dynamics outside of the breeding season are less understood, they are typically observed either alone or in pairs. Despite their broad distribution, Saker Falcons face significant population pressures, particularly from colder regions where they migrate to the Middle East and Africa during winter. These migrations span extensive distances across multiple countries, underscoring the need for international conservation efforts. In areas

like Hungary and Mongolia where the species is resident, localized management and protection strategies are essential to mitigate threats and support population stability.

Key threats to the Saker Falcon include habitat loss due to agricultural expansion and urbanization, electrocution by power lines, and illegal trapping for the falconry trade. Conservation efforts are crucial to mitigate these threats, with measures including habitat protection, enforcement of anti-poaching laws, and the installation of falcon-safe power infrastructure.

6.2.7.2 DISTRIBUTION

The Saker Falcon is widely distributed across its range but is facing population pressures in many areas. It is resident in some parts of its range, such as Hungary and Mongolia, but populations in colder regions migrate to the Middle East and Africa during the winter. The migration patterns involve traveling extensive distances across multiple countries, highlighting the need for international cooperation in conservation efforts.

Smaller numbers or vagrant individuals reach many other countries, underscoring its wide-ranging migratory patterns (Kovács et al. 2014).

The EOO of resident/breeding population of Saker Falcon is 19,100,000 km^2 (Birdlife Datazone, 2024).

The global population is estimated to number 12,200-29,800 Mature Individuals.

The following figures shows the geographical range of this species.

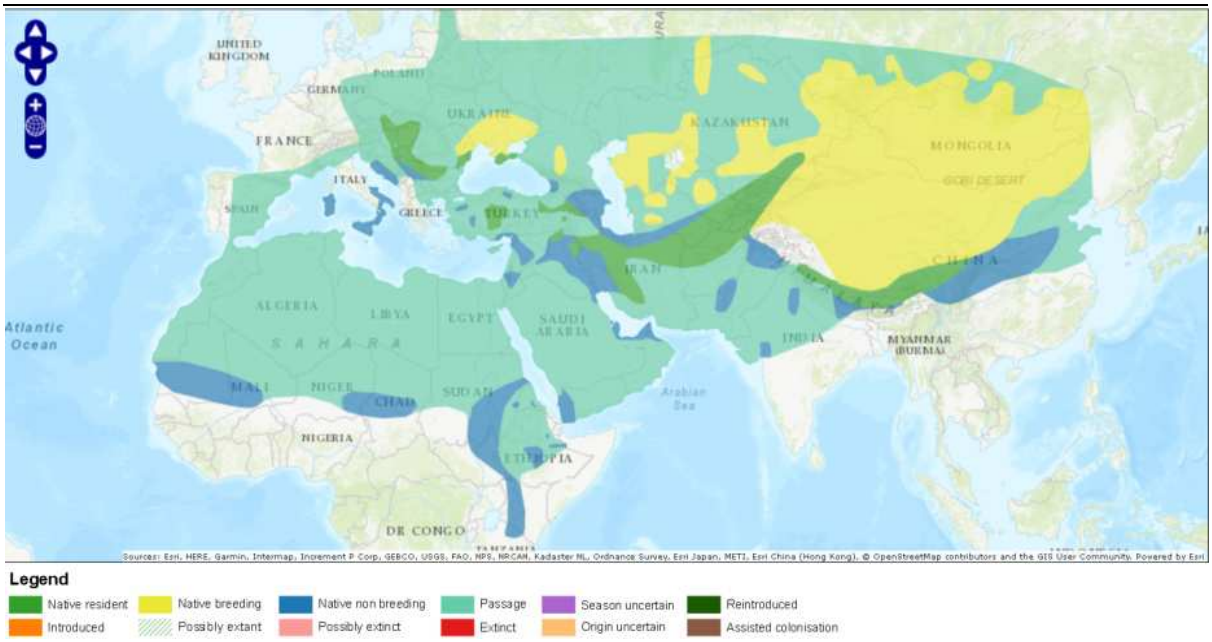

Figure 6-27 Geographical Distribution of the Saker Falcon [25]

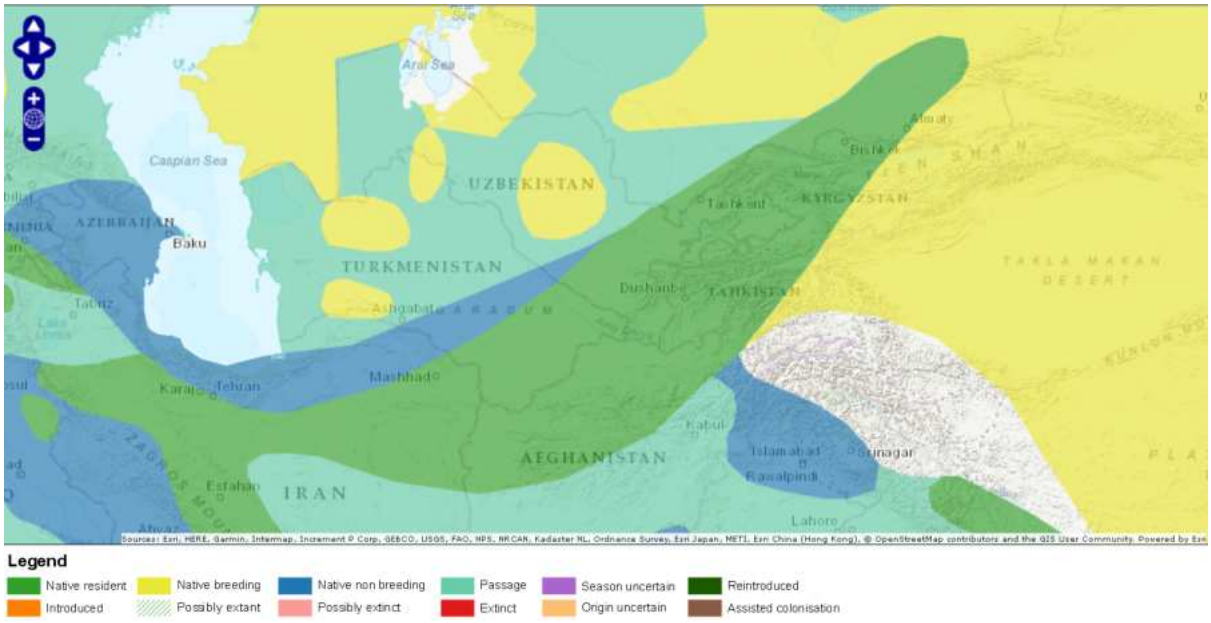

Figure 6-28 Geographical Distribution of the Saker Falcon

Birds exhibit varying migratory behaviors—sedentary, part-migratory, or fully migratory—largely influenced by the availability of food in their breeding territories during winter (Snow and Perrins 1998). Migrant birds typically winter in East Africa, southern Europe, and southern Asia. Notably, between 25-50% of the global population winters on the Qinghai-Tibetan Plateau (Dixon et al.

[25] BirdLife International (2024) Species factsheet: Falco cherrug. Downloaded from https://datazone.birdlife.org/species/factsheet/saker-falcon-falco-cherrug on 29/04/2024.

2015b). These migratory birds generally depart their breeding grounds in September and October and return between February and May (del Hoyo et al. 1994).

Migration is the biannual movement of Sakers between their breeding and wintering areas. Saker Falcons are partial migrants, meaning that while some individuals within a population migrate, others do not. Adult territory holders often show less inclination to migrate than younger individuals, especially juveniles. The factors influencing variations in migration behavior within and between populations remain unclear, though they are likely influenced by a combination of genetic and environmental factors.

The following figures provide detailed visualizations related to the migration and distribution of Saker Falcons. The first figure maps the general direction of the autumn migration routes of the Saker Falcon, illustrating the paths these birds take as they migrate southward. The second figure presents the general distribution of Saker Falcons, showing their widespread presence across their range. Each figure aims to offer insights into the migration behaviors and habitat utilization of this species, which are crucial for targeted conservation efforts.

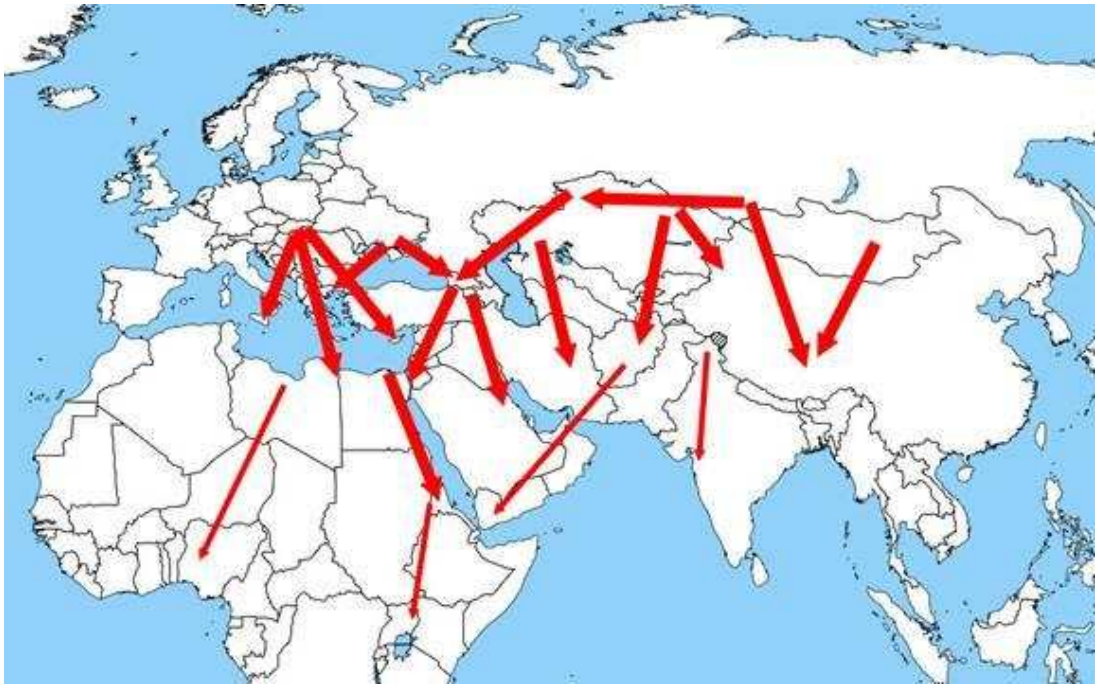

Figure 6-29 General direction of autumn migration routes of the Saker Falcon [26]

[26] International Wildlife Consultants (2024) Autumn migration of Saker Falcons, Available at: https://www.falcons.co.uk/conservation-research-and-welfare/the-saker-falcon/migration/ Accessed on 24 April, 2024.

6.2.7.3 BASELINE SURVEY RESULTS

This species was not recorded within the Project area during any of the baseline surveys conducted in 2023 and 2024.

6.2.7.4 ANALYSIS

6.2.7.4.1 EAAA

The EAAA is a difficult concept to apply to long-range migratory species, as encompassing the full geographic range of such species would result in extremely large population extrapolations. With migratory birds, CHA generally follows the IUCN KBA standard, emphasizing areas that function as significant migratory stopover sites and/or bottleneck, with EAAA delineated to include the Project component(s) footprint plus a reasonable buffer based on the scale of the species' typical daily foraging movements, rather than its entire migratory route.

The Saker Falcon nests on cliffs, in tree hollows, and may also use old nests of other large birds. It forages in grassy landscapes, including desert edges, semi-deserts, steppes, agricultural fields, and arid montane areas. Its ability to adapt to modified landscapes is notable, provided there are adequate hunting grounds available.

A 20 km buffer from the project footprint was applied based on the largest known home range of a breeding population in Hungary. [27] This area was then further extended to encompass the abovementioned surrounding suitable foraging habitats as well as the mountainous areas (potential breeding habitat) that extends towards the north, south and east of the project site. This should provide an adequate accounting of the population of birds likely to regularly utilize the project area.

The resulting EAAA has been mapped in the following figure.

[27] Prommer, Matyas & János, Bagyura & Fehérvári, Péter & Miklós, Váczi. (2018). Home Range Size and Habitat Use of Adult Saker Falcons Falco cherrug in the Breeding Season in Hungary. 10.13140/RG.2.2.19501.95204.

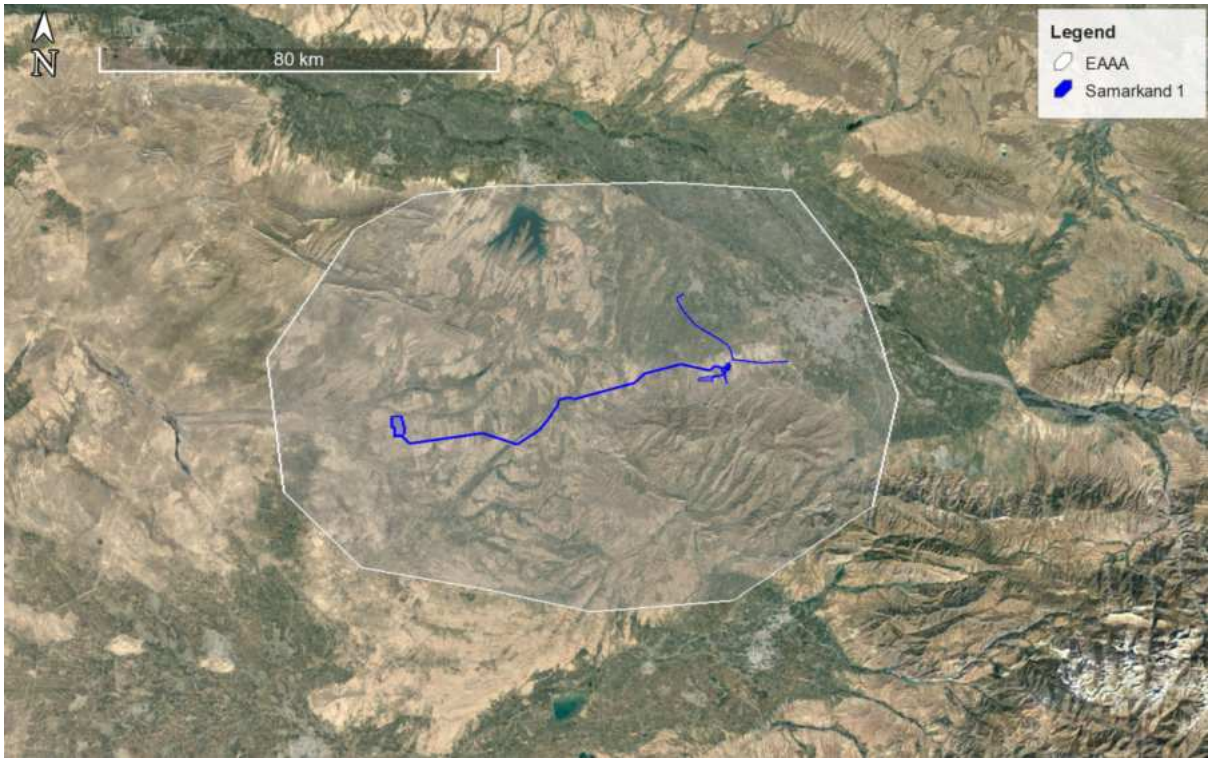

Figure 6-30 Estimated EAAA for the Saker Falcon species

6.2.7.4.2 Criticality

The global population of this species is estimated to range from 12,200-29,800 mature individuals. Taking a precautionary approach, the lower range is used to apply the thresholds.

Under IFC **Criterion 1**, the threshold for Endangered (EN) species is 0.5% of the global population, therefore the 0.5% criticality threshold would be 561 individuals.

Under IFC **Criterion 3**, the threshold is 1% of the global population using the EAAA on a regular/cyclical basis during migrations. This would amount to 122 individuals.

To date, zero observations of this species was made during baseline studies spanning across Autumn and Spring migration seasons.

Among the IBAs within EAAA, Saker Falcon is listed as a trigger species for Karnabchul Steppe in Uzbekistan as 1-5 adults were recorded in the winter between 1967-1980. This site is located approximately 30 km from the project footprint and indicates presence of suitable habitat. However, given that zero observations were recorded during the baseline surveys and that historical records show only 1-5 individuals were recorded in the EAAA area, it is not likely that that the EAAA population comprises of more of 561 individuals. Therefore, CH is not triggered under Criterion 1.

Since the species did not occur during any baseline surveying of the main facilities, it is not considered as a SBV/ PBF either for the Main Facilities component(s) of the Samarkand 1 and 2 projects. However, given the status of this species, if were to be observed during future monitoring efforts it would be assessed under the framework of adaptive management.

6.2.8 Great Bustard

The Great Bustard (*Otis tarda*) is a passage migrant in Uzbekistan, listed as Endangered (EN) species on the IUCN Global Red List, and Critically Endangered (CR) in the Uzbekistan National Red Data Book.

The CHA Screening exercise found that this species should be further investigated in the CHA against **IFC PS 6 Criteria 1 & 3 / EBRD PR 6 Criteria 2 & 4**.

6.2.8.1 ECOLOGY

This species was originally associated with Eurasian steppe, but it has acclimated to agricultural landscapes (M. Kessler in litt. 2016), and can now be found in open, flat or somewhat rolling landscapes, usually with short sward height and a mixture of low-intensity farmland activities and crops (J. C. Alonso in litt. 2012, Collar and Garcia 2020). In Asia, it can also be found in Artemisia and Stipa steppes, mountain foothills and in semi-desert habitats (Gubin 2007 per Kessler and Batbayar 2023).

The species exhibits highly variable migratory behaviour across populations, including obligate winter migrants across the majority of Asia (Morales et al. 2000, Alonso et al. 2000; Palacín et al. 2009, 2011; Kessler 2022). In Uzbekistan it is primarily a passage migrant, occasionally overwintering, rarely breeding.

Breeding occurs in April–May, also June in colder NE parts of its range. It nests on ground with or without scrape, where 2-3 eggs are laid (Rocha et al. 2013).

Its diet is mainly plant material and invertebrates, although small mammals, amphibians and nestling birds sometimes taken (Collar and Garcia 2020, Kessler and Batbayar 2023).

Poaching remains the main threat in Uzbekistan. According to AS Nuridjanov's observations in winter 1999, around 200 Great Bustards appeared near Aidar lake after a cold snap (Kashkarov et al 2002). Over the course of several days, practically all of these birds were shot by poachers (Kreitsberg-Mukhina 2003).

6.2.8.2 DISTRIBUTION

The species breeds in discrete 'pockets' from Spain, East through Eastern Europe, the Middle East to China. Most populations of the western subspecies are at least partially migratory,

depending on weather conditions, and occur on passage or in winter in Ukraine, Iraq, Kazakhstan and Uzbekistan (Y. Andryushchenko in litt. 1999, 2017; Kessler 2015, 2022; M. Kessler in litt. 2016, K. Ararat in litt. 2023).

A recent review of the species in Uzbekistan showed three key areas used by Great Bustard for wintering; the northern foothill plain of the Nuratau range and the Zaravshan nature reserve and adjacent foothill plains of the Zaravshan range, but during the migratory period they are also occasionally seen on the Karnabchul steppe (Figure 5-11). In recent years it has disappeared as a nesting species (Kashkarov et al 2002).

The species globally has a large EOO of 14,400,000 km^2.

The most recent global population estimate Alonso and Palacín 2022; Kessler, 2022; Alonso et al 2023). A review by Kashkrov et al (2002) estimated that the wintering population in Uzbekistan is between 100 to 500 individuals, depending on the severity of the winter.

In 1983, the species was added to the Red Data Book of the Uzbekistan SSR with the status 'extinct as a nesting species, very rare on migration and wintering' (Sadykov 1983); with this designation hunting of the species became illegal. In all subsequent editions of the Red Data Book of Uzbekistan (Azimov 2003, 2006, 2009, 2019), the Great Bustard was assessed on the national level as 'Critically Endangered – 1(CR) – migratory European subspecies on the verge of complete extinction.'

The figures below show the species distribution, both global and within Uzbekistan.

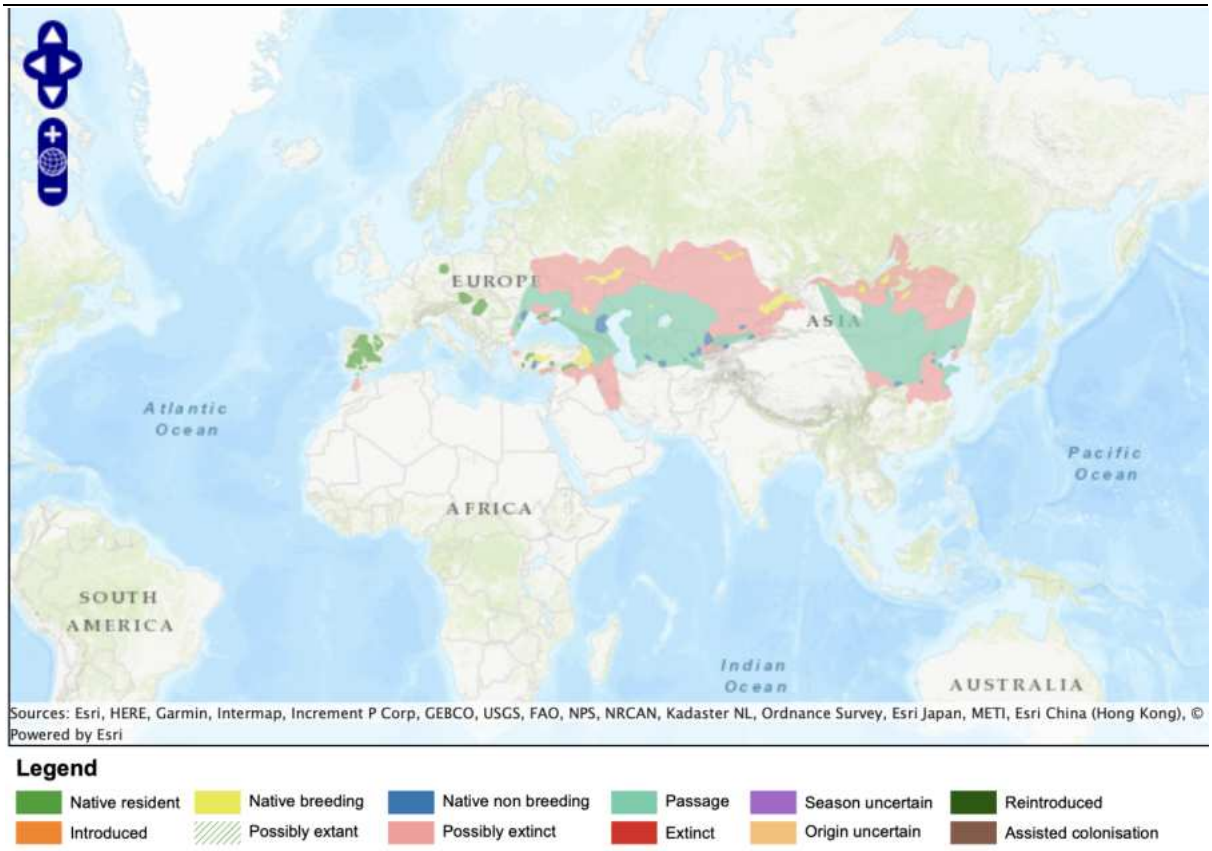

Figure 6-31 Distribution Map of Great Bustard [28]

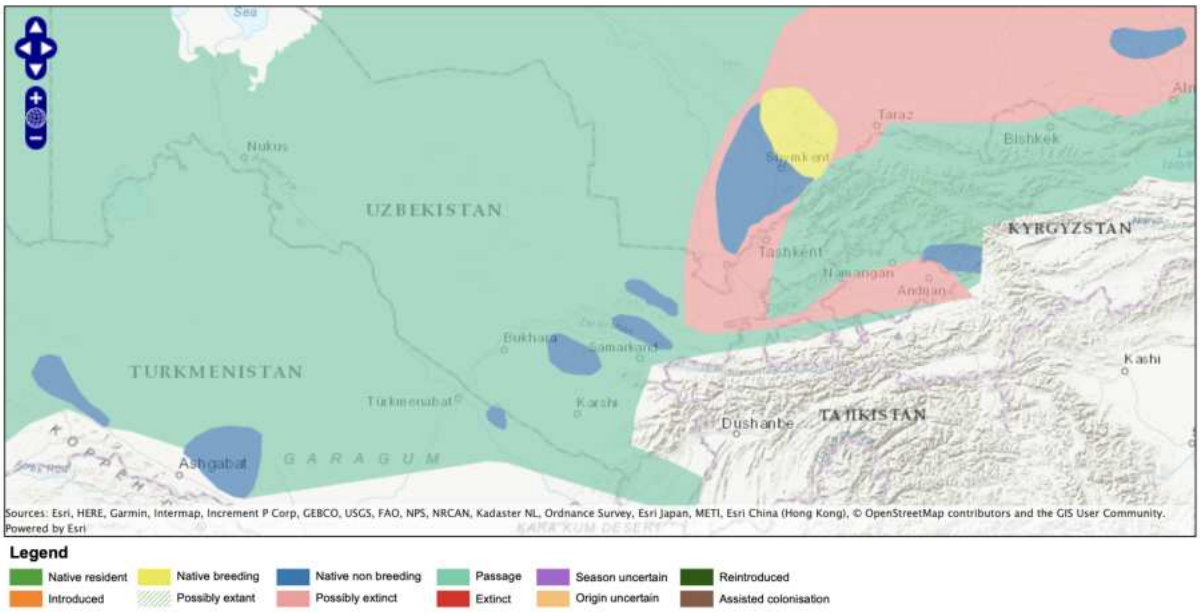

Figure 6-32 Distribution Map of Great Bustard

[28] BirdLife International (2024) Species factsheet: *Otis tarda*. Downloaded from https://datazone.birdlife.org/species/factsheet/great-bustard-otis-tarda on 25/04/2024.

6.2.8.3 BASELINE SURVEY RESULTS

One observation of this species was observed migrating on 20th March 2024 along the 70km OHTL (near VP17).

6.2.8.4 ANALYSIS

6.2.8.4.1 EAAA

The EAAA is a difficult concept to apply to long-range migratory species, as encompassing the full geographic range of such species would result in extremely large population extrapolations. With migratory birds, CHA generally follows the IUCN KBA standard, emphasizing areas that function as significant migratory stopover sites and/or bottleneck, with EAAA delineated to include the Project component(s) footprint plus a reasonable buffer based on the scale of the species' typical daily foraging movements, rather than its entire migratory route.

While winter home ranges of female bustards in Spain were less than 5 km in diameter, another study on a population of Great bustards resident in China indicates that the home range sizes for this species averages a width of 35 kilometres[29]. Other studies have shown that the foraging ranges Great bustards are generally less extensive within wintering habitats[30].

The AoI buffer was scaled based on the mean documented home range of the Great bustard. A 35-km wide AoI buffer was applied to the PV plant and BESS footprint, with regard to potential loss of suitable habitat. Likewise, the AoI of the 70-km OTL was defined as a 35-km buffer around the longitudinal span of the OTL route, where collision-related mortality is likely to occur. On this basis, the farthest perpendicular habitat location at which Great bustards are most susceptible to collision with overhead conductors is 35-km either side of the OTL route. It follows that any Great bustard habitats situated more than 35-km away from the OTL do not fall within the lateral buffer, which poses the highest risk for fatal collision with the powerline.

The Great bustard EAAA refers to the extent of suitable habitat intersecting the AoI of the OTL, where a regular occurrence of the species can be expected to occur. The delineation of the EAAA is a progressive process, which draws on literature surveys, field reconnaissance, subsequent habitat mapping surveys, and the outcomes of dedicated baseline surveys to validate and quantify the occurrence of this species in habitats that coincide with the AoI

[29] Kessler, Mimi & Batbayar, Nyambayar & Natsagdorj, Tseveenmyadag & Batsuuri, Dashnyam & Smith, Andrew. (2013). Satellite telemetry reveals long-distance migration in the Asian great bustard Otis tarda dybowskii. Journal of Avian Biology. 85287. 10.1111/j.1600-048X.2013.00072.x.

[30] Martinez. 2000. Daily Activity Patterns of Great Bustards Otis Tarda. Ardeola 47(1). Pp 57-68.

buffer. Prior to the start of baseline surveys for the Great bustard, a precautionary EAAA was defined as the entire extent of the AoI along the OTL route, as shown in Figure 6-33 below. This full-scale delineation approach has been applied in consideration of:

- The presence of multiple IBAs and protected areas within the Project's AoI.
- The vagrant and facultative patterns in the species' migration and overwintering activity, which may become increasingly frequent with prevailing stressors, such as habitat degradation and climate change.

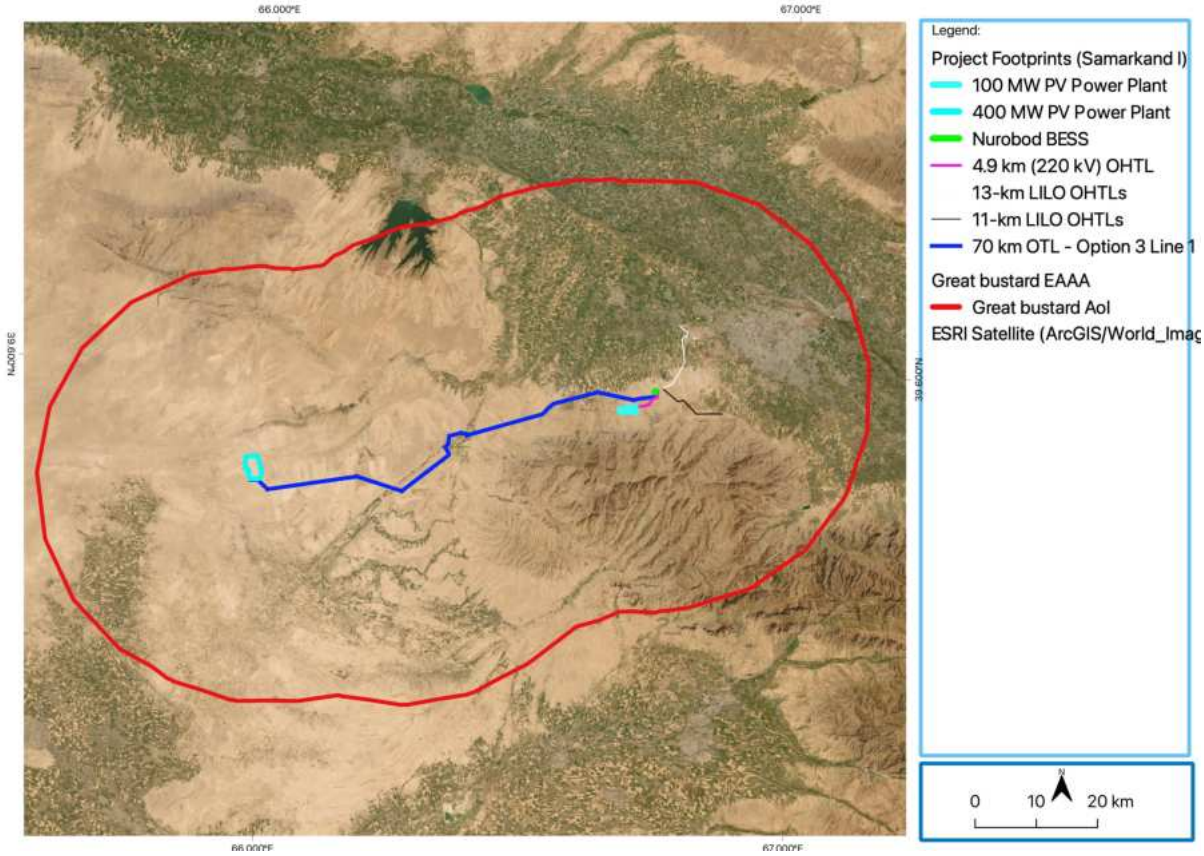

Figure 6-33 Area of Influence and precautionary EAAA for the Great bustard in relation to the project footprint

The EAAA was initially investigated based on secondary information[31] regarding suitable habitats within Samarkand and Kashakadaryo Regions, and the classification of the habitat landscape at the reconnaissance stage. Subsequently, migration monitoring (VP) and winter-bird surveys were conducted along the EAAA. and the wintertime survey placed particular focus on the most suitable potential habitat (i.e., flat, open areas with less disturbed, rainfed

[31] Mitropolskaya, Yuliya & Kashkarov, Roman & Ten, Anna. (2022). The historical and current status of the Great Bustard Otis tarda tarda in Uzbekistan, a key winter refuge. 44. 26-34.

crop fields and arid steppe landscapes). No sightings were reported across the VP (i.e., spring and autumn migration monitoring) surveys, however one isolated observation of a single Great bustard individual was recorded during the winter-time survey, along the 70-km OTL survey corridor.

As confirmed by the baseline surveys, the EAAA section with the most suitable potential habitat for the Great bustard is presented in Figure 6-3 below.

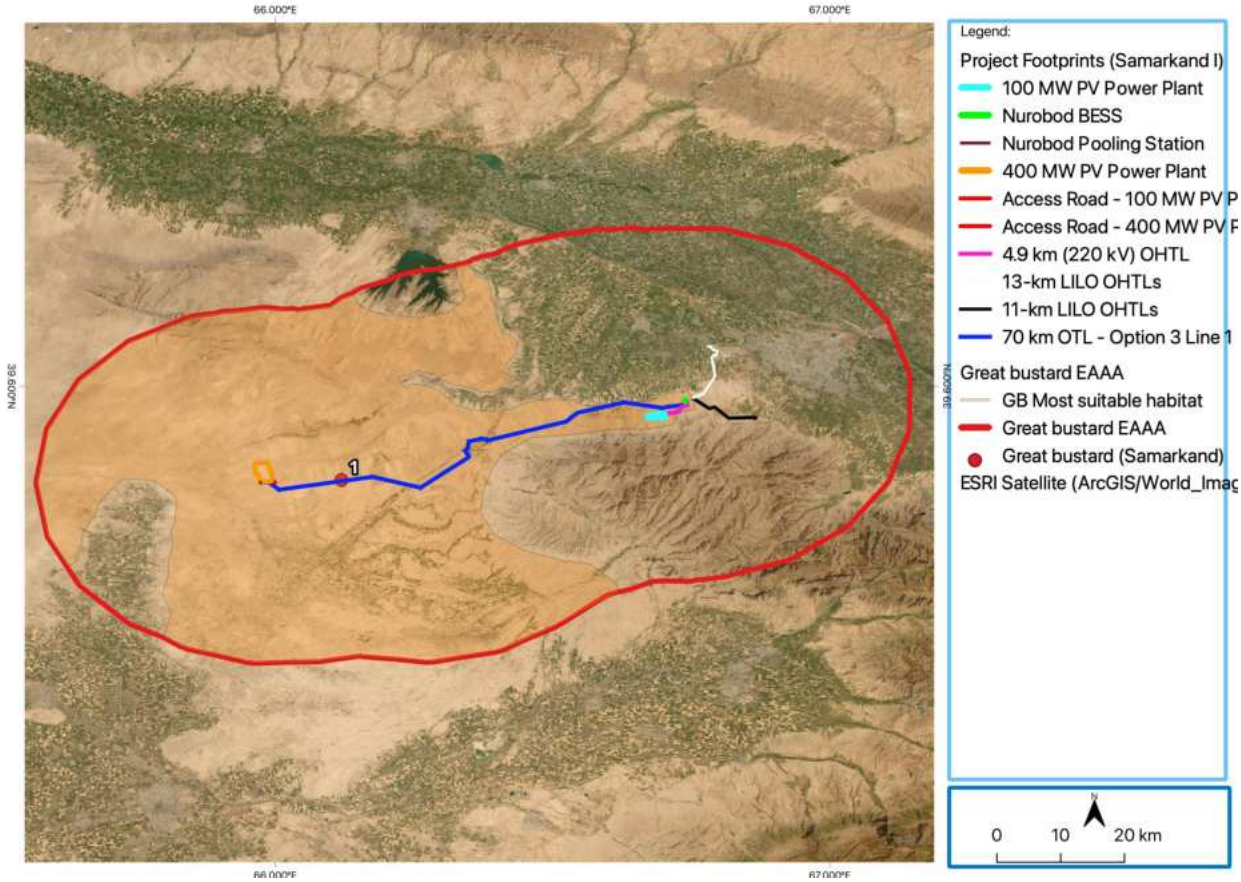

Figure 6-34 Section of the Great bustard EAAA with the most suitable potential habitat

6.2.8.4.2 Criticality

The global population of this species is estimated to range from 29,600-33,000 mature individuals. Taking a precautionary approach, the lower range is used to apply the thresholds.

- Under the IFC **Criterion 1** (EBRD Criterion 2), the threshold for Critically Endangered (CR) species is 0.5% of the global population, therefore the 0.5% criticality threshold would be 148 individuals.
- Under the IFC **Criterion 3** (EBRD criterion 4), the threshold is 1% of the global population using the EAAA on a regular/cyclical basis during migrations. This would amount to 296 individuals.

One individual was recorded at Vantage Point 17 along the 70 km OHTL baseline studies spanning across Autumn and Spring migration seasons.

The Great Bustard is not listed as an IBA trigger species among the IBAs/ KBAs in and around the EAAA. However, 24 individuals were recorded wintering is the Zarafshan Nature Reserve between 2007 and 2008. During the migratory period Great Bustards are also occasionally seen on the Karnabchul steppe (6 birds in 2009 and 2 birds in 2013) [32]. Therefore, as only one individual was recorded during the baseline surveys and a total of 32 individuals were recorded between 2007 and 2013 in the EAAA, it is considered unlikely that that the EAAA population comprises of more than 148 individuals under the IFC **Criterion 1a** (EBRD Criterion 2) or more than 296 individuals under the IFC **Criterion 3** (EBRD criterion 4). Furthermore, the population recorded during the baseline surveys represents less than 0.04% of the global population and may not constitute an important concentration of a nationally CR species under **Criterion 1c**.

Therefore, this species does not trigger CH status but is considered a Significant Biodiversity Value (SBV) and Priority Biodiversity Feature (PBF), due to its Endangered (EN) conservation status on the IUCN Red List and Critically Endangered (CR) status in the National Uzbekistan Red Data Book.

By the IFC PS 6 and EBRD PR 6, no Net Reduction is required for the Great bustard PBF habitat, to ensure no significant residual impact that could lead to a material change in the population. The project ESIA and Biodiversity Action Plan (BAP) will address this NNL requirement via the biodiversity impact assessment, mitigation commitments, contingent offset plan, and loss-gain analysis.

The following avoidance, mitigation and offset measures will be relevant to the Great bustard habitat within the EAAA for this project component, in the context of the Project's Cumulative Impact Assessment (CIA):

- Mitigation involving the adoption of Bird Flight Diverters (BFDs) along the 4.9-km and 70-km OTLs with the exception of highly modified, built-up sections of the EAAA corridor (i.e., town areas).
- Contingent offset plan applicable to a section of critical wintering habitat along the 350-km component planned under the co-located Samarkand II PV and BESS Project. The plan will prioritize the prospect of undergrounding existing or decommissioned, non-project transmission lines in agreement with competent authorities, among other offset alternatives, which are elaborated in the ESIA report for the Samarkand II PV and BESS Project.

[32] Mitropolskaya, Yuliya & Kashkarov, Roman & Ten, Anna. (2022). The historical and current status of the Great Bustard Otis tarda tarda in Uzbekistan, a key winter refuge. 44. 26-34.

6.2.9 Asian Houbara

The Asian Houbara (*Chlamydotis macqueenii*) is a native breeding resident in Uzbekistan, listed as Vulnerable (VU) species on the IUCN Global Red List, and Vulnerable (VU) in the Uzbekistan National Red Data Book.

The CHA Screening exercise found that this species should be further investigated in the CHA against **IFC PS 6 Criteria 1 & 3 / EBRD PR 6 Criteria 2 & 4**.

6.2.9.1 ECOLOGY

This species inhabits arid sandy semi-desert with tussock grass, flat bare stony plains with xerophytic and halophytic scrubs. Furthermore, this species often visit marginally cultivated areas in non-breeding periods.

This species has a variable diet and are opportunistic feeders. This can include vegetation such as fruits, seeds, shoots, leaves and flowers as well as insects and various invertebrates such as small snakes and lizards. In Iran, wintering birds often visit crops of alfalfa and rocket (Aghanajafizadeh et al 2010).

Males attract females with an extravagant courtship display which they perform at the same site each year. The display begins with a period of strutting and culminates with the male retracting his head within an ornamental shield of erected neck feathers and then running at speed in either a straight or curved line. The display is often accompanied by a series of subsonic booming calls (Gaucher *et al*. 1996). Females create a shallow scrape in the ground in which they typically lay 3-4 eggs, and occasionally up to six eggs in long-distance migrants (Collar 1996, Combreau *et al*. 2002). The incubation period is typically 24 days, whilst fledging takes around 35 days.

This species has suffered severe declines from overhunting, both by local people using guns and by visiting Arab falconers. Hunting is a particular threat in the winter quarters and has resulted in ongoing decline in Arabia, Iran and Iraq as well as in Pakistan and Kazakhstan. In addition to hunting, threats include intensive agricultural practices, human disturbance and habitat degradation through livestock overgrazing. Powerlines are a known cause of mortality, at least in Uzbekistan (Burnside et al. 2015).

Ongoing conservation measures include captive breeding schemes to provide substitute quarry for falconers and for restocking. However, mortality rates of released birds appear to be too high to mitigate and compensate for the loss of wild adults to hunting (Burnside et al. 2016).

The following image shows the nests of captive-bred and wild Asian Houbara.

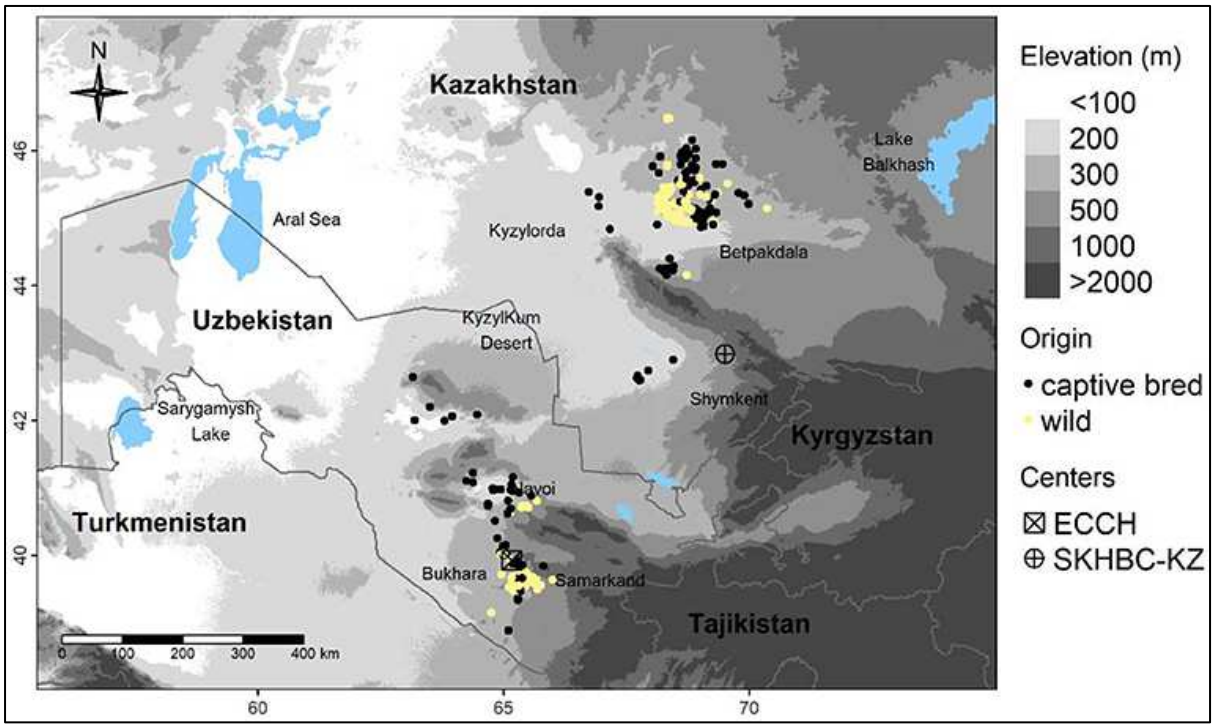

Figure 6-35 Map of Asian Houbara nest locations across Kazakhstan and Uzbekistan[33]

6.2.9.2 DISTRIBUTION

This species can be found in the Middle East and Arabian in the East to Iran and in Pakistan to the West. Central Asian populations are strongly migratory, leaving their breeding grounds in August-October on trans-Himalayan migration, and arriving September-November in their wintering grounds. Birds return north again in March-April. It breeds in Kazakhstan and Iran to Mongolia and Northern China. It winters in the Persian Gulf to Pakistan, India and China (del Hoyo, Collar and Garcia 2020).

Asian houbaras generally prefer to inhabit arid and sandy, semi-desert as well as bare stony plains with shrubs. A recent review of the species in Uzbekistan showed three key areas used by Asian Houbara for wintering; the Northern Shore of Aydarkul Lake and the Zarafshan nature reserve and adjacent foothill plains of the Zaravshan range, but during the migratory period

[33]Azar, J. F., Ferlat, C., Landsmann, C., Hingrat Y. 2022. Timing of Release Influence Breeding Success of Translocated Captive-Bred Migrant Asian Houbara Bustard. Front. Conserv. Sci., 22 February 2022 Volume 3 - 2022 | https://doi.org/10.3389/fcosc.2022.815506

they are also occasionally seen on the Karnabchul steppe. Captive breeding programs have been operational since 2015 and up to 10,400 Asian Houbara were released into the wild.

The species globally has a large EOO of 13,200,000 km^2.

As of 2014 the global population is estimated to be between 78,960 and 97,000 individuals globally (O. Combreau *in litt*. 2014, BirdLife International 2014), and more recent estimates expect the population to be roughly 50,000-99,999 individuals, equating to 33,000-67,000 mature individuals.

A study in 2017 compared satellite telemetry of migratory behaviour of wild and captive-bred Asian Houbara nesting individuals. These individuals were released from suitable nesting habitat in the Bukhara province of Uzbekistan (Burnside, Collar and Dolman 2017).

The following image shows the comparison of the migratory route taken by these individuals.

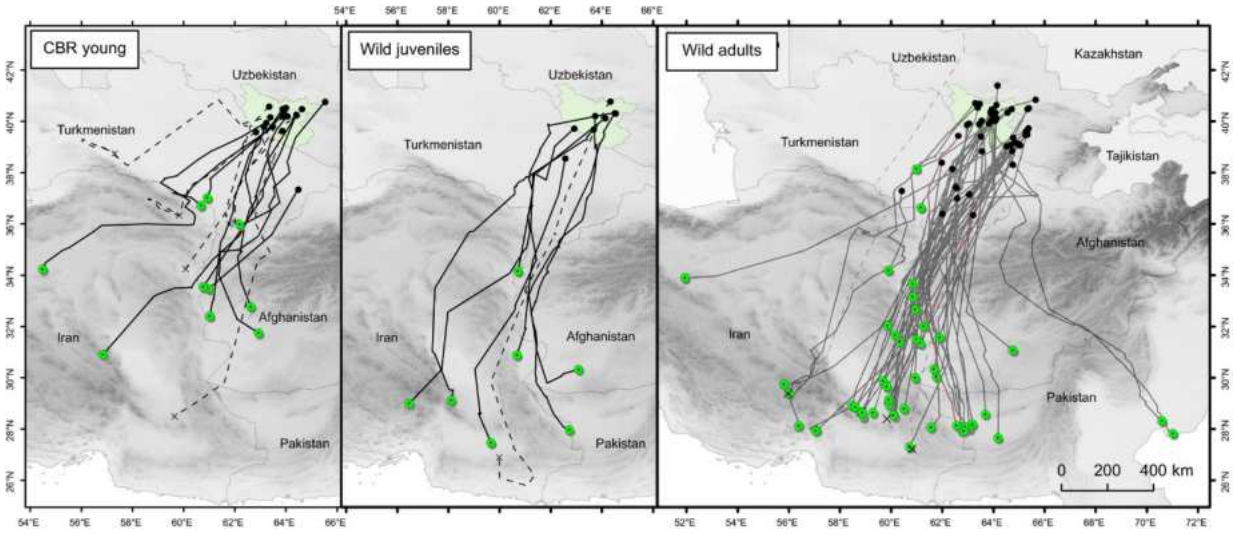

Figure 6-36 Map of Asian Houbara (Captive-bred vs Wild) autumn migration [34]

The figures below show the species distribution, both global and within Uzbekistan.

[34]Burnside, R.J., Collar, Ni.J., Dolman, P.M. (2017). Comparative migration strategies of wild and captive-bred Asian Houbara Chlamydotis macqueenii. *IBIS* 159 (2) pg 374-389. https://doi.org/10.1111/ibi.12462

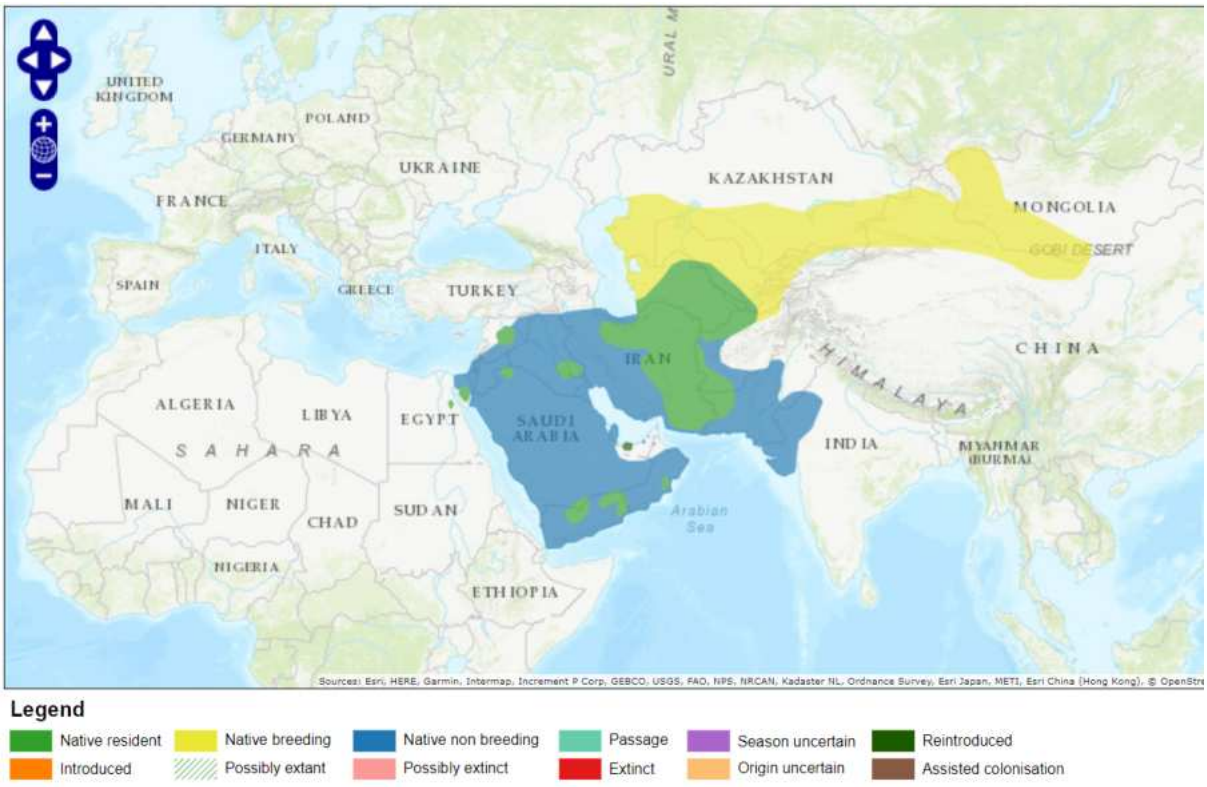

Figure 6-37 Distribution Map of Asian Houbara [35]

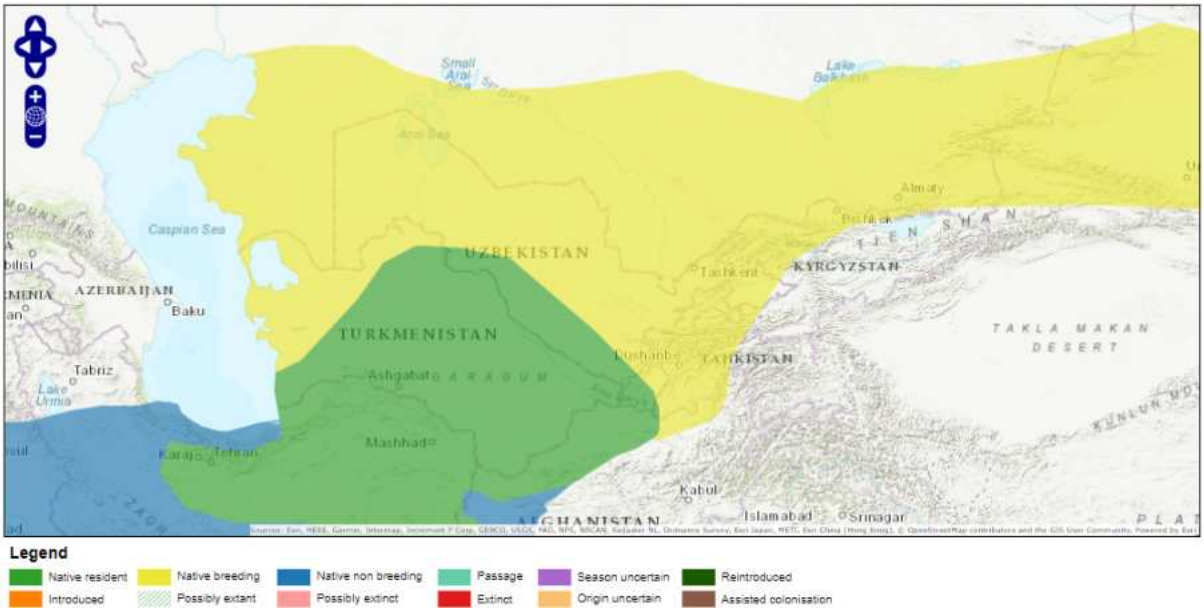

Figure 6-38 Distribution Map of Asian Houbara

[35] BirdLife International (2024) Species factsheet: Asian Houbara *Chlamydotis macqueenii*. Downloaded from https://datazone.birdlife.org/species/factsheet/asian-houbara-chlamydotis-macqueenii on 27/08/2024..

6.2.9.3 BASELINE SURVEY RESULTS

No observations of Asian Houbara was recorded during the Asian Houbara Survey on March 20-21 or March 29, 2024.

6.2.9.4 ANALYSIS

6.2.9.4.1 EAAA

The EAAA is a difficult concept to apply to long-range migratory species, as encompassing the full geographic range of such species would result in extremely large population extrapolations. With migratory birds, CHA generally follows the IUCN KBA standard, emphasizing areas that function as significant migratory stopover sites and/or bottleneck, with EAAA delineated to include the Project component(s) footprint plus a reasonable buffer based on the scale of the species' typical daily foraging movements, rather than its entire migratory route. The home range of the Asian houbara averages about 25 km in width.[36]

The AoI buffer was scaled based on the mean documented home range of the Asian houbara. A 25-km wide AoI buffer was applied to the PV plant and BESS footprint, with regard to potential loss of suitable habitat. Likewise, the AoI of the 70-km OTL was defined as a 25-km buffer around the longitudinal span of the OTL route, where collision-related mortality is likely to occur. The delineation of the EAAA is a progressive process, which draws on literature surveys, field reconnaissance, subsequent habitat mapping surveys, and the outcomes of dedicated baseline surveys to validate and quantify the occurrence of this species in habitats that coincide with the AoI buffer.

Prior to the start of baseline surveys for the Asian houbara, a precautionary EAAA was defined as the entire extent of the AoI along the project corridor, as shown in Figure 6-39 below. This full-scale delineation approach has been applied in consideration of:

- The presence of multiple IBAs and protected areas within the Project's AoI.
- Changing and vagrant patterns in the species' short-range migration and breeding activity, which may become increasingly frequent with prevailing stressors, such as habitat degradation and climate change.

[36] Combreau, O. & Rambaud, F. (1994). The houbara bustard program in Mahazat as-Sayd, April 1992–November 1994, Final report. Unpublished report, NWRC. Taif, Saudi Arabia. 201 pp;
Combreau .O. et al. 1999. Home range and movements of houbara bustards introduced in the Najd Pediplain in Saudi Arabia. Journal of Arid Environments (2000) 44: 229}240;
Judas. J. 2006. Migration and range use of Asian Houbara Bustard Chlamydotis macqueenii breeding in the Gobi Desert, China, revealed by satellite tracking. Ibis (2006), 148, 343–351

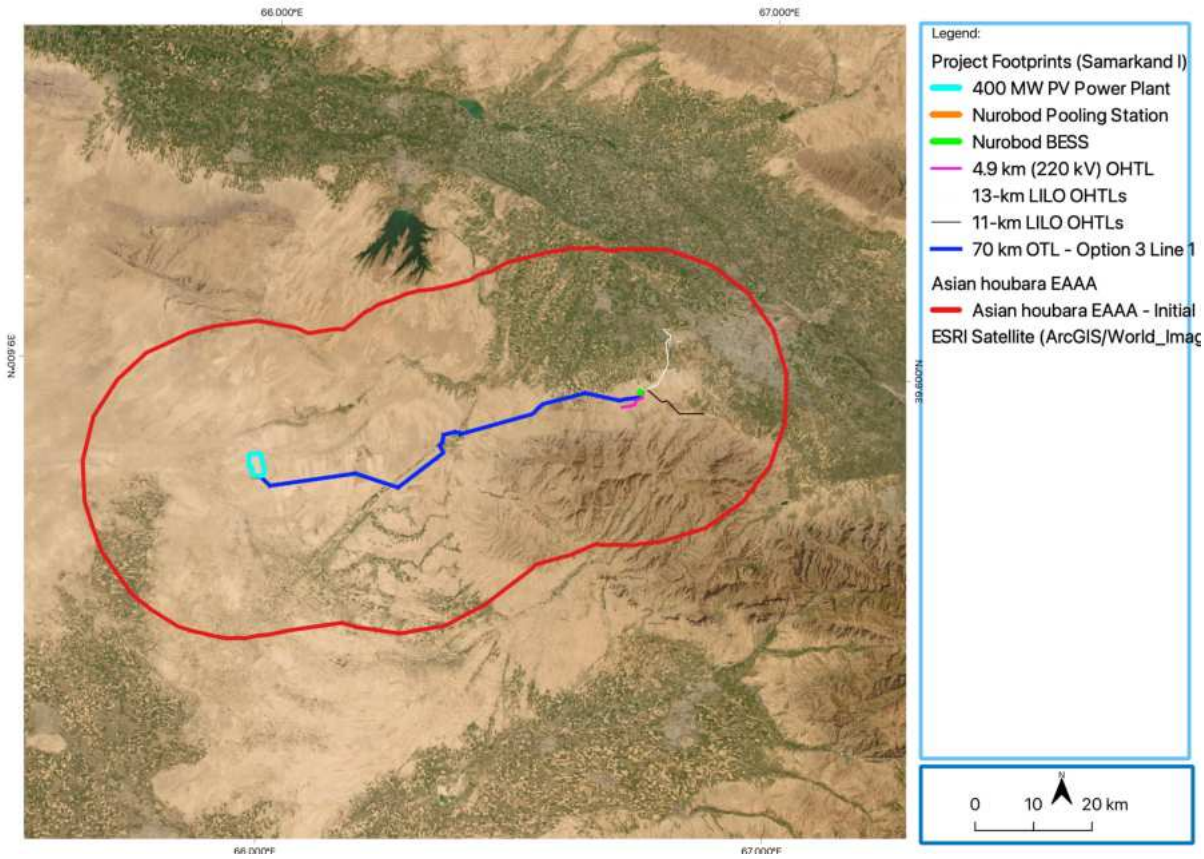

Figure 6-39 Area of Influence and precautionary EAAA for the Asian houbara in relation to the project footprint

The EAAA was initially investigated based on secondary information regarding suitable habitats within Samarkand and Kashkadaryo Region, and the classification of the habitat landscape at the reconnaissance stage. Subsequently, migration monitoring (VP), winter-bird and breeding-bird (spring-time) surveys were conducted along the EAAA, and the Spring-time point count survey placed particular focus on EAAA sections with the most suitable potential habitat (i.e., flat, open, sandy areas with less disturbed, arid steppe landscapes and sparse, low-lying shrubs (<0.5 cm)). No sightings of the Asian houbara were reported in the VP and winter-bird surveys. More importantly, the species was not found within the project site and surrounding EAAA during the dedicated round of survey in the species' courtship season.

As confirmed by the baseline surveys, the EAAA section with the most suitable potential habitat for the Asian houbara is presented in Figure 6-40 below.

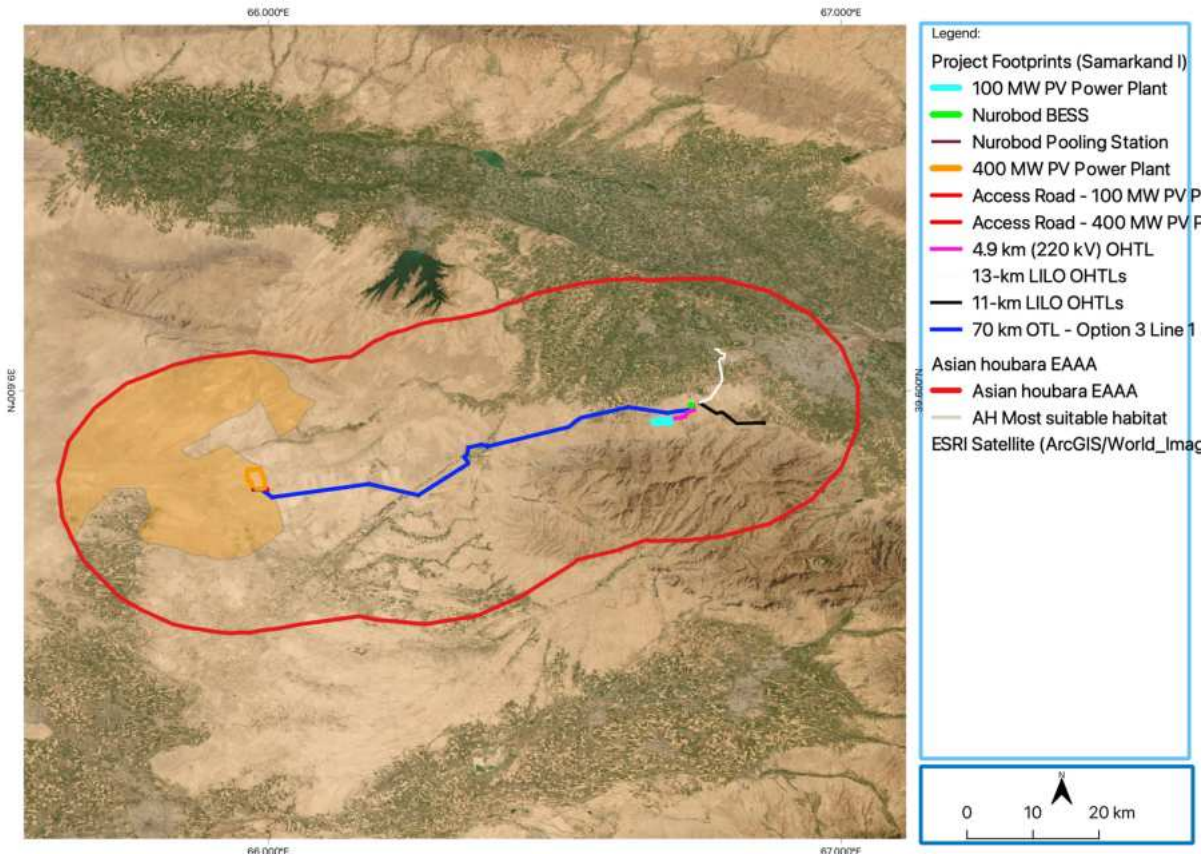

Figure 6-40 Section of the Asian houbara EAAA with the most suitable potential habitat

6.2.9.4.2 Criticality

The global population of this species is estimated to range from 50,000-99,999 individuals. Taking a precautionary approach, the lower range is used to apply the thresholds.

- Under the IFC **Criterion** 1 (EBRD Criterion 2), the threshold for VU species is EAAAs that support a globally important concentration of the global population such that the loss of the EAAA population would result in uplisting to CR/EN status and meet the quantitative thresholds of Criterion 1.
- Under IFC **Criterion 3** (EBRD Criterion 4), the threshold is 1% of the global population using the EAAA on a regular/cyclical basis during migrations. This would amount to 500 individuals.

No observations of this species nor evidence of breeding were recorded during the dedicated Asian Houbara Surveys, however secondary information on the presence of the species' nesting sites on the western extremity of the final EAAA indicates the potential for its occurrence within the project AoI. Furthermore, no IBAs triggered by Asian houbara populations are present within the Project's AoI and EAAA. The lack of direct observations in the species' breeding season and scant information on the occurrence of the species within the AoI indicates that this species likely does not have an EAAA population of more than 500

individuals nor a globally important concentration the loss of which would trigger uplisting to CR/EN status.

Therefore, this species does not trigger CH status. However, it is designated as a Significant Biodiversity Value (SBV) and Priority Biodiversity Feature (PBF), on a precautionary basis, considering its VU conservation status (on the IUCN Red List and in the National Uzbekistan Red Data Book) and the secondary information on its occurrence in or nearby the western front of the EAAA. The impact on the species' PBF habitat will be assessed in the ESIA, and mitigation commitments to avoid any significant residual impacts on this habitat will be established.

6.2.10 Little Bustard

The Little Bustard (*Tertax tetrax*) is a passage and wintering migrant in Uzbekistan, listed as Near Threatened (NT) species on the IUCN Global Red List, and Vulnerable (VU) in the Uzbekistan National Red Data Book. It is a fairly cryptic steppe species, which is gregarious outside of its breeding season. The Little bustard favours open, heterogenous agricultural landscapes which provide an advantageous balance between forage availability and visibility, ease of foraging mobility, and sheltered habitats (Alonso et al, 2020).

The CHA Screening exercise found that this species should be further investigated in the CHA against the **IFC PS 6 Criteria 1 & 3 / EBRD PR 6 Criteria 2 & 4.**

6.2.10.1 ECOLOGY

The Little bustard inhabits steppe and steppe-like landscapes, such as level or undulating short-grass plains, rich pasturelands, fallow areas as well as certain cultivation areas (particularly legume crops). These birds prefer areas with high diversity of plant species and high abundance of arthropods and thus they prefer pastures to arable land.

The species feed on beetles, grasshoppers and terrestrial invertebrates as well as plant materials. Generally, their diet is predominantly invertebrate biomass in summer and plant material in winter. Breeding generally occurs in February – June. The nests are shallow scrapes in dense-short grass.

Despite its status as Near Threatened (NT), this species has faced particular decline in the past, particularly in the western part of its range. This is largely due to habitat loss from agricultural intensification. Agricultural intensification affects both habitat availability as well as habitat quality through processes such as reduction of fallows and set-asides, the expansion of irrigated and arboreal crops, decline of food availability due to increased insecticide use as well as overgrazing. In addition, shooting and hunting may still be additional pressure faced by this species.

6.2.10.2 DISTRIBUTION

The species globally has a large EOO of 14,700,000 km2.

The global population (excluding 20,000 individuals in Kazakhstan) was previously estimated at a minimum of 240,000 individuals (C. Martínez in litt. 1999). In 2015, the European population was estimated to be 122,000-240,000 mature individuals and therefore placed in the band 100,000-499,999 individuals.

This species is found in Morocco and Iberia to France, Sardinia and possibly Italy, as well as Ukraine and Russian through Kazakhstan and Kyrgyzstan as well as China and Iran. This species winters from the Mediterranean through Turkey and Caucasus to Iran as well as Southern Asia (erratically).[37] It is largely sedentary or dispersive in central and south Iberia, south-east France, Sardinia and Italy and migratory in central and west France with southward shifts within the country in September to October and returns in March and April. Birds from Russia, Kazakhstan and the rest of the Asian range are also migratory where bird move at similar timings to and from Iran, Azerbaijan or elsewhere in south Asia.

The global population of the Little bustard can be split into the 'Eastern range' and 'Western range' sub-populations. Both categories include resident, partially migrating and fully migrating populations, and the main distinction appears to be preference for wintering habitats. Developing research indicates that Eastern range bustards are more dependent on grazed-grass, shrub-steppe and littoral shrub-steppe (grassland) habitats in the winter, whereas the Western range variety prefers to overwinter in extensive cereal farmland and intensive legume (i.e., alfalfa) farmland.

In terms of migration patterns, migrant populations of the Little bustard are understood to range between the temperate zones North of the Black and Caspian seas, and arid continental and semi-arid zone South of the seas. Most of the migrant population in the Eastern range breeds in Russia and Kazakhstan. Upon the onset of the harsh Northern winters, the southward migration traverses Uzbekistan, Tajikistan, Afghanistan, Azerbaijan and Iran. The greatest wintering populations have been recorded in Azerbaijan (150 to 200,000) and Iran (57,000). In Tajikistan, population sizes ranging between 150 and 4,000 have been reported in the valley habitats of Jaran Valley and Syr Darya, albeit recent populations have dropped significantly (Vicent et al, .

[37] Collar, N., E. F. J. Garcia, and E. de Juana (2020). Little Bustard (Tetrax tetrax), version 1.0. In Birds of the World (J. del Hoyo, A. Elliott, J. Sargatal, D. A. Christie, and E. de Juana, Editors). Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.litbus1.01

In Uzbekistan, the Amu Darya floodplain and winter crop farmland habitats near Termez in Surkhandarya Region constitute the most prominent wintering habitat, where annual aggregations totalling 1,500, 140, 1,400 and 1,980 were recorded in 2001, 2002 and 2018 respectively, in the winter months of January and February. Other hotspots identified in Uzbekistan include the Kyzylkum dessert (Bukara Region), where a maximum count of 16 passage (migrating) bustards was recorded in 2015. In February 2024, another wintering hotspot comprising wheat and alfalfa cropland was identified in Zomin District (Jizzakh Region), through three separate sightings with an estimated count of 7,000 individuals. The wintering habitats reported to date appear to be interspersed with fallow land and arid steppe. In addition, dozens of passage migrants were sighted in the natural steppe habitats spanning wildlife sanctuary biotope in Nurobod District (Samarkand Region) (Vincent et al, 2022, E-Bird 2024).

Populations of this species haven been noted to be declining in most countries. In general, agricultural intensification affects both habitat quality (reduction of fallows and set-asides, the expansion of irrigated and arboreal crops, the decline in arthropod availability due to pesticides use as well as the loss of ground cover to overgrazing (de Juana 2009).

The figures below show the species distribution, both global and within Uzbekistan.

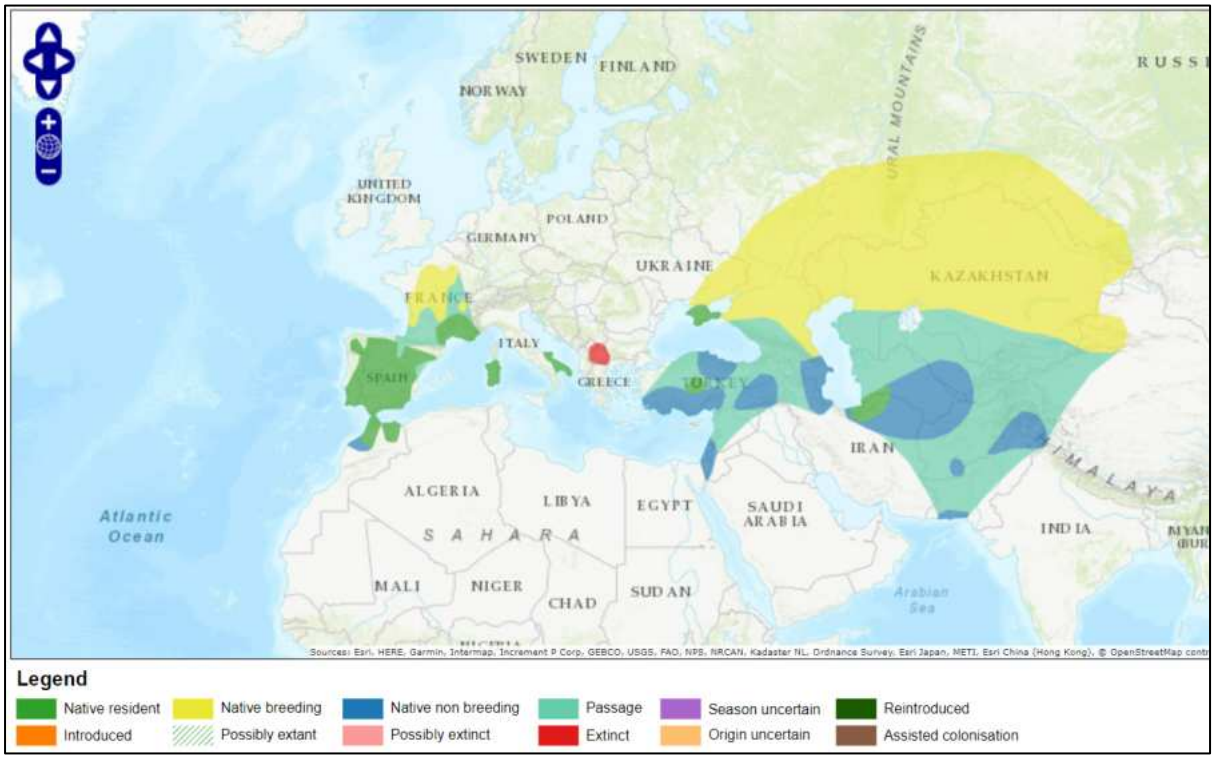

Figure 6-41 Distribution Map of Little Bustard [38]

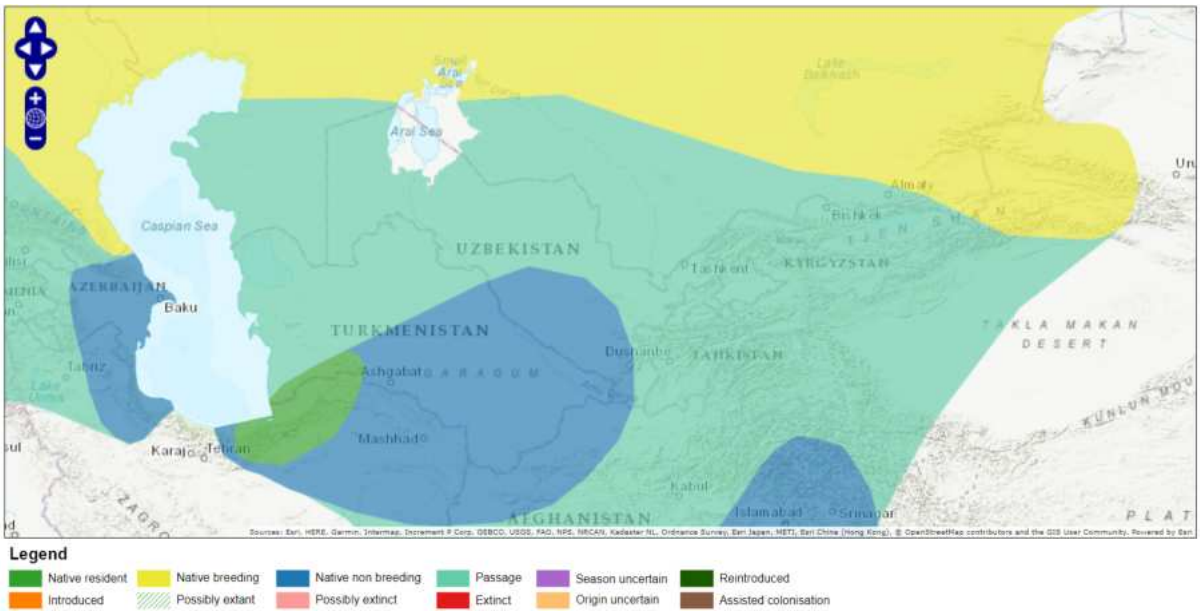

Figure 6-42 Distribution Map of Little Bustard

[38] BirdLife International (2024) Species factsheet: *Otis tarda*. Downloaded from https://datazone.birdlife.org/species/factsheet/great-bustard-otis-tarda on 25/04/2024.

6.2.10.3 BASELINE SURVEY RESULTS

Baseline surveys to identify stopover and wintering habitats of the Little bustard within the Project's Area of Influence (AoI) involved migration monitoring surveys including a total of four Vantage Points (VPs) sited within potentially suitable habitats along the 220 kV (4.9-km, 70-km and LILO) OTL corridors. These surveys were aimed at capturing passage migrants and two migration seasons were covered (i.e., Autumn of 2023 and Spring of 2024). In addition, an opportunistic point count survey was also undertaken in the Spring season of 2024, to investigate the occurrence of the species within a portion of natural habitat within the South-Western extremity of the OTL AoI, in Nurobod District. A wintering bird survey was conducted in the winter of 2024 (January to February) along the entire stretch of the OTL route, with search efforts involving driven transects and point counts from elevated VPs.

Two observations of this species were sighted migrating along the 70km OHTL (near VP 16 and 17), in the Autumn (November) of 2023.

2006 observations of Little Bustard were recorded migrating in the Spring (March 20-21 and March 29, 2024) of 2024 within the AoI of the 70-km OTL (West of the 400 MW PV plant). This marks the largest official sighting of the Little bustard in Nurobod District and the wider Samarkand Region.

Very limited studies have focused on extent of Little bustard activity in Uzbekistan, and no tracking research has been implemented to trace the migratory circuits of this migrant species. The bustard is a cryptic species which exhibits conspecific roosting and foraging aggregations beyond the breeding season. Recent studies have shown that the species employs a mobile foraging strategy, which involves the use of arthropod-rich, arid steppe grassland, fallow land, sparse cereal and legume farms, and moderately grazed pastures in the Spring, and the exploitation of agricultural mosaic with sheltered or remote irrigated portions, in the Winter. A number of studies have shown that Little bustards generally prefer remote and sheltered habitats during the breeding season, and avoidance of anthropogenic land-use including transit corridors and overhead powerlines is more common at this time. Site fidelity appears to be significant for overwintering grounds in Uzbekistan, however, the use of stopover habitats is more facultative for passage migrants.

6.2.10.4 ANALYSIS

6.2.10.4.1 EAAA

Since presence of the species has been confirmed, the EAAA must be delineated.

The EAAA is a difficult concept to apply to long-range migratory species, as encompassing the full geographic range of such species would result in extremely large population extrapolations. With migratory birds, CHA generally follows the IUCN KBA standard, emphasizing areas that function as significant migratory stopover sites and/or bottleneck, with EAAA delineated to include the Project component(s) footprint plus a reasonable buffer based on the scale of the species' typical daily foraging movements, rather than its entire migratory route.

The delineation of the EAAA for the Little bustard requires an understanding of the species' migration cycle, documented Areas of Occupancy (AOO) and biotopes which are potentially suitable for overwintering, migration stopovers, and related aggregation.

The Area of Influence (AoI) of the 220 kV OTLs can be defined as a 12-km buffer around the longitudinal span of the OTL routes, where collision-related mortality is most likely to occur. This buffer has been scaled based on the maximum documented home range of the Little bustard. In the breeding season, daily dispersal ranges ranging between 5 km and 12 km have been reported for the Little bustard (Silva et al, 2013). On this empirical basis, the farthest perpendicular habitat location at which Little bustards are most susceptible to collision with overhead conductors is 12-km either side of the OTL routes. It follows that any Little bustard habitats situated more than 12-km away from the OTL do not fall within the lateral buffer, which poses the highest risk for fatal collisions with the powerline.

The Little bustard EAAA refers to the extent of suitable habitat across the AoI of the OTLs, where a regular occurrence of the species can be expected to occur. The delineation of the EAAA is a progressive process, which draws on literature surveys, field reconnaissance, subsequent habitat mapping surveys, and the outcomes of dedicated baseline surveys and stakeholder consultations, to validate and quantify the occurrence of this species in habitats that coincide with the AoI buffer.

Prior to the start of baseline surveys for the Little bustard, a precautionary EAAA was defined as the entire extent of the AoI along the OTL route, as shown in Figure 6-43. This full-scale delineation approach has been applied in consideration of:

- The presence of multiple IBAs and protected areas within the Project's AoI.
- The vagrant and facultative patterns in the species' migration and overwintering activity, which may become increasingly frequent with prevailing stressors, such as habitat degradation and climate change.

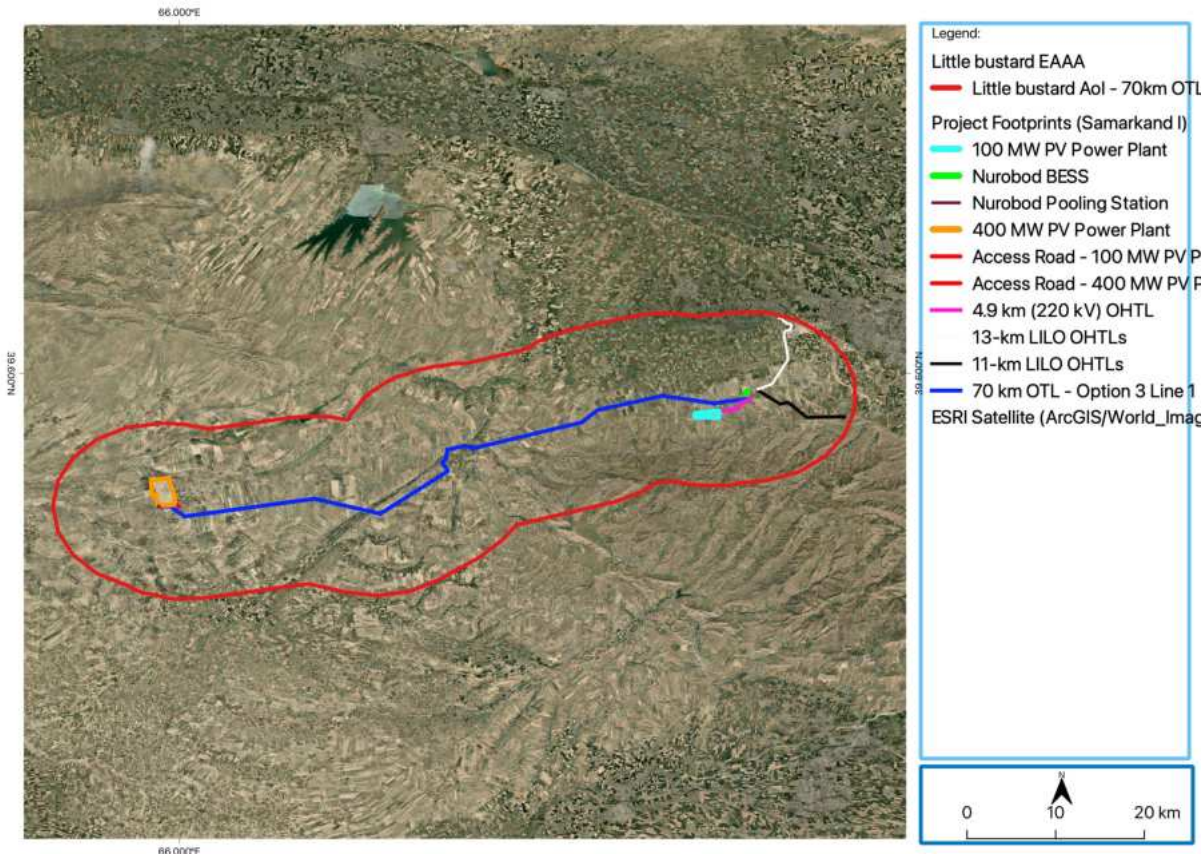

Figure 6-43 Area of influence and precautionary EAAA for the Little bustard in relation to the project footprint

The EAAA was initially investigated based on secondary information regarding suitable habitats within Samarkand and Kashakadaryo Regions, and the classification of the habitat landscape at the reconnaissance stage. Subsequently, migration monitoring (VP) and winter-bird surveys were conducted along the EAAA, and the winter-time surveys placed particular focus on EAAA sections with the most suitable potential habitat (i.e., rainfed open cultivation intertwined with temporary and permanent pastural land).

Baseline information gathered from the continuum of habitats uncovered a Spring-time concentration of the species within a natural, steppe habitat located in the Western extremity of the 70-km OTL AoI. Substantially smaller observations were recorded coincidentally in nearby fallow land and disturbed grassland. A kernel polygon was derived from the string of Little bustard observations within the variably disturbed steppe landscape in and around the 70-km OTL route. This polygon represents the EAAA section with the most suitable potential habitat for the Little bustard.

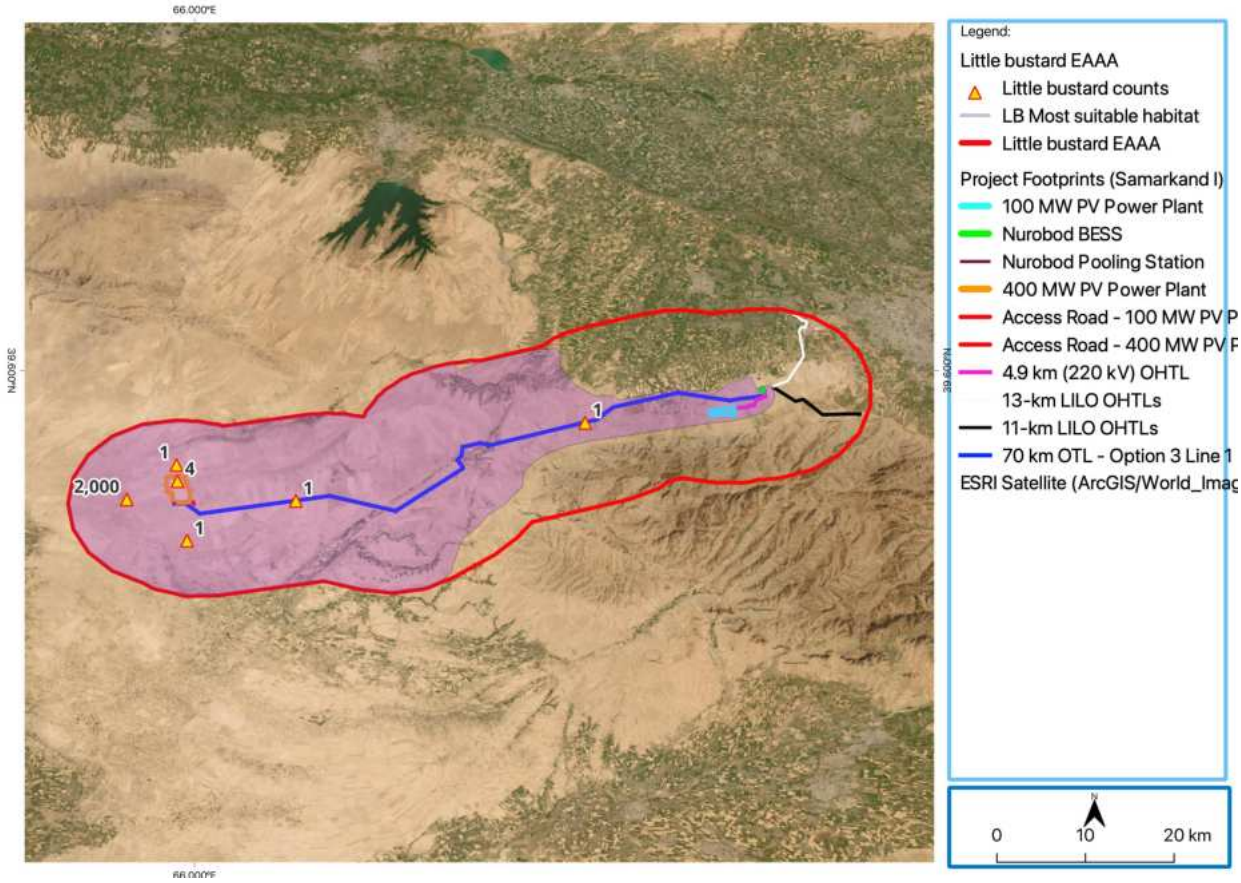

Figure 6-44 Section of the Little bustard EAAA with the most suitable potential habitat (highest number of Little bustard observations)

6.2.10.4.2 Criticality

The global population of this species is estimated to range from 100,000-499,999. Taking a precautionary approach, the lower range is used to apply the thresholds.

Under the IFC **Criterion 3** (EBRD Criterion 4), the threshold is 1% of the global population using the EAAA on a regular/cyclical basis during migrations. This would amount to 1000 individuals.

No IBAs triggered by Little bustard populations are present within the Project's AoI and EAAA. Nevertheless, the baseline survey indicates that the EAAA not only provides suitable habitat capable of supporting a population of over 1,000 individuals, but also contains a significant population of this species. Extrapolation methods for population estimation within the EAAA were not adopted considering the high variance in population densities and dynamic ranging patterns of the species.

Therefore, habitat criticality is triggered under the IFC Criterion 3 (EBRD Criterion 4). Net Gain is therefore required to ensure a net positive impact for the species population and/or habitat.

The project ESIA and BAP will address this requirement via the biodiversity impact assessment, mitigation commitments, contingent offset plan and loss-gain analysis.

6.2.11 Yellow-Eyed Pigeon

The Yellow-eyed Pigeon (*Columba eversmanni*) is a native resident in Uzbekistan. It is listed as Vulnerable (VU) on the Global IUCN Red List and Vulnerable (VU) in the National Uzbekistan Red Data Book.

The CHA Screening exercise found that this species should be further investigated in the CHA against **IFC Criterion 1 / EBRD Criterion 2.**

6.2.11.1 ECOLOGY

The Yellow-eyed Pigeon primarily inhabits open, semi-desert regions with sparse vegetation and scattered trees, essential for breeding. The species nests in trees and occasionally on abandoned buildings, thriving at various elevations but predominantly at lower altitudes. It prefers areas minimally affected by human activities, though it sometimes ventures into agricultural lands to forage. During winter, the pigeon is found in open areas with scattered trees, often amid agricultural crops or near fruiting trees where it feeds and roosts in groups. Notably, its population is on the rise in the western Thar Desert, characterized by extreme temperatures and sparse thorny vegetation and grasses (D. L. Bohra, 2014).

The breeding season of Yellow-eyed Pigeon typically spans from late April to July. These birds are monogamous, frequently returning to the same nesting sites each year, where they usually lay 1-2 eggs per clutch. Both parents contribute to incubating the eggs and raising the young (Baptista et al. 2020). They exhibit a broad range of nesting preferences, utilizing holes in trees, buildings, cliffs, earth banks, and potentially power lines. The species is found in diverse habitats including steppe, semi-arid and desert areas, often near human settlements and, in regions like Kazakhstan, within woodland environments. They are also known to breed in mountain valleys close to water sources (D. L. Bohra, 2014; Baptista et al. 2020).

Primarily granivorous, the Yellow-eyed Pigeon's diet consists mostly of seeds collected from the ground, including grass seeds, arable crop seeds and the fruit of trees and shrubs, including Zizyphus and mulberry. During the breeding season, they may also consume insects and small invertebrates to meet the increased nutritional demands.

Yellow-eyed Pigeons are gregarious outside of the breeding season, often forming large flocks that can include other pigeon species. Their flight is fast and direct, with regular glides and the characteristic sharp wing claps typical of pigeons when taking off.

Key threats to Yellow-eyed Pigeon include habitat degradation due to agricultural expansion and intensification, which reduces their feeding and nesting sites. Hunting and trapping for

sport and food also significantly impact their populations. Environmental pollutants and the use of pesticides in agriculture pose additional risks by contaminating their food sources.

In terms of conservation, there is a pressing need for targeted actions such as habitat preservation, sustainable agricultural practices, and strict regulation of hunting activities to ensure the survival of this unique species.

6.2.11.2 DISTRIBUTION

The Yellow-eyed Pigeon primarily resides within its range but exhibits migratory behavior, moving southward to Pakistan and northwestern India during the colder months from breeding grounds in Kazakhstan, Turkmenistan, and Uzbekistan. Although the species is considered rare throughout most of its range, it has historically faced declines due to hunting pressure and habitat loss in both breeding and wintering areas. While there have been reports of local population increases (Bohra and Vyas 2014[39]; D. L. Bohra, 2014), it is unclear if these reflect global population trends. Consequently, the species is suspected to be experiencing a rapid decline over the past decade (Baptista et al. 2020).

The EOO of resident/breeding population of Yellow-eyed Pigeon is 3,080,000 km^2 (Birdlife Datazone, 2024).

The following figures shows the geographical range of this species.

[39] Bohra, D. L.; Vyas, S. 2014. Large wintering flocks of Yellow-eyed Pigeon Columba eversmanni at Jorbeer, Bikaner District Rajasthan, India. BirdingASIA 21: 64-65.

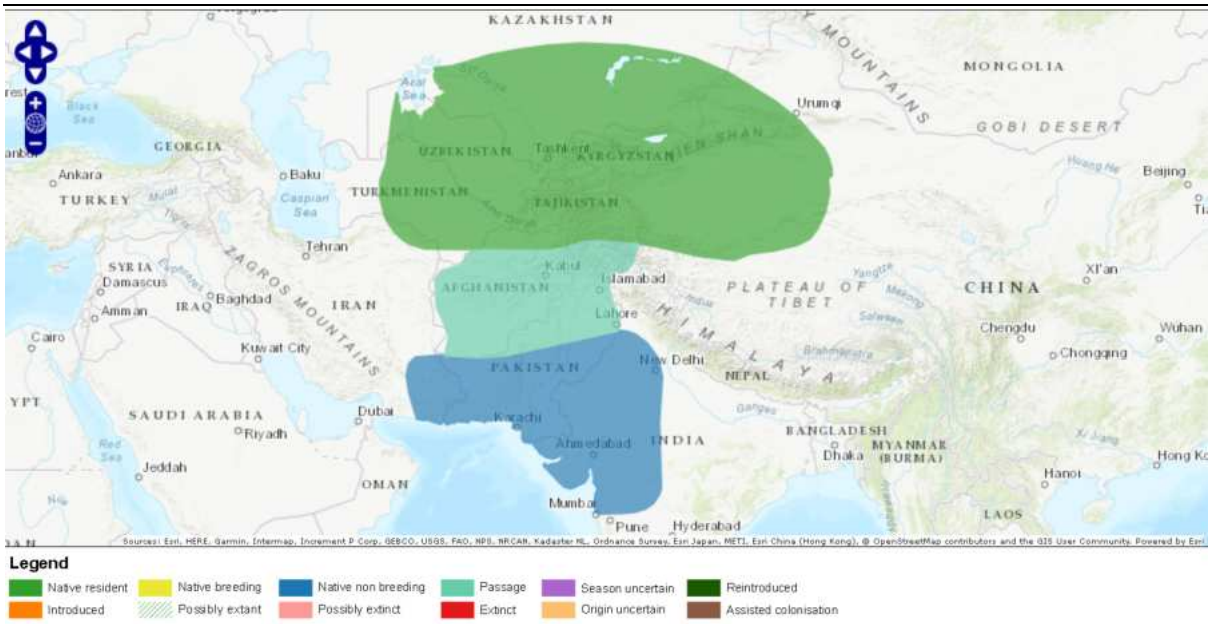

Figure 6-45 Geographical Distribution of the Yellow-eyed Pigeon [40]

Figure 6-46 Geographical Distribution of the Yellow-eyed Pigeon

The Yellow-eyed Pigeon, breeds across southern regions of Kazakhstan, Uzbekistan, Turkmenistan, Tajikistan, Kyrgyzstan, Afghanistan, northeast Iran, and extreme northwest China. Its detailed status and distribution within these areas remain largely undocumented (BirdLife International 2001). The species winters in Pakistan and northwest India, historically extending as far as Bihar, southern Xinjiang, and western Gansu in China.

[40] BirdLife International (2024) Species factsheet: Columba eversmanni. Downloaded from https://datazone.birdlife.org/species/factsheet/yellow-eyed-pigeon-columba-eversmanni on 29/04/2024.

Historically noted for forming large flocks in the 19th and early 20th centuries, especially in Punjab, India, the Yellow-eyed Pigeon has experienced a sharp decline. Wintering populations have decreased from thousands to generally tens or a few hundreds, though a significant count in 1995 recorded up to 2,000 individuals in a single flock. The current trend of the population is not definitively known, but there is evidence suggesting a potential increase at one site in India (Jorbeer dead animal dump) since 2011 (Bohra and Vyas 2014; D. L. Bohra in litt. 2016).

The following figure illustrates the autumn migration paths and stopover locations of two Yellow-eyed Pigeons, distinguished by the colors Orange and Blue, using GSM/GPS tracking data from 2020. It traces the routes taken by these pigeons as they migrated southward. The capture location at Shakpak Pass is indicated by a green circle, while the various dots along the migration paths represent the estimated sizes of stopover sites, calculated using an OUF motion model.

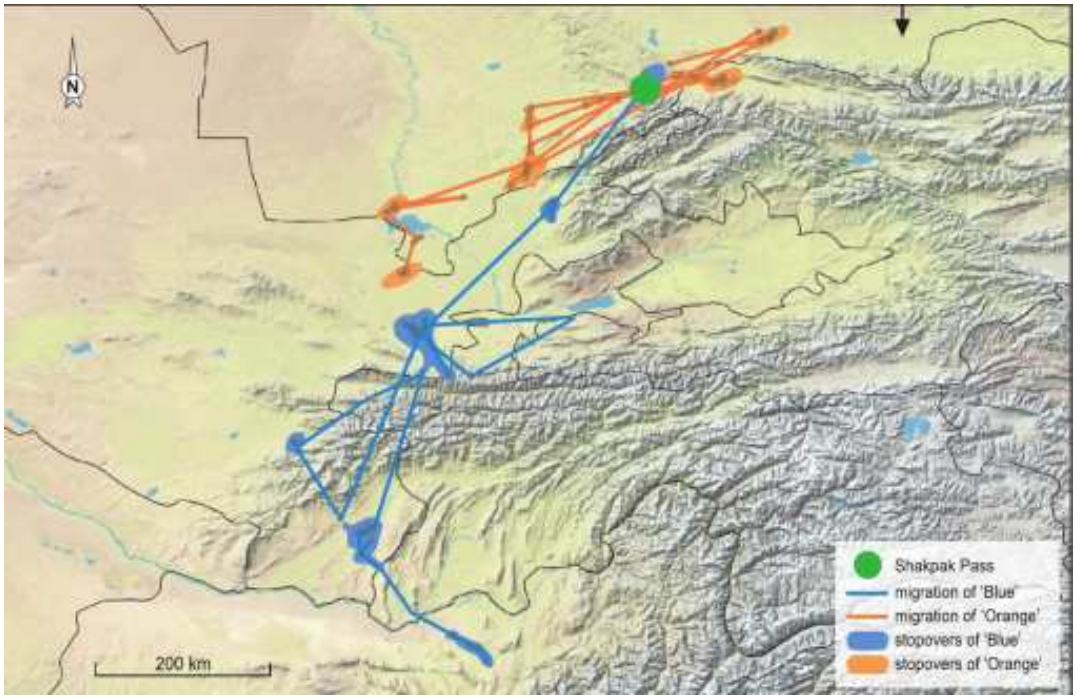

Figure 6-47 Autumn migration Paths of the Yellow-eyed Pigeon [41]

[41] Berdikulov B.T., Gavrilov, A.E., Ilina, V.O., Song, G., Lei, F.M., (2024) Autumn Migration of the Rare Yellow-Eyed Pigeon Columba eversmanni from Western Tian Shan (Tanyrtau), Kazakhstan, *BioOne Digital Library*, Ardea, 112(1):1-10, Available at: https://bioone.org/journals/ardea/volume-112/issue-1/arde.2023.a12/Autumn-Migration-of-the-Rare-Yellow-Eyed-Pigeon-Columba-eversmanni/10.5253/arde.2023.a12.full

6.2.11.3 BASELINE SURVEY RESULTS

This species was not recorded within the Project area during any of the baseline surveys conducted in 2023 and 2024.

6.2.11.4 ANALYSIS

6.2.11.4.1 EAAA

The total EAAA for breeding birds is applied as all suitable breeding habitat that overlaps the project footprint and exists within a reasonable buffer from the project footprint, determined by species specific ecology.

The Yellow-eyed Pigeon uses open semi-desert region with spare vegetation and scattered trees which are required for breeding. This species also occasionally nests in abandoned buildings and may fly 5-10km from nesting site to forage.[42] Therefore, EAAA is applied as all of the above-mentioned suitable habitats within the project boundaries as well as within a buffer of 10km around the project footprint. This should provide an adequate accounting of the population of birds likely to regularly utilize the project area.

The resulting EAAA has been mapped in the following figure.

[42] Baptista, L. F., P. W. Trail, H. M. Horblit, E. de Juana, P. F. D. Boesman, and E. F. J. Garcia (2020). Yellow-eyed Pigeon (*Columba eversmanni*), version 1.0. In Birds of the World (J. del Hoyo, A. Elliott, J. Sargatal, D. A. Christie, and E. de Juana, Editors). Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.pabpig1.01

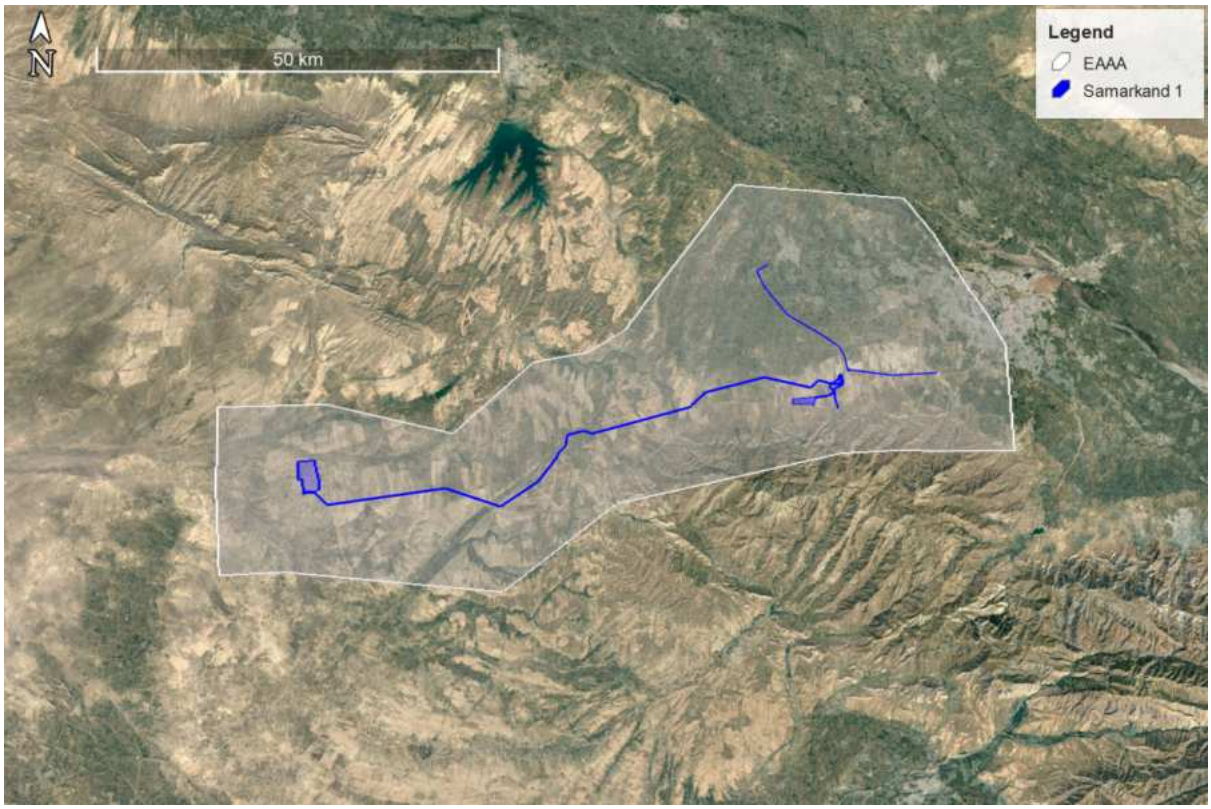

Figure 6-48 Estimated EAAA for the Yellow-eyed Pigeon at the PV Site.

6.2.11.4.2 Criticality

The global population of this species is estimated to range from 10,000-19,999 mature individuals. Taking a precautionary approach, the lower range is used to apply the thresholds.

Under IFC **Criterion 1**, the threshold for VU species is EAAAs that support a globally important concentration of the global population such that the loss of the EAAA population would result in uplisting to CR/EN status and meet the quantitative thresholds of Criterion 1.

To date, zero observations of this species was made during baseline studies spanning across Autumn and Spring migration seasons.

There are no IBAs within the EAAA for which the Yellow-eyed Pigeon is a trigger species. There are no records of breeding hotspots in the EAAA. It can be deduced that any existing habitat within the EAAA may be of poor quality and unable to support significant concentrations of this species. Therefore, this species does not trigger criticality under the IFC **Criterion 1**.

Due to the VU status on the IUCN Red List and Uzbekistan Red Data Book, it is considered as an SBV/ PBF for the Main Facilities component(s) of the Samarkand 1 project. The ESIA will address this via the biodiversity impact assessment, mitigation program and residual significance analysis.

6.2.12 European Turtle-Dove

The European Turtle-dove (*Streptopelia turtur*) is a native breeding bird and migrant in Uzbekistan, listed as Vulnerable (VU) species on the IUCN Global Red List, and Vulnerable (VU) in the Uzbekistan National Red Data Book.[43]

The CHA Screening exercise found that this species should be further investigated in the CHA against **IFC PS 6 Criteria 1 & 3 / EBRD PR 6 Criteria 2 & 4.**

6.2.12.1 ECOLOGY

The European Turtle-Dove thrives in a varied landscape that includes arable fields, open woodlands, hedgerows, and diverse woodland types, as well as steppe and semi-desert regions. These environments offer critical resources such as nesting sites and a diverse diet, which are essential during the breeding season (Baptista et al. 2015)[44]. Additionally, the species relies heavily on agricultural lands for feeding and utilizes a range of other habitats including forest borders, groves, spinneys, coppices, young tree plantations, scrubby wastelands, and woody marshes (Tucker and Heath 1994)[45]. Non-breeding habitats are located primarily in sub-Saharan Africa, where they inhabit wooded savannas and similar open wooded areas.

The European Turtle-Dove's breeding season typically spans from late April to July, during which it produces one to two broods per season, with each clutch containing usually two eggs. This species prefers breeding at low altitudes, generally not exceeding 500 m in temperate zones and up to 1,000-1,300 m in Mediterranean areas (Tucker and Heath 1994). The nests, small platforms of twigs lined with plant material, are strategically placed in the lower parts of trees and in shrubs and hedges. While the species tolerates human presence, it avoids breeding near towns or villages (Baptista et al. 2015). The nesting and parental care phases, extending potentially until September, are critical periods when the birds are particularly vulnerable to disturbances.

The European Turtle-Dove primarily feeds on seeds from grasses, cereals, and occasionally herbaceous plants, focusing significantly on small invertebrates during the breeding season to satisfy the heightened nutritional needs for chick rearing. Additionally, the species commonly forages on the ground, consuming seeds and fruits from weeds and cereals, and less frequently berries, fungi, and invertebrates. This diet supports their energy needs throughout their lifecycle, particularly during critical breeding periods.

[43] Red Book of Uzbekistan (2019) Animal World Red Book of the Republic of Uzbekistan. Available at: https://drive.google.com/file/d/19wwTZ6Ubk2zut9xwjG0dMRdSbBZKMJv0/view Accessed on 24 April, 2024.
[44] Baptista, L.F., Trail, P.W., Horblit, H.M., Boesman, P. and Sharpe, C.J. 2015. European Turtle-dove (Streptopelia turtur). In: del Hoyo, J., Elliott, A., Sargatal, J., Christie, D.A. and de Juana, E. (eds), Handbook of the Birds of the World Alive, Lynx Edicions, Barcelona.
[45] Tucker, G.M. and Heath, M.F. 1994. Birds in Europe: their conservation status. BirdLife International, Cambridge, U.K.

The European Turtle-Dove is strongly migratory, undertaking extensive journeys between its breeding grounds in Europe and wintering sites in sub-Saharan Africa, from Senegal east to Eritrea and Ethiopia. This migration is critical to its lifecycle but comes with risks such as hunting and habitat degradation along the routes (Baptista et al. 2015; Tucker and Heath 1994). Socially, the species typically forms pairs or small flocks, with a tendency towards more solitary or paired behavior during the breeding season. The distinctive soft, purring coo of the doves is a characteristic sound in rural European landscapes during early summer. Their survival during the winter is closely linked to cereal production, highlighting the impact of agricultural practices on their habitats (Eraud et al. 2009)[46].

Major threats include intensive farming and the consequent reduction of food resources and nesting sites. Hunting during migration also significantly impacts populations, with millions estimated to be harvested annually. Furthermore, drought conditions in wintering areas exacerbate the decline by reducing available resources and habitat quality.

The species' populations are showing increasingly patchy distributions, particularly in Western Europe, where declines have been most notable. Conservation efforts focus on habitat management, legal protection, and reducing hunting pressures along migratory pathways to stabilize and eventually increase the population numbers.

6.2.12.2 DISTRIBUTION

The European Turtle-Dove, a breeding visitor throughout Europe, migrates annually to winter in Africa south of the Sahara. During its breeding season, it frequents suitable habitats like lightly wooded landscapes, traditional orchards, and areas scattered with trees and shrubs. However, significant population declines have been noted in various regions.

In Central Asia, including countries like Afghanistan, Kazakhstan, and Uzbekistan, the species has shown moderate to severe declines over the past few decades, with Uzbekistan experiencing a particularly drastic reduction. Similarly, the once large population in European Russia has plummeted by more than 80% since 2000 and more than 90% since 1980 (BirdLife International 2015). Declines have also been observed in east and southeast Kazakhstan, notably in the Manrak Mountains where the species is now rare or absent (Wassink and Oreel 2008). These declines underscore the vulnerability of this species across its range.

The EOO of resident/breeding population of the European Turtle-dove is 35,700,000 km2 (Birdlife Datazone, 2024).

[46] Eraud, C.; Boutin, J.-M.; Riviere, M.; Brun, J.; Barbraud, C.; Lormee, H. 2009. Survival of Turtle Doves Streptopelia turtur in relation to western Africa environmental conditions. Ibis 151: 186-190.

The estimated European population of the species stands at approximately 3.15 to 5.94 million pairs, translating to between 6.31 and 11.9 million mature individuals. This accounts for 25-49% of the species' global range, leading to a preliminary global population estimate of 19.3 to 71.4 million individuals, or about 12.8 to 47.6 million mature individuals. However, this estimate requires further validation.

The following figures shows the geographical range of this species.

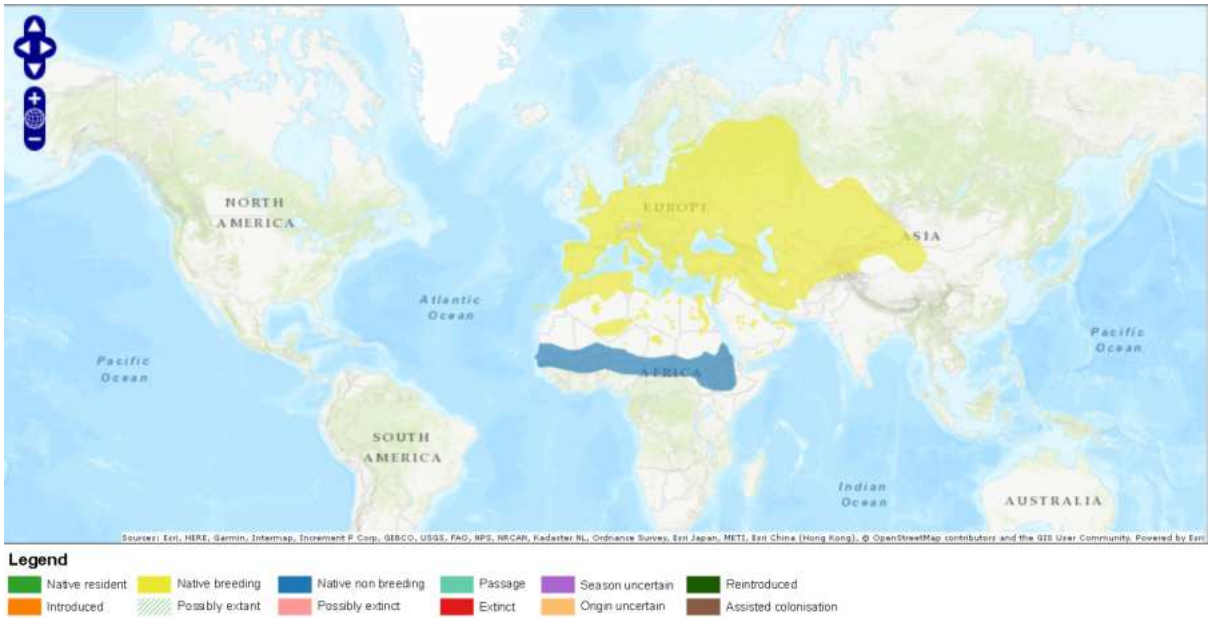

Figure 6-49 Geographical Distribution of the European Turtle-dove [47]

[47] BirdLife International (2024) Species factsheet: Streptopelia turtur. Downloaded from https://datazone.birdlife.org/species/factsheet/european-turtle-dove-streptopelia-turtur on 29/04/2024.

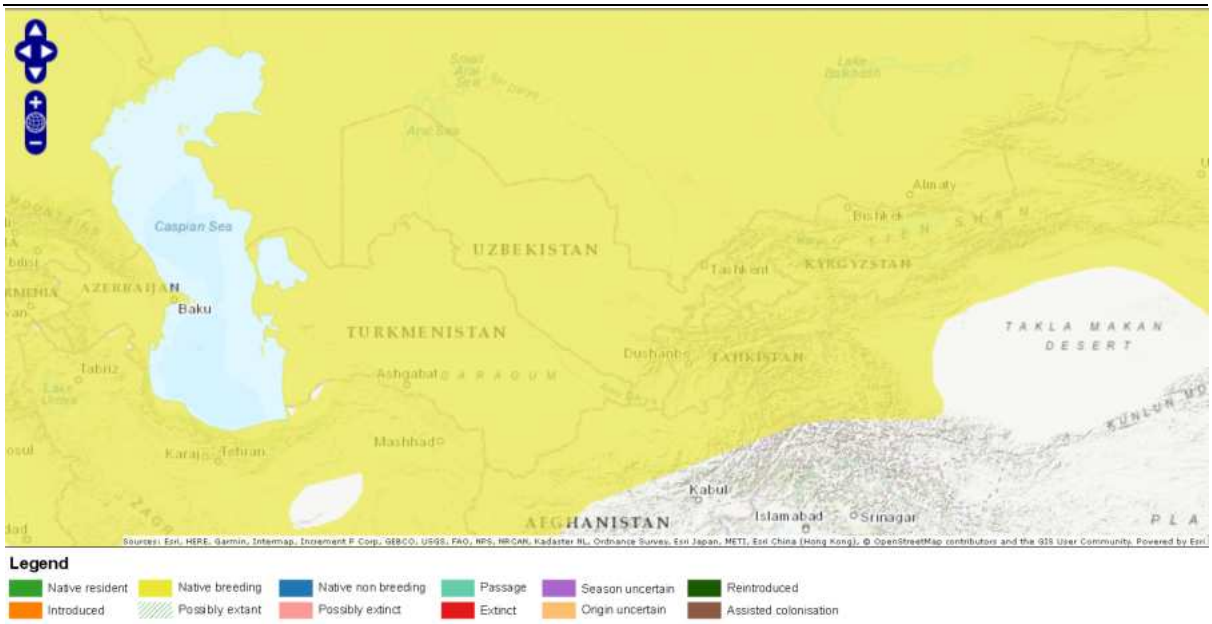

Figure 6-50 Geographical Distribution of the European Turtle-dove

The European Turtle-Dove is a widespread migrant breeder found across central and southern Europe, Central Asia, the Middle East, and North Africa, predominantly wintering in the Sahel zone of Africa. Despite its extensive range, the species has experienced significant declines, particularly in northwest Europe, including the Netherlands and the U.K., where large range declines have been documented (e.g., Balmer et al. 2013). Overall, the population continues to decrease across Europe, indicating ongoing conservation challenges (BirdLife International 2015).

6.2.12.3 BASELINE SURVEY RESULTS

This species was not recorded within the Project area during any of the baseline surveys conducted in 2023 and 2024. However one observation of this species was recorded migrating at VP13 along the OHTL corridor, during autumn surveys conducted between 13th September and 8th November 2023. VP 13 is located in an adjacent area to the project.

6.2.12.4 ANALYSIS

6.2.12.4.1 EAAA

The total EAAA for breeding birds is applied as all suitable breeding habitat that overlaps the project footprint and exists within a reasonable buffer from the project footprint, determined by species specific ecology.

The European-turtle Dove uses varied landscapes that includes arable fields, open woodlands, hedgerows, and diverse woodland types, as well as steppe and semi-desert regions. This species relies heavily on agricultural lands for foraging.

Assuming that this species has a similar home range size as the Yellow-eyed Pigeon, the EAAA is applied as all of the above-mentioned suitable habitats within the project boundaries as well as within a buffer of 10km around the project footprint. This should provide an adequate accounting of the population of birds likely to regularly utilize the project area.

The resulting EAAA encompasses has been mapped in the following figure.

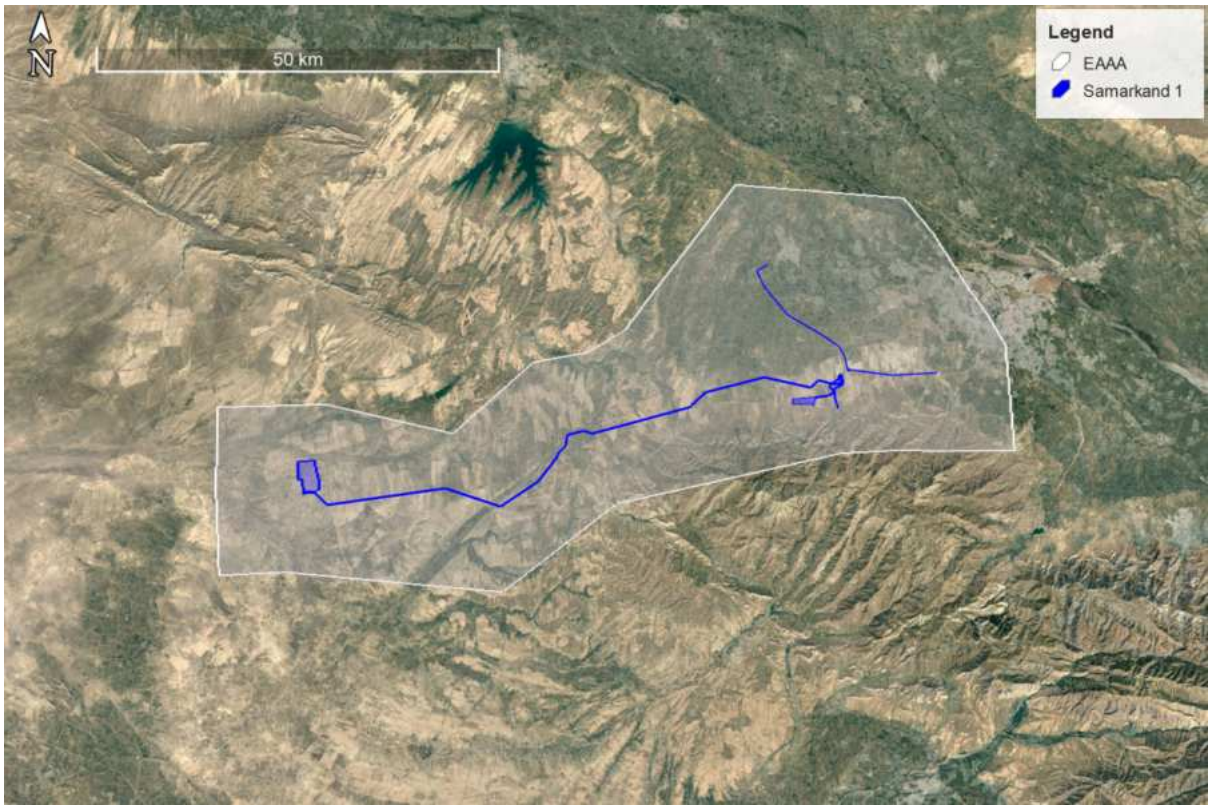

Figure 6-51 EAAA and potential habitats for the European Turtle-Dove in the PV plant site

6.2.12.4.2 Criticality

The global population of this species is estimated to range from 6,310,000-11,900,000 mature individuals. Taking a precautionary approach, the lower range is used to apply the thresholds.

Under IFC **Criterion 1**, the threshold for VU species is EAAAs that support a globally important concentration of the global population such that the loss of the EAAA population would result in uplisting to CR/EN status and meet the quantitative thresholds of Criterion 1.

Under IFC **Criterion 3**, the threshold is 1% of the global population using the EAAA on a regular/cyclical basis during migrations. This would amount to 63,100 individuals.

To date, zero observations of this species was made during baseline studies spanning across Autumn and Spring migration seasons. However, species presence was confirmed in the EAAA during surveys of adjacent areas.

There are no IBAs within the EAAA for which the European Turtle Dove is a trigger species. There are no records of breeding hotspots in the EAAA. It can be deduced that any existing habitat within the EAAA may be of poor quality and unable to support significant concentrations of this species. Therefore, this species does not trigger criticality under the IFC **Criteria 1 and 3**.

Due to the VU status on the IUCN Red List and Uzbekistan Red Data Book, it is considered as an SBV/ PBF for the Main Facilities component(s) of the Samarkand 1 project. The ESIA will address this via the biodiversity impact assessment, mitigation program and residual significance analysis.

6.2.13 Sociable Lapwing

The Sociable Lapwing (*Vanellus gregarius*) is a native resident in Uzbekistan. It is listed as Critically Endangered (CR) on the Global IUCN Red List.

The CHA Screening exercise found that this species should be further investigated in the CHA against **IFC PS 6 Criteria 1 & 3 / EBRD PR 6 Criteria 2 & 4.**

6.2.13.1 ECOLOGY

The Sociable Lapwing prefers open steppes and agricultural fields as its breeding habitat, which are found in its breeding range across Kazakhstan and parts of southern Russia. During migration, it uses a variety of stopover sites, including agricultural fields, grasslands, and wetlands, which are crucial for resting and feeding. Significant stopovers have been identified in Turkmenistan and Uzbekistan, particularly at the Tallymarzhan site on the border of these two countries, where large aggregations have been recorded. Its wintering grounds are typically in the grasslands and semi-arid regions of Sudan, northwest India, and Pakistan.

Breeding generally occurs from late April to June. The Sociable Lapwing nests on the ground in shallow scrapes, often forming loose colonies. The reproductive success of this species is highly sensitive to disturbance and predation, which are exacerbated by habitat changes such as land cultivation and increased human activity.

Its diet mainly consists of insects, which are abundant in its steppe habitat, along with seeds and other plant material. During the breeding season, the increased need for protein to rear chicks sees a higher consumption of invertebrates.

The Sociable Lapwing is known for its gregarious nature, often seen in flocks during migration and in its wintering areas. It exhibits strong migratory behavior, traveling long distances

between breeding and wintering sites. This species is also characterized by a distinctive loud call, often used to maintain flock cohesion.

Major threats include habitat degradation through the intensification of agriculture, land conversion, and disturbance during breeding. Hunting and trapping at migratory and wintering sites also contribute to their decline. Conservation efforts are focused on habitat protection, management, and raising awareness to mitigate hunting pressures.

The species' population is declining sharply, with current estimates suggesting severe fragmentation and small, isolated groups outside the main breeding areas. Active international cooperation is crucial to monitor and manage the habitats across its migratory routes to improve the species' survival prospects.

6.2.13.2 DISTRIBUTION

The Sociable Lapwing breeds in Kazakhstan and southern Russia, migrates through countries such as Turkey, Syria, and Iran, and winters primarily in Sudan, Pakistan, and northwest India. Its presence varies significantly with the seasons, being primarily a passage migrant in many parts of its range outside the breeding season.

Despite a historical decline—40% from 1930 to 1960 and a further halving by 1987 in northern Kazakhstan—recent surveys suggest a stabilizing, though still vulnerable, population. In 2006, 376 breeding pairs were counted in Kazakhstan, indicating a potential population of 11,200 mature individuals (Sheldon et al. 2006). Key stopover sites include the Manych depression in south Russia and areas in Turkey such as the Muş Plain and Ceylanpınar, where significant flocks have been recorded (Sheldon 2014).

Significant numbers have also been recorded in Uzbekistan and Turkmenistan as recently as 2015, with counts suggesting these areas may support a substantial portion of the global population (Donald et al. 2016). In October 2015, the world's largest aggregation of Sociable Lapwings in recent years was discovered at Tallymarzhan (also known as Tallymerjen), a site that straddles the border between eastern Turkmenistan and southwestern Uzbekistan, where 6,000–8,000 birds were recorded (Azimov et al. 2018; Donald et al. 2016)[48].

This finding highlights the significance of the shorter eastern migratory route, which runs south from Kazakhstan through Turkmenistan and Uzbekistan to wintering areas in Pakistan and northwestern India. Despite this, recent surveys noted fewer birds passing through traditional

[48] Donald, P. F., Kamp, J., Green, R. E., Urazaliyev, R., Koshkin, M., & Sheldon, R. D. (2021). Migration strategy, site fidelity and population size of the globally threatened Sociable Lapwing Vanellus gregarius. Journal of Ornithology, 162(2), 349–367. doi:10.1007/s10336-020-01844-y

areas in autumn 2015, possibly due to adverse weather conditions. Satellite tracking has revealed new migratory patterns and confirmed the importance of Middle Eastern sites as stopovers en route to Africa. Despite extensive survey work, no birds have been located in Iraq as of the latest reports (Sheldon 2014).

The EOO of resident/breeding population of the Sociable Lapwing is 1,670,000 km^2 (Birdlife Datazone, 2024).

Surveys in 2006 within a 145,000 km^2 area in Kazakhstan recorded 376 breeding pairs of the Sociable Lapwing. Extrapolation of these figures suggests a potential total breeding population of 5,600 pairs, or about 11,200 mature individuals, equivalent to 16,000-17,000 individuals overall. This estimate is under ongoing refinement but aligns with subsequent observations, including a count of 3,200 individuals in Turkey in October 2007 and between 6,000-8,000 individuals on the Uzbekistan/Turkmenistan border in more recent counts (Donald et al. 2016). The European population, however, remains extremely small, estimated at 0-10 pairs, translating to 0-20 mature individuals (BirdLife International 2015).

The Sociable Lapwing has experienced a significant decline and range contraction, particularly noted in northern Kazakhstan with a 40% decline from 1930 to 1960, followed by a further halving from 1960 to 1987. However, more recent fieldwork, particularly in central Kazakhstan around Korgalzhyn and Pavlodar, indicates a potentially stabilizing or even increasing population trend. For instance, nest counts in Korgalzhyn rose from 85 in 2005 to 113 by 2007, and in Pavlodar, numbers increased from 55 in 1991 to 140 in 2007 (Sheldon et al. 2006). Despite these localized signs of recovery, a global decline of over 50% is still suspected for the past 27 years, with a steeper decline anticipated for the next three generations due to ongoing severe threats. In Europe, the population has decreased by more than 80% over the same 27-year period, and by more than 25% in the last nine years alone (BirdLife International 2015). Further fieldwork is needed to confirm these trends and potentially revise these estimates.

The following figures shows the geographical range of this species.

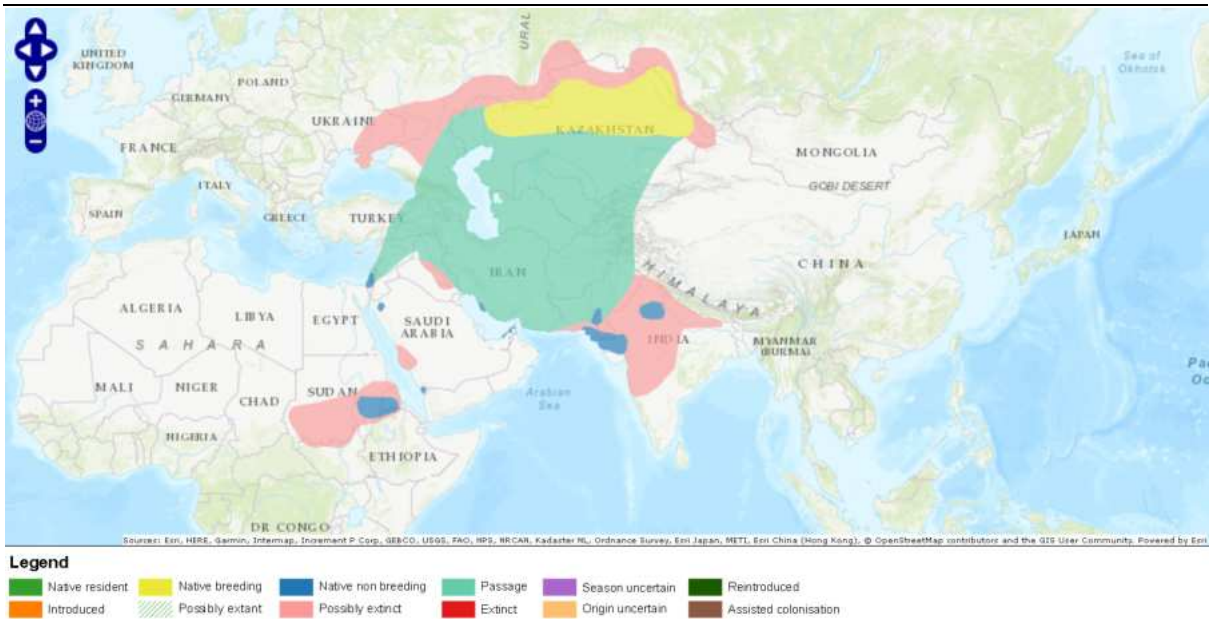

Figure 6-52 Geographical Distribution of the Sociable Lapwing [49]

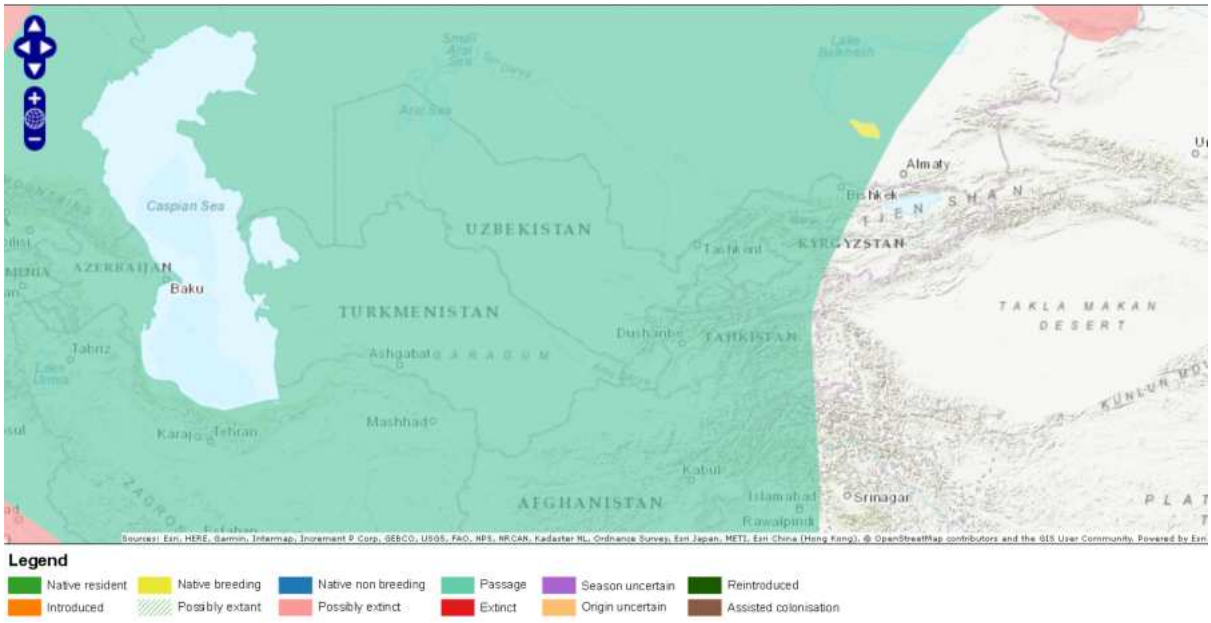

Figure 6-53 Geographical Distribution of the Sociable Lapwing

The Sociable Lapwing breeds primarily in northern and central Kazakhstan and south-central Russia, with historical records from western China (Kamp et al. 2010). After breeding, it disperses widely across Central Asia, the Middle East, and into key wintering sites in Sudan, Pakistan, and north-west India. Notable recent sightings include a flock of 28 birds near Ahmedabad village, Pakistan in 2015, and several large flocks in India between 2007 and 2012, with up to 90 birds

[49] BirdLife International (2024) Species factsheet: Vanellus gregarius. Downloaded from https://datazone.birdlife.org/species/factsheet/sociable-lapwing-vanellus-gregarius on 29/04/2024.

observed (Sheldon 2013; Deomurari 2007). Smaller numbers winter regularly in Saudi Arabia, Oman, and the UAE, with vagrant records across Europe and potential overwintering in Iberia (de Juana 2011).

The figures below illustrate the migration pathways of the Sociable Lapwing from Central Kazakhstan, showcasing two primary routes: the western route, which extends west across Kazakhstan to the Arabian Peninsula and northeastern Africa, and the eastern route, which heads directly south through Central Asia to the Indian subcontinent. The data highlight the distances travelled, key stopover sites, and differences in migration strategies between the two routes.

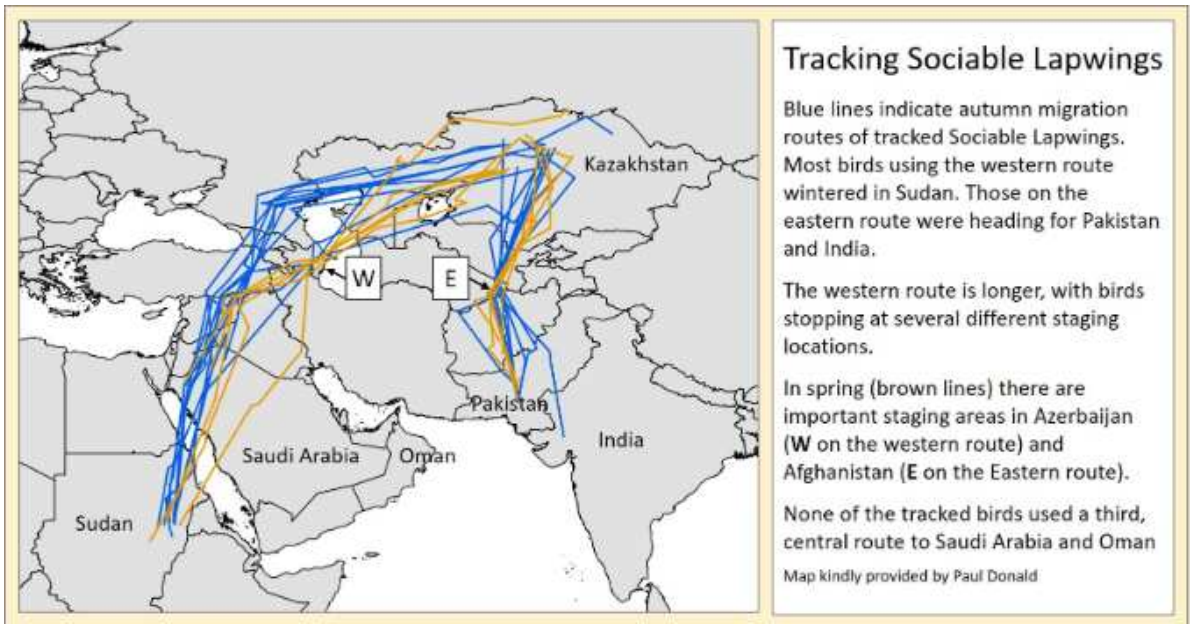

Figure 6-54 Migration Routes of the Sociable Lapwing: Western and Eastern Pathways from Central Kazakhstan [50]

[50] Graham, A., (2021) Following Sociable Lapwings, *Watertales*, Available at: https://wadertales.wordpress.com/2021/01/03/following-sociable-lapwings/ Accessed 24 April, 2024.

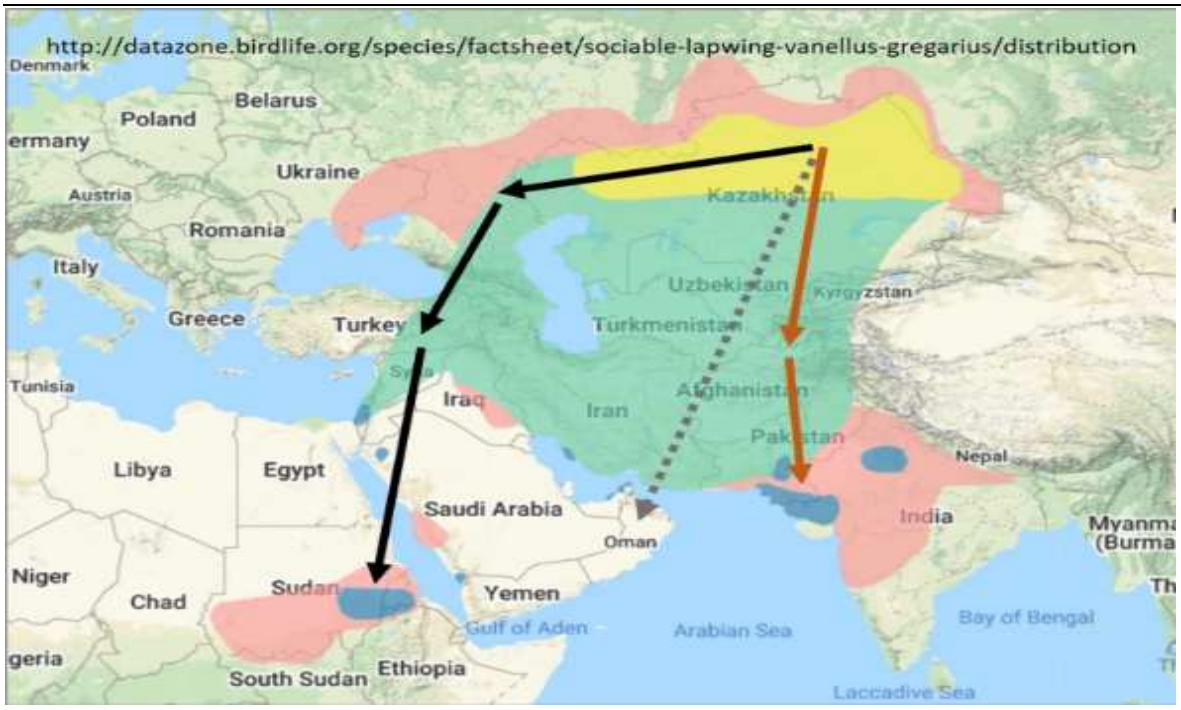

Figure 6-55 Identified Migration Routes and Population Estimates of Sociable Lapwing Based on Historical and GPS Tracking Data

6.2.13.3 BASELINE SURVEY RESULTS

This species was not recorded within the Project area during any of the baseline surveys conducted in 2023 and 2024.

6.2.13.4 ANALYSIS

A long-term study of the species movements using satellite tagging shows that the migration strategy of this species is characterised by infrequent long-distance movements followed by lengthy stopovers in a small number of staging areas that are used consistently across years. Based on the data presented in the study, this species travels an average of 534km per day and is likely to use the project airspace on migration to the stopover site, at Lake Talimarzhan located 115km to the south.[51] About 6,000 individuals have been recorded in the Talimarzhan IBA, and several dozen individuals have been reported in Karshi area, which is located about

[51] Donald, Paul & Kamp, Johannes & Green, Rhys & Urazaliyev, Ruslan & Koshkin, Maxim & Sheldon, Rob. (2021). Migration strategy, site fidelity and population size of the globally threatened Sociable Lapwing Vanellus gregarius. Journal of Ornithology. 162. 10.1007/s10336-020-01844-y.

50 kilometres away from the 400 MW site[52]. Records on eBird data also show that a number of observations have been noted in Karnachabul located 30km west in 2020 and 2021.[53]

During migration, the species appears to be strongly associated with areas of agriculture, particularly along rivers. Though such habitats are present, to date no known observations of this species have been made within project footprint and AoI (considered as a 20km buffer from the project footprint due to habitat displacement for birds) which suggests a lack of interaction with the project site. Consultations with the regional ornithologist imply that this species is unlikely to be observed in the AoI. Moreover, the presence of this species 30 km west and 115km south of the project footprint potentially indicate a preference for these areas over the habitat conditions found within the project AoI.

Therefore, due to the unlikelihood of presence in the project AoI, an EAAA cannot be applied as a result of which CH will be not further assessed for this species. However, given the status of this species, if were to be observed during future monitoring efforts it would be assessed under the framework of adaptive management.

6.2.14 Lesser White-Fronted Goose

The Lesser White-fronted Goose (*Anser erythropus*) is a passage migrant in Uzbekistan, listed as Vulnerable (VU) species on the IUCN Global Red List, and Vulnerable (VU) in the Uzbekistan National Red Data Book.

The CHA Screening exercise found that this species should be further investigated in the CHA against **IFC PS 6 Criteria 1 & 3 / EBRD PR 6 Criteria 2 & 4**.

6.2.14.1 ECOLOGY

During winter and on migration, this species frequents open short grassland in the steppe and semi-arid zones, particularly in sodic (e.g. seashore) pastures, arable farmland, pastures and meadows (Cramp and Simmons 1977, Madsen 1996, Kear 2005). Winter roosting colonies are also formed on large lakes and rivers, or in reedbeds and rushes (Cramp and Simmons 1977, Madge and Burn 1988).

[52] Azimov, N., Iankov, P., Kashkarov, R., Koshkin, M., Rustamov, E., Soldatov, V., Ten, A., & Veyisov, A. (2018). Further surveys at a globally important staging site for migrating Sociable Lapwings (Vanellus gregarius) in Turkmenistan and Uzbekistan, 40.

[53] Wiersma, P., G. M. Kirwan, and C. J. Sharpe (2020). Sociable Lapwing (*Vanellus gregarius*), version 1.0. In Birds of the World (J. del Hoyo, A. Elliott, J. Sargatal, D. A. Christie, and E. de Juana, Editors). Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.soclap1.01

Breeding generally occurs in late May/June and depart breeding grounds in mid-August to mid-September (Kear, 2005). Young remain with parents throughout most of first winter (Kear, 2005).

Feeds mostly by grazing on land, primarily on green parts of grasses, plants and small bushes. During winter it will supplement feeding with agricultural grains (Kear, 2005).

Climate change and associated habitat shifts are expected to impact negatively on this species. Illegal hunting, particularly in wintering sites, is also a major threat.

6.2.14.2 DISTRIBUTION

The species breeds in a discontinuous narrow band across Arctic Eurasia from Norway to Eastern Siberia. There are four subpopulations recognised, where the Western Asian main population is known to winter around the Black and Caspian Seas, mainly in Azerbaijan, Iraq, Iran and Uzbekistan (V. Morozov in litt. 2016, N. Mikander, I. Øien and T. Aarvak in litt. 2016).

The figure below shows the mapped migratory routes across the Western Palearctic.

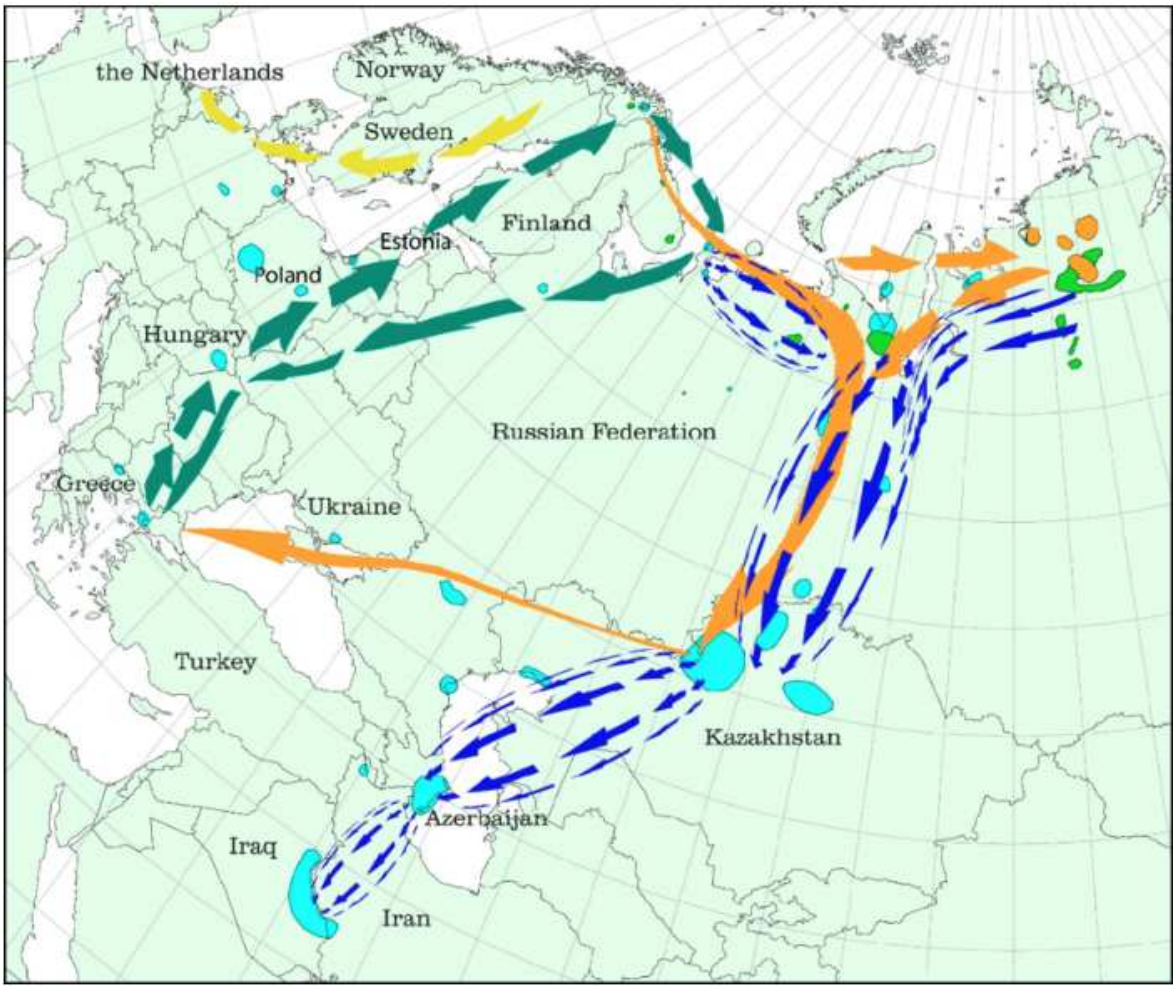

Figure 6-56 Mapped Migratory Routes of the Lesser White-fronted Goose in the Western Palearctic [54]

The species has a large EOO of 7,060,000km^2.

The global population is estimated at 24,000 – 40,000 individuals, which includes 14,000 – 19,000 individuals from the East Asian Flyway (Jia et al 2016; Lei per A. Fox *in litt.* 2016).

The figures below show the species distribution.

[54] Aarvak, Tomas & Øien, Ingar & Shimmings, Paul. (2016). A critical review of Lesser White-fronted Goose release projects. NOF-BirdLife Norway. Report 6.

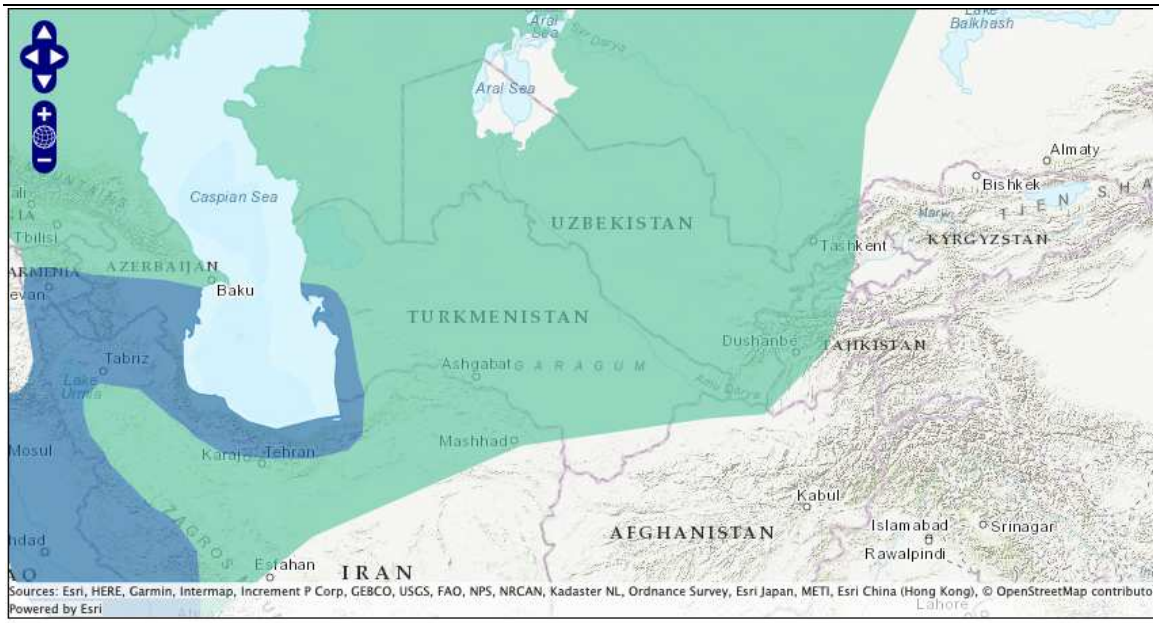

Figure 6-57 Distribution Map of Lesser White-fronted Goose[55]

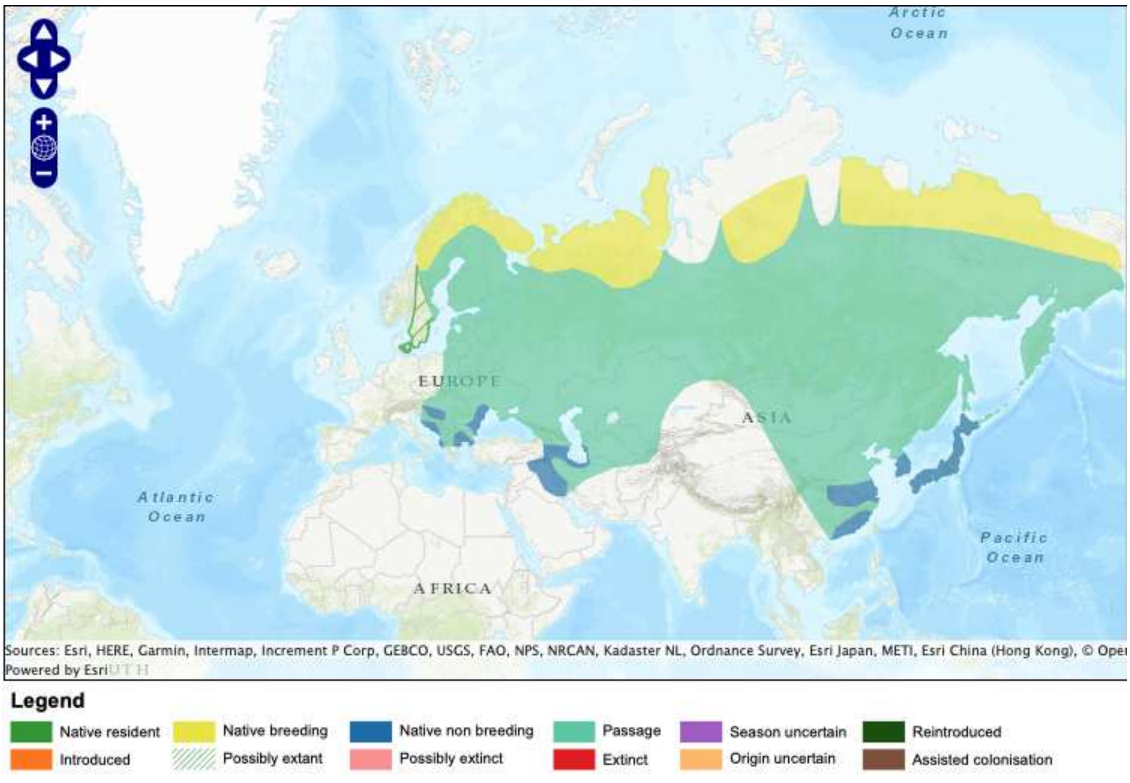

Figure 6-58 Distribution Map of Lesser White-fronted Goose

[55] BirdLife International (2024) Species factsheet: *Anser erythropus*. Downloaded from https://datazone.birdlife.org/species/factsheet/lesser-white-fronted-goose-anser-erythropuson 24/04/2024.

6.2.14.3 BASELINE SURVEY RESULTS

This species was not recorded within the Project area during any of the baseline surveys conducted in 2023 and 2024.

6.2.14.4 ANALYSIS

During winter and at stopover sites, the Lesser White-fronted Goose, roosts on lakes and frequents adjacent open short grassland in the steppe and semi-arid zones, particularly in sodic (e.g. seashore) pastures, arable farmland, pastures and meadows. Such habitats i.e. lakes with adjacent grassland, farmland, pastures and meadows are not present within the project footprint nor within AoI (considered as a 20km buffer from the project footprint due to habitat displacement for birds).

The closest known records of Lesser White-fronted Goose is the Karnachabul Steppe IBA for which it is a trigger species. The IBA located approximately 30km from the project area. This may suggest the lack of suitable habitat within project footprint and AoI (considered as a 20km buffer from the project footprint due to habitat displacement for birds).

Therefore, due to the unlikelihood of presence in the project AoI, an EAAA cannot be applied as a result of which CH will be not further assessed for this species. However, given the status of this species, if were to be observed during future monitoring efforts it would be assessed under the framework of adaptive management.

6.2.15 White-Headed Duck

The White-Headed Duck (*Oxyura leucocephala*) is a resident (possibly breeding) and a passage migrant in Eastern Uzbekistan and has been noted to winter in some regions. It is listed as Endangered (EN) species on the IUCN Global Red List, and Endangered (EN) in the Uzbekistan National Red Data Book.

The CHA Screening exercise found that this species should be further investigated in the CHA against **IFC PS 6 Criteria 1 & 3 / EBRD PR 6 Criteria 2 & 4.**

6.2.15.1 ECOLOGY

The White-headed Duck is a highly aquatic species that is found in a variety of wetlands throughout the year, including natural and man-made habitats (Salvador 2023). During passage migration, they have been recorded in a variety of habitats, including sea bays and rivers (Anstey, 1998). In Uzbekistan during spring migration, the species was recorded in the Syrdaria and Zeravshan rivers, and during autumn migration on lakes (Kreuzberg-Mukhina et al 2001). Whilst wintering the species inhabits larger, deeper alkaline or saline waters which often have less emergent vegetation than in the breeding season, but still support algae and

pondweeds (Johnsgard and Carbonell 1996). White-headed Ducks were observed wintering during 2020–2021 in a reservoir (Tudakul) and in lakes (Dengizkul, Karakir, Xadicha, and Zikri) of Bukhara Region, Uzbekistan (Yorkulov & Azimov 2021).

Migrating birds breed from April to July (Sánchez et al. 2000, Kear 2005). After breeding it begins migration to its wintering grounds in late August to arrive September-October, and the return journey occurs between February and early May (Johnsgard and Carbonell 1996, Kear 2005).

In Uzbekistan, breeding birds were observed in July on the Sudochye Wetland (Kreuzberg-Mukhina, in press; Lanovenko et al., in press). It breeds on small, enclosed, semi-permanent or temporary freshwater, brackish or eutrophic lakes with a fringe of dense emergent vegetation. The nest is constructed over water in emergent vegetation (usually Phragmites spp. or Typha spp.) ((Sánchez et al. 2000, Sebastián-González et al. submitted; Kear 2005).

This is a diving duck. Its diet consists predominantly of midge (chironomid) larvae and other aquatic invertebrates, but seeds and aquatic plants may also be taken (Johnsgard and Carbonell 1996; Sánchez et al. 2000; Kear 2005).

The greatest long-term threat to the species is competition and introgressive hybridisation with the non-native North American Ruddy Duck *Oxyura jamaicensis* (Green and Hughes 1996, Green and Hughes 2001, Muñoz-Fuentes et al. 2007). Both male Ruddy Ducks and male hybrids are socially dominant over male White-headed Ducks during courtship (Johnsgard and Carbonell 1996). Droughts in Kazakhstan and Uzbekistan may have caused poor breeding seasons in 2002 and 2003 (Li and Mundkur 1993, B. Hughes in litt. 1999).

6.2.15.2 DISTRIBUTION

This species is distributed across Central Asia, parts of Europe and the middle east. Across much of Uzbekistan it is noted as a resident but breeds in some localities primarily in the West. Important passage concentrations also occur in Uzbekistan (E. Kreuzberg-Mukhina in litt. 1999), particularly near Jizzkah and Tashkent. It has also been recorded to overwinter in recent years, although no regular wintering sites have been found (Li and Mundkur 2003).

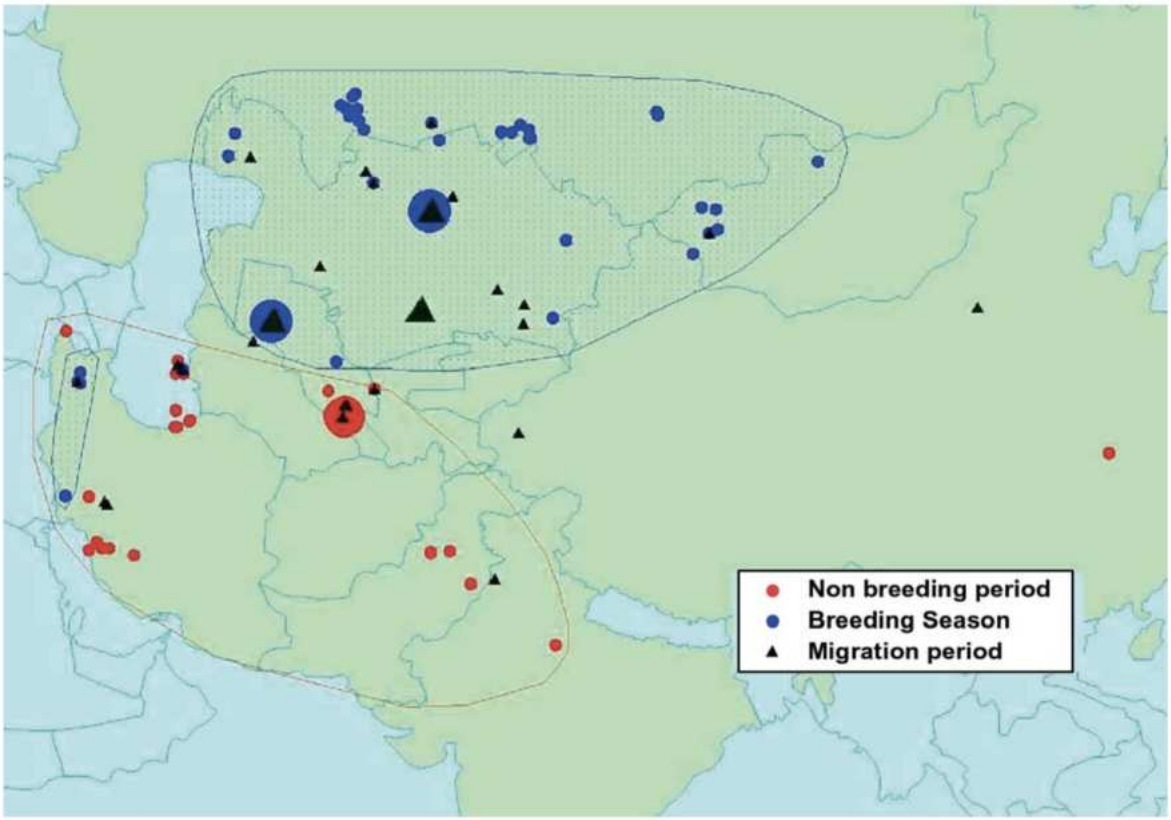

Figure 6-59 Distribution of White-headed Duck in Central and South Asia in 1990-2004[56]

It's EOO is 14,100,000km^2.

The global population is estimated to number 7,900-13,100 individuals. In Uzbekistan the breeding populations in Sudochye Wetlands numbered 2,835 and 1,149 in 2001 and 2002 respectively. Numbers of non-breeding individuals may increase in Autumn. Migrating and wintering populations are more common in Eastern Uzbekistan, for example, 1,192 individuals were recorded at several wetlands in Bukhara Province in Uzbekistan in 2004 (Li and Mundkur 2003; Li et al 2006)

The following figures show the species distribution.

[56] Li, Z.W.D., Mundkur, T., Kreuzberg-Mukhina, E.A., Yerokhov, S., Solokha, A., Ali, Z. & Chaudhry, A.A. 2006. Conservation of the White-headed Duck *Oxyura leucocephala* in Central and South Asia. *Waterbirds around the world.* Eds. G.C. Boere, C.A. Galbraith & D.A. Stroud. The Stationery Office, Edinburgh, UK. pp. 624-628.

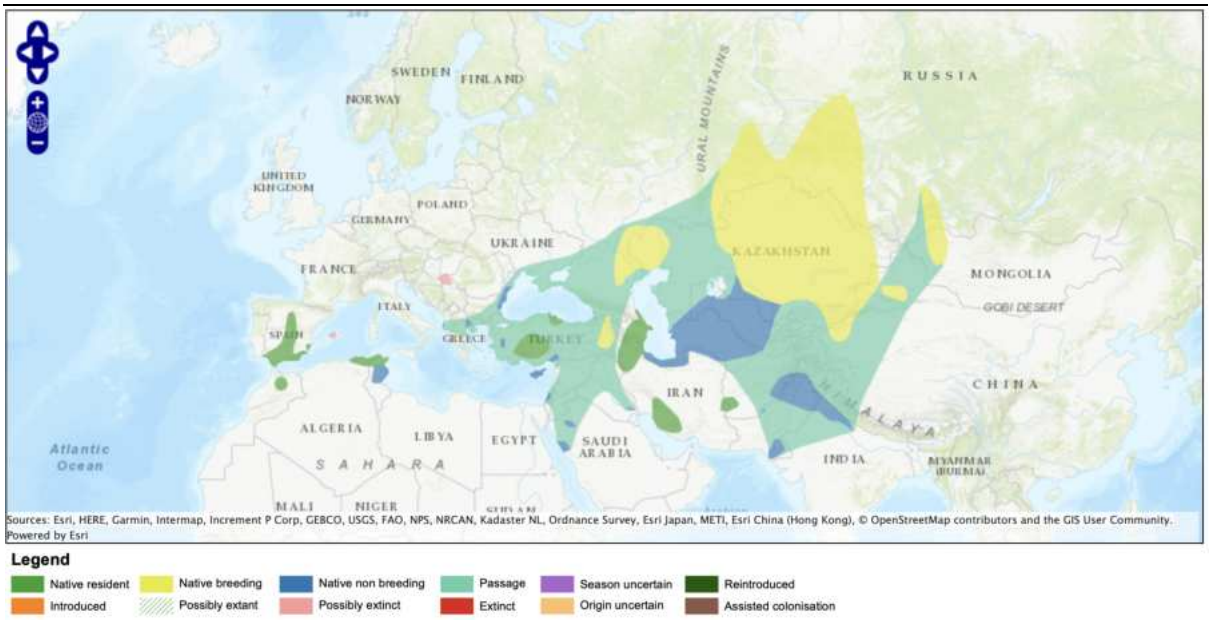

Figure 6-60 Distribution Map of White-Headed Duck[57]

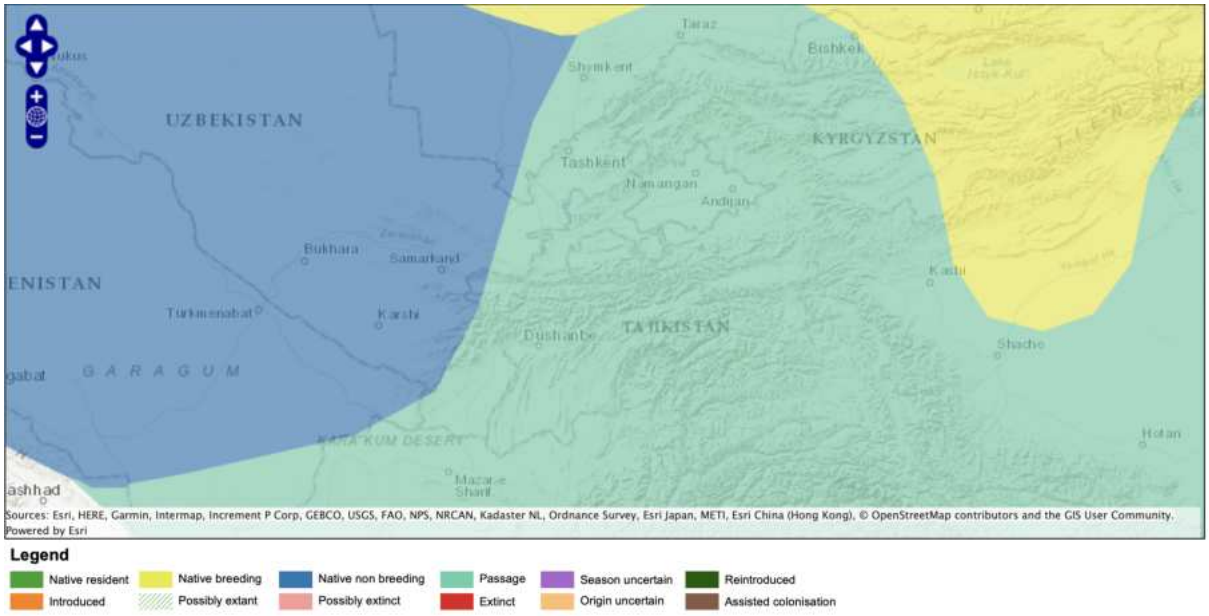

Figure 6-61 Distribution Map of White-Headed Duck

6.2.15.3 BASELINE SURVEY RESULTS

This species was not recorded within the Project area during any of the baseline surveys conducted in 2023 and 2024.

[57]BirdLife International (2024) Species factsheet: *Oxyura leucocephala*. Downloaded from https://datazone.birdlife.org/species/factsheet/white-headed-duck-oxyura-leucocephalaon 01/05/2024

6.2.15.4 ANALYSIS

During the wintering season, the species inhabits larger, deeper alkaline or saline waters such as Karakyr Lakes, Dengikul Lake and the northern shore of Ayadarkul Lake all of which are IBAs, for which White-headed duck is a trigger species, located more than 150km from the project footprint.

The most important sites for White-headed Duck in Uzbekistan are the Sudochye Wetlands and Dengizkul Lake located approximated 760km and 140km from the project site. During spring migration 1903, the species was recorded in the Syrdarya and Zeravshan rivers (near the Karmana and Ziadin areas which located just over 80km from the project footprint), and during autumn migration on lakes.[58]

There are no known known wintering or passage areas mapped as IBAs within the project footprint and AoI (considered as a 20km buffer from the project footprint due to displacement for birds). Therefore, due to the lack of suitable habitats and unlikelihood of presence in the project AoI, an EAAA cannot be applied as a result of which CH will be not further assessed for this species. However, given the status of this species, if were to be observed during future monitoring efforts it would be assessed under the framework of adaptive management.

6.2.16 Marbled Teal

The Marbled Teal (*Marmaronetta angustirostris*) is a breeding resident and possible passage migrant in much of Uzbekistan and is listed as Near Threatened (NT) on the Global IUCN Red List. It is also listed as Vulnerable (VU) in the National Uzbekistan Red Data Book.

The CHA Screening exercise found that this species should be further investigated in the CHA against **IFC PS 6 Criteria 1 & 3 / EBRD PR 6 Criteria 2 & 4**.

6.2.16.1 ECOLOGY

This species inhabits temporary or semi-permanent wetlands although it is tolerant of many types of wetland provided there are shallow areas.

Marbled Ducks are omnivorous and feeds on aquatic plant seeds and also invertebrates.

This species is gregarious, non-territorial and non-aggressive and socially monogamous. This species is a late breeder with broods ranging from April to September. Nests are constructed

[58] Li, Z. W. D. and Mundkur, T. 2003. Status Overview and Recommendations for Conservation of the White-headed Duck Oxyura leucocephala in Central Asia. Wetlands International Global Series 15, Kuala Lumpur, Malaysia

by the female and are sited on the ground, not far from water, under a low shrub or herbaceous cover.

Threats faced by this species include destruction and degradation of wetland habitats, illegal hunting and trapping, lead poisoning and pollution and the spread of invasive species.

6.2.16.2 DISTRIBUTION

The Marbled Teal has a fragmented global population across central and southwest Palearctic, as well as Central Asia in the east to northwest Africa and the Iberian Peninsula in the west.

The estimates global population is 10,000 to 42,0000 mature individuals, with an estimated EOO of 13,500,000 km^2.

The following figures show the distribution of Marbled Teal in Uzbekistan and globally.

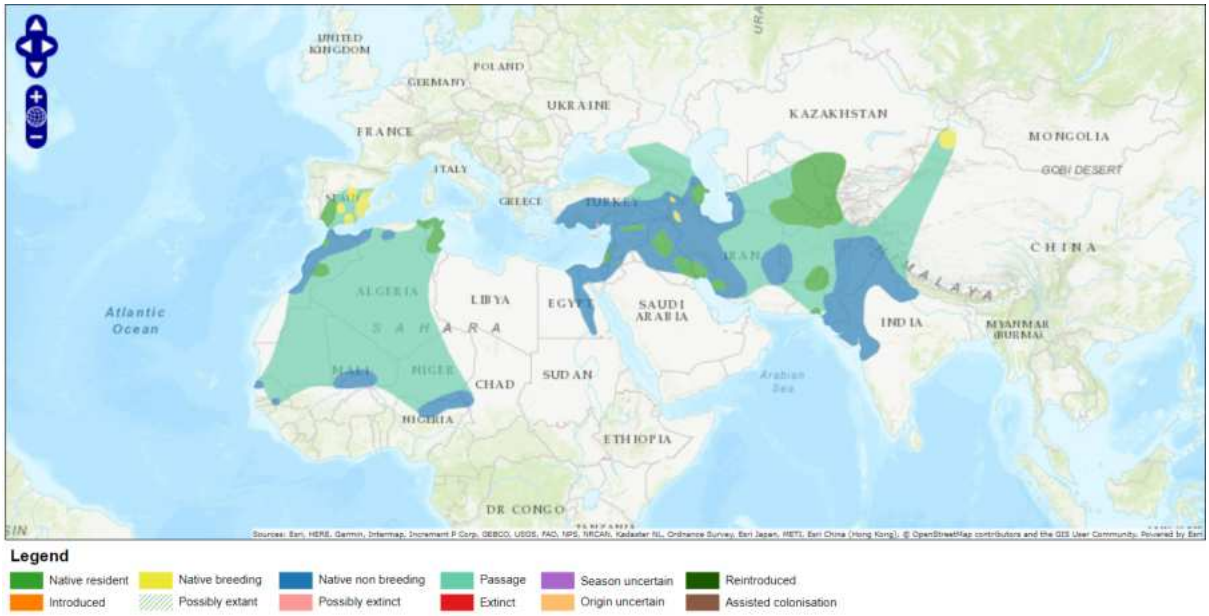

Figure 6-62 Geographical Distribution of the Marbled Teal [59]

[59] BirdLife International (2024) Species factsheet: Marbled Teal *Marmaronetta angustirostris*. Downloaded from https://datazone.birdlife.org/species/factsheet/marbled-teal-marmaronetta-angustirostris on 07/08/2024.

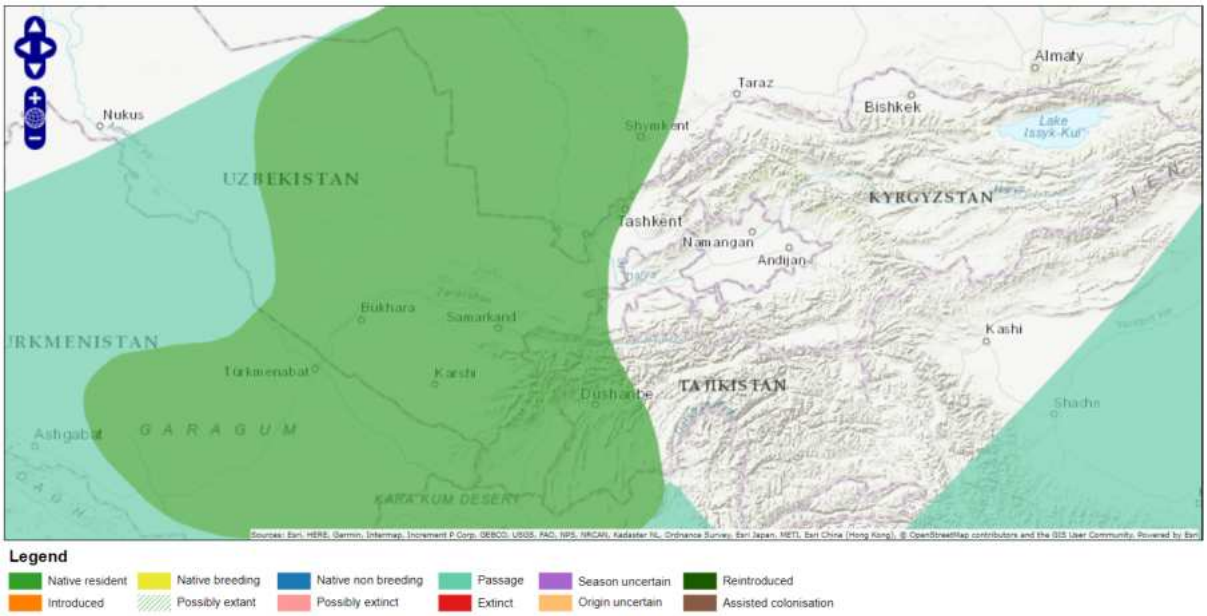

Figure 6-63 Geographical Distribution of the Marbled Teal

6.2.16.3 BASELINE SURVEY RESULTS

This species was not recorded within the Project area during any of the baseline surveys conducted in 2023 and 2024.

6.2.16.4 ANALYSIS

The closest known records of Marbled Teal is the Amudarya Floodlands near Termez IBA for which it is a trigger species. The IBA is located approximately 245km southeast from the project area. Habitat requirement for this species are temporary or semi-permanent wetlands although it is tolerant of many types of wetlands provided there are shallow areas with emergent vegetation. This may suggest the lack of suitable habitat within project footprint and AoI (considered as a 20km buffer from the project footprint due to habitat displacement for birds).

Therefore, due to the lack of suitable habitat and unlikelihood of presence in the project AoI, an EAAA cannot be applied as a result of which CH will be not further assessed for this species. However, given the nationally important status of this species, if were to be observed during future monitoring efforts it would be assessed under the framework of adaptive management.

6.2.17 Dalmatian Pelican

The Dalmatian Pelican (*Pelecanus crispus*) is a passage migrant in much of Uzbekistan and is listed as Near Threatened (NT) on the Global IUCN Red List. It is also listed as Vulnerable (VU) in the National Uzbekistan Red Data Book.

The CHA Screening exercise found that this species should be further investigated in the CHA against **IFC PS 6 Criteria 1 & 3 / EBRD PR 6 Criteria 2 & 4**.

6.2.17.1 ECOLOGY

This species inhabits rivers, lakes, deltas and estuaries. It occurs mainly at inland, freshwater wetlands as well as coastal lagoons, river deltas and estuaries. During migration, large lakes form important stop-over sites.

This species feed mainly on fish, especially carp, perch, rudd, pike and eels.

Adults form monogamous pairs. It departs from the colonies between the end of July and September, although a few remain until November. On migration, large lakes form important stop-over sites**.** It is gregarious during the winter, often occurring in large flocks and foraging communally and cooperatively in small groups, although occasionally singly. The birds return to their breeding sites in late-January to April, depending on the region. Immature birds and non-breeders may remain in the wintering grounds year round, or may stay with the breeding colonies. They are often nomadic, especially in the Caspian Sea.

6.2.17.2 DISTRIBUTION

This species breeds in Southeast Europe, to the east they breed in Asia to Kazakhstan and in the west to Mongolia. The Asian populations of this species tend to migrate and arrive in the Danube Delta during March and depart again in August.

The estimates global population is 11,400 to 13,400 mature individuals, with an estimated EOO of 12,600,000 km^2.

The following figures show the distribution of Dalmatian Pelican in Uzbekistan and globally.

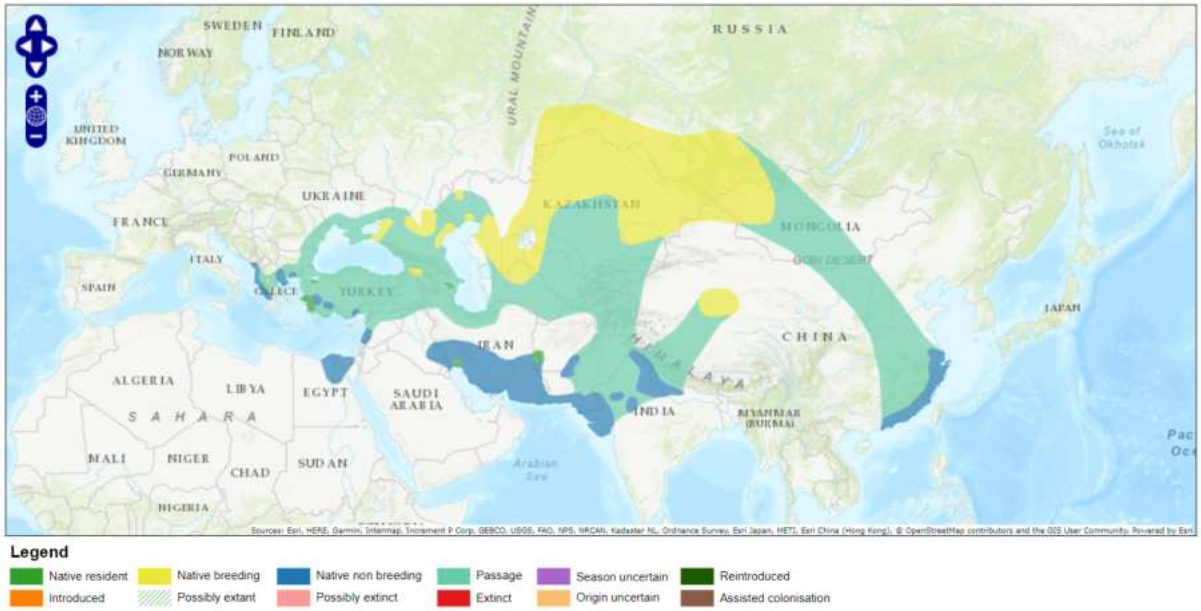

Figure 6-64 Distribution Map of Dalmatian Pelican[60]

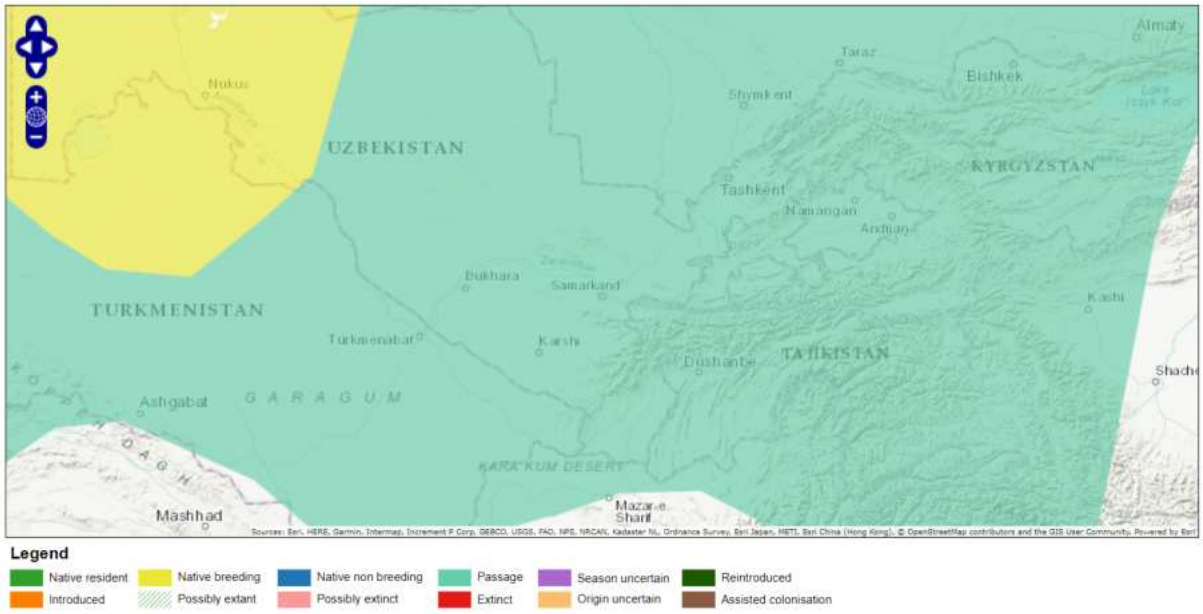

Figure 6-65 Distribution Map of Dalmatian Pelican

6.2.17.3 BASELINE SURVEY RESULTS

This species was not recorded within the Project area during any of the baseline surveys conducted in 2023 and 2024.

[60]BirdLife International (2024) Species factsheet: Dalmatian Pelican *Pelecanus crispus*. Downloaded from https://datazone.birdlife.org/species/factsheet/dalmatian-pelican-pelecanus-crispus on 07/08/2024.

6.2.17.4 ANALYSIS

Large lakes present important stopover sites during migration. No such habitats exist within the project footprint and AoI (considered as a 20km buffer from the project footprint due to habitat displacement for birds).

The closest known stopover sites of Dalmatian Pelican is the Dzheiran Ecocentre and Tuzkan Lakes IBAs for which it is a trigger species. These IBAs are located approximately 100km west and 120km north from the project site.

Therefore, due to the absence of suitable habitat and subsequent unlikelihood of presence in the project AoI, an EAAA cannot be applied as a result of which CH will be not further assessed for this species. However, given the nationally important status of this species, if were to be observed during future monitoring efforts it would be assessed under the framework of adaptive management.

7 CHIROPTERA

A number of bat species were identified during CHA Screening that pertain to the CH criteria for threatened species, and potentially migratory/congregating species as well as range-restricted:

- IFC PS6 Criterion 1: Critically Endangered and Endangered Species
- IFC PS6 Criterion 2: Endemic and Restricted-range Species
- IFC PS6 Criterion 3: Migratory and Congregatory Species
- EBRD PR6 Criterion (ii): Habitats of significant importance to endangered or critically endangered species /// IFC PS6 Criterion 1: Critically Endangered and Endangered Species
- EBRD PR6 Criterion (iii) Habitats of significant importance to endemic or geographically restricted species and sub-species /// IFC PS6 Criterion 2: Endemic and Restricted-range Species
- EBRD PR6 Criterion (iv) Habitats supporting globally significant concentrations of migratory or congregatory species /// IFC PS6 Criterion 3: Migratory and Congregatory Species

7.1 Literature Review

The desktop screening exercise described in Section 2.1 identified eleven bat species that could potentially trigger criticality.

As part of baseline surveys, experts in the region compiled a list of species likely to inhabit mostly adjacent areas near the project site. This was based on their own observations in the field and detailed literature reviews. Studies on Jizzakh region are limited, and in the Samarkand region are more related to the city itself or mountainous areas. The list therefore includes those species that may not form colonies near power lines but may be observed during migrations / movements.

Table 6-1 List and status of bats species potentially can be recorded in the project area

ID	SPECIES	IUCN RED LIST	UZRDB (2019)	CMS	STATUS	SOURCE
Jizzakh region						
1	Greater Horseshoe Bat (*Rhinolophus ferrumequinum*)	LC	-	II	widespread species in suitable habitats	Meklenburtsev, 1935; 1935; Bogdabov, 1950; Bogdabov, 1953; Bogdabov, 1956;

ID	Species	IUCN Red List	UzRDB (2019)	CMS	Status	Source
2	Lesser Horseshoe Bat (*Rhinolophus hipposideros*)	LC	2(VU:D)	II	sporadic records in the country	included in the list based on own observations
3	Lesser Mouse-eared Bat (*Myotis blythii*)	LC	-	II	widespread species in suitable habitats	Meklenburtsev, 1935; Bogdabov, 1950; Bogdabov, 1953;
4	Geoffroy's Bat (*Myotis emarginatus*)	LC	-	II	widespread small number species	Meklenburtsev, 1935; Bogdabov, 1950; Bogdabov, 1953
5	Nepal Myotis (*Myotis nipalensis*)	LC	-	-	widespread species,	Bogdabov, 1950; Bogdabov, 1953
6	Bokhara Whiskered Bat (*Myotis bucharensis*)	DD	1(CR)	-	a rare, poorly studied species. There are several current records in the country	included in the list based on own observations and conclusions
7	Asian Barbastelle (*Barbastella leucomelas*)	LC	-	II	widespread species, but poorly studied	Meklenburtsev, 1935; Bogdabov, 1950; Bogdabov, 1953; Vologeninov, 1978
8	Long-eared Bat (*Plecotus strelkovi*)	LC	-	-	widespread species in suitable habitats	Ognev S.I., 1928; Bobrinsky N.A., 1931; Bogdabov, 1953;
9	Noctule Bat (*Nyctalus noctula*)	LC	-	II	widespread species	Meklenburtsev, 1935; Bogdabov, 1950; Bogdabov, 1953
10	Common pipistrelle bat (*Pipistrellus pipistrellus*)	LC	-	II	widespread species, numerous	Meklenburtsev, 1935; Bogdabov, 1953; Korelov, 1956; Vologeninov, 1978
11	Serotine Bat (*Eptesicus serotinus*)	LC	-	II	widespread species	Satunin K.A., 1909; Bobrinsky N.A.,1925; Meklenburtsev, 1935; Bogdabov, 1950; Bogdabov, 1953
12	Particoloured Bat (*Vespertilio murinus*)	LC	-	II	widespread species	Bogdabov, 1950; Bogdabov, 1953; Vologeninov, 1978
Samarkand region						
1	Greater Horseshoe Bat (*Rhinolophus ferrumequinum*)	LC	-	II	widespread species in suitable habitats	Meklenburtsev, 1935; 1935; Bogdabov, 1950; Bogdabov, 1953; Bogdabov, 1956; Gritsina et al,

ID	Species	IUCN Red List	UzRDB (2019)	CMS	Status	Source
						2013 (a); Tadjibaeva, Khabilov, 2017
2	Lesser Horseshoe Bat (*Rhinolophus hipposideros*)	LC	2(VU:D)	II	sporadic records in the country	Bogdabov, 1953; Bogdabov, 1956; Gritsina et al, 2013 (b); Tadjibaeva, Khabilov, 2017
3	Buchara Horseshoe Bat (*Rhinolophus bocharicus*)	LC	-	II	AF, IR, TM, KZ, KY, TJ, UZ	Bogdabov, 1956; Tadjibaeva, Khabilov, 2017
4	Blyth's Horseshoe Bat (*Rhinolophus lepidus*)	LC	-	-	poorly studied species. There are several current records in the country	Benda et al, 2016; Tadjibaeva, Khabilov, 2017; Khabilov et al, 2018
5	Lesser Mouse-eared Bat (*Myotis blythii*)	LC	-	II	widespread species in suitable habitats	Meklenburtsev, 1935; Bogdabov, 1950; Bogdabov, 1953; Tadjibaeva, Khabilov, 2017
6	Geoffroy's Bat (*Myotis emarginatus*)	LC	-	II	widespread small number species	Meklenburtsev, 1935; Bogdabov, 1950; Bogdabov, 1953; Tadjibaeva, Khabilov, 2017
7	Nepal Myotis (*Myotis nipalensis*)	LC	-	-	widespread small number species	Bogdabov, 1950; Bogdabov, 1953; Tadjibaeva, Khabilov, 2017
8	Bokhara Whiskered Bat (*Myotis bucharensis*)	DD	1(CR)	-	a rare, poorly studied species. There are several current records in the country	Bogdabov, 1960; Kazakov et al, 2020; Khabilov, Tadjibaeva, ,2020
9	Asian Barbastelle (*Barbastella leucomelas*)	LC	-	II	widespread species, but poorly studied	Meklenburtsev, 1935; Bogdabov, 1950; Bogdabov, 1953; Vologeninov, 1978; Tadjibaeva, Khabilov, 2017
10	Noctule Bat (*Nyctalus noctula*)	LC	-	II	widespread species	Meklenburtsev, 1935; Bogdabov, 1953; Korelov, 1956; Vologeninov, 1978

ID	Species	IUCN Red List	UzRDB (2019)	CMS	Status	Source
11	Common pipistrelle bat (*Pipistrellus pipistrellus*)	LC	-	II	widespread species, numerous	Meklenburtsev, 1935; Bogdabov, 1953; Korelov, 1956; Vologeninov, 1978; Gritsina et al, 2013; Tadjibaeva, Khabilov, 2017
12	Long-eared Bat (*Plecotus strelkovi*)	LC	-	-	widespread species in suitable habitats	Ognev S.I., 1928; Bobrinsky N.A., 1931; Tadjibaeva, Khabilov, 2017; own observations
13	Serotine Bat (*Eptesicus serotinus*)	LC	-	II	widespread species	Satunin K.A., 1909; Bobrinsky N.A., 1925; Meklenburtsev, 1935; Bogdabov, 1950; Bogdabov, 1953;
14	Botta's serotine (*Eptesicus ognevi*)	LC	-	-	numerous in suitable habitats	Kashkarov, Mitropolskaya 2004
15	Savi's Pipistrelle (*Hypsugo savii*)	LC	-	II	a poorly studied species in the country	Khabilov, 1992; Tadjibaeva, Khabilov, 2017
16	Particoloured Bat (*Vespertilio murinus*)	LC	-	II	widespread species	Bogdabov, 1950; Bogdabov, 1953; Vologeninov, 1978; Khabilov, 1992
17	Turkestani Long-eared Bat (*Otonycteris leucophaea)*	DD	-	-	a poorly studied species in the country	Bogdabov, 1956; Khabilov, 1992

Endemism: *AF-Afghanistan, IR- Iran, KZ – Kazakhstan; TM – Turkmenistan; KG – Kyrgyzstan; TJ – Tajikistan; UZ – Uzbekistan.*

The Bokhara Whiskered Bat, is included in the IUCN Red List with DD status, is endemic to Uzbekistan and classified as Vulnerable in the Uzbekistan Red Data Book. The Lesser Horseshoe Bat is also included in the Uzbek Red Data Book as Vulnerable.

A combined list of bat species to be assessed, based on initial CHA screening and expert literature reviews is as follows.

Table 7-1 Combined list of all bat species expected to be present in the Project area.

Species	IUCN Classification	UZBEK RDB	Assessment Criteria
Gobi Big Brown Bat (*Eptesicus gobiensis*)	LC	-	Criterion 3
Ognev's Serotine (*Eptesicus ognevi*)	LC	-	Criterion 3

Serotine Bat (*Eptesicus serotinus*)	LC	-	Criterion 3
Lesser Mouse-eared Myotis (*Myotis blythii*)	LC	-	Criterion 3
Geoffroy's Bat (*Myotis emarginatus*)	LC	-	Criterion 3
Nepal Myotis (*Myotis nipalensis*)	LC	-	Criterion 3
Common Pipistrelle (*Pipistrellus pipistrellus*)	LC	-	Criterion 3
Bokhara horseshoe bat (*Rhinolophus bocharicus*)	LC	-	Criterion 3
Particoloured Bat (*Vespertilio murinus*)	LC	-	Criterion 3
Greater Horseshoe Bat (*Rhinolophus ferrumequinum*)	LC		Criterion 3
Long-eared Bat (*Plecotus strelkovi*)	LC		Criterion 3
Noctule Bat (*Nyctalus noctula*)	LC		Criterion 3
Savi's Pipistrelle (*Hypsugo savii*)	LC		Criterion 3
Turkestani Long-eared Bat (*Otonycteris leucophaea)*	DD	-	Criterion 3
Bokhara Whiskered Bat (*Myotis bucharensis*)	DD	1(CR)	Criterion 1, 2 and 3
Lesser Horseshoe Bat (*Rhinolophus hipposideros*)	LC	2(VU:D)	Criterion 1 and 3

7.2 Bat Baseline Survey Method

The survey methodology consisted of three stages: Desktop analysis, Bat roost searches and Acoustic Monitoring

Desktop preparation; analysis of detailed topographic maps of the area (scale: 1:100 000, 1:200 000) and *Google Earth* satellite images to identify the locations (GPS coordinates) of potential bat roosts – mostly buildings. Those locations were then transferred to the *LocusPro* smartphone application for further use in the field.

The bat roost survey was conducted during two periods; 12th to 13th March 2024 (Samarkand and Bukhara regions) and 20th to 21st March 2024 (Samarkand regions). Field work included a survey of the potential roosts, identified during the desktop stage, along the project site including a 500m buffer zone. When a roost was found, it was thoroughly examined, both for the presence of bats and signs of bat activity such as guano and forage remains. All suitable bat habitat was surveyed, mapped and photographed. Each surveyed object was mapped, photographed; its brief description was made, including notes on the suitability of the objects for bats.

The following figure provides transects of the roost search survey.

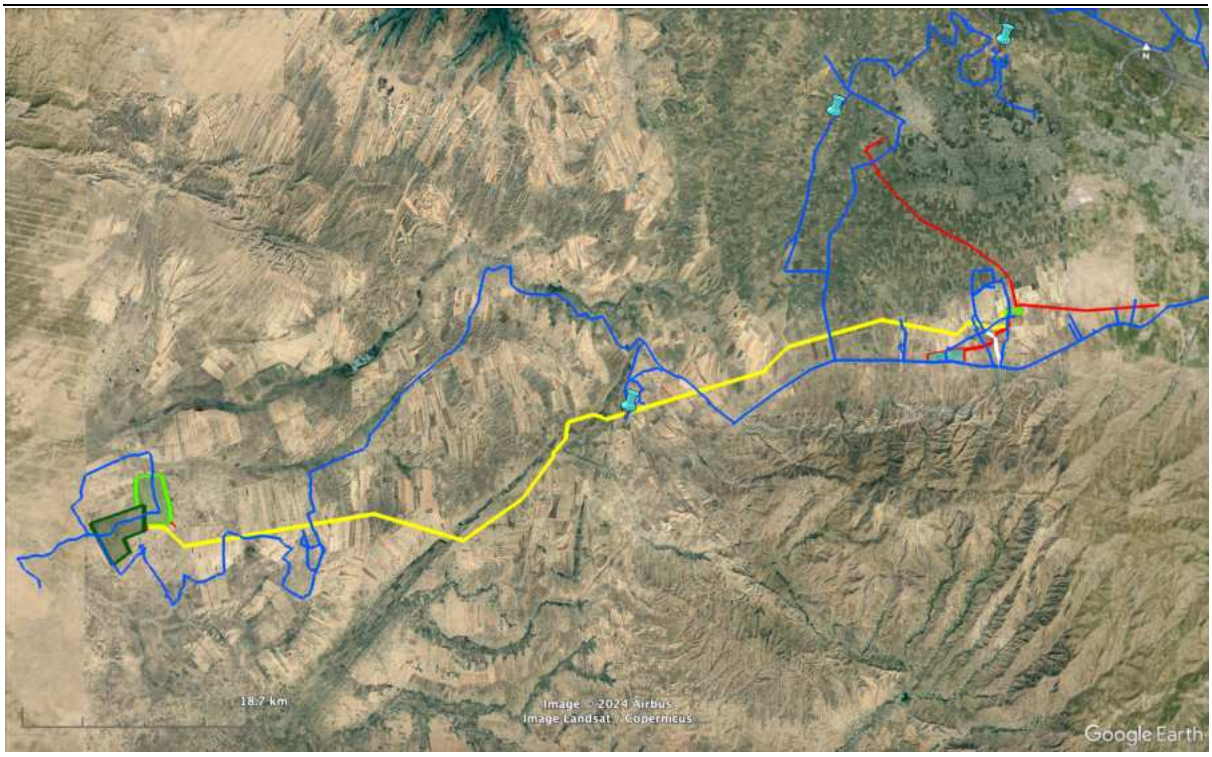

Figure 7-1 Transects of the roost search survey (blue line) and potential roosting sites (pins)

Bat activity was monitored using mobile bat detectors Echo Meter Touch (Wildlife Acoustics, USA) along two transects, one at each of the 100 MW, 400 MW and Nurobod BESS. The transects were surveyed twice, once in April (25th and 27th) in May (13th and 15th).

The transect passed along the route at registration points with a step of about 400 m. A stop was made at each registration point, during which the bat ultrasonic calls were recorded for approximately 10 minutes. After this, the recording was stopped, and started again at the next point. Surveying continued in this manner until the survey transect was finished. The detector recorded data from 19:50 to 23:40.

Due to the migratory patterns of bats in the area, the survey was conducted across two months. It was assumed that bats migrating above the survey sites would be counted in April, and sedentary species feeding above the survey sites would be counted in May.

Table 7-2 The total duration of recordings at the surveyed facilities

Project Facility	Month	Duration, s	Duration, h
100 MW PV Plant	Apr	3674	1.02
	May	4071	1.13
400 MW PV Plant	April	4878	1.36
	May	5841	1.62
Nurabad BESS	April	612	0.17
	May	662	0.18

7.3 Species Assessments

7.3.1 Bokhara Whiskered Bat

The Bokhara Whiskered Bat (*Myotis bucharensis*) is a congregatory species, with a possibly restricted range within Central Asia, including Uzbekistan. It is listed as Data Deficient (DD) on the Global IUCN Red List but Critically Endangered (CR) in the national Uzbekistan Red Data Book.

The CHA Screening exercise found that this species should be further investigated in the CHA against **IFC PS 6 Criteria 1, 2 & 3 / EBRD PR 6 Criteria 2, 3 & 4**.

7.3.1.1 ECOLOGY & CONSERVATION

The species is found in arid areas and caves.

There is currently no additional information on the ecology of this species.

7.3.1.2 DISTRIBUTION

Known from three locations in Middle Asia (Uzbekistan, Tajikistan). Four specimens of this species were discovered, collected from Samarkand and Tashkent, Uzbekistan between 1959 and 1963 (Benda et al. 2011). It was thought to be extinct until a single male specimen was confirmed from the Zerafshan river basin in Tajikistan (Kazakov et al 2020).

May also occur in Kyrgyzstan, however Benda and Gaisler (2015) did not find the presence of this species from Afghanistan.

There are no estimates of population available.

The following figure shows the species distribution globally and within Uzbekistan.

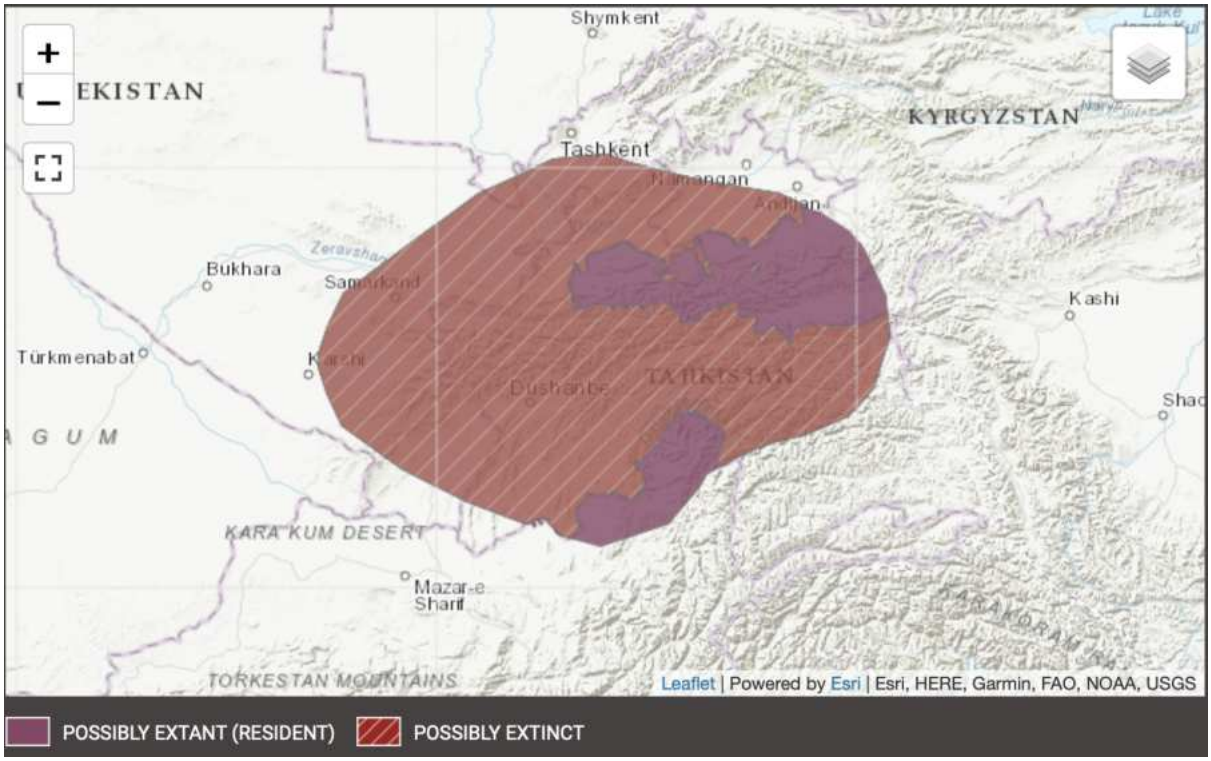

Figure 7-2 Geographic Distribution of Bokhara Whiskered Bat [61]

7.3.1.3 BASELINE SURVEY RESULTS

This species was not recorded within the Project area during Bat Roost Searches conducted in 2024. **Four *Myotis sp.*** were recorded during acoustic surveys, across the 100MW and Nurobod BESS facilities however the calls could not be identified to species level.

7.3.1.4 ANALYSIS

As this species has not been reported in Uzbekistan since 1963, it is considered possibly extinct in Uzbekistan as per IUCN. The closest known records of this species are from the Zeravshan River Basin in Tajikistan. Due to the lack of known records in Uzbekistan, an EAAA cannot be applied for this species.

Therefore, due to the unlikelihood of presence in the project AoI (considered as project footprint and a 5km buffer due to potential impacts habitat displacement due to the PV panels), an EAAA cannot be applied as a result of which CH will be not further assessed for this species. However, given the nationally important status of this species, if were to be observed

[61] IUCN (International Union for Conservation of Nature) 2019. *Myotis bucharensis.* The IUCN Red List of Threatened Species. Version 2023-1

during future monitoring efforts it would be assessed under the framework of adaptive management.

7.3.2 All Other Bats

The CHA Screening exercise found that 18 bat species should be further investigated in the CHA against **IFC Criterion 3 / EBRD Criterion 4.** All species are classified as Least Concern by the IUCN Red List and are not listed as protected in the Uzbekistan Red Data Book (UzRDB). The following table gives a summary of these species.

Table 7-3 Bat species identified for CHA screening under Criteria 3

No.	Species	Ecology & Threats	Distribution & Population
1	Asian (Eastern) Barbastelle (Barbastella leucomelas)	Found in Himalayan moist temperate forest and dry coniferous forest areas in Asia. Insectivorous. It roosts in caves, tunnels, crevices, old buildings, mines, tree hollows, and can be found beneath bark.	The main distribution occurs from the Caucasus eastwards including Iran, Afghanistan and India, and onwards to China. EOO is 24,710,500 km^2 and unknown population estimate.
2	Bokhara horseshoe bat (*Rhinolophus bocharicus*)	Arid and semi-arid regions. Insectivorous. Habitat destruction is a major threat.	Distributed in Central Asia. No EOO or population estimates data.
3	Common Pipistrelle (*Pipistrellus pipistrellus)*	Adaptable – found in urban centres, arable land and woodlands. Migratory behaviour inferred. 1-2 offspring. Insectivorous Habitat loss is a major threat.	Widespread western Palearctic species. No population estimates or EOO available.
4	Gobi Big Brown Bat (*Eptesicus gobiensis*)	Inhabits desert, semi-desert and steppe habitats and dry areas. Low reproductive rate. 1 offspring. Insectivorous. Threatened by droughts.	Subspecies *E. g. gobiensis l*ikely found in Uzbekistan. No population estimates or EOO available.
5	Geoffroy's Bat (*Myotis emarginatus*)	Arid and semi-arid habitats – lowland steppe and rocky mountains. Insectivorous Lives in large colonies. Thought to be sedentary but may migrate to wintering sites. Threatened by habitat degradation.	Broadly distribution across Europe, Central Asia and Middle East. EOO = 15,654,608 km^2 No population estimates.

6	Greater Horseshoe Bat (*Rhinolophus ferrumequinum*)	Forages in pastures, deciduous temperate woodland, and shrubland. Uses caves all year. Insectivorous. Give birth to single pups. Mainly threatened by habitat fragmentation and loss of insects through pesticide use.	The species has a wide range in the Palaearctic. EOO = 31424082 km^2. No population estimates available.
7	Lesser Horseshoe Bat (*Rhinolophus hipposideros*)	A sedentary species, winter and summer roosts are usually found within 5-10km. Roosts are found in natural and artificial underground sites and in attics and buildings in the northern part of it. Foraging activities take place nearly exclusively within woodland areas, while open areas are avoided Threatened by disturbance and loss of underground habitats	Widely distributed in the western and central Palaearctic, from sea level to 2000m. It is found in the Eastern borders of Uzbekistan. EOO = 22,157,273 km2. No population estimates are available.
8	Lesser Mouse-eared Myotis (*Myotis blythii*)	Favours temperate zones with grassland and agriculture. Breeding begins in autumn – 2 pups born in late spring. Insectivorous. Threatened by habitat loss.	Broad range from Europe to China. EOO = is 23,471,950 km^2 No population estimates available.
9	Long-eared Bat (*Plecotus strelkovi*)	Inhabits montane and forest-steppe habitats. No other information on the species ecology or threats.	Mountainous regions of Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan, China, Afghanistan and Iran. 10No available EOO or population estimates.
10	Nepal Myotis (*Myotis nipalensis*)	Arid or mountainous habitats including forest, shrubland and desert. Single pup once a year. Likely non-migratory. Reproduces once a year. No notable threats.	Widely distributed across Central Asia. The EOO is noted as >20,000 km^2. No population estimates.
11	Noctule Bat (*Nyctalus noctula*)	Forages over wetland, woodland and pasture. Roosts in crevices, caves and occasionally artificial structures. Seasonal migrations to wintering sites in Europe.	Wide Palaearctic distribution. EOO = 24101079 km^2 No population estimates
12	Ognev's Serotine (*Eptesicus ognevi*)	Arid and semi-arid habitats – lowland steppe and rocky mountains. Insectivorous Threatened by habitat degradation.	Distributed in Central Asia primarily around the Aral and Caspian Seas. No population estimates or EOO.

13	Particoloured Bat (*Vespertilio murinus*)	Forages in open areas over various habitat types (forest, semi-desert, urban, steppe, agricultural land) Migratory species (up to 1,780km). 1-2 pups born in June/July No major threats.	Widely distributed in North Palearctic. EOO = 25,697,109 km^2 No population estimates.
14	Savi's Pipistrelle (*Hypsugo savii*)	Forages in woodland, pasture and wetlands, and often feeds at lights in rural areas. Roosts in crevices, occasionally in buildings or under bark. Migration and breeding unknown. No major threats.	Wide range in the Palaearctic (and marginally in Indomalaya) EOO = 15658670 km^2 No population estimates are available.
15	Serotine Bat (*Eptesicus serotinus)*	Varied landscapes from urban centres to woodlands. Breed in autumn. 1 pup born in spring. Insectivorous. Threatened by habitat loss.	Widley distributed across Palearctic. No population estimates or EOO is available.
16	Turkestan Pipistrelle (*Pipistrellus aladdin*)	Inhabits semi-desert areas, rocky landscapes, woodlands, farmlands, rural gardens, and urban areas, as well as water bodies like rivers and lakes. One breeding period a year. 1-2 offspring. Insectivorous. No major threats.	Primarily found in Central Asia. No EOO or population estimates available.
17	Turkestani Long-eared Bat (*Otonycteris leucophaeaei)*	This species is associated with dry steppe to desert zone of sub-montane and lowland areas. Its habitats are xeric, sparsely vegetated, and rocky. If similar to *O. hemprichii*, this species roosts in rock fissures or in human constructions. Insectivorous. This is a ground-gleaning species. No major threats.	This species occurs in the Central Asia. Occurs in the southern desert and sub-desert belt of Western and Central Palaearctic from Morocco and Niger as far east as north-west India. EOO = 11,617,147 km^2 This species is DD and no EOO could be derived. No population estimates are available.
18	European Free-tail Bat (*Tadarida teniotis*)	Forages over temperate to semi-desert habitats, occasionally humid habitats in some areas. Inhabits semi-desert steppe and dry areas. Insectivorous Threatened by disturbance and loss of roosts in buildings, and by use of	It is mainly a Palaearctic species, although the south-eastern edge of its range extends into the Indomalayan region. EOO = 18,885,688 km^2 and population estimate is not known.

		pesticides. It is also potentially threatened by wind farms.	

7.3.2.1 BASELINE SURVEY RESULTS

During bat acoustic surveys several species listed above were recorded, shown in the table below.

Table 7-4 Bat species recorded during acoustic monitoring surveys

	100 MW		NUROBOD BESS		400 MW		NUROBOD SS		500 MW		TOTAL
	APRIL	MAY	APRIL	MAY	APRIL	MAY	APRIL	MAY	APRIL	MAY	
Calls of *Eptesicus sp.(serotinus+ognevi)*	0	33	8	13	8	0	25	28	-	-	115
Calls of *Myotis sp.*	0	2	1	0	-		0	1	-	-	4
Calls of *Pipistrellus pipistrellus*	2	33	0	7	-	-	3	23	0	7	75
Calls of *Tadarida teniotis*	-	-	-	-	0	51	-	-	-	-	51
Calls of Pipistrellus kuhlii	-	-	-	-	-	-	2	0	-	-	2
Calls of all species	**2**	**68**	**9**	**20**	**8**	**51**	**30**	**52**	**0**	**7**	
Number of species	**1**	**3**	**2**	**2**	**1**	**1**	**3**	**3**	**0**	**1**	

Calls attributed to the common pipistrelle (*Pipistrellus pipistrellus*) were recorded 75 times across 4 of the 5 facilities surveyed. Calls of *Eptesicus serotinus* and/or *Esptesicus ognevi* were recorded across 4 of the 5 sites surveyed, a total of 115 times. Due to the difficulties differentiating these calls it is unclear whether just one of these species, or both, are present in the area.

Myotis sp. calls were recorded 4 times across several sites. It was not possible to determine which species these calls belong to.

Finally, two species not initially screened in by Literature reviews were the *Tadarida teniotis* and *Pipistrellus kuhli* were recorded 51 and 2 times respectively at just a single site each.

7.3.2.2 ANALYSIS

7.3.2.2.1 EAAA

The total EAAA for all bats has been applied as all connected suitable habitat that overlaps the project footprint as well as exists within a reasonable buffer from the project footprint, determined by species specific ecology.

The habitat type within the project footprint indicate lack of suitable roosting habitat. However, acoustic surveys in the PV areas have confirmed species presence which suggests presence of foraging habitat within the project AoI (considered as project footprint and a 5km[62] buffer due to potential impacts habitat displacement due to the PV panels).

The EAAA is considered as the project footprint and a 10km buffer to account for potential localised foraging movement in and around the project site. This should provide an adequate accounting of the population of bats likely to regularly utilize the project area. The resulting EAAA has been mapped in the following figure.

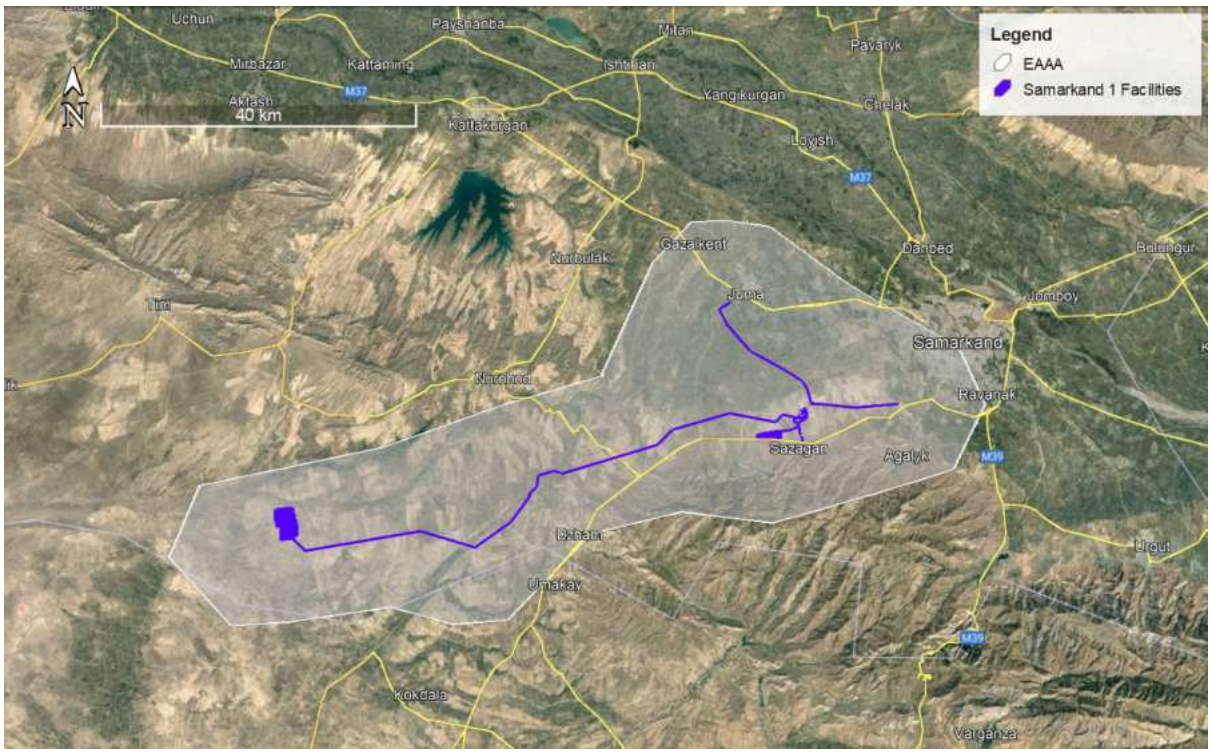

Figure 7-3 Estimated EAAA for all other bat species

7.3.2.2.2 Criticality

These species are assessed under IFC Criterion 3/ EBRD Criterion 4, as they are considered to be congregatory and migratory species. This criterion requires that the project area should support at least 1% of the global population.

The baseline surveys recorded a total of 194 discrete calls from at least 3 of the species being assessed. However, given that surveys were conducted over 2 survey periods across 5 different

[62] Rainho A, Palmeirim JM. The importance of distance to resources in the spatial modelling of bat foraging habitat. PLoS One. 2011 Apr 25;6(4):e19227. doi: 10.1371/journal.pone.0019227. PMID: 21547076; PMCID: PMC3081845.

areas, bat activity and diversity was minimal. The most commonly recorded species were *Pipistrellus pipistrellus* and *Eptesicus serotinus* and/or *Eptesicus ognevi*

In many cases for the species of microbats listed in the tables above, global population estimates are not available and thus cannot be assessed against the numerical threshold of the IFC Criterion 3. However, given the small size of the EAAA and relatively large geographic distribution of these common and widespread species, it is unlikely that that EAAA populations of each species would comprise more the 1% of the respective global populations. For example, based on the distribution data provided by IUCN, the Serotine Bat (Eptesicus serotinus) has an approximate EOO of 11,200,736 km2. Comparatively, the EAAA makes up 0.021% of the EOO.

Turkestan Pipistrelle (Pipistrellus aladdin) is the only other DD species among these microbats. Based on the distribution data provided by IUCN, this species has an approximate EOO of 2,111,695 km^2. Comparatively, the EAAA makes up 0.116% of the EOO. Therefore, it is considered unlikely that more than 1% of the global populations of the common and widespread bat species recorded during the baseline surveys regularly occur in the EAAA to meet the migratory and congregatory requirements of the IFC Criterion 3. Furthermore, given the status of these species they will also not be considered as SBVs or PBFs, although they will be assessed as Sensitive Receptors in the respective Samarkand project ESIAs.

8 HERPETOFAUNA

One reptile species was identified during CHA Screening that pertain to the CH criteria for threatened species, and potentially migratory/congregating species as well as range-restricted:

- IFC PS6 Criterion 1: Critically Endangered and Endangered Species
- IFC PS6 Criterion 2: Endemic and Restricted-range Species
- EBRD PR6 Criterion (ii): Habitats of significant importance to endangered or critically endangered species /// IFC PS6 Criterion 1: Critically Endangered and Endangered Species
- EBRD PR6 Criterion (iii) Habitats of significant importance to endemic or geographically restricted species and sub-species /// IFC PS6 Criterion 2: Endemic and Restricted-range Species

8.1 Herptiles Baseline Survey Method

8.1.1 Methodology

Field surveys to assess Herptiles in the Project area were carried out in the Spring and Summer 2023 and 2024. A combination of field surveys and desktop analysis was used to assess Herptile diversity. The survey locations and dates are detailed in the table below.

Table 8-1 Locations and Dates of Herptile Surveys across Project Facilities

PROJECT FACILITY	SURVEY POINT	DATE AND TIME	LENGTH	N (DD FORMAT)	E (DD FORMAT)	BIOTOPE
Nurobod SS, BESS and 100 MW PV Plants	PS-1	28/06/23	1 km	39.549109°	66.685559°	Deposited lands
	PS-2	28/06/23	1 km	39.545677°	66.687853°	Deposited lands
	PS-3	28/06/23	2 km	39.576767°	66.744959°	Deposited lands
	PS-4	28/06/23	1 km	39.574226°	66.737152°	Agricultural fields
	PS-5	28/06/23	1 km	39.553687°	66.686383°	Agricultural fields
	Nurobod BESS	11/03/24				Deposited lands
	Nurobod SS	11/03/24				Deposited lands
400 and 500 MW PV and pooling station	P-1	27/06/23	5 km	39.443530°	65.977999°	Deposited lands
	P-2	27/06/23	3,6 km	39.444009°	65.987181°	Deposited lands
	P-3	27/06/23	2 km	39.426815°	65.966046°	Gravelly-clay plain
	P-4	27/06/23	2,6 km	39.427411°	65.933010°	Gravelly-clay plain
	P-5	27/06/23	4 km	39.419400°	65.944827°	Gravelly-clay plain
Nurabod SS-Pooling Station – 70km OHTL	PLN-1	30/08/23	1.13 km	39.576059° 66.737745°	39.566393° 66.742018°	Sazagan site
	PLN-2	30/08/23	1.06 km	39.568289° 66.651061°	39.569996° 66.639031°	Wheat fields, fallow land, ravine

Project Facility	Survey point	Date and time	Length	N (DD format)	E (DD format)	Biotope
	PLN-3	30/08/23	1.26 km	39.533276° 66.512261°	39.530160° 66.498623°	A ravine, a scour
	PLN-4	30/08/23	1.04 km	39.512995° 66.426383°	39.510381° 66.414994°	Bagara foothills through which the gas pipeline passes
	PLN-5	30/08/23	1.06 km	39.504631° 66.367995°	39.503814° 66.361326°	The natural hilly landscape
	PLN-6	30/08/23	1.07 km	39.439060° 66.180656°	39.435895° 66.169032°	The hills between the bagara
	PLN-7	30/08/23	1.2 km	39.420389° 66.054487°	39.418424° 66.040842°	Small-scale transformation of the territory near the village, steppe area
	PLN-8	30/08/23	1.05 km	39.427239° 65.983609°	39.426674° 65.971470°	Well-preserved steppe site with salinization
11 km LILO	LILO11km_1	11/03/24		39.579708	66.855531	Vinegard
	LILO11km_2	11/03/24		39.579296	66.838477	Fallow lands
	LILO11km_3	11/03/24		39.576897	66.802835	Temporary stream and riverbed

The main research method was mixed stationary and transect surveys, where points and transects were selected along the project site in accordance with different habitat types, and therefore to maximise the Herptile diversity captured. Field studies were carried out according to generally accepted zoological methods for identifying species composition. The following methodological guidelines were used in the survey: L. G. Dinesman, M. L. Kaletskaya (1952), V. M. Makeev, A. T. Bozhansky (1988), D.A. Bondarenko, N.G. Chelintsev (1996).

Thus, the method of quantitative assessment was based on the ecology of the species under consideration, landscape and geographical conditions, season and type of work.

The quantitative assessment of reptiles and amphibians was mainly based on the transect survey. The transect method consists in counting individuals along a fixed long line (transect), on both sides of it, with the duration of the survey determined by the known distance, which is selected depending on the type of reptile and the area, but does not exceed 1 km in one way. In this case, all individuals encountered on the transect are registered, regardless of the distance they are identified at. The perpendicular distance is measured between the transect axis and each individual. The results obtained are used to calculate the density of recorded reptiles. The 1 km transect was chosen because heaviest errors arise when long transects are

used for species that, like the Central Asian Tortoise, have high density, daily and seasonal activity cycles fluctuations with high peak values, and are caused by incorrect selection of a minimum survey area for a particular species (Vashetko et al, 2001).

The Central Asian tortoise population density (D) was calculated using the following formula:

$$D=n2LB$$

where n – number of animal individuals recorded on the transect; L – length of the transect; B – formula to calculate an effective width of the survey strip:

$$B=W(0,79F+0,21F4)$$

where W – width of the limited strip on both sides of the transect axis; F:

$$F=2yW$$

The use of perpendicular distances to carry out survey on a strip of limited width excludes underestimation of the population density of the Central Asian tortoise caused by a decrease in their detectability in remote parts of the survey strip, regardless of the degree of its limitation.

The abundance of the reptiles in habitats was estimated using the following population density scale for 1 ha (Kuzyakin, 1962): 0.1 – 0.9 – rare, 1.0 – 9.9 – common, 10.0 and higher – abundant.

The following figures show the locations of sample points and transects in relation to various Project elements.

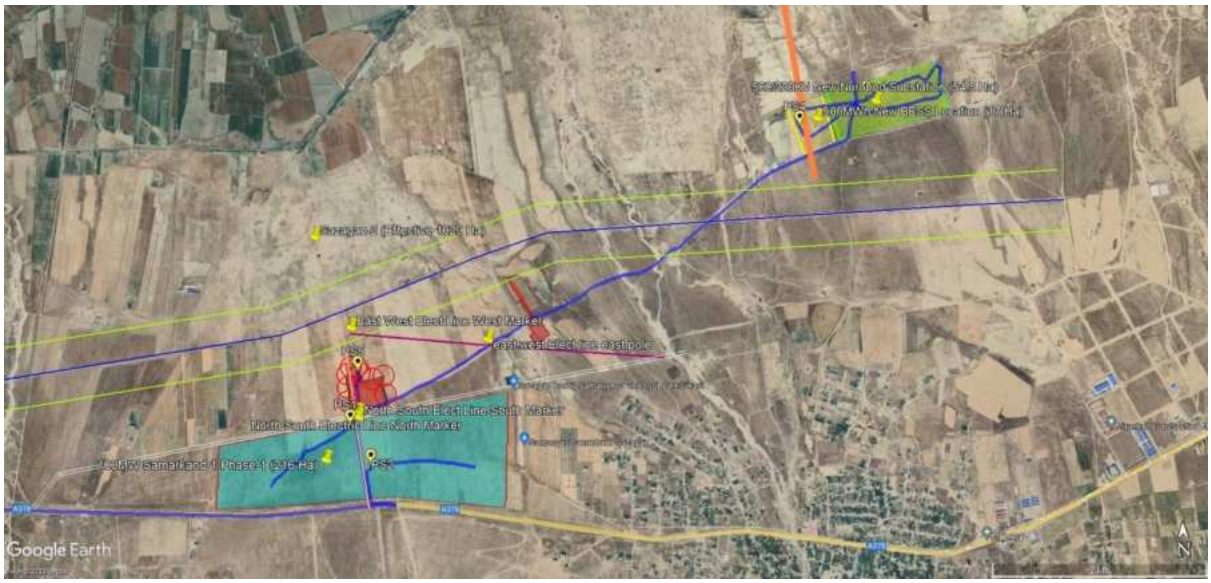

Figure 8-1 Survey points and transects on Nurabad Substation, Nurabad Bess, Solar 100 MW PV (June 2023).

Figure 8-2 Survey points and transects on Nurabad Substation, Nurabad BESS (March 2024).

Figure 8-3 Survey points and transects on Solar 400 MW PV, Solar 500 MW PV and pooling station (June 2023).

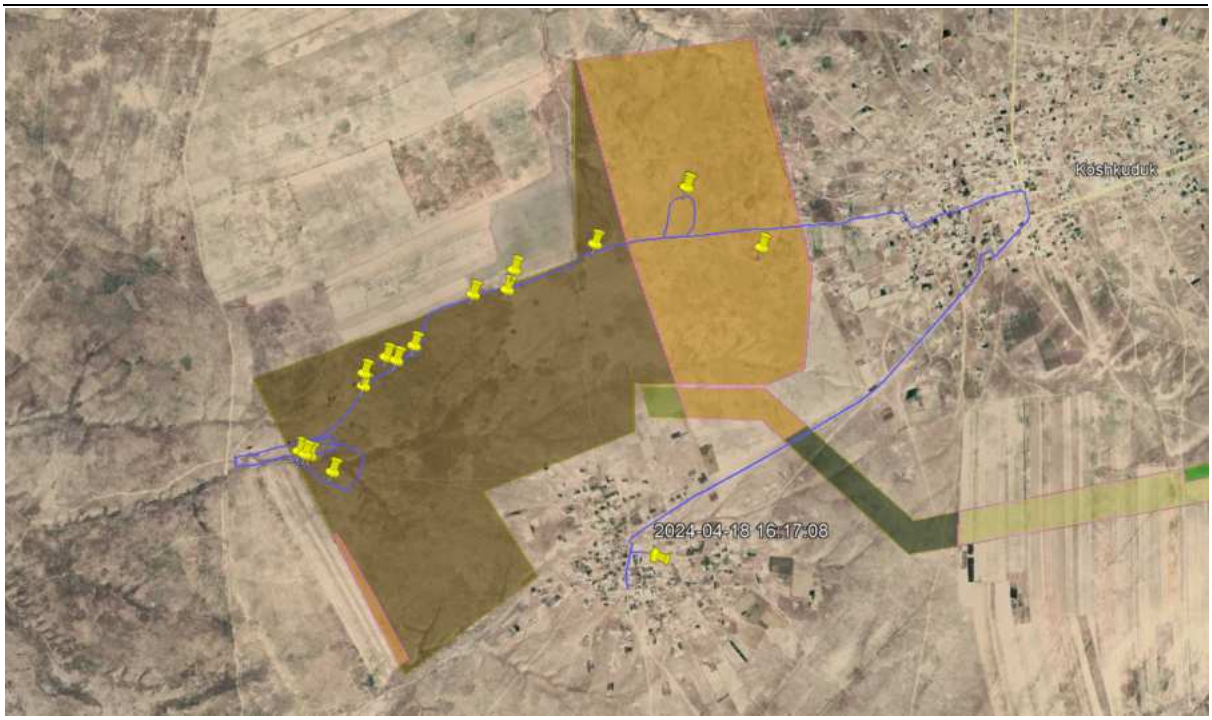

Figure 8-4 Survey points and transects on Solar 400 MW PV, Solar 500 MW PV and pooling station (April 2024).

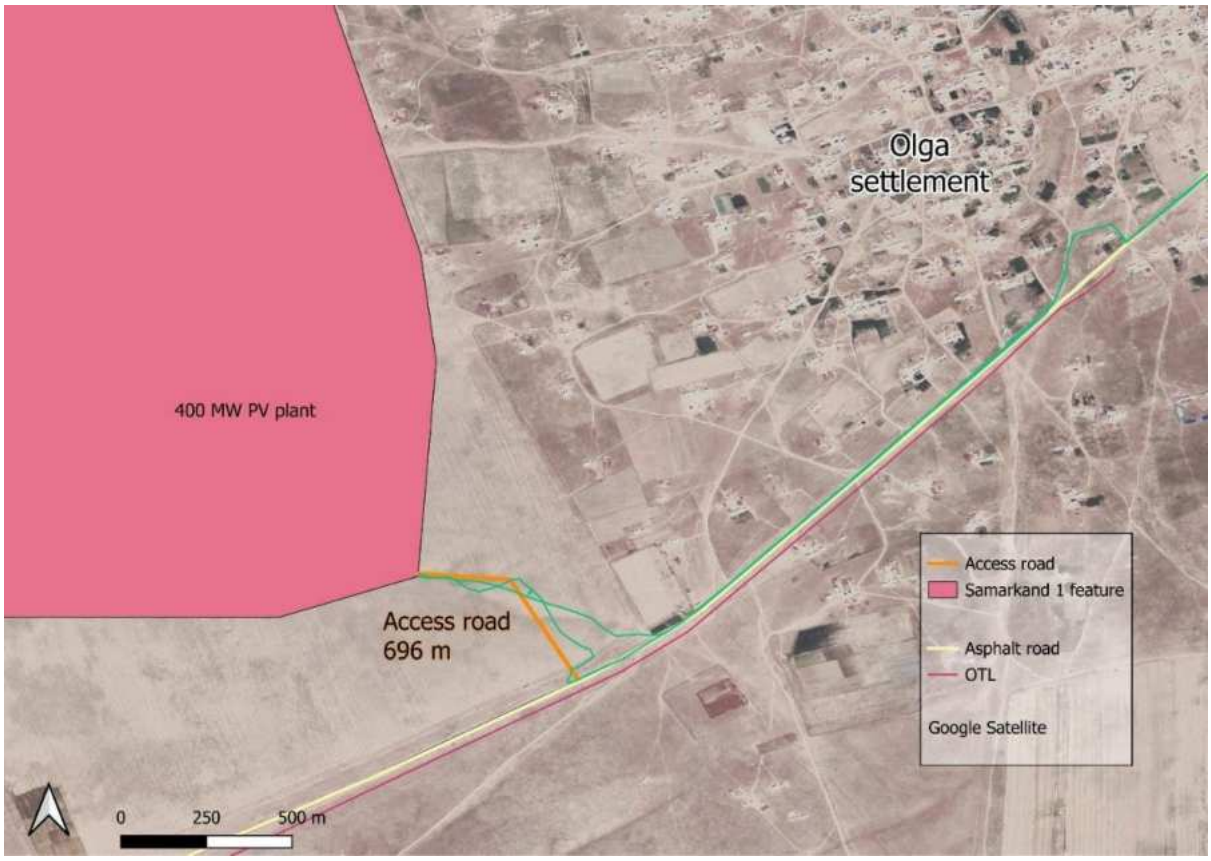

Figure 8-5 Survey map of the access road (March 2024)

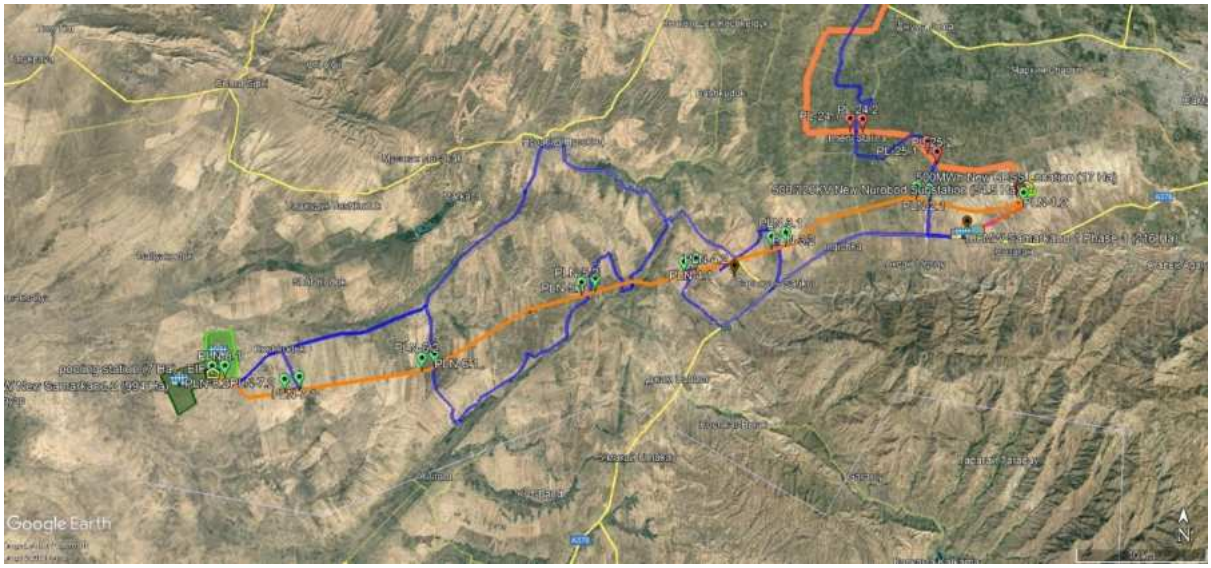

Figure 8-6 Survey map including survey points and transects on Nurabad SS – Pooling station – 70km

Additional surveying was completed between 17th – 19th April and 14th to 15th May 2024 to align with the known active period of the Central Asian Tortoise. A total of nine additional transects were completed across the facilities.

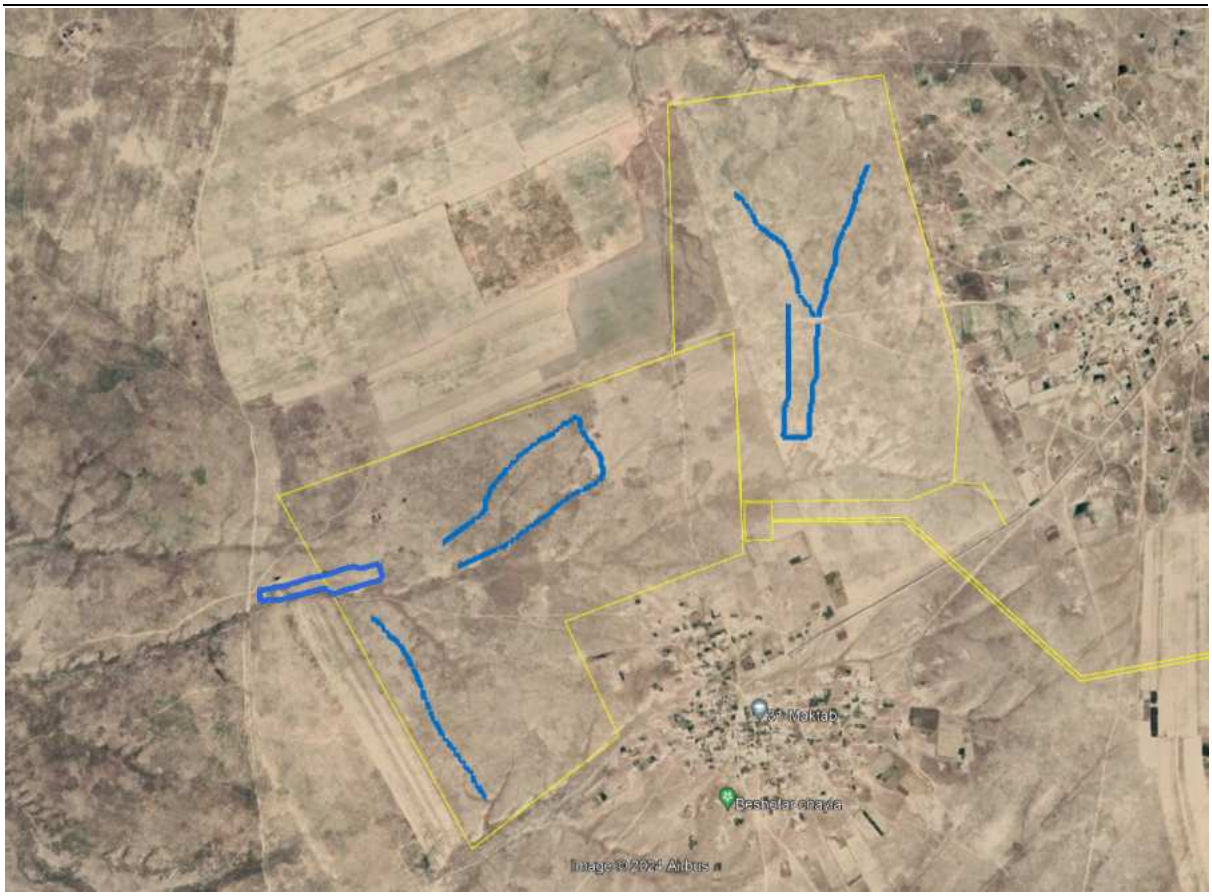

Figure 8-7 April 2024 survey points and transects covering the 400MW and 500 MW PV

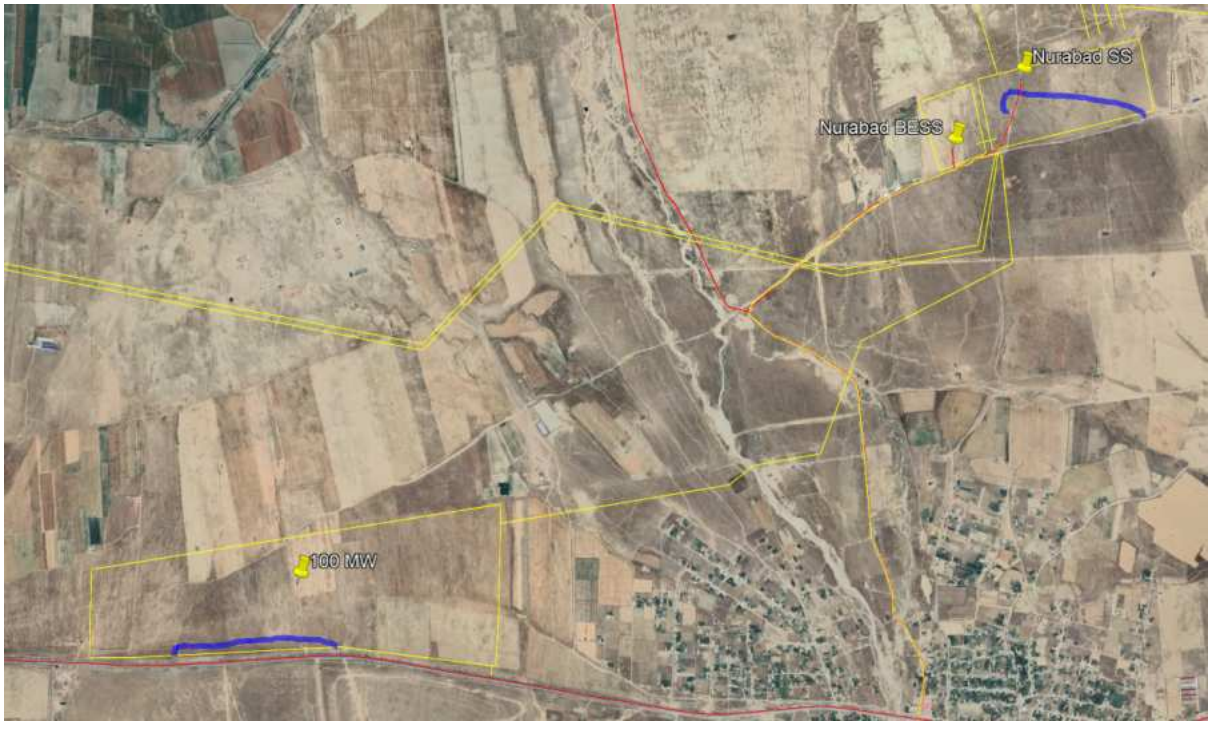

Figure 8-8 Additional transects within the Nurobod SS and Nurobod BESS completed in May 2024

Table 8-2 Survey transects along main facilities and OTHL in April and May 2024

Facility and Transect	Date and time	Start of transect N, E (DD format)	End of transect N, E (DD format)	Length, km	Biotope
500MW_1	18/04/24	1.4	Deposited lands	500MW_1	18/04/24
500MW_2	18/04/24	2.5	Deposited lands	500MW_2	18/04/24
500MW_3	18/04/24	1.5	Deposited lands	500MW_3	18/04/24
500MW_4	18/04/24	2.7	Gravelly-clay plain	500MW_4	18/04/24
500MW_5	18/04/24	4	Gravelly-clay plain	500MW_5	18/04/24
Nurabad_ 2024-05-14 15:22_1.12km	14/05/2024	39.575297 66.742706	39.575114 66.753605	1.12	Fallow land
70km OHTL_1	15/05/24	39.499133 66.346217	39.505922 66.345690	2 km	Dry grassland
70km OHTL_2	15/05/24	39.436137 66.175653	39.435445 66.175692	2 km	Dry grassland
70km OHTL_3	15/05/24	39.427084 65.995941	39.423554 65.993406	3 km	Dry grassland and fallow lands

8.2 Species Assessments

8.2.1 Central Asian Tortoise

The Central Asian Tortoise (*Testudo horsfieldii)* is a Herptile native to Uzbekistan, listed as Vulnerable (VU) species on the IUCN Global Red List, and Vulnerable (VU) in the Uzbekistan National Red Data Book.

The CHA Screening exercise found that this species should be further investigated in the CHA against the **IFC Criterion 1/ EBRD Criterion 2.**

8.2.1.1 Ecology & Conservation

They mostly inhabit arid, dessert regions and sandy steppe landscapes (Ernst & Barbour, 1989; Iverson, 1992).

The ecology of this species in the wild is not well studied, however recent studies have focusing on populations in the Djeiron Ecocenter near Bukhara in Uzbekistan give a good indication of the ecology of these species specific to this region (Lagarde et al 2011).

The species bury themselves in sandy soil for hibernation during much of the year. They are active above ground for just 2- 3 months during Spring when favourable weather conditions

permit. Females may remain buried and hibernating from mid-June to March the following year, whilst males, are more likely to emerge from hibernation as soon as climatic conditions are favourable (Naulleau et al. 1987), probably in anticipation of the mating period (Bonnet et al. 2001). Mating immediately follows hibernation and lasts for approximately 3 weeks. The egg-laying period occurred from late April to the end of the active season (Henen et al. 2000), where females lay upto 9 eggs per year across different clutches (Lagarde et al 2011).

They are diurnal. They spend large portions of their short time active feeding. The species is strictly herbivorous, feeding on available annual vegetation (Ataev 1997).

Females have the largest territories (~30Ha) which overlap the territories several males (Lagarde et al 2011).

Its primary threats are habitat destruction and collection for the pet trade (Stubbs 1989; Brushko and Kubykin 1982; Kubykin 1995). Climate change may also pose a threat as this species is sensitive to extreme temperatures and relies on rain fall during active periods for adequate vegetation and food (Lagarde et al 2011).

The distribution of T. horsfieldii in Uzbekistan is extensive, covering various habitats that provide the open, arid environments essential for the species. Despite the large estimated population, there are indications that ongoing pressures, including high levels of legal and potentially illegal trade, could impact the population over time. However, detailed maps of the species' distribution are now available, offering valuable insights into its range and habitat use across the country.

8.2.1.2 DISTRIBUTION

The Central Asian Tortoise inhabits arid regions from south-eastern Russia, south to northern regions of Iran and Afghanistan, northwest regions of Pakistan and Baluchistan, and western China (Ernst and Barbour, 1989; Iverson, 1992). It is one of the most widespread tortoises.

The Central Asian Tortoise (*Testudo horsfieldii*) is widely distributed across the steppes and desert regions of Uzbekistan, which is home to one of the largest populations of this species. In Uzbekistan, population densities of *T. horsfieldii* have been reported to range from 0.5 to 43 tortoises per hectare, leading to an estimated total population of around 20 million individuals. These estimates, provided by the Uzbekistani government in 1997 and reaffirmed in 2011, suggest a robust population, although the data originates from a commercial exporter and remains unpublished, raising concerns about its reliability.

Published literature suggests that the population density has declined markedly through-out the species' range (Stubbs 1989), owing to habitat destruction and extensive collecting for the pet trade (Brushko and Kubykin 1982; Kubykin 1995).

The following maps outlines the distribution of the tortoise species of the genus Testudo.

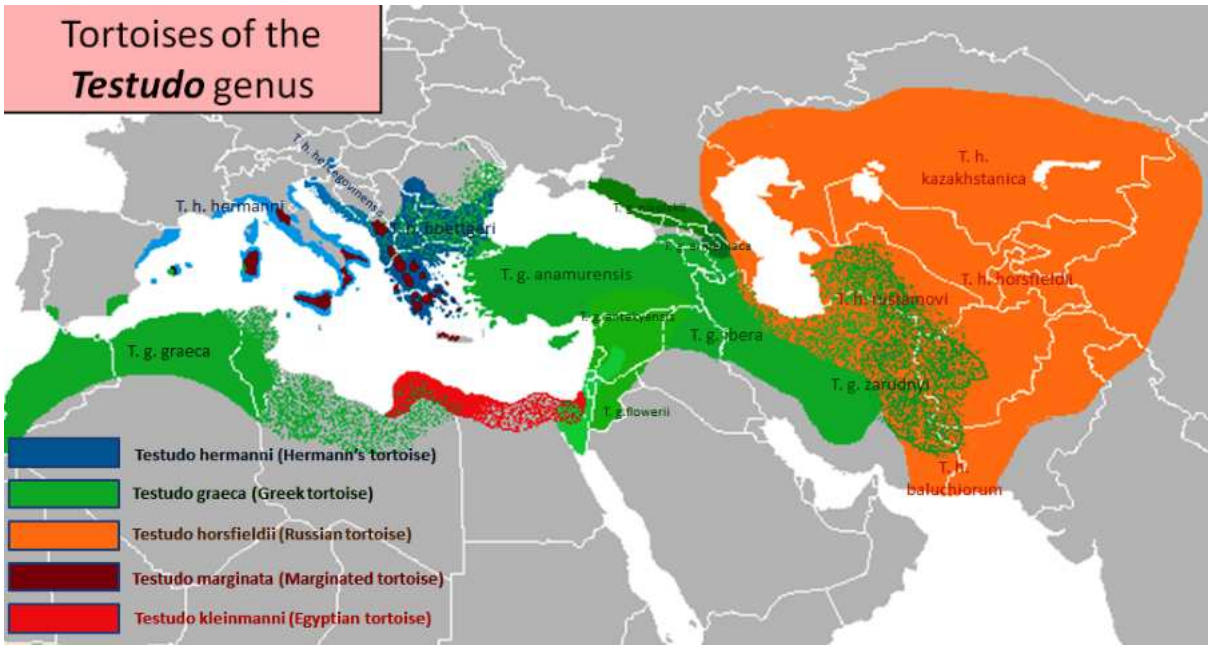

Figure 8-9 Distribution map[63] of tortoise species of genus Testudo.

8.2.1.3 BASELINE SURVEY RESULTS

During initial 2023 surveys a total of 36 tortoises were recorded during baseline surveys, with density estimates suggesting a large population across the Project area. The following table shows counts and density estimates for each aspect of the Project facilities.

Table 8-3 Results of Central Asian Tortoise Surveys across the Project area.

PROJECT ELEMENT	DATE OF SAMPLE	OBSERVATIONS	COUNTS	AVERAGE DENSITY (IND/HA)	ESTIMATED TOTAL IN PROJECT AREA
500MW	April 2024	Adult individuals	21	0.63	626
400 MW	April 2024	Adult Individuals	7	0.66	533
Access Road	March 2024	Adult individuals	7	16.76	
70km OHTL	August 2023	1 adult	1		

[63] Abu Shawka, CC BY-SA 3.0 <https://creativecommons.org/licenses/by-sa/3.0>, via Wikimedia Commons

Project Element	Date of Sample	Observations	Counts	Average Density (Ind/ha)	Estimated Total in Project Area
		Several burrows and carapax			
11km and 19km LILO	March and April 2024	Suitable habitat			

In sampled areas where individuals were not recorded, all were described as having suitable habitat for the species and a high likelihood of its presence.

8.2.1.4 Analysis

8.2.1.4.1 EAAA

The total EAAA for resident reptiles is applied as all connected suitable habitat that overlaps the project footprint as well as exists within a reasonable buffer from the project footprint, determined by species specific ecology.

The Central Asian Tortoise inhabits arid, dessert regions and sandy steppe landscapes. The EAAA was considered as all suitable habitats found within the project AoI (considered as a 10km buffer from the project footprint to account for habitat displacement for species with small home ranges). This should provide an adequate accounting of the population likely to regularly utilize the project area.

The resulting EAAA has been mapped in the following figure.

Figure 8-10 EAAA and potential habitats for the Central Asian Tortoise in the PV plant site

8.2.1.4.2 Criticality

The global population of the Central Asian Tortoise (*Testudo horsfieldii*) is unknown, making it challenging to assess criticality based solely on global population estimates. However, a literature review identified a report on the illegal trade of the species, which includes population surveys conducted between 1991 and 1999 in the Kyzil-Kum desert in central Uzbekistan. These surveys estimated the population in Uzbekistan alone to be around 15-20 million mature individuals (Mitropolski & Kashkarov, 2000; Bozhansky & Polinova, 2000). Given that *T. horsfieldii* is widespread across 12 countries, including Afghanistan, Kazakhstan, and Russia, it is likely that the global population significantly exceeds this estimate.

Recent data from unpublished studies indicate population densities in Uzbekistan ranging from 0.5 to 43 tortoises per hectare, suggesting considerable variability in tortoise distribution across different habitats. In the specific project areas, baseline surveys recorded 36 individuals, translating to an estimated 1,159 individuals at a minimum density. This localized density estimate provides a more precise understanding of tortoise populations in areas potentially impacted by development.

Under the IFC **Criterion 1**, the threshold for a species to be classified as Vulnerable (VU) requires that the Ecological and Associated Area of Assessment (EAAA) supports a globally important concentration of the species, such that the loss of this population would result in uplisting to

Critically Endangered (CR) or Endangered (EN) status. Given the estimated number of individuals within the project areas and the broader population distribution, it is considered unlikely that the EAAA population comprises a globally significant concentration, the loss of which would trigger an uplisting.

As such, the Central Asian Tortoise does not trigger CH status, but is considered a Significant Biodiversity Value and a Priority Biodiversity Feature (PBF) due to its Vulnerable (VU) designated conservation status on both IUCN and in the National Uzbekistan Red Data Book.

The ESIA will address impacts on this species as a Sensitive Receptor, via the biodiversity impact assessment, mitigation program and residual significance analysis.

9 MAMMALS (NON-VOLANT)

9.1 Mammals Baseline Survey

9.1.1 Methodology

To assess and record the mammal populations present in the Project area and surrounding Areas of Influence, meticulous field surveys were employed, encompassing the 100 MW PV solar plant, Nurabad BESS, and 400MW PV Plant area. These surveys utilized a combination of walkover transect surveys and point observations to gather data on mammal activity and habitat use. Each walkover transect ranged from 0.5 to 1.5 kilometres in length, with a 3-meter width for recording mammal activity traces, and a 50-meter width for observing the mammals themselves. Binoculars were used for additional territory surveillance, and general observations were made from a moving vehicle. The data recorded during the walkover routes included tracks, burrows, animal droppings, and direct observations of the animals.

Coordinates of encounters were documented, and habitat areas, activity traces, and the animals themselves were photographed. The research took place on June 15, 29; July 26-27; August 29-30, 2023, covering a total of 15,000 meters of traversed transects and surveying an area of 3,190 hectares.

As part of the mammal survey methodology, two camera traps were deployed on July 13 2023 across various project areas. This aimed to capture photographic evidence of mammalian presence and activity, supporting direct observational data with visual records. Deployment locations were carefully selected to encompass diverse habitats within the project vicinity, including the Pooling Station, and 400 MW PV plant, as detailed in the deployment log. Each Camera trap was assigned a unique identifier for precise tracking and data collection purposes. Unfortunately, the camera traps were stolen prior to August 2023, however, some information was retrieved prior to theft.

9.2 Species Assessments

9.2.1 Marbled pole cat

The Marbled pole cat (Vormela peregusna) is a mustelid species designated as Vulnerable on the IUCN global red list and categorized as VU (decreasing) in Uzbekistan.

The CHA screening review uncovered historical and recent records of this species in Samarkand Region and Nurobod District. The species was therefore shortlisted for further

investigation in subsequent baseline survey and CHA analyses, against the EBRD PBF criterion ii (b).

9.2.1.1 ECOLOGY & CONSERVATION

This species inhabits desert, semi-desert and steppe habitats, but, at least in Israel, also cultivated landcapes (Werner 2012). It is a specialised predator, feeding mainly on desert and steppe rodents such as gerbils, ground squirrels and birds. It was recorded from a sparsely vegetated, sandy area southeast of Bir El Abd, northern Sinai, while another was recorded from a sandy area just north of Gabal El Maghara (Saleh and Basuony 1998). It is the most fossorial of all weasels.

They are solitary animals and tend to become aggressive when they encounter wildlife, including themselves. The species' mating season runs from April to June. Gestation lasts about 243-327 days as, similar to the American mink, the Marbled polecat usually delays implantation of the fertilised egg until more favourable conditions. They can produce 1-8 offspring at a time.

The Marbled polecat is most active during dawn and dusk, when it uses its well-developed sense of smell to seek out prey. The most common prey are hamsters and ground squirrels along with other rodents, small birds, frogs, reptiles and insects.

9.2.1.2 DISTRIBUTION

Marbled Polecat occurs from south-east Europe through Asia Minor, the Middle East, the Caucasus, and Central Asia, to northern China and Mongolia. In Europe, it is found in Serbia and Montenegro, Macedonia, Greece, Romania, Bulgaria, Turkish Thrace, southern parts of Ukraine (but it has disappeared from most of the Ukraine, persisting only in the east), the south of the Russian Federation and the northern Caucasus (in the steppe areas, not the mountains). It is widespread in the Middle East, having been recorded from Israel/Palestine, Jordan, Lebanon, Syria, northern Iraq and northern Saudi Arabia (Ellerman and Morrison-Scott 1951, Harrison 1968, Nader 1991, Werner 2012). In Israel its southern range border is retreating northward (Werner 2012). Two localities in the northern part of the Sinai Peninsula (south-east of Bir El Abd and just north of Gabal El Maghara) constituted the first records from Egypt (Saleh and Basuony 1998). In China it has been recorded from the provinces of Nei Mongol, Shaanxi, Shanxi, Gansu, Ningxia, Qinghai and Xinjiang (Wang 2003). In Mongolia it occurs in the west, south and, locally, centre (Dulamtseren et al. 2009). It occurs from sea level to 2,000 m, and up to 3,000 m in the Tien Shan Mountains.

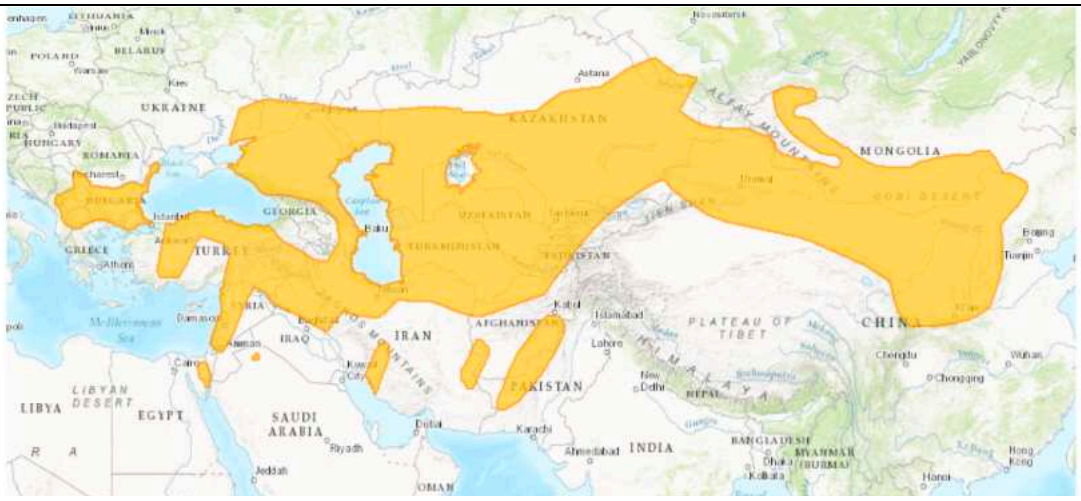

Figure 9-1 Global distribution map of the Marbled polecat

The polecat has historically widely inhabited the flat, steppe, and desert areas of Samarkand Region, spreading as far out as Samarkand City. Its habitats are associated with the settlements of great gerbils and ground squirrels, including the red-tailed gerbil and yellow ground squirrel. In river valleys, it settles at the base of loess cliffs, and in the foothills, it inhabits hilly terrain with wormwood-ephemeral vegetation (Ishunin, 1961; Red Book of the Uzbek SSR, 1983). It is also known to inhabit the Karnabchul area (Salikhbayev et al., 1967; Abduraupov et al., 2021), where its habitats include clayey and sandy deserts, loess hilly foothills, clayey plains, semi-fixed hilly sand dunes, wormwood thickets, and saxaul thickets. Otherwise, it has also been recorded on the northeastern shore of the Kattakurgan Reservoir, located 35 km northwest of the 400 MW PV plant in Nurobod (Marmazinskaya, Mardonova, 2016).

9.2.1.3 BASELINE SURVEY RESULTS

Records of the Marbled polecat in Samarkand region are documented in local literature, however, the current regional (Samarkand) home range map of threatened species listed in the Red Book of Uzbekistan does not include any habitats for the Marbled polecat in Nurobod District (in and around the project sites). Nevertheless, the transect search and camera-trapping surveys for mammals in each of the project sites did not yield any finds to confirm the occurrence of the polecat within the PV plant and BESS sites. A sufficient visual surveillance of the sites was no achieved due to the camera trap equipment being stolen early on in the survey. However, no sightings, recognizable tracks or droppings were reported within potentially suitable habitats covered in the project sites and a precautionary 10-km buffer which represents the species' potential home range. Additionally, no sightings or traces of the species were reported in the rapid (follow-up) pre-construction survey undertaken prior to the start of early works on the 100 MW and 400 MW PV plant sites and Nurobod BESS sites.

9.2.1.4 ANALYSIS

Due to the unlikelihood of presence in the project AoI, an EAAA cannot be applied as a result of which CH will be not further assessed for this species. However, given the globally Vulnerable (VU) conservation status of this species, an assessment under the framework of adaptive management will apply in the event of any affirmative observations during future monitoring efforts.

10 BOTANY

There is a gap in the IUCN database when it comes to flora species distributions. In many cases, spatial distributions are not mapped, and therefore species of conservation concern that may otherwise trigger CH status, might be missed during initial CHA Screening.

A literature review provided by a regional botanist was conducted, which is a typical requirement for setting the botanical baseline and integrating into the ESIA process. The review includes consideration of the Uzbekistan Red Data Book which lists the nationally threatened & endangered flora species. The regional botanist utilizes experience and professional opinion as well as previous study knowledge to determine if any botanical species of concern (from UzRDB or otherwise) could potentially be present.

The findings of the literature review and subsequent botanical surveys found no species which would require consideration under the CHA. The botanical report did not find any species of concern and also did not highlight any potential species of concern that the specialist considered as possibly occurring within the project's area of influence.

11 ICTHYOFAUNA

Ichthyologist Interview

The initial CHA Screening exercise identified a total of two ichtyofauna species listed on the IUCN Red List as Vulnerable (UV), whose global distribution included portions of the Chirchik's river. As such, an interview with a specialist was conducted – Akbar Jonruzimov, an ichthyologist with expertise in Chirchik's ichtyofauna.

The following table provides the information obtained from the specialist in relation to these three species.

SPECIES	COMMON NAME	IUCN RED LIST	NARIONAL RDB	CRITERION	OCCURRENCE	PROJECT SITE AND EAAA OCCURRENCE
IUCN Threatened Fish						
Luciobarbus brachycephalus	Aral Barbel	VU	EN	IFC PS 6 Criterion 1(CR/EN)/ EBRD PR (ii)	Only occurs in a few reservoirs in the Amu Darya and Syr Darya	Could possibly occur
Cyprinus carpio	*Eurasian Carp*	VU	EN	IFC PS 6 Criterion 1(CR/EN)/ EBRD PR (ii)	Has an extensive extant and introduced population across a large range	Could possibly occur

In relation to the CHA, the two species listed as threatened on the IUCN Red List are scoped out as the specialist confirmed that the terrestrial nature of this project is unlikely to affect the population of these aquatic species.

12 CONCLUSION

12.1 Critical Habitats

A Little bustard (Tetrax tetrax) congregation recorded in the species' EAAA along the project corridor triggers habitat criticality, by the EBRD PR 6 Criterion 4 and IFC PS 6 Criterion 3.

The congregation was observed within Mubarek State Wildlife Sanctuary, 4.6 km West of the 400 MW PV power plant. According to ADB SPS guidance, this Category IV protected area therefore qualifies as an additional area of critical habitat.

The project ESIA and BAP will ensure that the Net Gain requirement for the project-affected Little bustard critical habitat is fulfilled in line with the ADB SPS, EBRD PR 6 and IFC PS 6.

12.2 Priority Biodiversity Feature (PBF) Habitats

The list of species for which Significant Biodiversity Value (SBV) and Priority Biodiversity Feature (PBF) habitats have been identified in relation to the project sites is provided in the table below.

Table 12-1 Significant Biodiversity Values and Priority Biodiversity Features Categorized from CHA Screening Process

SN	COMMON NAME	GLOBALLY THREATENED	CRITERION
1.	Great Bustard	✓ IUCN EN Status triggers SBV and No Net Reduction requirement	EBRD PR6 Criteria 2 and 4, and IFC PS6 Criteria 1 and 3
2.	Asian Houbara (precautionary)	✓ IUCN VU Status triggers SBV	EBRD PR6 Criteria 2 and 4, and IFC PS6 Criteria 1 and 3
3.	Egyptian Vulture	✓ IUCN EN Status triggers SBV and No Net Reduction requirement	EBRD PR6 Criteria 2 and 4, and IFC PS6 Criteria 1 and 3
4.	Steppe Eagle (observed in Autumn 2023 and Spring 2024 VP surveys)	✓ IUCN EN Status triggers SBV/PBF and No Net Reduction requirement	EBRD PR6 Criteria 2 and 4, and IFC PS6 Criteria 1 and 3
5.	Great Bustard	✓ IUCN EN Status triggers SBV/PBF and No Net Reduction requirement	EBRD PR6 Criteria 2 and 4, and IFC PS6 Criteria 1 and 3EBRD PR6 Criteria 2 and 4, and IFC PS6 Criteria 1 and 3
6.	Eastern Imperial Eagle (observed in Autumn 2023 and Spring 2024 VP surveys)	✓ IUCN VU Status triggers SBV/PBF	EBRD PR6 Criteria 2 and 4, and IFC PS6 Criteria 1 and 3
7.	Greater Spotted Eagle	✓ IUCN VU Status triggers SBV/PBF	EBRD PR6 Criteria 2 and 4, and IFC PS6 Criteria 1 and 3

8.	Yellow-eyed Pigeon	✓ IUCN VU Status triggers SBV/PBF	EBRD PR6 Criteria 2 and 4, and IFC PS6 Criteria 1 and 3
9.	European Turtle Dove	✓ IUCN VU Status triggers SBV/PBF	EBRD PR6 Criterion 2, and IFC PS6 Criterion 1
10.	Asian Houbara	✓ IUCN VU Status triggers SBV/PBF	EBRD PR6 Criteria 2 and 4, and IFC PS6 Criteria 1 and 3
11.	Central Asian Tortoise (observed)	✓ IUCN VU Status triggers SBV/PBF	EBRD PR6 Criteria 2 and 4, and IFC PS6 Criteria 1 and 3EBRD PR6 Criteria 2 and 4, and IFC PS6 Criteria 1 and 3

12.3 Requirements for Development

The project ESIA will ensure that the No Net Loss (NNL) requirement for the project-affected PBF/ SBV habitats and relevant trigger species is fulfilled in line with the EBRD PR 6 and IFC PS 6.

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ANNEX A – CRITICAL HABITAT SCREENING MATRICES