

Samarkand II Solar PV and BESS Project Republic of Uzbekistan

Critical Habitat Assessment (CHA)
– Volume II (350-km OTL Corridor)



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5Cs PROJECT DIRECTOR	Ken Wade

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CONTENTS

1	INTRODUCTION	1
1.1	Project Background	1
1.2	Purpose and Scope of Report	3
1.3	Critical Habitat	4
1.3.1	Habitat Designations	4
1.3.2	Determining Critical Habitat	5
1.3.3	Critical Habitat Assessment Process	6
2	CHA SCREENING	8
2.1	Methodology	8
2.1.1	Desktop Review and Scoping	8
2.2	Results	9
2.2.1	Desktop Screening	9
2.2.2	Stakeholder Information	12
3	CHA METHODOLOGY	13
3.1	CHA Criteria	13
3.1.1	Critical Habitat Criteria and Associated Thresholds	14
3.1.2	Significant Biodiversity Values	14
3.1.3	Priority Biodiversity Features	14
3.1.4	Critical Habitat Criteria and Associated Thresholds	15
3.1.5	Priority Biodiversity Feature Criteria Thresholds	16
3.2	Ecologically Appropriate Area of Analysis	17
3.2.1	Defining EAAA	18
3.3	Analyzing and Assessing	20
4	ASSESSMENT	21
4.1	Overview of Study Area	21
4.1.1	Geographical and climatic overview	21
4.1.2	Recognized Biodiversity Areas	21
4.2	Approach to CHA	35
5	ASSESSMENT	36
6	AVIFAUNA	37

6.1	Bird Baseline Survey Method	37
6.1.1	Migration Vantage Point Surveys	37
6.1.2	Wintering Birds and Great Bustard Surveys	39
6.1.3	Raptor Nest Search	40
6.1.4	Asian Houbara surveys	41
6.2	Species Assessments	43
6.2.1	Egyptian Vulture	43
6.2.2	Cinereous Vulture	49
6.2.3	Steppe Eagle	54
6.2.4	Saker Falcon	59
6.2.5	Pallas's Fish-eagle	64
6.2.6	Eastern Imperial Eagle	67
6.2.7	Greater Spotted Eagle	73
6.2.8	Great Bustard	79
6.2.9	Asian Houbara	90
6.2.10	Little Bustard	96
6.2.11	Sociable Lapwing	106
6.2.12	Yellow-eyed Pigeon	112
6.2.13	European Turtle Dove	116
6.2.14	Lesser White-fronted Goose	121
6.2.15	Marbled Teal	124
6.2.16	Dalmatian Pelican	127
7	CHIROPTERA	131
7.1	Literature Review	131
7.2	Bat Survey Method	132
7.2.1	Roost Search Method	132
7.2.2	Study Area & Bat Calls Recording	133
7.2.3	Bat Calls Identification	133
7.3	Species Assessment	134
7.3.1	Bokhara Whiskered Bat	134
7.3.2	All Other Bats	136
8	HERPTILES	140
8.1	Herptiles Baseline Survey Method	140
8.2	Species Assessments	145
8.2.1	Central Asian/Russian Tortoise	145
9	BOTANY	150

9.1.1	Tulipa micheliana	150
9.1.2	Phlomis nubilans	152
9.1.3	Dianthus helenae	156
9.1.4	Nanophyton saxatile	159
9.1.5	Prunus bucharica	162
10	ICTHYOFAUNA	167
	Ichthyologist Interview	167
11	CONCLUSION	168
11.1	Final List of SBVs/PBFs	168
11.2	Requirements for Development	169
12	REFERENCES	170

LIST OF ABBREVIATIONS

ABBREVIATION	MEANING
ADB	Asian Development Bank
AoI	Area of Influence
AZE	Alliance for Zero Extinction
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	
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
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	
PR	Performance Requirement
PS	Performance Standard
RDB	Red Data Book
SAC	Special Areas of Conservation
SBV	Significant Biodiversity Value
SPA	Special Protection Areas
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. In 2019, the installed capacity of electricity generation in Uzbekistan totalled 63 TWh, with natural gas fired thermal power plants accounting for 85% of this production. The emergence of a dire energy crisis at the height of recent peak-demand periods in Uzbekistan has been met with urgent measures to augment the country's installed power capacity. This agenda will largely involve the establishment of additional renewable energy sources, with a view to attaining a solar power capacity of 10,000 MW by 2030, amongst other targets.

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 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)

In the same period, a parallel PPA was established with the 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 19-km OTLs constituting a Loop-In-Loop-Out (LILO) interconnection

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, with the exception of the Karakul BESS, which is located in Karakul District, Bukhara 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.

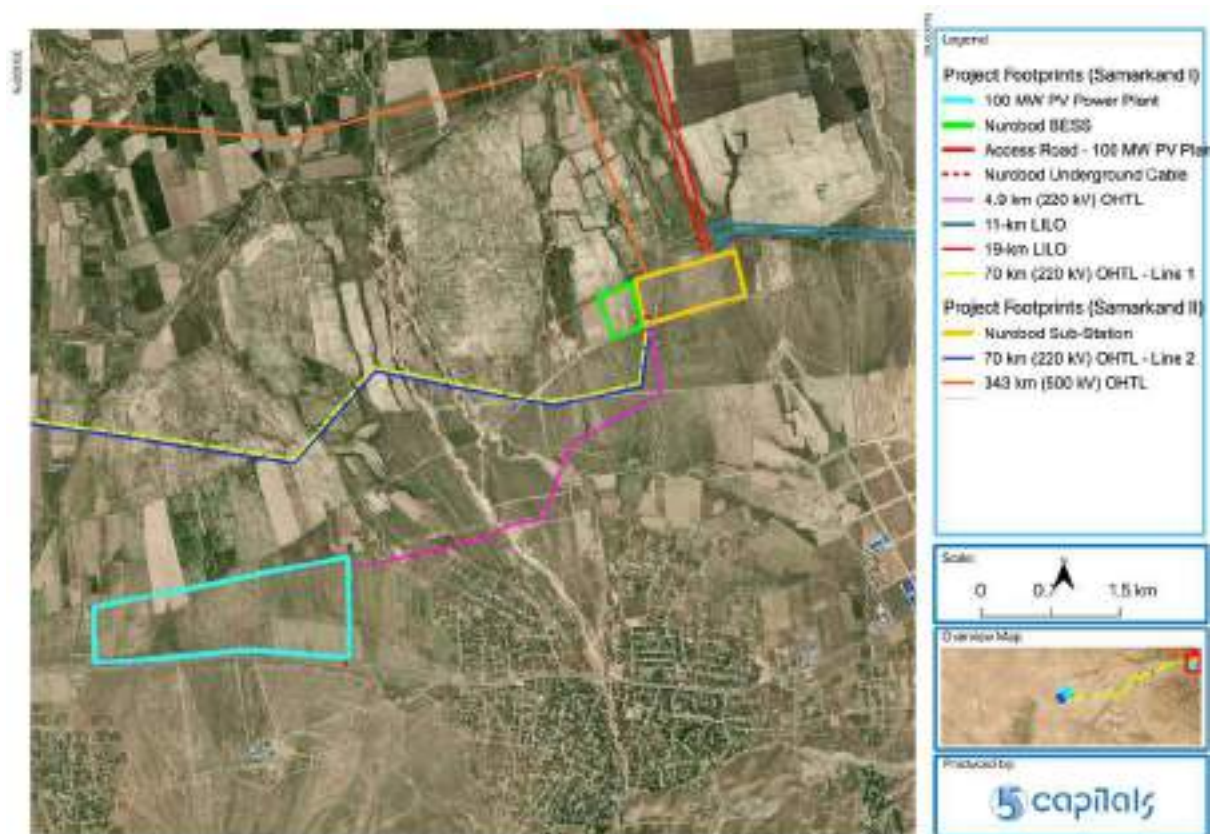


Figure 1-1 First cluster of facilities planned under the Samarkand I and II solar projects in Nurobod District

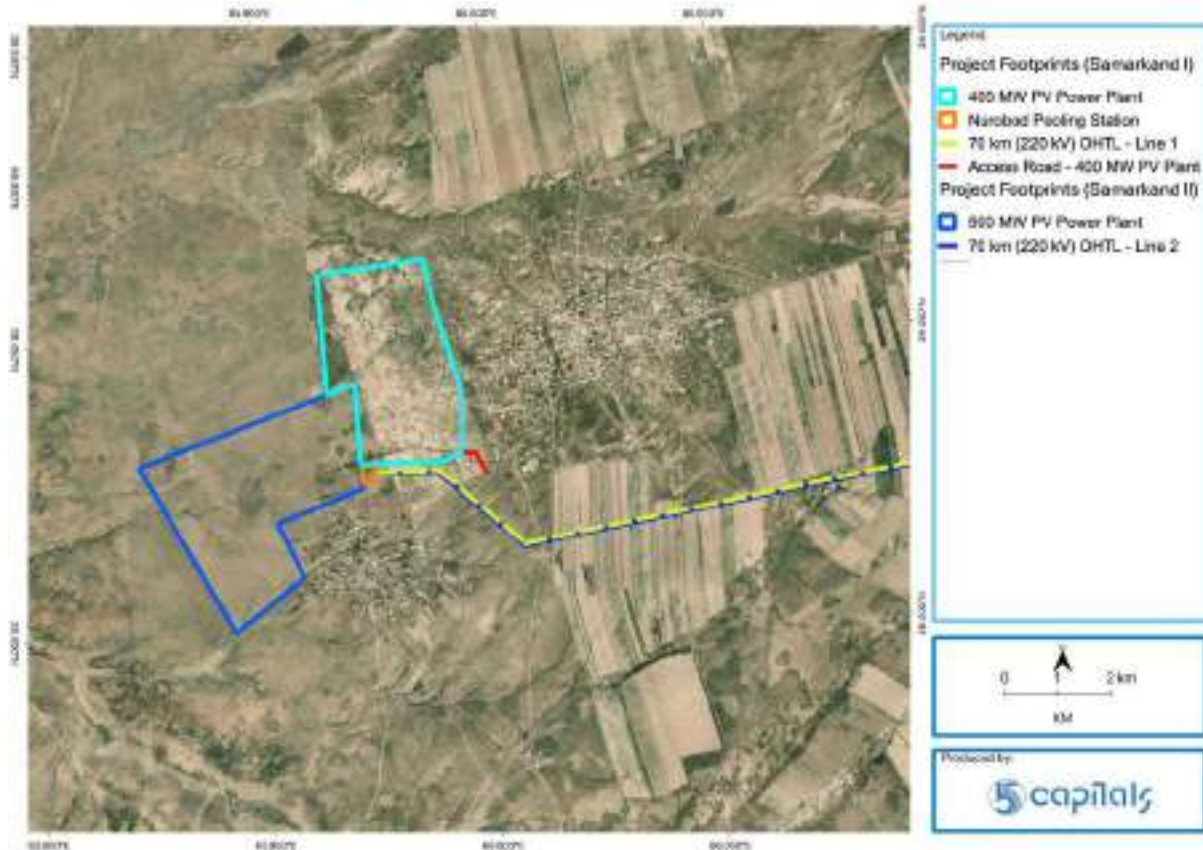


Figure 1-2 Second cluster of facilities planned under the Samarkand I and II solar projects

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

This CHA Report presents the process used to conduct the critical habitat assessment, the findings of which inform the CHA study for the **Samarkand II Solar PV and BESS Project**, in line

with E&S performance standards stipulated by the Project Lenders, including but not limited to the IFC PS 6 and ADB Environmental Safeguards.

The general purpose of the CHA is the identification habitats that are subject to elevated conservation concern (i.e., critical habitats or significant biodiversity values), in relation to the project's potential impacts on threatened, resident species.

This report provides the results of detailed baseline studies (encompassing desktop review, relevant stakeholder engagement, and field survey work) to assess the conservation status of species against IFC/ADB criteria and associated thresholds for critical habitats resulting from the Project's potential impacts on biodiversity.

Due to the large scale of the project footprint in the context of Ecologically Appropriate Areas of Analyses (EAAAs), the CHA study has been split into the following three components, which are covered in separate volumes of the CHA report:

- CHA report for the PV power plants, substation and powerlines in Nurobod District, Samarkand Region (Volume I).
- CHA report for the 350-km OTL in Samarkand, Jizzakh, Syrdarya and Tashkent Regions (Volume II).
- CHA report for the BESS and underground powerline in Karakul District, Samarkand Region (Volume III).

The introduction, analyses and outcomes of the CHA study pertaining to the 350-km corridor are presented in this report (CHA – Volume II).

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 value³, including habitat required for the survival of critically endangered or endangered species;⁴ 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 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”

GN54. 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.GN9
- 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 distributed 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

An overarching Study Area was first defined, looking from a regional scale. As this component of the project is an OTL, 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 area polygon below.



Figure 2-1 Study Area

2.1.1 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 Aol. Each species is assessed to determine the likelihood of its presence based on habitat requirements compared to the known habitat types within the Project Aol.

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 or PBF 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

Initially, a total of forty-four 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 five flora species. 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 critically under any of the CH criteria.

It is important to note that non-volant mammals, fish, and flora (and relevant habitats) were included in the CHA screening. The assessment was comprehensive, covering all potential taxa to ensure no significant biodiversity feature was overlooked.

Refer to the **CHA Screening Table** for a comprehensive database, including species-specific rationale to screening out (descoping) prior to the CHA.

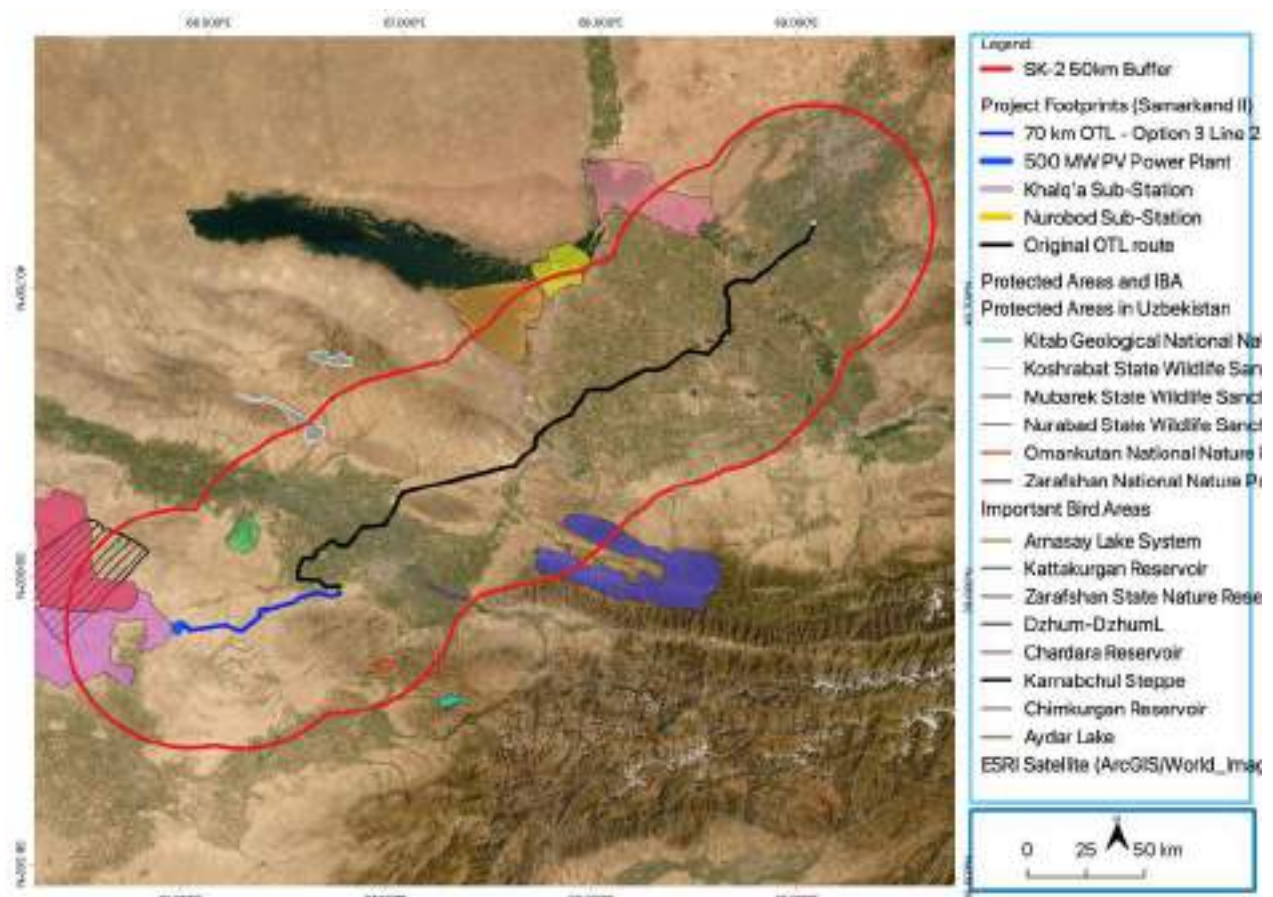
Table 2-1 Species Screened In for further investigation in the CHA

No.	FAMILY	SPECIES	COMMON NAME	IUCN RED LIST	NATIONAL UzRDB	CRITERION
1	Aves	<i>Aegypius monachus</i>	Cinereous Vulture	NT	NT	Criterion 3
2	Aves	<i>Anser erythropus</i>	Lesser White-fronted Goose	VU	VU	Criteria 1 & 3
3	Aves	<i>Aquila heliaca</i>	Eastern Imperial Eagle	VU	VU	Criteria 1 & 3
4	Aves	<i>Aquila nipalensis</i>	Steppe Eagle	EN	VU	Criterion 1 & 3
5	Aves	<i>Chlamydotis macqueenii</i>	Asian Houbara	VU	VU	Criteria 1 & 3
6	Aves	<i>Clanga clanga</i>	Greater Spotted Eagle	VU	VU	Criteria 1 & 3
7	Aves	<i>Columba eversmanni</i>	Yellow-eyed Pigeon	VU	VU	Criterion 1
8	Aves	<i>Falco cherrug</i>	Saker Falcon	EN	EN	Criteria 1 & 3
9	Aves	<i>Haliaeetus leucoryphus</i>	Pallas's Fish-eagle	EN	EN	Criteria 1 & 3
10	Aves	<i>Marmaronetta angustirostris</i>	Marbled Teal	NT	EN	Criterion 1 & 3
11	Aves	<i>Neophron percnopterus</i>	Egyptian Vulture	EN	VU	Criterion 1
12	Aves	<i>Otis tarda</i>	Great Bustard	EN	CR	Criteria 1 & 3
13	Aves	<i>Oxyura leucocephala</i>	White-headed Duck	EN	EN	Criteria 1 & 3
14	Aves	<i>Pelecanus crispus</i>	Dalmatian Pelican	NT	EN	Criteria 1 & 3
15	Aves	<i>Streptopelia turtur</i>	European Turtle-Dove	VU	VU	Criteria 1 & 3
16	Aves	<i>Tetrax tetrax</i>	Little Bustard	NT	VU	Criterion 3
17	Aves	<i>Vanellus gregarius</i>	Sociable Lapwing	CR	-	Criteria 1 & 3
18	Chiroptera	<i>Barbastella leucomelas</i>	Asian (Eastern) Barbastelle	LC	-	Criterion 3
19	Chiroptera	<i>Eptesicus gobiensis</i>	Gobi Big Brown Bat	LC	-	Criterion 3
20	Chiroptera	<i>Eptesicus ognevi</i>	Ognev's Serotine	LC	-	Criterion 3
21	Chiroptera	<i>Eptesicus serotinus</i>	Serotine Bat	LC	-	Criterion 3
22	Chiroptera	<i>Hypsugo savii</i>	Savi's Pipistrelle	LC	-	Criterion 3

No.	FAMILY	SPECIES	COMMON NAME	IUCN RED LIST	NATIONAL UzRDB	CRITERION
23	Chiroptera	<i>Myotis blythii</i>	Lesser Mouse-eared Myotis	LC	-	Criterion 3
24	Chiroptera	<i>Myotis bucharensis</i>	Bokhara Whiskered Bat	DD	CR	Criteria 1, 2 and 3
25	Chiroptera	<i>Myotis emarginatus</i>	Geoffroy's Bat	LC	-	Criterion 3
26	Chiroptera	<i>Myotis nipalensis</i>	Nepal Myotis	LC		Criterion 3
27	Chiroptera	<i>Nyctalus noctula</i>	Common Noctule	LC	-	Criterion 3
28	Chiroptera	<i>Otonycteris leucophaea</i>	Turkestani Long-eared Bat	LC	2(VU:R)	Criterion 3
29	Chiroptera	<i>Pipistrellus aladdin</i>	Turkestan Pipistrelle	DD	-	Criterion 3
30	Chiroptera	<i>Pipistrellus pipistrellus</i>	Common Pipistrelle	LC	-	Criterion 3
31	Chiroptera	<i>Plecotus strelkovi</i>	Strelkov's Long-eared Bat	LC	-	Criterion 3
32	Chiroptera	<i>Rhinolophus bocharicus</i>	Bokhara horseshoe bat	LC	-	Criterion 3
33	Chiroptera	<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	LC	-	Criterion 3
34	Chiroptera	<i>Rhinolophus hipposideros</i>	Lesser Horseshoe Bat	LC	2(VU:D)	Criterion 3
35	Chiroptera	<i>Tadarida teniotis</i>	European Free-tailed Bat	LC	2(VU:R)	Criterion 3
36	Chiroptera	<i>Vespertilio murinus</i>	Particoloured Bat	LC	-	Criterion 3
37	Herpetofauna	<i>Testudo horsfieldii</i>	Central Asian Tortoise/Russian Tortoise	VU	VU	Criterion 1
38	Ichtyofauna	<i>Cyprinus carpio</i>	Eurasian Carp	VU		Criterion 1
39	Ichtyofauna	<i>Luciobarbus brachycephalus</i>	Aral Barbel	VU	EN	Criterion 1
40	Plant	<i>Amygdalus bucharica</i>		VU	-	Criterion 1
41	Plant	<i>Dianthus helena</i>		-	-	Criterion 2
42	Plant	<i>Nanophyton saxatile</i>		-	-	Criterion 2
43	Plant	<i>Phlomis nubilans</i>		-	Status 2 Rare	Criterion 2
44	Plant	<i>Tulipa micheliana</i>		VU	Status 2 Rare	Criterion 1

In addition, screening-stage reviews confirmed that the project footprint does not overlap with any existing or proposed protected areas. Protected areas located closest to the project sites include the following:

- Zarafshan National Nature Park, which lies 21 km South of the OTL route.
- Omankutant National Nature Park, which is situated 37 km South-West of the 500 MW PV plant site.



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 Syrdarya 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 Aol.

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 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";
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- EBRD PR6 Criterion (ii): Habitats of significant importance to endangered or critically endangered species /// IFC PS6 Criterion 1: Critically Endangered and Endangered Species
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- 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) EAAA¹ that is $\geq 5\%$ 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 ($\geq 0.5\%$ of the global population AND ≥ 5 reproductive units of a CR or EN species);
- 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

¹ 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.

- 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 $\geq 10\%$ 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 Aol considered for the evaluation of noise impacts)².

² 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 Aol for noise impacts on fauna may be inclusive of the noise-generating activity footprint and a 500m buffer; whilst the Aol 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 requirements, the largest applicable area of influence would amount to the full construction

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

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 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 Aol 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 5km. 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 other 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 Analyzing 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 Recognized Biodiversity Areas

A number of state-declared reserves/protected areas are located within a 50km radius of the project site.

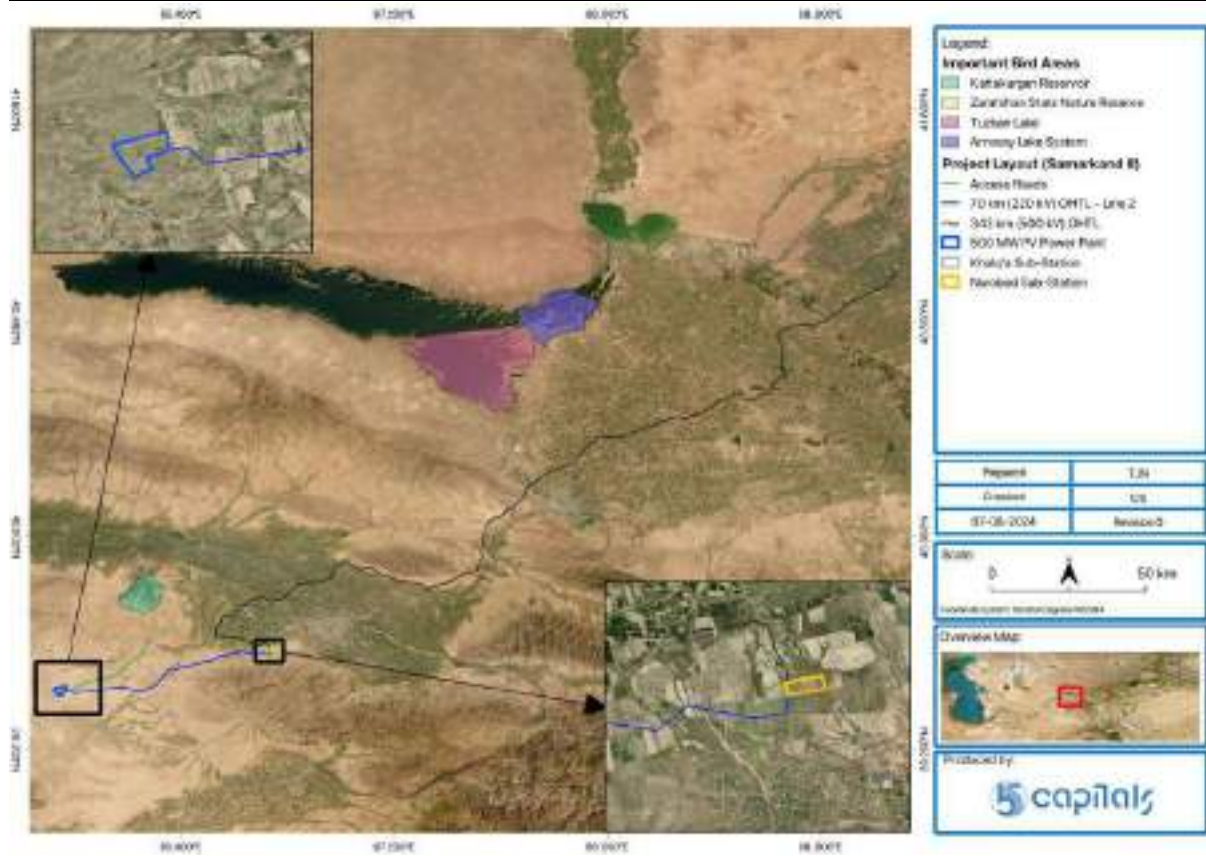


Figure 4-1 Map of Important Bird Areas (IBAs)

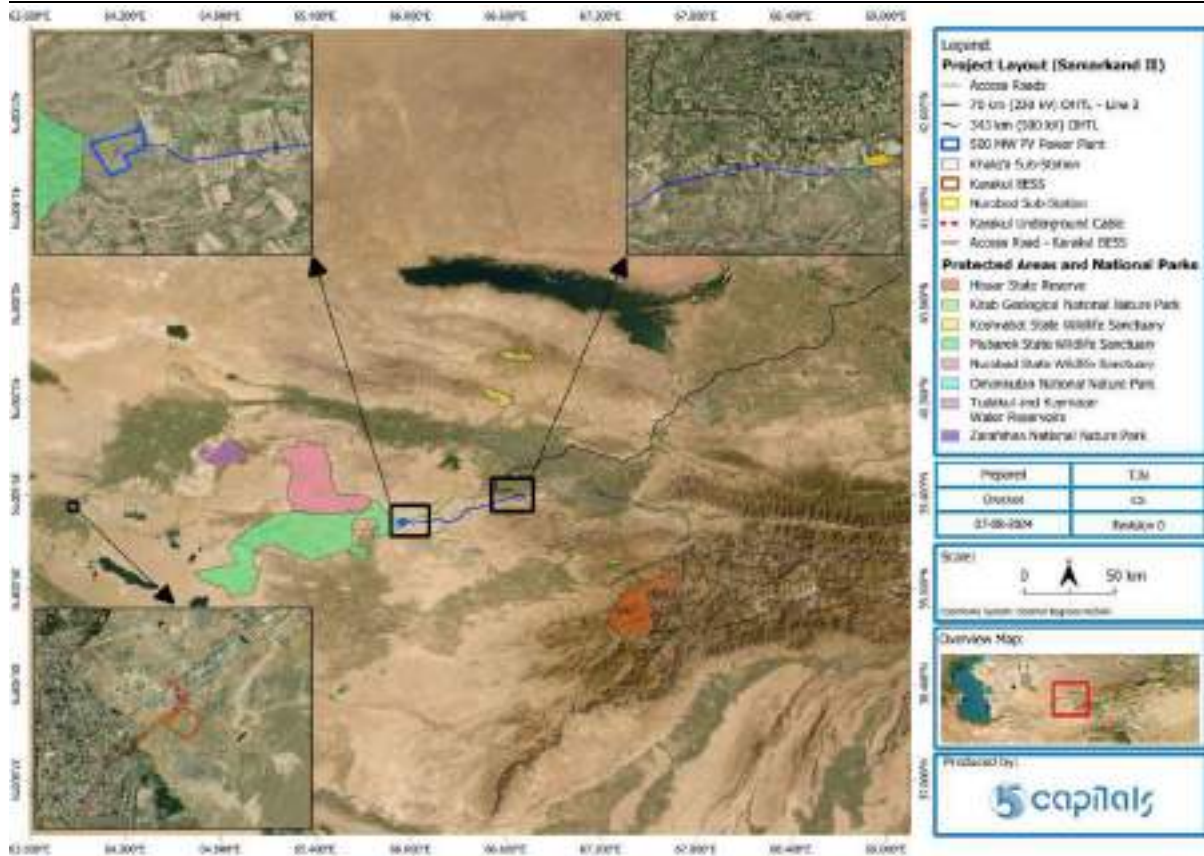


Figure 4-2 Map of Protected Areas

The closest of the designated national sanctuary is the Mubarek State Wildlife Sanctuary, which is approximately 7km from the 400MW PV Site. Known locally as Mubarak davlat buyurtma qo'riqxonasi, the sanctuary is a terrestrial and inland waters protected area. It is governed by a federal or national ministry or agency under the management of the Kashkadarya regional Khokimiyat. No further information on the biodiversity values for which it was designated is available at this time. A letter has been drafted to the relevant authorities to enquire about the status of the area and conservation status of the biodiversity values within.

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.

Nuratau Range

UZ037

Summary Taxonomy Data table and detailed info Map References and further resources

IBA Justification

The site was identified as important in 2005 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 <i>Neophila johnsonii</i>	EN	breeding	2005-2004	5-10 breeding pairs	A1
Common Nighthawk <i>Agelaius phoeniceus</i>	NT	breeding	2005	10 individuals	A1, A2
Saker Falcon <i>Falco tinnunculus</i>	EN	breeding	2004	2 adults	A1
Eastern Black Noddy <i>Sitta leucophaea</i>	LC	breeding	2005	abundant	A2
White-tailed Redstart <i>Merula philina</i>	LC	breeding	2005	common	A2
Lesser Black Noddy <i>Sitta leucophaea</i>	LC	breeding	2005	uncommon	A2
White-capped Noddy <i>Sitta leucophaea</i>	LC	breeding	2005	uncommon	A2

¹ The current IUCN Red List category. The category at the time of the IBA criteria assessment (2005) may differ.

Figure 4-3 BirdLife International (2024) Important Bird Area factsheet: Nuratau Range. Downloaded from <https://datazone.birdlife.org/site/factsheet/nuratau-range-iba-uzbekistan> on 09/08/2024.

Nuratau Range IBA/KBA is of note as records of Egyptian Vulture, Saker Falcon are listed as trigger species; both of which will be assessed.

Northern shore of Aydarkul Lake

UZ029

Summary Site account Data table and detailed info Map References and further resources

IBA Justification

The site was identified as important in 2000 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 <i>Scopus uroaegophala</i>	EN	winter	2004	0 individuals	A1
Greylag Goose <i>Anser anser</i>	LC	winter	2000-2007	794-6,091 individuals	A4
Red-crowned Pheasant <i>Phasianus versicolor</i>	LC	winter	1997-2007	560-2,540 individuals	A4
Ferruginous Duck <i>Anas platyrhynchos</i>	NT	winter	2000-2007	33-296 individuals	A1
Gadwall <i>Mareca strepera</i>	LC	winter	1997-2007	350-2,880 individuals	A4
Mallard Anas <i>platyrhynchos</i>	LC	winter	1997-2007	1,540-6,750 individuals	A4
Great Crested Grebe <i>Podiceps cristatus</i>	LC	passage	1997-2007	260-360 individuals	A4
Pallasi's Sandpiper <i>Sympterus pallasi</i>	LC	breeding	2007	101 individuals	A3
Egyptian Nightjar <i>Caprimulgus aegyptius</i>	LC	breeding	1997-2002	0 individuals	A3
Common Coot <i>Fulica atra</i>	LC	winter	2000-2007	31,522-100,101 individuals	A4
Asian Houbara <i>Otoryzodroma maculosa</i>	VU	breeding	1997-2007	4-41 individuals	A1, A3
Great White Egret <i>Ardea alba</i>	LC	winter	2000-2007	106-6,011 individuals	A4
Dalmatian Pelican <i>Pelecanus cristatus</i>	NT	winter	2000-2007	9-107 individuals	A1, A4
Great White Pelican <i>Pelecanus onocrotalus</i>	LC	passage	1997-2007	38-400 individuals	A4
Pygmy Cormorant <i>Microcarbo pygmaeus</i>	LC	winter	1997-2007	590-2,580 individuals	A4
Great Cormorant <i>Phalacrocorax carbo</i>	LC	resident	2000-2007	1,551-7,016 individuals	A4
Brown-necked Raven <i>Corvus sinuatus</i>	LC	breeding	1997-2007	max: 8 individuals	A3
Great Tit <i>Parus major</i>	LC	resident	1997-2007	52 individuals	A3
Streaked Scrub-wrenbler <i>Scopelogadus imberbis</i>	LC	resident	1997-2002	15 individuals	A3
Asian Desert Warbler <i>Certhia asiatica</i>	LC	breeding	1997-2002	57 individuals	A3
Desert Finch <i>Rhodospiza obsoleta</i>	LC	breeding	2007	145 individuals	A3
Red-headed Bunting <i>Emberiza bruniceps</i>	LC	breeding	1997-2002	60 individuals	A3
All IBA species group - individuals	var	winter	2000-2007	24,702-102,050 individuals	A4

¹ The current IUCN Red List version. The category of the time of the IBA criteria assessment (2000) may differ.

Figure 4-4 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 09/08/2024.

Northern shore of Aydarkul Lake IBA/KBA is of note as records of Dalmatian Pelican and Asian Houbara are listed as trigger species, which will be assessed. White-headed Duck was screened out during the CHA screening process as there was found to not be suitable habitat along the project area.

Tuzkan Lake

UZ035

Summary Test 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 <i>Anser anser</i>	LC	winter	2006	4,014 individuals	A4i
Pusill (Shovell) Teal <i>Tringa stagnatilis</i>	LC	winter	2006	7-18,306 adults	A4i
Temugovsk Duck <i>Ardeya cygnetica</i>	NT	breeding	2006	6-146 adults	A1i
Great Crested Grebe <i>Podiceps cristatus</i>	LC	winter	2003-2006	9-671 adults	A4i
Black-necked Grebe <i>Podiceps nigricollis</i>	LC	winter	2003-2006	167-1,034 adults	A4i
Common Coot <i>Fulicaria</i>	LC	winter	2003-2006	467-22,867 adults	A4i
Common Crane <i>Grus grus</i>	LC	winter	2003-2006	848 individuals	A4i
Dalmatian Pelican <i>Pelecanus crispus</i>	NT	winter	2003-2006	3-111 adults	A1, A3
Pygmy Cormorant <i>Microcarbo pygmaeus</i>	LC	winter	2003-2006	495-894 adults	A4i
Great Cormorant <i>Phalacrocorax carbo</i>	LC	winter	2003	52-12,573 adults	A4i
Asian Dowitcher <i>Limnodromus semipalmatus</i>	NT	passage	2006	6 adults	A1
Chinese Yulian <i>Agropus monachus</i>	NT	non-breeding	2003	4 adults	A1
Pallas's Fish-eagle <i>Haliaeetus leucorhynchus</i>	EN	winter	2004	6 adults	A1
All Species group - waterbirds	n/a	winter	2003-2004	26,047-61,982 individuals	A4ii

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.

Balykchi Fish Farm

UZ031

Summary Test 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
Temugovsk Duck <i>Ardeya cygnetica</i>	NT	passage	2006	434 adults	A1
Great Crested Grebe <i>Podiceps cristatus</i>	LC	passage	1960-1963	320-1,176 adults	A4i
White Stork <i>Ciconia nigra</i>	LC	passage	1960-2006	47-400 adults	A4i
Eastern Spoonbill <i>Plectroscopus leucorhynchus</i>	LC	passage	1960	275 adults	A4i
Grey Heron <i>Ardea cinerea</i>	LC	passage	2000	1,300 adults	A4i
Pygmy Cormorant <i>Microcarbo pygmaeus</i>	LC	resident	2000	721-3,246 adults	A4i
Great Cormorant <i>Phalacrocorax carbo</i>	LC	resident	1960-2000	65-3,500 adults	A4i
Black-headed Owl <i>Larus melanocephalus</i>	LC	passage	1960	7,400 adults	A4i
All Species group - waterbirds	n/a	winter	1960	20,000 individuals	A4ii

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

Figure 4-5 BirdLife International (2024) Important Bird Area factsheet: Balykchi Fish Farm. Downloaded from <https://datazone.birdlife.org/site/factsheet/balykchi-fish-farm-iba-uzbekistan> on 09/08/2024.

Balykchi Fish Farm IBA/KBA does not list any species investigated in the CHA as trigger species.

Dzhum-Dzhum

UZ040

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
Common Vulture <i>Agypsus monastus</i>	NT	resident	1999-2006	1-6 individuals	A1
European Roller <i>Coracias garrulus</i>	LC	breeding	2006	5-79 individuals	A1
Red-winged Teal <i>Actitis rubripes</i>	LC	resident	2006	1-7 individuals	A3
Adult T. C. <i>Cyanospiza cyanea</i>	LC	breeding	2006	1 adult	A3
Hummer Lark <i>Catalpa aquatica</i>	LC	breeding	2006	1-6 individuals	A3
Sulphur-bellied Warbler <i>Myioboscops griseolus</i>	LC	breeding	1973-2006	present	A3
Watercreeper <i>Troglodytes aedon</i>	LC	resident	2006	1 individual	A3
Blue-capped Redstart <i>Phoenicurus phoenicurus</i>	LC	breeding	1973-2006	2-26 adults	A3
White-winged Crossbill <i>Myristicivora sibirica</i>	LC	resident	2006	1-4 individuals	A3
Red-fronted Parrot <i>Seiurus pusillus</i>	LC	resident	2006	1 individual	A3

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

Figure 4-6 BirdLife International (2024) Important Bird Area factsheet: Dzhum-Dzhum.
Downloaded from <https://datazone.birdlife.org/site/factsheet/dzhum-dzhum-iba-uzbekistan> on 09/08/2024.

Dzhum-Dzhum IBA/KBA does not list any species investigated in the CHA as trigger species.

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 2020 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 Nighthawk <i>Caprimulgus埃及</i>	LC	breeding	2020	1 individual	A1
Black-crowned Night-heron <i>Nycticorax nycticorax</i>	LC	breeding	1976-2006	50-1,000 individuals	A4
Pallid Scops-owl <i>Otus borsali</i>	LC	breeding	2006-2007	20 individuals	A3
Greater Spotted Eagle <i>Clanga clanga</i>	VU	overage	2006	15 individuals	A3
European Roller <i>Coracias garrulus</i>	LC	breeding	2006-2007	30 individuals	A3
White-winged Warbler <i>Dendrocoptes leucophaea</i>	LC	resident	2007-2007	10 breeding pairs	A3
Great T. P. <i>Falco major</i>	LC	resident	2006-2006	20-27 breeding pairs	A3
Red-headed Bunting <i>Emberiza hortulana</i>	LC	breeding	2007	1 individual	A3

1. The current IUCN Red List category. The category at the time of the IBA criteria assessment (2020) 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.



Figure 4-7 BirdLife International (2024) Important Bird Area factsheet: Sarazm. Downloaded from <https://datazone.birdlife.org/site/factsheet/sarazm-iba-tajikistan> on 09/08/2024.

Sarazm IBA/KBA is of note as records of Yellow-eyed Pigeon, Saker Falcon are listed as a trigger species; which will be assessed.



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.

Kattakurgan Reservoir IBA/KBA does not list any species investigated in the CHA as trigger species.

Karnabchul Steppe

UZ018

Summary Tax account Data table and detailed info Map References 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
Common Golden Plover	LC	passage	2006	27,040 individuals	A4
Lesser White-fronted Goose	VU	winter	2000-2006	4-140 individuals	A1, A4
Ruddy Turnstone	LC	passage	2006	1,400 individuals	A4
Mallard Duck	LC	passage	2006	10,410 individuals	A4
Common Teal	LC	passage	2006	10,180 individuals	A4
Egyptian Night Heron	LC	breeding	2000-2006	1-2 individuals	A5
Asian Houbara	VU	breeding	1980-1990	1-60 adults	A1, A3
Great Cormorant	LC	passage	2006	1,200 individuals	A4
Cinereous Vulture	NT	non-breeding	2000-2006	1-6 individuals	A1
Saker Falcon	EN	winter	1987-1990	1-5 individuals	A1
Western Cuckoo Shrike	LC	resident	1980-2006	common	A5
Great Tit	LC	resident	2000-2006	common	A5
Lesser Frigatebird	LC	breeding	2000-2006	5-33 individuals	A5
Siberian Thrush	LC	breeding	2000-2006	common	A5
Asian Desert Warbler	LC	breeding	2000-2006	uncommon	A5
Desert Finch	LC	resident	1980-2006	uncommon	A5
Red-necked Diving Petrel	LC	breeding	1990-2006	common	A5
3481 species group - unknown	na	passage	2006	20,000-70,000 individuals	A4

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

Figure 4-8 BirdLife International (2024) Important Bird Area factsheet: Karnabchul Steppe. Downloaded from <https://datazone.birdlife.org/site/factsheet/karnabchul-steppe-iba-uzbekistan> on 08/08/2024.

Karnabchul Steppe IBA/KBA is of note as records of Lesser White-fronted Goose, Asian Houbara and Saker Falcon are listed as trigger species and will be assessed. Cinereous Vulture was screened out during CHA Screening and will not be further assessed.

Sarmysh Nature Park

UZ013

Summary Tax account Data table and detailed info Map References 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	LC	breeding	2007	60-90 individuals	A1
Eastern Rock Nuthatch	LC	resident	2007	150-200 individuals	A3
Western Whistler	LC	breeding	2007	30-50 individuals	A3
Frank's Warbler	LC	breeding	2007	400-700 individuals	A3
Grey-necked Bunting	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.

Sarmysh Nature Park IBA/KBA does not list any species investigated in the CHA as trigger species.

Kayrakkum Reservoir						TJ003
Summary Text content 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)	How	IBA criteria	
Haberd Ash-throated Flycatcher	LC	winter	2004-2006	10,301-17,856 individuals	A4	
Yellow-eyed Pigeon <i>Columba eversmanni</i>	VU	breeding	2004-2006	20 breeding pairs	A1, A5	
Egyptian Nighthawk <i>Caprimulgus europaeus</i>	LC	breeding	2004-2006	3-4 breeding pairs	A3	
Common Crane <i>Grus grus</i>	LC	passage	2004-2006	2,400-3,000 individuals	A4	
Great Siskin <i>Actitis hypoleucos</i>	EN	passage	2004-2006	20 individuals	A7	
Asian Houbara <i>Chrysolophus nectans</i>	VU	breeding	2004-2006	180	A3	
Purple Cormorant <i>Phalacrocorax nigripennis</i>	LC	winter	2004-2006	190-600 individuals	A4	
Field Sparrow <i>Actitis hypoleucos</i>	LC	breeding	2004-2006	3-6 breeding pairs	A3	
Cinereous Vulture <i>Accipiter monachus</i>	NT	resident	2004-2006	12 breeding pairs	A1	
Common Siskin <i>Actitis hypoleucos</i>	LC	breeding	2004-2006	75 breeding pairs	A3	
White-winged Woodpecker <i>Dendrocoptes leucotis</i>	LC	resident	2004-2006	10-12 breeding pairs	A3	
Saker Falcon <i>Falco tinnunculus</i>	EN	resident	2004-2006	30 breeding pairs	A1	
Great Tattler <i>Actitis hypoleucos</i>	LC	resident	2004-2006	100-150 breeding pairs	A3	
Green Lark <i>Ammodramus olivaceus</i>	LC	resident	2004-2006	3-4 breeding pairs	A3	
Sykes's Warbler <i>Mniotilta</i>	LC	breeding	2004-2006	5-6 breeding pairs	A3	
Spurred Parula <i>Parula leucostriata</i>	LC	resident	2004-2006	3-5 breeding pairs	A3	
Asian Desert Warbler <i>Certhia asiatica</i>	LC	breeding	2004-2006	5-6 breeding pairs	A3	
Spotted Sparrow <i>Passer ammodendri</i>	LC	resident	2004-2006	5-8 breeding pairs	A3	
Desert Parrot <i>Psittacula krameri</i>	LC	resident	2004-2006	3-5 breeding pairs	A3	
All 8 species group - waterbirds	sq	-	2004	present	A4B	

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

Figure 4-9 BirdLife International (2024) Important Bird Area factsheet: Kayrakkum Reservoir. Downloaded from <https://datazone.birdlife.org/site/factsheet/kayrakkum-reservoir-iba-tajikistan> on 09/08/2024.

Kayrakkum Reservoir IBA/KBA is of note as records of Yellow-eyed Pigeon, Asian Houbara, Saker Falcon are listed as trigger species and will be assessed. Cinereous Vulture was screened out during CHA Screening and will not be further assessed.

Mogoltau massif

TJ001

Summary Test account Data table and detailed info Map References and further resources

IBA Justification

This 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
Cinereous Vulture <i>Aegypius monachus</i>	NT	resident	2005-2008	8-8 individuals	A1
European Robin <i>Corvus garrulus</i>	LC	breeding	2005-2008	120-150 individuals	A1
Saker Falcon <i>Falco cherrug</i>	EN	resident	2005-2008	2-4 breeding pairs	A1
Uchta's Warbler <i>Hippolais languria</i>	LC	breeding	2005-2008	10-12 breeding pairs	A3
Rain Lark-walker <i>Phylloscopus neglectus</i>	LC	breeding	2005-2008	5-8 breeding pairs	A3
White-throated Robin <i>Irania gutturalis</i>	LC	breeding	2005-2008	2-4 breeding pairs	A3
Savanna Wrenbler <i>Oenanthe isabellae</i>	LC	breeding	2005-2008	10-15 breeding pairs	A3
Finch's Wrenbler <i>Corvinia leucoptera</i>	LC	resident	2005-2008	8-10 breeding pairs	A3
Grey-headed Bunting <i>Emberiza hortulana</i>	LC	breeding	2005-2008	16-20 breeding pairs	A3
White-rumped Bunting <i>Emberiza stewarti</i>	LC	breeding	2005-2008	20-25 breeding pairs	A3

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

Figure 4-10 BirdLife International (2024) Important Bird Area factsheet: Mogoltau massif. Downloaded from <https://datazone.birdlife.org/site/factsheet/mogoltau-massif-iba-tajikistan> on 09/08/2024.

Mogoltau massif IBA/KBA is of note as records of Saker Falcon is listed as a trigger species; which will be assessed. Cinereous Vulture was screened out during CHA Screening and will not be further assessed.

Dalverzin State Forestry and Hunting Management Area (20680)
Uzbekistan, Central Asia

Expand all additional information

Other species not triggering KBA criteria

Search:

Taxonomic group	Scientific name	Common name	Year	IUCN Red List Category
Aves	<i>Circus cygnus</i>	White Stork	2006	LC
Aves	<i>Anas platyrhynchos</i>	Mallard	2006	LC
Aves	<i>Actitis alpina</i>	Great White Egret	2006	LC
Aves	<i>Anser erythrorhynchos</i>	Lesser White-fronted Goose	2006	VU
Aves	<i>Phalacrocorax carbo</i>	Great Cormorant	2006	LC
Aves	<i>Circus clanga</i>	Greater Spotted Eagle	2006	VU
Aves	<i>Dendrocygna macropus</i>	White-winged Woodcock	2006	LC
Aves	<i>Aythya nyroca</i>	Ferruginous Duck	2006	NT
Aves	<i>Colinus pectoratus</i>	Red-legged Quail	2006	LC
	<i>Falco tinnunculus</i>		2006	LC

Figure 4-11 Key Biodiversity Areas Partnership (2024) Key Biodiversity Areas factsheet: Dalverzin State Forestry and Hunting Management Area. Extracted from the World Database of Key Biodiversity Areas. Developed by the Key Biodiversity Areas Partnership: BirdLife

Dalverzin State Forestry and Hunting Management Area KBA is of note as records of Greater Spotted Eagle and Lesser White-fronted Goose; which will be assessed.

Central section of the Kurama Mountain Range

UZ033

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
Himalayan Snowcock <i>Tetraopanax himalayensis</i>	LC	resident	2000-2007	uncommon	A3
Cinereous Vulture <i>Neophelina indea</i>	NT	resident	2003-2007	2-6 individuals	A1
Saker Falcon <i>Falco cherrug</i>	EN	breeding	2003-2007	1-4 individuals	A1
White-bellied Noddy <i>Phaethon lepturus</i>	LC	breeding	2007	2 individuals	A3
Sulphur-bellied Noddy <i>Phaethon punctatus</i>	LC	breeding	2007	2 individuals	A3
Willieooper <i>Trochopus trochus</i>	LC	resident	2007	1 individual	A3
Alpine Accentor <i>Prunella collaris</i>	LC	resident	2007	1 breeding pair	A3
Brown Accentor <i>Prunella sylvatica</i>	LC	breeding	2007	present	A3
Water Pipit <i>Arcticus alpina</i>	LC	breeding	2007	1 individual	A3
White-winged Cuckoo <i>Nyctanassa violacea</i>	LC	resident	2007	10 individuals	A3
Red-breasted Nuthatch <i>Sitta europaea</i>	LC	resident	2007	1 breeding pair	A3
European Golden-winged Nuthatch <i>Sitta europaea</i>	LC	resident	2007	4 individuals	A3
Red-breasted Siskin <i>Spinus pinus</i>	LC	resident	2007	50 individuals	A3

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

Figure 4-12 BirdLife International (2024) Important Bird Area factsheet: Central section of the Kurama Mountain Range. Downloaded from <https://datazone.birdlife.org/site/factsheet/central-section-of-the-kurama-mountain-range-iba-uzbekistan> on 09/08/2024.

Central section of the Kurama Mountain Range IBA/KBA is of note as records of Saker Falcon is listed as a trigger species; which will be assessed. Cinereous Vulture was screened out during CHA Screening and will not be further assessed.

Bashkzyzysay Unit of the Chatkal Mountains Biosphere Reserve

UZ028

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
Himalayan Snowcock <i>Tetraopanax himalayensis</i>	LC	resident	2006	5 adults	A3
Cinereous Vulture <i>Neophelina indea</i>	NT	resident	2006-2008	6 adults	A1
Saker Falcon <i>Falco cherrug</i>	EN	resident	2006	1 adult	A1
Sulphur-bellied Noddy <i>Phaethon punctatus</i>	LC	breeding	2006	present	A3
Willieooper <i>Trochopus trochus</i>	LC	breeding	2006	present	A3
Alpine Accentor <i>Prunella collaris</i>	LC	resident	2006	present	A3
Brown Accentor <i>Prunella sylvatica</i>	LC	resident	2006	present	A3
Water Pipit <i>Arcticus alpina</i>	LC	breeding	2004-2008	5-25 adults	A3
White-winged Cuckoo <i>Nyctanassa violacea</i>	LC	resident	2004	present	A3
European Golden-winged Nuthatch <i>Sitta europaea</i>	LC	breeding	2004-2008	1 individual	A3
Red-breasted Siskin <i>Spinus pinus</i>	LC	breeding	2006-2008	5-6 individuals	A3

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

Figure 4-13 BirdLife International (2024) Important Bird Area factsheet: Bashkzyzysay Unit of the Chatkal Mountains Biosphere Reserve. Downloaded from

<https://datazone.birdlife.org/site/factsheet/bashkyzylsay-unit-of-the-chatkal-mountains-biosphere-reserve-iba-uzbe>

Bashkyzylsay Unit of the Chatkal Mountains Biosphere Reserve IBA/KBA is of note as records of Saker Falcon is listed as a trigger species; which will be assessed. Cinereous Vulture was screened out during CHA Screening and will not be further assessed.



Figure 4-14 BirdLife International (2024) Important Bird Area factsheet: Tuyabuguz Reservoir. Downloaded from <https://datazone.birdlife.org/site/factsheet/tuyabuguz-reservoir-iba-uzbekistan> on 09/08/2024.

Tuyabuguz Reservoir IBA/KBA does not list any species investigated in the CHA as trigger species.



Figure 4-15 BirdLife International (2024) Important Bird Area factsheet: Chardara Reservoir. Downloaded from <https://datazone.birdlife.org/site/factsheet/chardara-reservoir-iba-kazakhstan> on 09/08/2024.

Chardara Reservoir IBA/KBA is of note as records of Dalmatian Pelican is listed as a trigger species; 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 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

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

Avifauna surveys consisted of the following elements to fully assess the avifauna communities that are resident, breeding or visiting the project site:

- Migration Vantage Point Surveys
- Wintering bird surveys (Great Bustard populations);
- Asian Houbara surveys;
- Raptor Nest Search.

6.1.1 Migration Vantage Point Surveys

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

Fifteen VPs were selected along the 350km OHTL corridor (VP01 to VP15). The fourteen locations were surveyed for 2-3 hours per visit, giving a total survey effort of 20 hours per VP.

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. 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.

The VP locations are outlined in the following table.

Table 5-1 Locations of vantage points used in autumn avifauna surveys along 350km OHTL and Khalka Substation

N _e	VP	PROJECT PART	N	E	LOCATION
1	VP01	350km OHTL-Khalka SS	40.937088	69.033505	Agrolandscape
2	VP02	350km OHTL-Khalka SS	40.819372	68.826185	Syrdarya river
3	VP03	350km OHTL-Khalka SS	40.798054	68.79279	Agrolandscape with ponds
4	VP04	350km OHTL-Khalka SS	40.544184	68.602296	Agrolandscape near ponds
5	VP05	350km OHTL-Khalka SS	40.361165	67.947682	Agrolandscape
6	VP06	350km OHTL-Khalka SS	40.144112	67.69065	Djizzak pass-1. Northern slopes of Koitash ridge
7	VP07	350km OHTL-Khalka SS	40.096298	67.61901	Djizzak pass-2. Rain fed fields
8	VP08	350km OHTL-Khalka SS	40.072616	67.593899	Djizzak pass-3. Rain fed fields
9	VP09	350km OHTL-Khalka SS	39.903015	67.523184	Djizzak pass-4. Rain fed fields
10	VP10	350km OHTL-Khalka SS	39.81531	67.363407	Southern slopes of Gobduntau-1. Rain-fed fields.
11	VP11	350km OHTL-Khalka SS	39.838152	67.216359	Southern slopes of Gobduntau-2. Gardens
12	VP12	350km OHTL-Khalka SS	39.904251	67.013635	Southern slopes of Gobduntau-3. Rain-fed fields.
13	VP13	350km OHTL-Khalka SS	39.776289	66.791105	Riparian vegetation and Zarafshan river
14	VP14	350km OHTL-Khalka SS	39.69826	66.552972	Agrolandscape
15	VP15	350km OHTL-Khalka SS	39.577843	66.742028	Sazagan_1. Clay desert

The 350km lies mainly on agro-landscape, but the route crosses Syrdarya and Zarafshan rivers, Djizak pass (between Koitash and Malguzar ridges), slopes of Gobduntau mounts, Agalyk plain, foothills near Djam settlement, Karnabchul steppe near Tym settlement (modern Koshrabad). These areas could be important for migrating birds.

The figure below shows the locations of the VPs along the 350km OHTL.



Figure 5-1 Proposed routes of OHTL “Khalka SS-Nurabad SS” 350 km (orange line) and Vantage points/VP (green dots).

6.1.2 Wintering Birds and Great Bustard Surveys

A winter avifauna survey was conducted between January 6th and February 13th 2024, to assess wintering birds and, specifically, the Great Bustard populations. This species requires a more complex and specialised approach due to its rarity, elusive behaviour, low population numbers and scattered distribution. The survey utilized two primary methods: a combined auto transect count, entailing slow drives (up to 30 km/h) through the area with stops every 1-3 km, adjusted based on environmental conditions and avian presence; and point counts from elevated locations to accurately assess the Great Bustard population.



Figure 5-2 Survey areas used for wintering avifauna and Great Bustard surveys along the 350km OHTL.

6.1.3 Raptor Nest Search

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 carried out by a local expert between April 26th – 28th 2024 and covered the main the 350km OHTL corridor including a 5km buffer from the project footprint. Within this area, a total of 30 locations were determined to be suitable habitats for raptor nests and observed during surveys, shown on the figure below.



Figure 6-3 Survey locations of Raptor Nest search along 350km OHTL

Survey methods included foot surveys, vehicle stopovers and more thorough observations at suitable nesting sites. The survey area was carefully inspected for suitable nesting habitats such as cliffs, rocky outcrops, trees, and man-made structures like powerline poles, which are preferred nesting sites for many raptor species known to occur in the region. If territorial birds were encountered, observation was conducted for an extended period of 0.5 hours.

Optical instruments used during searches were; Nikon binoculars x 8, Swarovski telescope x 60 and laser rangefinder compass. Birds were photographed using a mobile phone with djscooping and a Nikon D20 digital camera with a 300mm lens.

6.1.4 Asian Houbara surveys

Houbara point count surveys were conducted in potentially suitable Asian Houbara habitat within the project footprint and surrounding areas. Based on literature reviews and the knowledge of local specialists, the most suitable locations were determined. A total of two such point-count locations were determined in the area at the beginning of the OHTL route and surveyed between 20th – 29th March 2024.

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, apart from several that were considered invalid due to high winds. All such

invalidated surveys were subsequently repeated under suitable weather conditions within the same survey period.

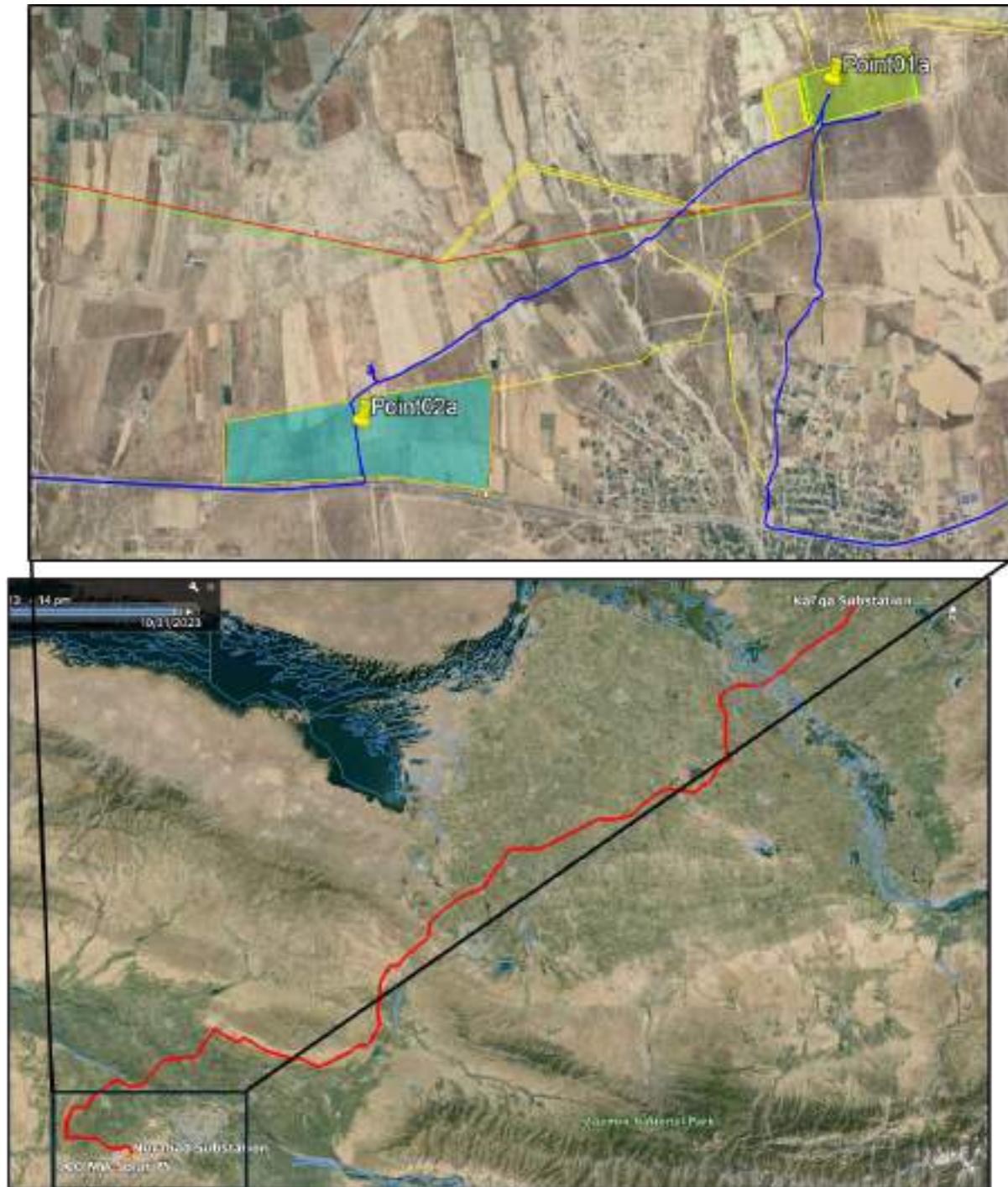


Figure 5-4 A) Map of point count locations at the Samarkand 2 project elements and adjacent areas, and B) The location of the Samarkand 2 project elements and adjacent areas in relation to 350km OHTL (red line).

Table 5-2 Point count locations for Asian Houbara surveys

No	POINT	N	E	1 ST ROUND	NOTE
1	Point01a	39.575788	66.743553	20/03/2024	Territory is not suitable for breeding A houbara
2	Point02a	39.546636	66.686862	20/03/2024	Territory is not suitable for breeding A houbara

6.2 Species Assessments

6.2.1 Egyptian Vulture

The Egyptian Vulture (*Neophron percnopterus*) is a breeding resident and possible passage migrant 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 **Criteria 1 & 3**.

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 is 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, or fallen livestock who have been treated with veterinary drugs. 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 km².

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.

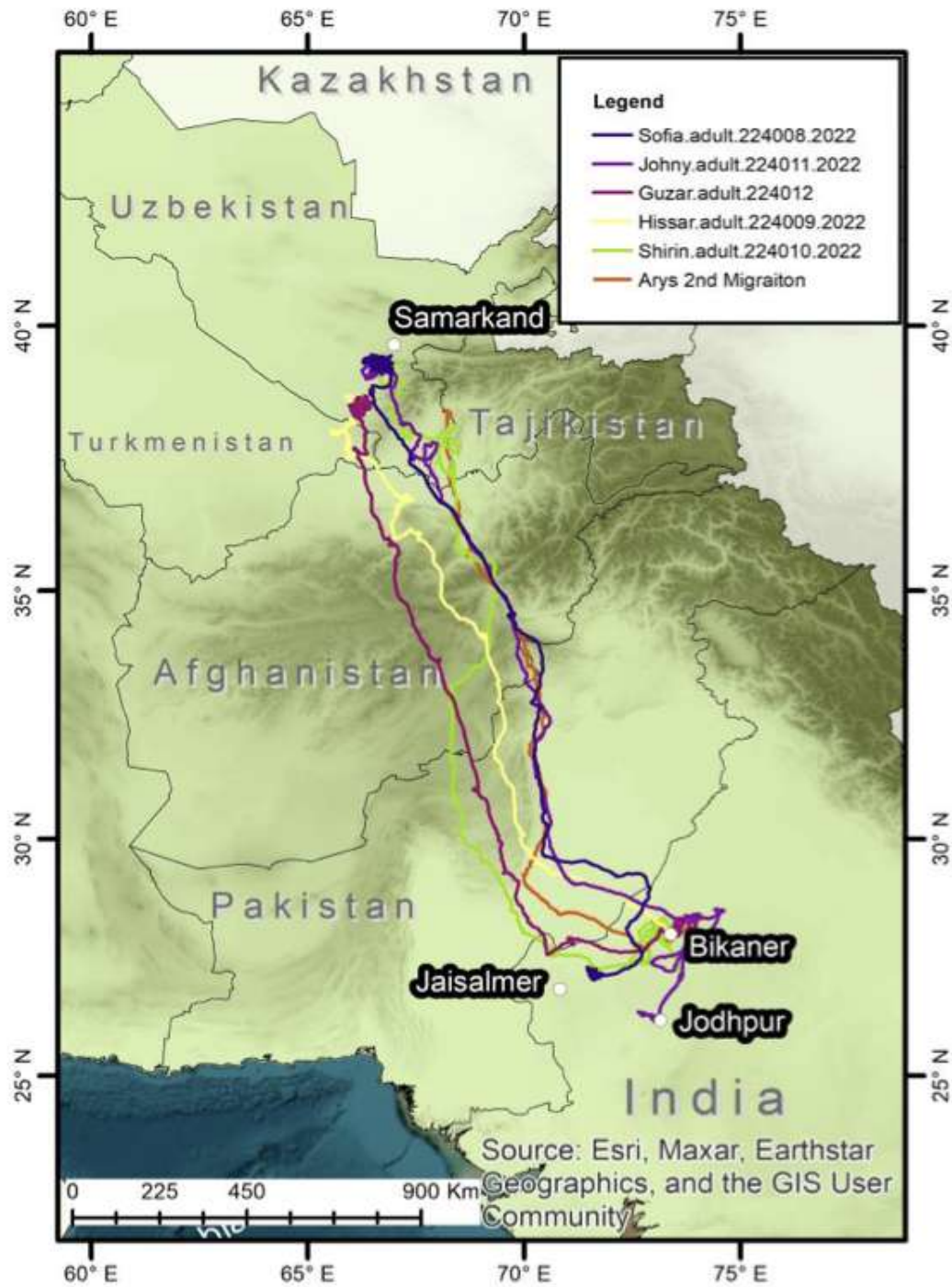


Figure 5-5 Autumn 2022 migration routes of 6 sub-adult Egyptian Vultures from Central Asia to India³

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

³ 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.

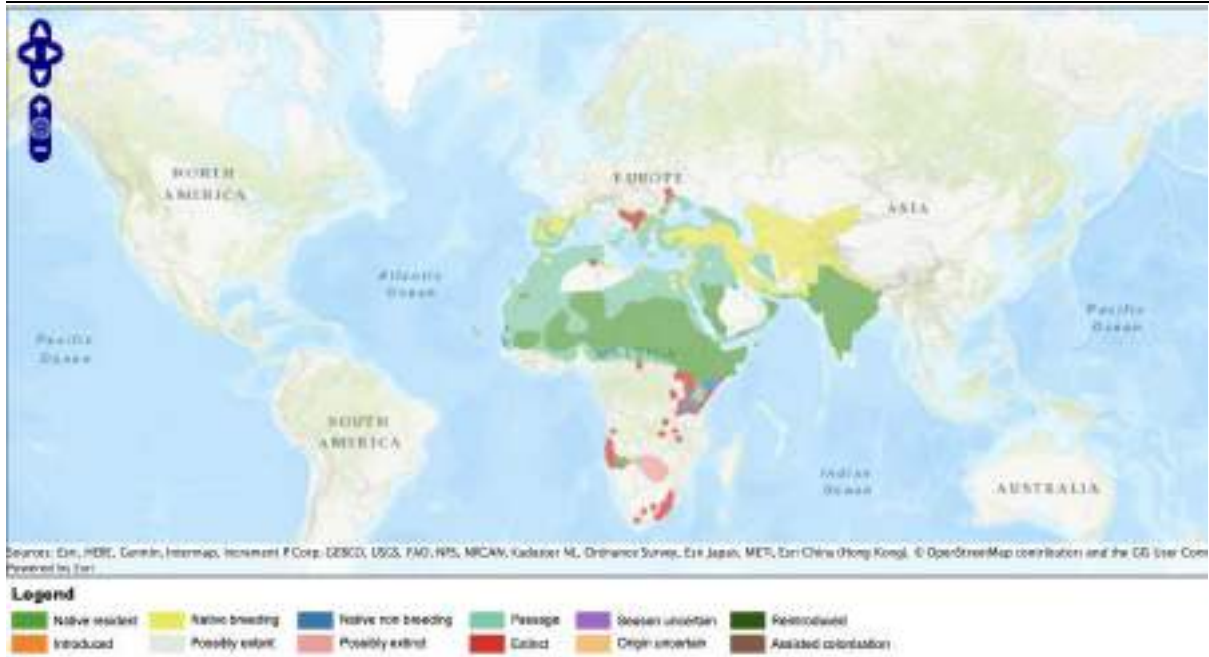


Figure 5-6 Geographic Distribution of the Egyptian Vulture⁴

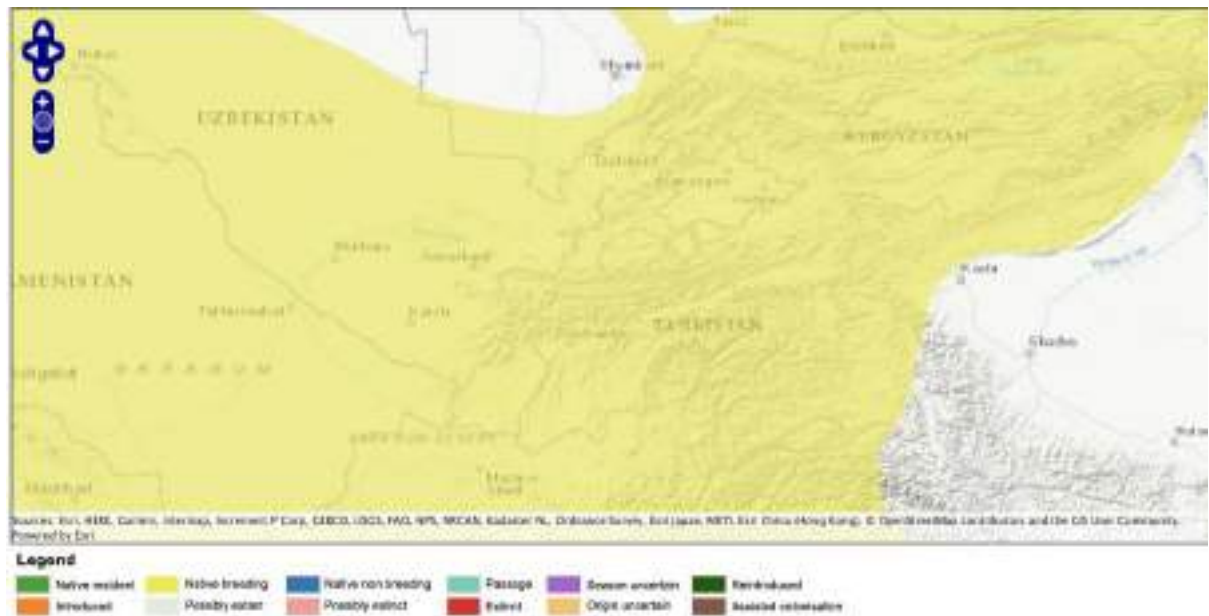


Figure 5-7 Geographic Distribution of Egyptian Vulture within Uzbekistan¹²

6.2.1.3 Baseline Survey Results

A total of **2 observations** of this species were recorded from VPs 7 and 8 during autumn migrations conducted between September and November 2023.

⁴ BirdLife International (2024) Species factsheet: *Neophron percnopterus*. Downloaded from <https://datazone.birdlife.org/species/factsheet/egyptian-vulture-neophron-percnopterus> on 02/05/2024

During wintering bird surveys, **1 observation** of this species was recorded in flight on 27th March 2024, with a known nest noted to be >11km from the survey area.

In subsequent Spring migration surveys undertaken between February and May 2024, a total of **9 observations** of this species were observed migrating over a broad front. They were recorded from 4 VPs (VP6, VP7, VP11, VP15), the 6 observations recorded at VP6 and 7 were likely to be breeding. VP 15 is from an area adjacent to the proposed OHTL.

6.2.1.4 Analysis

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 scavenges at human settlements.

The home range of breeding Egyptian Vultures in Spain⁵ varies from 745.2-3954.4 km², averaging 1257km². 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.

⁵ 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 on the OHTL route

Criticality

The global population of this species is estimated to range from 12,400-36,000 mature individuals. Taking a precautionary approach, the lower range is used to apply the thresholds.

Under **Criteria 1**, the threshold for Endangered (EN) species is 0.5% of the global population, therefore the 0.5% criticality threshold would be 62 individuals.

Under **Criteria 3**, the threshold is 1% of the global population using the EAAA on a regular/cyclical basis during migrations. This would amount to 124 individuals.

A total of 12 observations of this species were recorded at 5 Vantage Points during the baseline studies spanning across Autumn - Spring migration seasons, and wintering surveys indicating species presence in the EAAA. Furthermore, no nests were recorded during the raptor nest survey.

The closest known IBAs for which Egyptian Vulture is a breeding trigger species is Nuratau Range and Pulatkhan Gorge located over 50km away. There are no areas mapped as IBAs within the EAAA for which the Egyptian Vulture is a trigger species. This indicates that there are no breeding hotspots in the EAAA. Although this is not a quantitative extrapolation, the context and the relatively low observations during the baseline surveys, indicates that this species likely

does not have an EAAA population comprising of more than 62 individuals 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 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.

6.2.2 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 **Criteria 3**.

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.⁶

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.⁷

It has an extremely large EOO of 22,400,000 km².

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 Egyptian Vultures in Uzbekistan and globally.

⁶ 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>

⁷ 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 5-6 Geographic Distribution of the Cinereous Vulture⁸



Figure 5-7 Geographic Distribution of Cinereous Vulture within Uzbekistan¹²

6.2.2.3 Baseline Survey Results

A total of **6 observations** of this species were recorded from VPs 5, 6, 7, 11, and 16 during autumn migrations conducted between September and November 2023. VP16 is located in an area adjacent to the proposed OHTL.

⁸ 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.

During wintering bird surveys, **19 observations** of this species was recorded on 06/01/2024, 28/01/2024, 10/02/2024 and 11/02/2024.

During the spring surveys (February 28 to April 30, 2024), **5 observations** of this species were recorded. 4 observations were made at VP 6 and 1 observation at VP 9.

6.2.2.4 Analysis

EAAA

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

The total EAAA for resident and non-breeding birds is applied as all suitable 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 they tend to nest on trees, rocky outcrops, cliffs and montane slopes near high elevation plateaux. Based on breeding pairs from the population in Iberia, the home range of this species can vary from 9-138 km based on if the individuals are breeding or non-breeding.⁹ Therefore, a 25km buffer was applied to the footprint and was then further extended to included 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.

⁹ Jorge García-Macía, Ernesto Álvarez, Manuel Galán, Juan José Iglesias-Lebrija, Marc Gálvez, Gerard Plana, Núria Vallverdú, Vicente Uríos, 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>.



Figure 6-8 EAAA and potential habitats for the Cinereous Vulture on the OHTL route

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 **Criteria 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 30 observations of this species were recorded during the baseline studies spanning across Autumn - Spring migration seasons, and wintering surveys indicating species presence in the EAAA. No nests were recorded during the raptor nest survey.

This species is listed as a trigger species for several IBA/KBA within a 100km of the project footprint. These IBAs/KBAs includes the Nuratau Range where this species is known to breed, as well as Tuzkan Lake, Dzhum-Dzhum, Karnabchul Steppe, Mogoltau massif, central section of the Kurama Mountain Range and Bashkzylsay Unit of the Chatkal Mountain Range where this species is noted to be present as a resident during the non-breeding season. The closest of these are Tuzkan Lake IBA located 30 km from the project footprint with 4 non-breeding adults observed in 2003, Dzhum-Dzhum IBA located 16 km from the project footprint with 1-6 resident individuals observed from 1990-2006 and Karnabchul Steppe IBA located 31 km from the project footprint with 1-6 non-breeding individuals observed between 2003-2005. Mogoltau massif, The central section of the Kurama Mountain Range, Bashkzylsay Unit of the Chatkal

Mountain Range and Nuratau Range IBAs are located more than more than 60km from the project footprint. 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.

This species does not trigger CH status and is not considered a Significant Biodiversity and will not be further assessed.

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 **Criteria 1 & 3**.

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 km².

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

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.

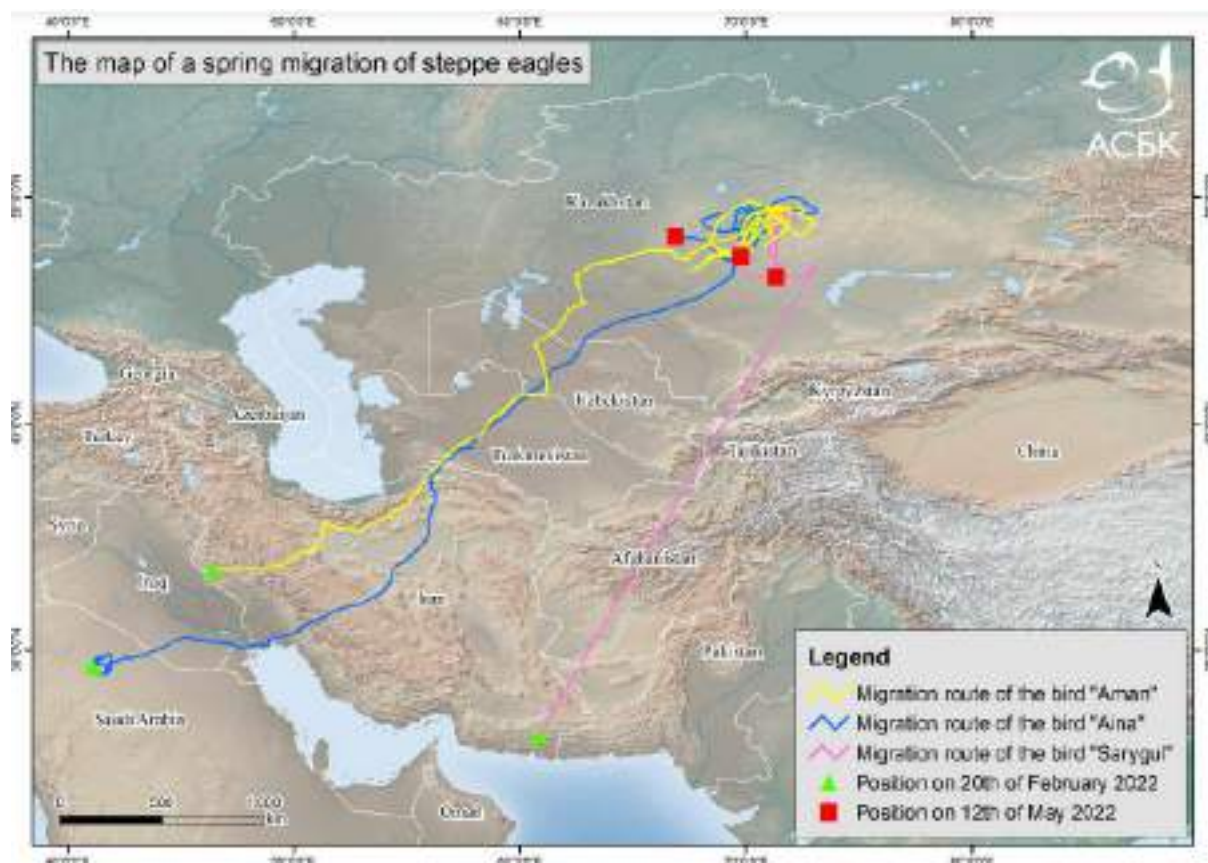


Figure 5-9 Spring 2021 migration routes of 3 sub-adult Steppe Eagle tagged in Central Kazakhstan in 2018⁶

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.



Figure 5-10 Geographic Distribution of Steppe Eagle within Uzbekistan¹²

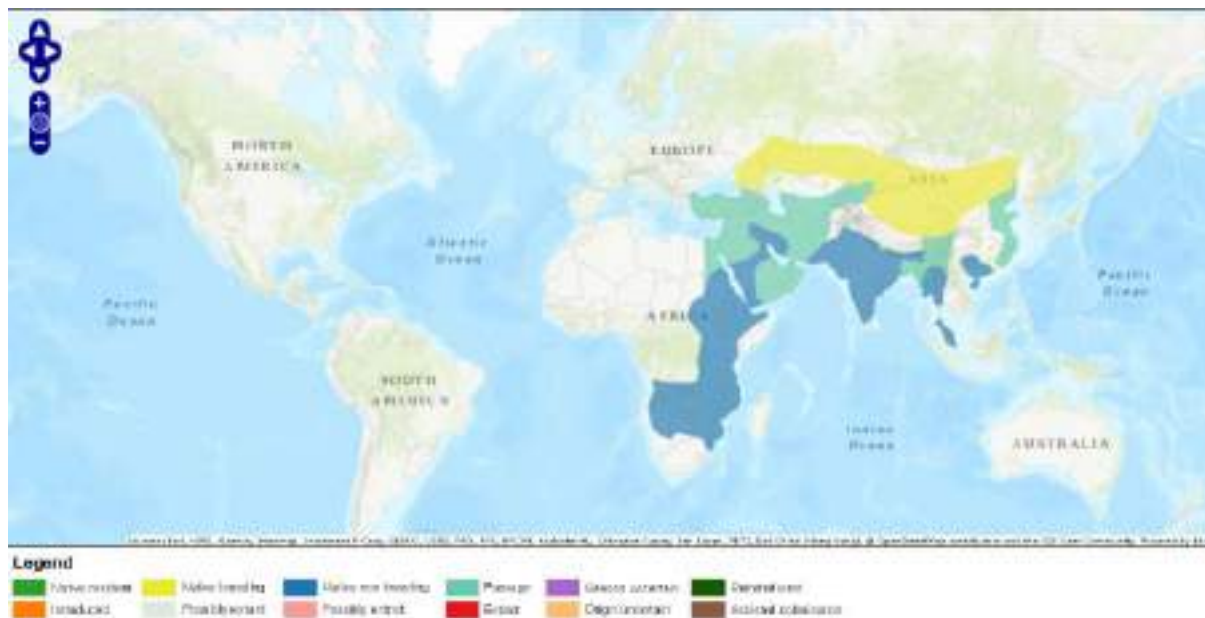


Figure 5-11 Geographic Distribution of the Steppe Eagle¹

Habitat preferences of Steppe Eagle include 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.

6.2.3.3 Baseline Survey Results

During Autumn migration surveys conducted between September and November 2023, **10 observations** of this species were observed across 7 VPs (VP1, 6, 7, 8, 11, 14 and 15). VP 15 is in an area adjacent to the proposed OHTL.

Another **10 observations** of this species were recorded during winter bird surveys; 8 on 28th January 2024, 1 on 10th February 2024 and 1 on 12th February 2024. All were sighted between 1km and 23kms Northwest of the OHTL corridor.

In subsequent Spring Migration surveys undertaken between 28th February and 1st May 2024, **8 observations** of this species were reported from 8 VPs along the length of the OHTL (VP2, 3, 4, 5, 7, 10, 12, 15). Again VP 15 was located in an area adjacent to the proposed OHTL.

6.2.3.4 Analysis

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 from the project footprint 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 km¹⁰. Nevertheless, as smaller reported range distances range between 2 km and 30 km, the home range in the context of the Project's Aol has been limited to 50 km. On this basis, the Aol of the 350-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 Aol buffer.

¹⁰ Meyburg B et al. 2012. Steppe Eagle migration strategies – revealed by satellite telemetry. *British Birds* 105, September 2012, 506–519.

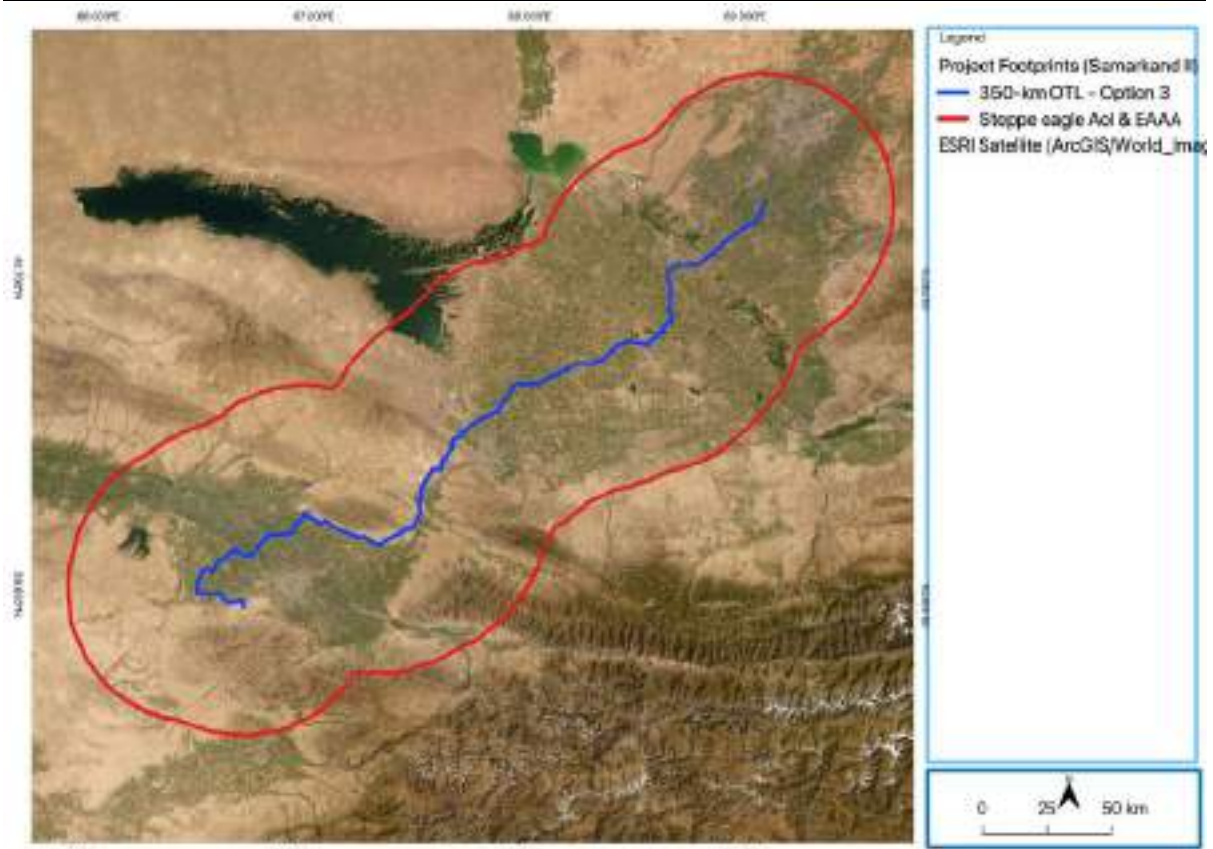


Figure 6-1 Area of Influence and EAAA for the Steppe eagle in relation to the 350-km OTL

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 13 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.

Criticality

The global population of this species is estimated to range from 50,000-75,000 mature individuals. Taking a precautionary approach, the lower range is used to apply the thresholds.

Under **Criteria 1**, the threshold for Endangered (EN) species is 0.5% of the global population, therefore the 0.5% criticality threshold would be 250 individuals.

Under **Criteria 3**, the threshold is 1% of the global population using the EAAA on a regular/cyclical basis during migrations. This would amount to 500 individuals.

A total of 28 observations of this species were recorded at 13 Vantage Points during the baseline studies spanning across Autumn - Spring migration seasons, and wintering surveys. However, no congregating areas or bottle neck sites mapped as IBAs for the Steppe Eagle have been reported within the EAAA, to date. 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. Although this is not a quantitative extrapolation, the context indicates that this species likely does not have an EAAA population of more than 250 individuals. CH is not triggered under **Criteria 1 or 3**.

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

Due to its EN status, No Net Loss (NNL) 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 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 **Criteria 1 & 3**.

6.2.4.1 Ecology

The Saker Falcon is typically found in a variety of open landscapes including grasslands, semi-deserts, and agricultural fields, extending across Eastern Europe and Central Asia. It often prefers flat or rolling terrains with sparse vegetation, which facilitates hunting. Suitable habitats also include river valleys and rocky outcrops when available (R. N. Dixon in litt. 2020).

Saker Falcons generally breed from March to May, depending on the geographical location. They exhibit a preference for nesting on cliffs, rocky ledges, or even old nests of other large birds. In regions lacking natural elevations, they might also utilize human-made structures. A typical clutch consists of 3-4 eggs, which are incubated primarily by the female for about 28-32 days (J. P. Smith in litt. 2019).

Their diet is diverse, primarily consisting of birds and small mammals, which they capture in flight. Saker Falcons may also hunt reptiles, insects, and occasionally fish, adapting their diet based on local prey availability. This adaptability in diet is crucial for their survival across varied environments (A. T. Peterson 2018).

Threats to the Saker Falcon include habitat degradation due to agricultural expansion and urbanization. Additionally, they face risks from direct persecution and collision with power lines. Illegal wildlife trade, particularly for falconry, poses a significant threat, leading to declines in certain populations. Conservation efforts are critical to mitigate these threats and ensure the species' survival (Conservation Action Trust 2021).

6.2.4.2 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 km² (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.

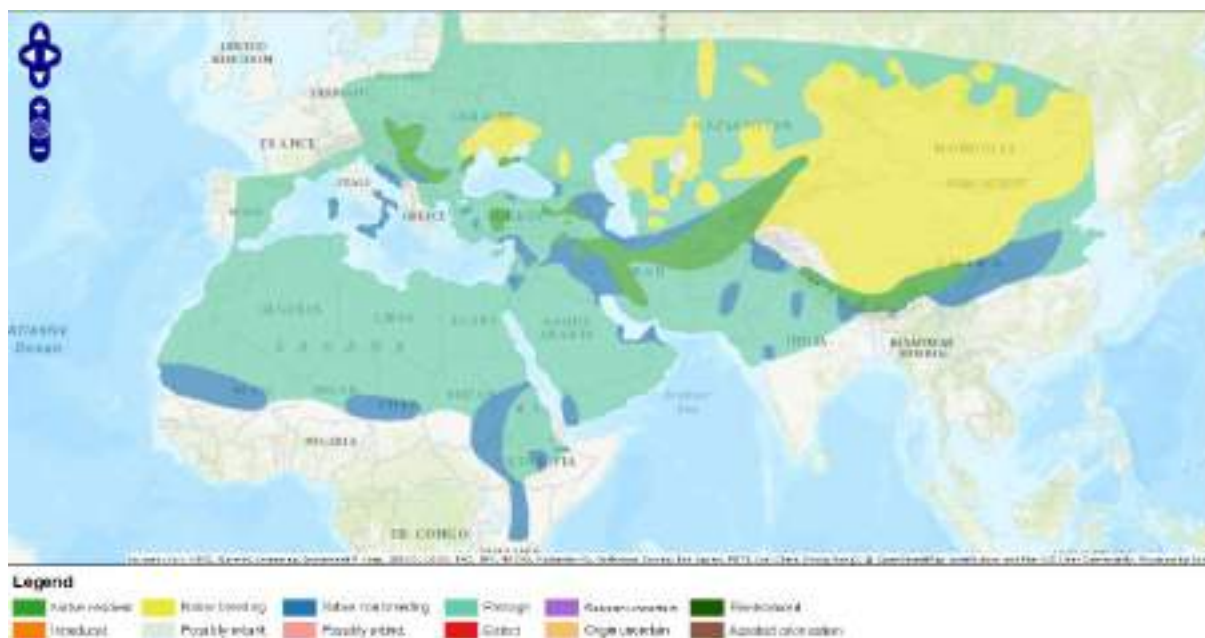


Figure 5-13 Distribution Map of the Saker Falcon

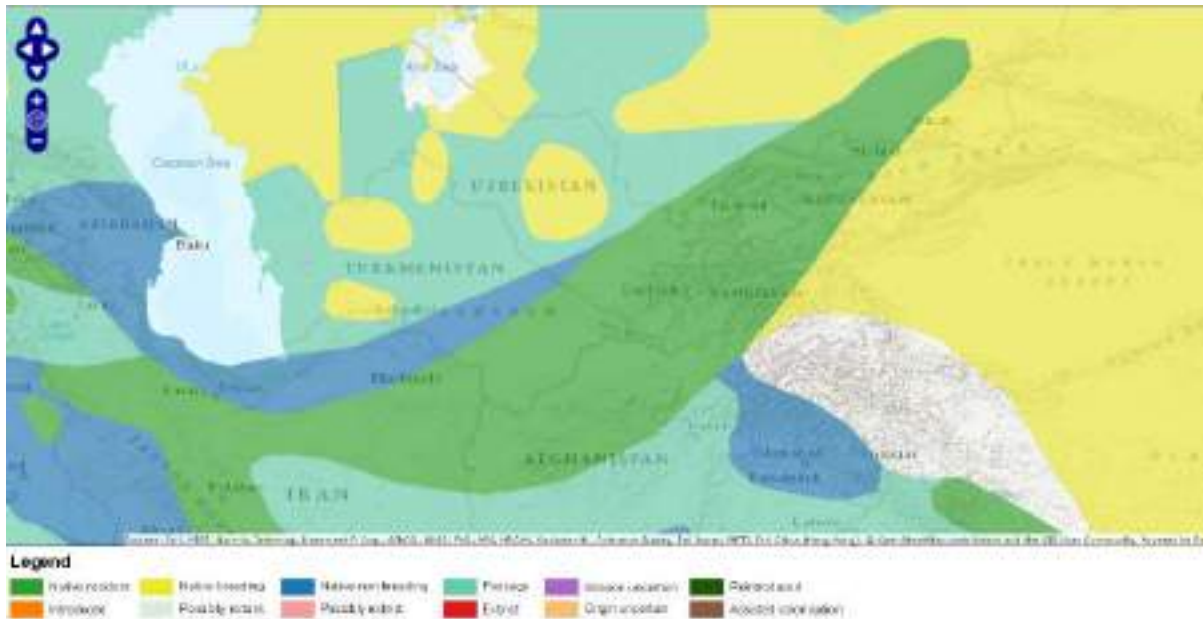


Figure 5-14 Distribution Map of the Saker Falcon¹¹

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. 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.

¹¹ BirdLife International (2024) Species factsheet: Saker Falcon *Falco cherrug*. Downloaded from <https://datazone.birdlife.org/species/factsheet/saker-falcon-falco-cherrug> on 27/06/2024.

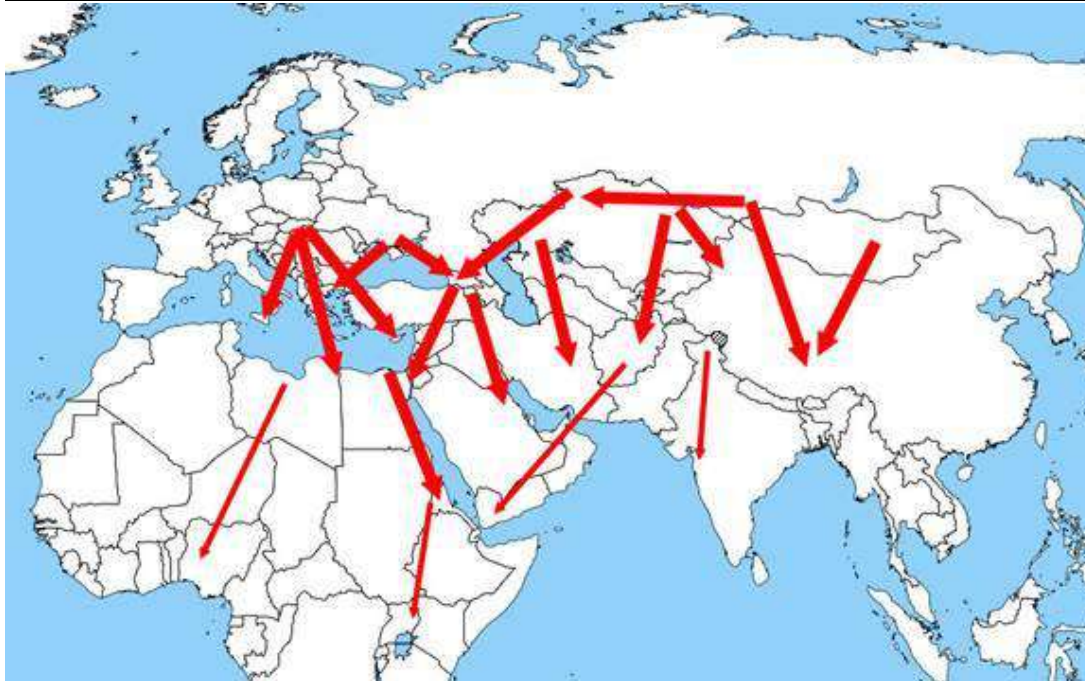


Figure 6-2 General direction of autumn migration routes of the Saker Falcon ¹²

6.2.4.3 Baseline Survey Results

During wintering bird surveys, **2 observations** of this species were recorded near the proposed 350km OHTL. The first was observed 23km Northwest of the OHTL on the 10th February 2024, and the second 18km Northwest on the 11th February 2024.

6.2.4.4 Analysis

EAAA

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

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 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

¹²International 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.

there are adequate hunting grounds available. This species is able to adapt to modified landscapes, 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.¹³ 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.

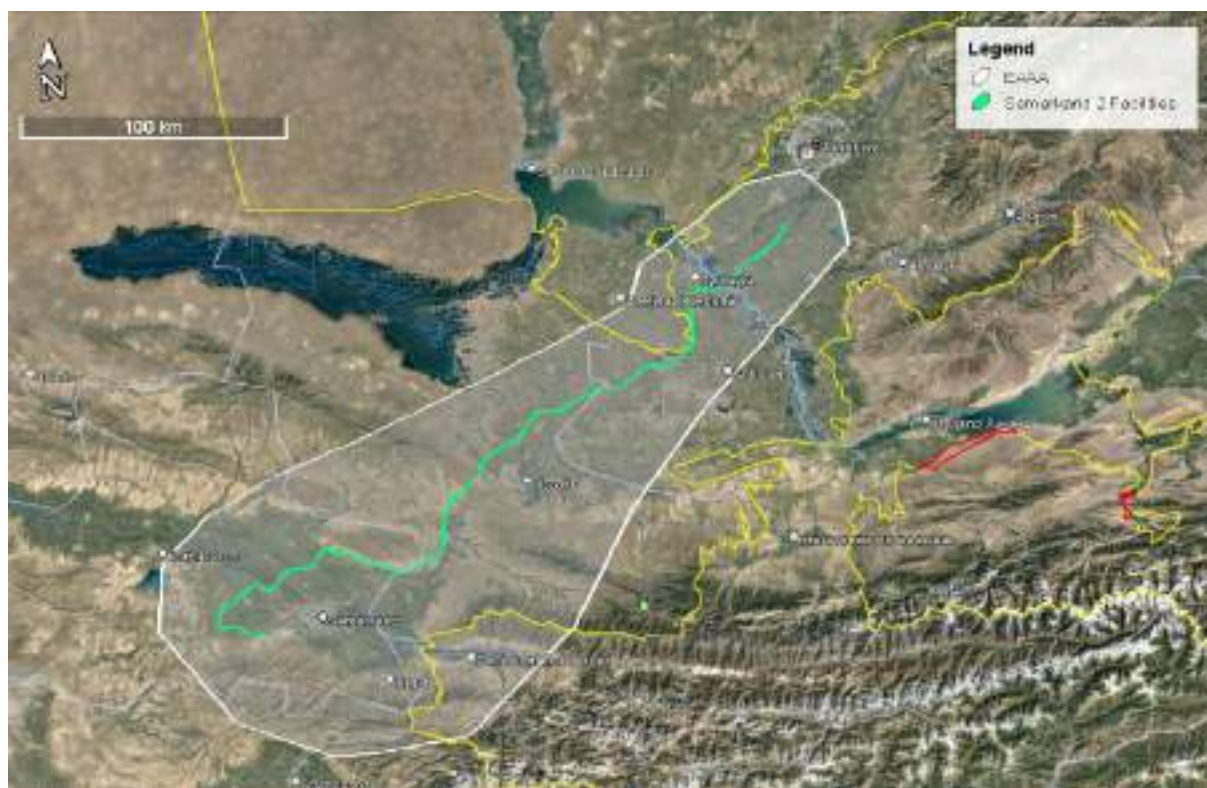


Figure 5-14 EAAA for the Saker Falcon on the OHTL route

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 **Criteria 1**, the threshold for Endangered (EN) species is 0.5% of the global population, therefore the 0.5% criticality threshold would be 61 individuals.

¹³ Prommer, Matyas & János, Bagyura & Fehérvári, Péter & Miklós, Váci. (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.

Under **Criteria 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.

A total of 2 observations of this species were recorded at 23km Northwest and 18km Northwest of the proposed 350 km OHTL during the baseline studies spanning across Autumn - Spring migration seasons, and wintering surveys indicating species presence in the EAAA.

The closest known IBA where Saker Falcon is listed as a trigger species is Nuratau Range in Uzbekistan as 2 resident adults were recorded between 2004-2006. This site is located approximately 50 km from the project footprint and 30km from the EAAA. Based on the lack of IBAs for which Saker Falcon is a trigger species within the EAAA it is considered unlikely that the EAAA has suitable habitat to support a population that comprises of more than 61 individuals.

Therefore, this species does not trigger CH status but is considered a Significant Biodiversity Value due to its IUCN Endangered (EN) designation and Endangered (EN) 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.

6.2.5 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 **Criterion 1 & 3**.

6.2.5.1 Ecology

The Pallas's Fish-eagle favors 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)¹⁴, while in Bangladesh, the species returns to nest sites in late August (Sourav et al. 2011).¹⁵

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.

6.2.5.2 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 km² (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),¹⁶ 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.

¹⁴ BirdLife International. 2001. Threatened birds of Asia: the BirdLife International Red Data Book. BirdLife International, Cambridge, U.K.

¹⁵ Sourav, M.S.H., Ahmed, B. & Thompson, P. 2011. Pallas's Fish Eagle *Haliaeetus leucoryphus* in Bangladesh. *BirdingASIA* 16: 101-105.

¹⁶ Steele, M. L. 2017. Where in the World are Pallas's Fish Eagles? Migration and Ecology of *Haliaeetus leucoryphus* in Asia. Theses and Dissertations. 2015. <http://scholarworks.uark.edu/etd/2015>.

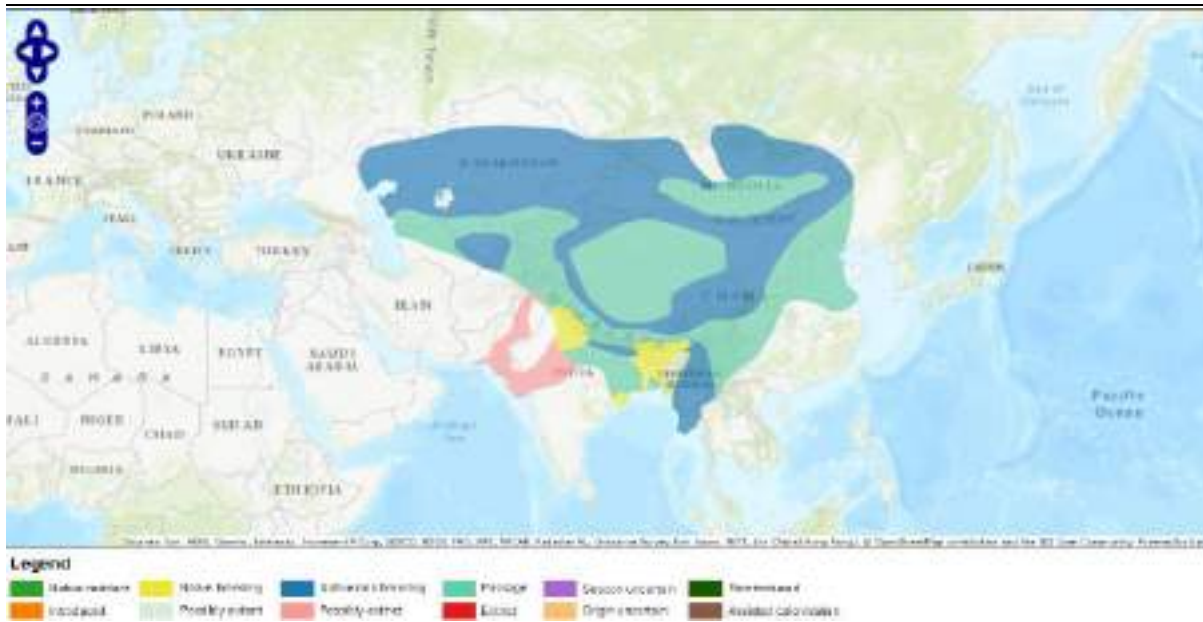


Figure 5 15 Geographical Distribution of Pallas's Fish-eagle



Figure 6-15 Geographical Distribution of Pallas's Fish-eagle 17

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 to 2015 found no evidence of breeding at 13 of 21 historically known sites (Gilbert et al. 2014)¹⁸.

¹⁷ BirdLife International (2024) Species factsheet: *Haliaeetus leucoryphus*. Downloaded from <https://datazone.birdlife.org/species/factsheet/pallass-fish-eagle-haliaeetus-leucoryphus> on 29/04/2024.

¹⁸ 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.

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).

6.2.5.3 Baseline Survey Results

No observations of this species were recorded during baseline surveys of the OHTL corridor.

6.2.5.4 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 Lakes in Uzbekistan since 6 adults were recorded during the winter of 2004. This site is located approximately 32 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 Aol (considered as areas within a 20km buffer from the project footprint for birds). Furthermore, lack of baseline observations and consultations with the regional ornithologist confirm that it is unlikely to observe this species in the project Aol due to lack of suitable habitat.

Therefore, due to the unlikelihood of presence and lack of suitable habitat in the project Aol, 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.

6.2.6 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 **Criteria 1 & 3**.

6.2.6.1 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).

The Eastern Imperial Eagle faces multiple threats including habitat loss due to deforestation and agriculture, poaching for trade, electrocution from power lines, and disturbances near nesting sites from human activities. These factors collectively contribute to the decline in their population.

6.2.6.2 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 Kazakhstan to the Middle East (Poessel et al 2018). Satellite tracking has eluded to some winter site faithfulness (Meyburg and Meyburg, 2011).



Figure 5-17 Migration routes of Eastern Imperial Eagles captured in Kazakhstan ¹⁹

It has a large EOO of 14,900,000 km².

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.

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>

6.2.6.3 Baseline Survey Results

During wintering bird surveys, **2 observations** of this species were recorded. The first on the 5th January 2024 22km NW of the OHTL and the second on the 10th February 2024, 25km Northwest of the proposed OHTL.

In subsequent Spring migration surveys undertaken between February and May 2024, **4 observations** of this species were observed at points VP02, V08 and VP11.

6.2.6.4 Analysis

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 from the project footprint - 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.²¹ 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.

²¹ 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 5-20 EAAA and potential habitats for the Eastern Imperial Eagle on the OHTL route

Criticality

The global population of this species is estimated to range from 2,500-3,800 mature individuals. Taking a precautionary approach, the lower range is used to apply the thresholds.

Under **Criteria 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 **Criteria 3**, the threshold is 1% of the global population using the EAAA on a regular/cyclical basis during migrations. This would amount to 25 individuals.

A total of 6 observations of this species were recorded at 3 Vantage Points during the baseline studies spanning across Autumn - Spring migration seasons, and wintering surveys indicating presence within the EAAA. However, the closest known IBA for which Eastern Imperial Eagle is a trigger species (5-10 individuals) is the Arys-Karaktau State Reserved Zone in Kazakhstan. This IBA is located 120km to the north of the project site and is within the breeding range of this species whereas the EAAA for this species is located further south in its migratory range. There are no known congregating areas or bottle neck sites mapped as IBAs for Eastern Imperial Eagle within the EAAA. Based on the known migratory corridors for this species, it is unlikely that such areas exist within the EAAA.

Although this is not a quantitative extrapolation, the context indicates that this species likely does not have an EAAA population of more than 25 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 but 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.

6.2.7 Greater Spotted Eagle

The Greater Spotted Eagle (*Clanga clanga*) is a passage migrant in Uzbekistan, listed as a Vulnerable (VU) species on the IUCN Global Red List, and is listed as 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 **Criteria 1 & 3.**

6.2.7.1 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. Löhmus *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; Löhmus and Väli 2001; Dombrovski 2002; Väli *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).

The Greater Spotted Eagle is threatened by habitat degradation from agricultural expansion and wetland drainage, human disturbances at nesting sites, contamination from pesticides, and illegal hunting. These challenges are critical factors contributing to the species' vulnerability.

6.2.7.2 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.

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.

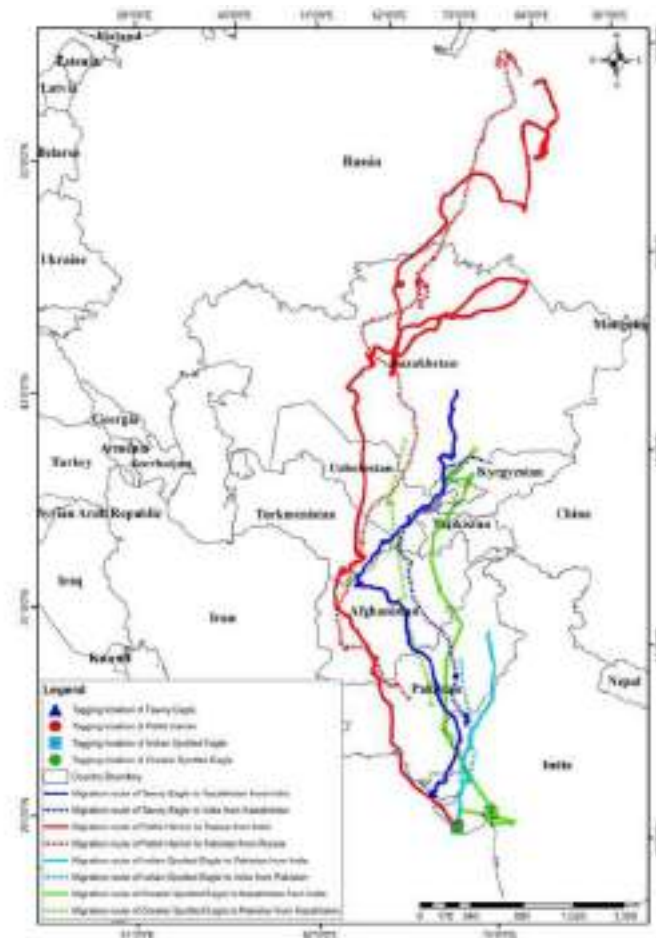
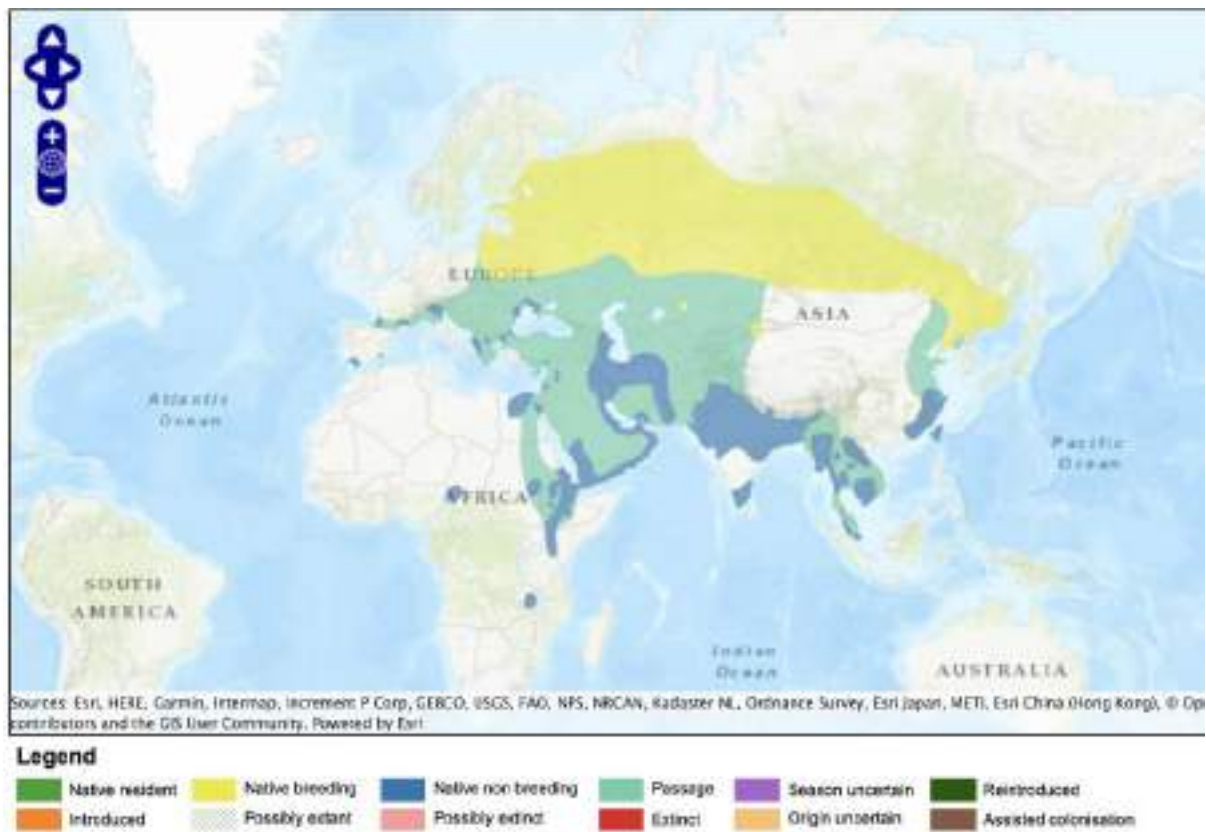


Figure 5-21 Migratory routes of raptor species through Central Asia. Green tracks indicate Greater Spotted Eagle routes.²²

The species has an EOO of 15,300,000km².

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.



²² 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 5-22 Distribution Map of Greater Spotted Eagle²³

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 daily migration movement has been measured at approximately 250km per day.²⁴ The EAAA is applied to all of the above-mentioned suitable habitats within the project footprint and as well as within an applied buffer of 250km around the project footprint.

6.2.7.3 Baseline Survey Results

During autumn migration surveys undertaken between September and November 2023, a total of **7 observations** of this species were recorded at 6 VPs along the proposed 350km OHTL (VP2, VP3, VP5, VP6, VP8, VP9).

A single observation of this species was recorded at VP13 during subsequent Spring migration surveys carried out between February and May 2024.

²³ BirdLife International (2024) Species factsheet: *Clanga clanga*. Downloaded from <https://datazone.birdlife.org/species/factsheet/greater-spotted-eagle-clanga-clanga> on 24/04/2024.

²⁴ Ram, Mohan, Aradhana Sahu, Shyamal Tikadar, Devesh Gadhavi, Tahir Ali Rather, Lahar Jhala, and Yashpal Zala. 2022. "Home Ranges and Migration Routes of Four Threatened Raptors in Central Asia: Preliminary Results" *Birds* 3, no. 3: 293-305. <https://doi.org/10.3390/birds3030020>

6.2.7.4 Analysis

6.2.7.5 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 from the project footprint - 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 km²⁵. Nevertheless, as smaller reported range distances vary from 2 km to 30 km, the home range in the context of the Project's Aol has been limited to 50 km. On this basis, a 50-km wide Aol buffer was applied to the PV plant and sub-station footprint, with regard to potential loss of suitable habitat. Likewise, the Aol of the 350-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 Aol buffer.

²⁵ Meyburg B et al. 2012. Steppe Eagle migration strategies – revealed by satellite telemetry. *British Birds* 105, September 2012, 506–519.

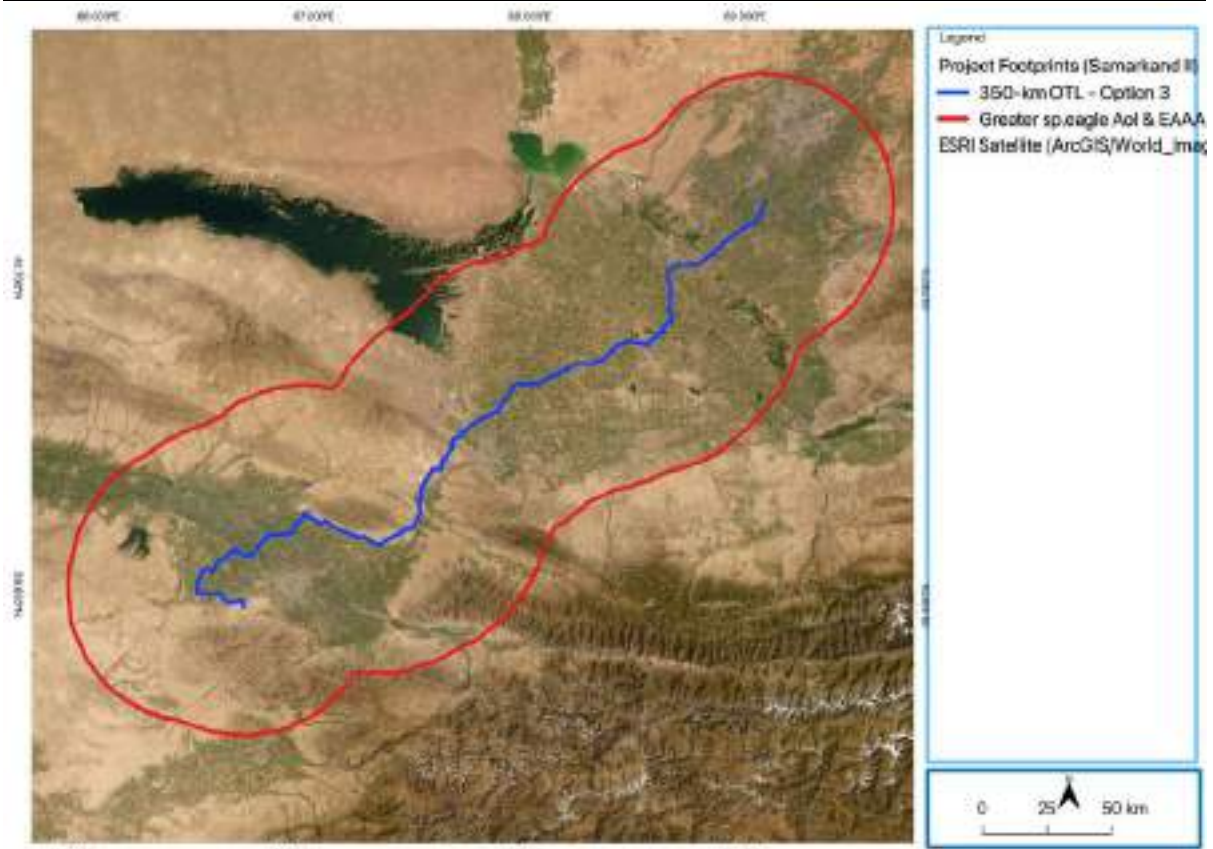


Figure 6-3 Area of Influence and EAAA for the Greater spotted eagle in relation to the project footprint

The species has been shown to occur within a range of habitats, some of which are well-represented within the broad Aol. The outcomes of the VP surveys did not confirm a regular occurrence of the species within the Aol, 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.

6.2.7.6 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 **Criteria 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 **Criteria 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.

A total of 8 observations of this species were recorded at 7 Vantage Points during the baseline studies spanning across Autumn - Spring migration seasons, and wintering surveys indicating presence within the EAAA.

Greater Spotted Eagle is listed as a trigger species for 3 IBAs in and around the EAAA; Dalverzin State Forestry and Hunting Management Area, Zaravshan State Nature Reserve and Angren Plateau. 15 observations 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. In 1998, 50-500 individuals were recorded on passage in the Angren Plateau IBA. However, this data is over two decades old and it is likely that it is not reflective of the current conditions of the area. In this context, while the data indicates presence within the EAAA, it is not likely that the EAAA contains suitable habitat to support a population of 39 individuals on a regular cyclical basis nor a concentration the loss of which would trigger uplisting to CR/EN status.

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.

6.2.8 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 **Criteria 1 & 3**.

6.2.8.1 Ecology

The Great bustard is a well-studied cryptic, steppe species. 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). It can also be found in *Artemisia* and *Stipa* steppes, mountain foothills and in semi-desert habitats, in its range within Asia (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.

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). 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). In terms of its breeding ecology, the Great bustard is a lekking bird of a polygynous and gregarious nature.

Globally, the Great bustard exhibits a preference for natural steppe biotopes, in the Spring-time breeding season. Nevertheless, sheltered valley habitats characterized by moderately grazed pastures and low-intensity agriculture make up a considerable fraction of the species' breeding grounds. Agricultural breeding habitats offer favourable non-cereal vegetation and invertebrate forage. In the Winter, however, Great bustard populations migrate towards wintering habitats which typically include rainfed and sheltered or abandoned winter crop (i.e., wheat stubble) and legume (i.e., alfalfa) fields and idle pastureland.

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). 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.' Nevertheless, since 2000 there is some evidence of a recovery.

6.2.8.2 Distribution

The species globally has a large EOO of 14,400,000 km². 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. Recent literature identifies two global sub-populations of the Great bustard, which are referred to as the Asian and European sub-populations. These sub-populations are differentiated by their geographical extents of occurrence, and by the coloration and appearance of their plumage.

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).

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

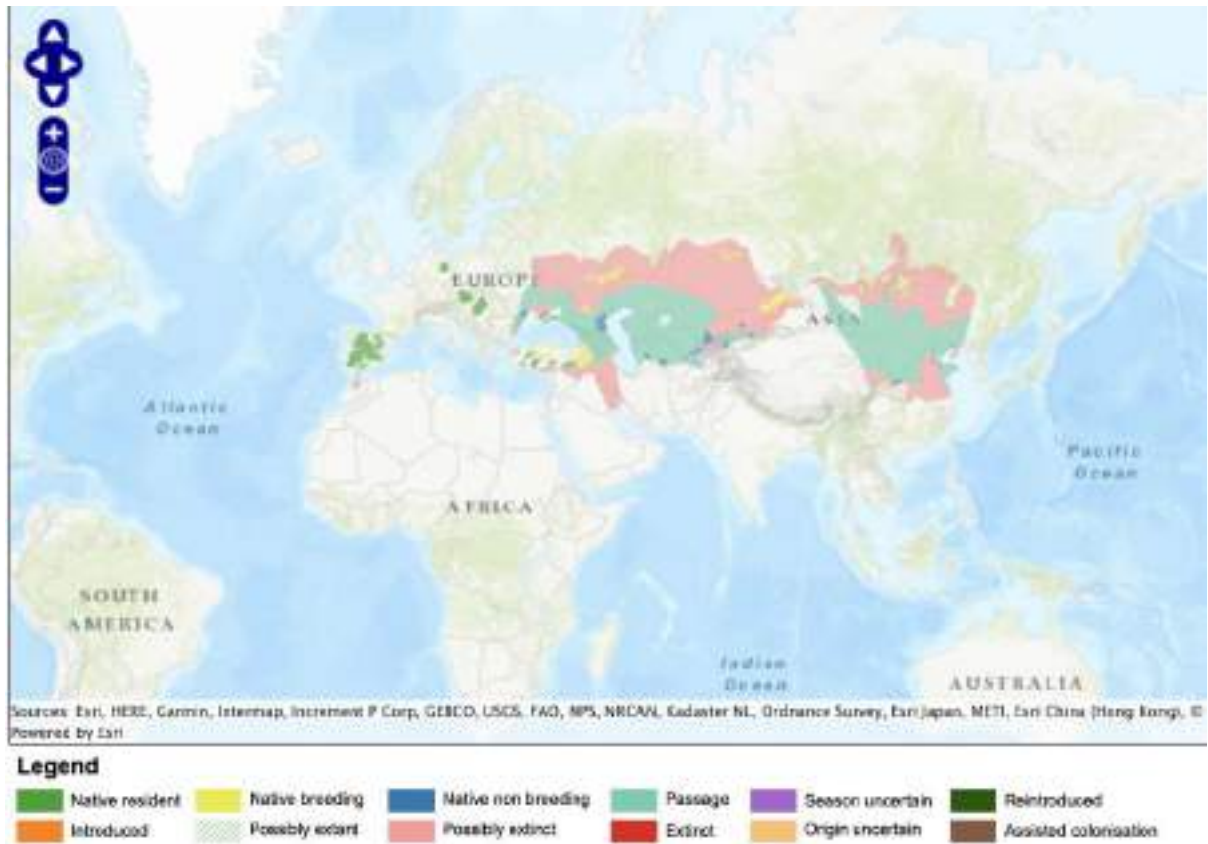


Figure 5-25 Distribution Map of Great Bustard

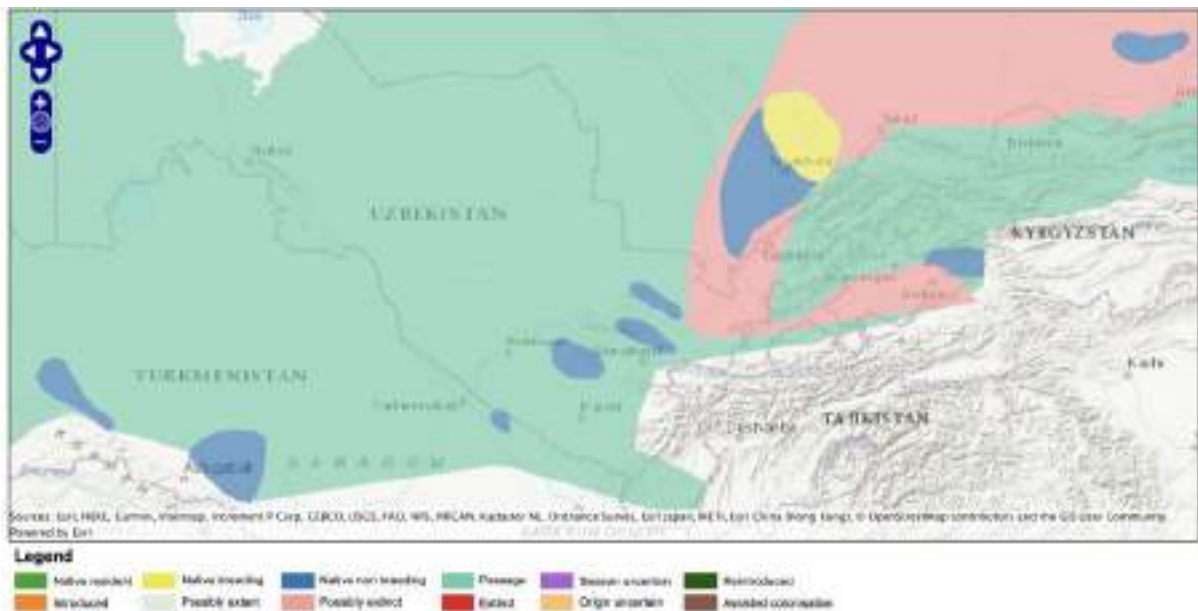


Figure 5-25 Distribution Map of Great Bustard²⁶

²⁶ BirdLife International (2024) Species factsheet: *Otis tarda*. Downloaded from <https://datazone.birdlife.org/species/factsheet/great-bustard-otis-tarda> on 25/04/2024.

Literature and older studies suggest that migratory populations of the Great bustard in Central Asia migrated between temperate habitats in Kazakhstan and Tajikistan, and the mediterranean stopover and wintering habitats in Uzbekistan and Turkmenistan (besides the wintering grounds in Afghanistan and Pakistan). Mongolia is another known hotspot for the Great bustard, in the Central Asian region. Breeding populations of the bustard in Eastern and Central Mongolia migrate to and from wintering habitats.

Historically, the agro-ecological landscapes in Uzbekistan have hosted wintering, passage and breeding populations of the Great bustard. Very small breeding populations of the Great bustard previously occurred in relatively undisturbed steppe biotopes within Jizzakh and Samarkand. However, rapid agricultural transformation and the expansion of irrigated agriculture drove breeding populations out of these areas. The current occurrence of the Great bustard in Uzbekistan is limited to passage and overwintering migrant populations, which have been reported to inhabit non-irrigated winter crop fields and wheat farms in particular, and to a lesser extent, clayey and gravelly foothills and piedmonts, mostly those with sagebrush scrub. The earliest arrival of the bustard occurs around December, and wintering activity extends up to mid-February.

A series of exploratory studies in the period 2019-2021 established that the two main wintering habitats for the Great bustard in Uzbekistan are both situated in Jizzakh Region. These prime biotopes include wheat fields nestled between neighbouring mountain ranges in Gallorol District, as well as the foothills of the Pistaltau mountain range and adjacent wheatfields bounded by Aydar Lake to the North, in Forsih District. A total of 107 individuals were recorded in these habitats in 2019-2020, while a maximum population of 455 was reported in the follow-up survey of 2021-2022. In the Gallorol habitat, the bustards settled on rain-fed crop fields, whereas in Forsih, relative natural piedmont habitat was shown to host the majority of the resident bustard population. Overall, the total count of Great bustards reported for Gallorol was comparatively high, owing to abundant food resources on extensive wheat farmland.

Lesser sightings of the Great bustard were reported in conservation areas within Samarkand Region, including the Zarafshan Nature Reserve (in Zarafshan District) and two contiguous sanctuaries in Pahtachi District.

6.2.8.3 Baseline Survey Results

Following literature surveys and rounds of critical habitat screening, a wintering birds survey was implemented, as one of the specialized baseline ecological surveys integrating into the CHA and ESIA studies. Considering the cryptic nature of this species and its circulation across extensive, known home ranges, the survey employed both auto transects and point counts

from elevated vantage points to quantify variable aggregations of the species in multiple, discrete habitat patches. The extent of the wintering surveys spanned much of the project transmission (OTL) corridor, and the survey effort was focused on the EAAA delineated through literature reviews, remote sensing and field reconnaissance, in Gallorol District.

The search was initiated in December 2023. However, due to the late onset of the Winter, the first observations of the Great bustard were recorded in January 2024, and sightings continued up to February 2024.

A total of **185 observations** of this species were recorded between 5th January and 11th February 2024. The 19 flocks of Great Bustard observed ranged in size from 2 to 36 birds. No foraging or roosting sites with directly observed ground activity were identified within 5 km of the 550 kV (350-km) OTL. Nevertheless, supplementary interviews with local farmers and herders provided anecdotal accounts of two Great bustard sightings within the 5 km buffer. A flying flock of eight Great bustard individuals was also observed within the buffer, but no landing was observed in this range.

Beyond the aggregations recorded in Jizzakh Region, one Great bustard individual was sighted on a wheat field situated within 5 km of the 220 kV (70-km) OTL, in Nurobod District, Samarkand Region. This was an isolated, solitary finding, with no indication of conspecific aggregation and distant flocks further out in the landscape and in the wider Nurobod District.

Beyond the winter survey, no Great bustard activity was recorded during the Autumn and Spring migration monitoring at the 16 vantage points sited within a range of potentially suitable avian habitats.

6.2.8.4 Stakeholder Consultations

Stakeholder consultations were undertaken in the form of letters and email-exchanges with Dr Mimi Kessler, a member of the IUCN Bustards Specialist Group and renowned expert on bustards in the region.

Dr. Kessler informed that the project's OHTL indeed crosses through known important wintering grounds for the Great Bustard, which aligns with the secondary information and primary records obtained for the project.

Ana Ten, an Uzbekistan-based ornithologist and bustard expert, has confirmed that a regular wintering population estimated at circa 500 individuals has been recorded within suitable habitat directly adjacent to the planned route of the OHTL.

6.2.8.5 Analysis

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

The Area of Influence (AoI) of the 500 kV (350-km) OTL can be defined as a precautionary, 35-km buffer around the longitudinal span of the OTL route, where collision-related mortality is likely to occur. This buffer has been scaled based on the maximum documented home range of the Great bustard. While a 2-km daily home range has been reported for the bustard's European sub-population, home ranges as wide as 35-km have been referenced in studies involving Great bustard wintering habitats in China. On this empirical 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 buffer. The EAAA for this species was delimited based on secondary information regarding the wintering habitats in Gallorol District and the classification of the habitat landscape at the reconnaissance stage. Advances in ecological research around the Great bustard in Uzbekistan have established that this species is a non-breeding migrant, which forms sizeable and facultative wintering population clusters in the Northern part of Jizzakh Region. The relative

ecological importance of this area for the Great bustard can be ascribed to the following contextual factors:

- While little to no tracking studies have been undertaken to trace the migratory routes of the overwintering Great bustard population of Uzbekistan, this population is believed to originate from the breeding grounds in Kazakhstan. The wintering habitats of Gallorol and Forish are located 60-100 km from the southern border of Kazakhstan and therefore represent the closest suitable habitat in relation to the species' breeding range.
- Unlike other patches of suitable habitat in Jizzakh region (e.g., in Zomin and Arnasay) and Samarkand Region (Kattakurgan and Pahtachi), the major wintering habitats in Gallorol and Forish offer expanses of prime habitat including rainfed and traditionally exploited wheat fields as well as gravelly foothills along the Pistalitau mountain range. The large wintering populations recorded in these parts require ample vegetative forage, as the availability of supplementary food resources (e.g., invertebrate biomass) becomes increasingly limited within alternative biotopes (e.g., other pastoral land, non-intensive farmland and steppe habitats) in the winter.
- The Great bustard is a gregarious lekking bird that is cryptic in nature. It therefore resides in habitats that not only provide copious feeding grounds for multiple flocks but also offer a sheltered geographical setting (i.e., flat terrain with good predator visibility, etc.). The wintering habitats in Gallorol and Forsih are ideal in this regard, as they are bounded by mountainous and lacustrine areas which present a relatively lower degree of anthropogenic disturbance.
- Both European and Asian sub-populations of the Great bustard exhibit habitat fidelity on a regional scale, and a number of recent studies demonstrate the importance of short-range migration movements within neighbouring patches of wintering grounds, some of which may be distinguished by ecological function (e.g., roosting versus foraging). Large concentrations of the Great bustard have occurred consistently in the habitats of Gallorol and Forish. Rounds of research undertaken between 2019 and 2021 indicate that the two habitats are likely interconnected, as resident flocks appear to rotate between these favourable sites, depending on the availability of forage and anthropogenic influence. The availability of a heterogenous, wider habitat system for mobile overwintering flocks is another key advantage associated with this overwintering location.

Prior to the start of a specialized baseline survey for the Great bustard, a preliminary, blanket EAAA was taken as the entire extent of the Aol along the OTL route. Migration monitoring (VP) and winter surveys were conducted along the preliminary EAAA, and wintering surveys were focused on the preliminary EAAA corridor in Jizzakh and Samarkand regions.

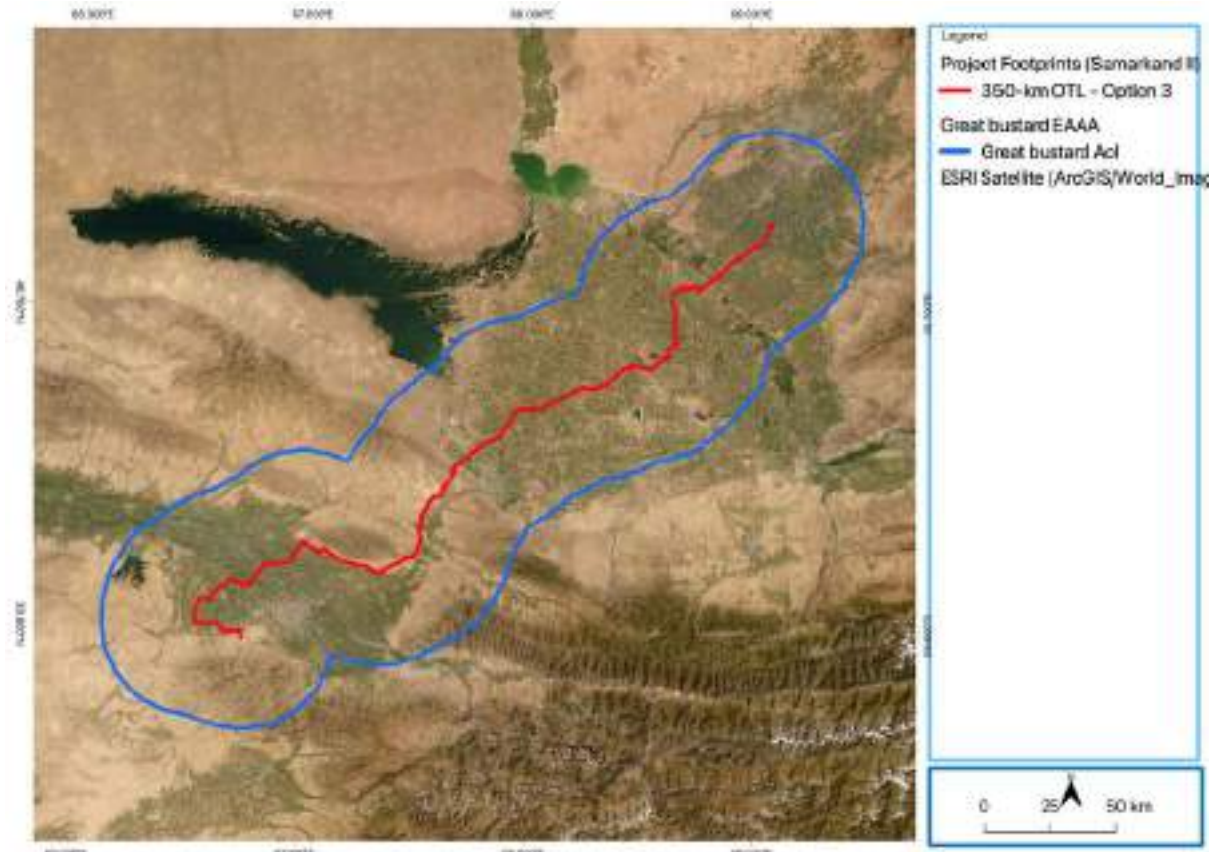


Figure 6-4 Area of Influence and preliminary EAAA for the Great bustard in relation to the 500 kV OTL

Baseline information gathered from a mosaic of habitats along the preliminary EAAA confirmed the wintering range of this species relative to the AoI. All observations of foraging activity within the Gallorol wintering habitat were concentrated within a Minimum Convex Polygon (MCP), which lies about 16 km away from the OTL route. An extended version of the MCP, which includes indirect observations such as anecdotal sightings and in-flight identification intersects the OTL route.

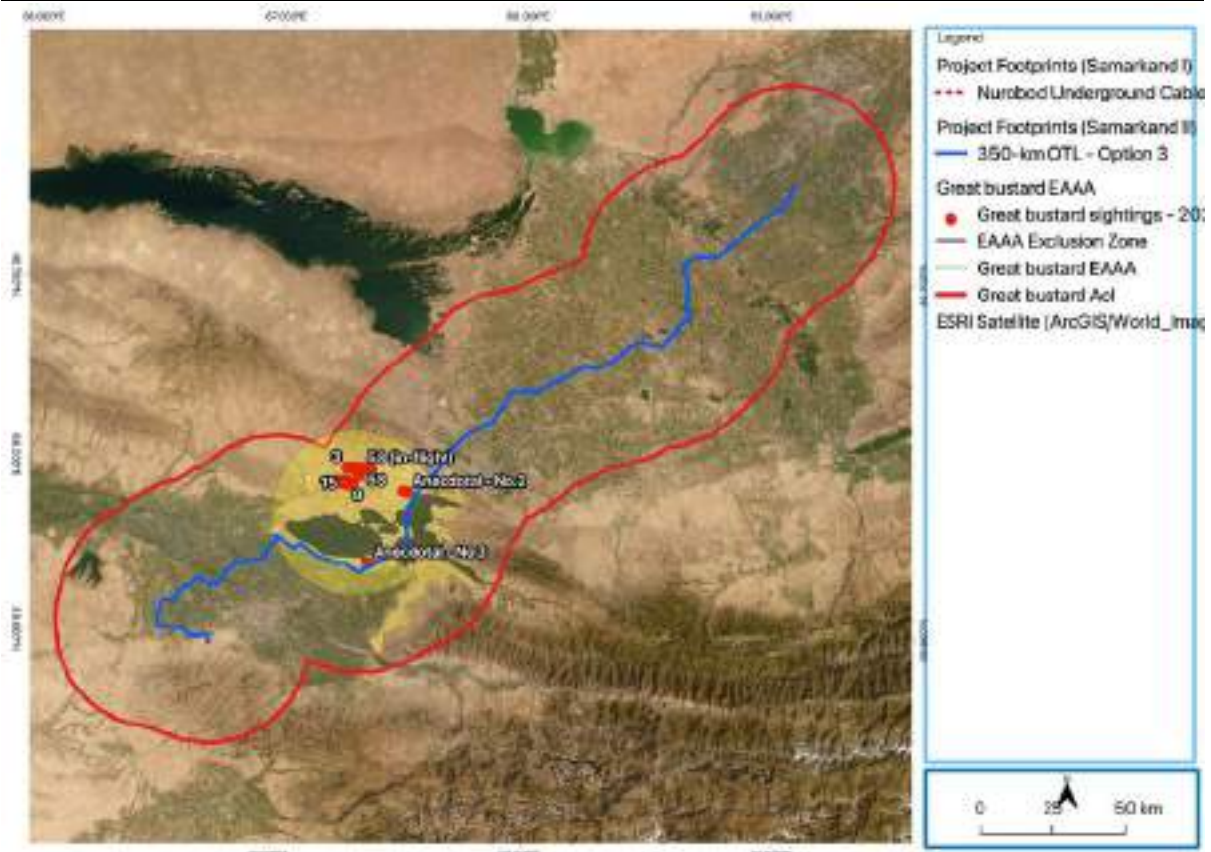


Figure 6-5 Final EAAA for the Great bustard in relation to the 500 kV OTL (zoomed out)

The baseline survey was more extensive on the EAAA in and around the North-Western half of the Aol, as this area spans the main wintering habitat identified in prior research. The survey area within the South-Eastern portion of the EAAA was more limited in terms of spatial coverage, considering the intervening pockets of unsuitable habitat, such as patches of settlements, transit infrastructure, intensive, irrigated agriculture, wetland areas, and steep mountain slopes with wet grassland and open outcrops. Nevertheless, the overall habitat map and record of flying Great bustard flocks closer (1.8-km West) to the line suggests that the occurrence of the species within the EAAA extent East of the OTL cannot be ruled out.

Based on the outcomes of the baseline surveys, the EAAA was redefined as the full potential (extrapolated) extent of the wintering habitat in Gallorol, within the OTL's Area of Influence (35-km buffer). A precautionary 10-km buffer was applied to the extended MCP constituting the EAAA. This expanse was taken as the final/ validated EAAA for the critical habitat assessment.

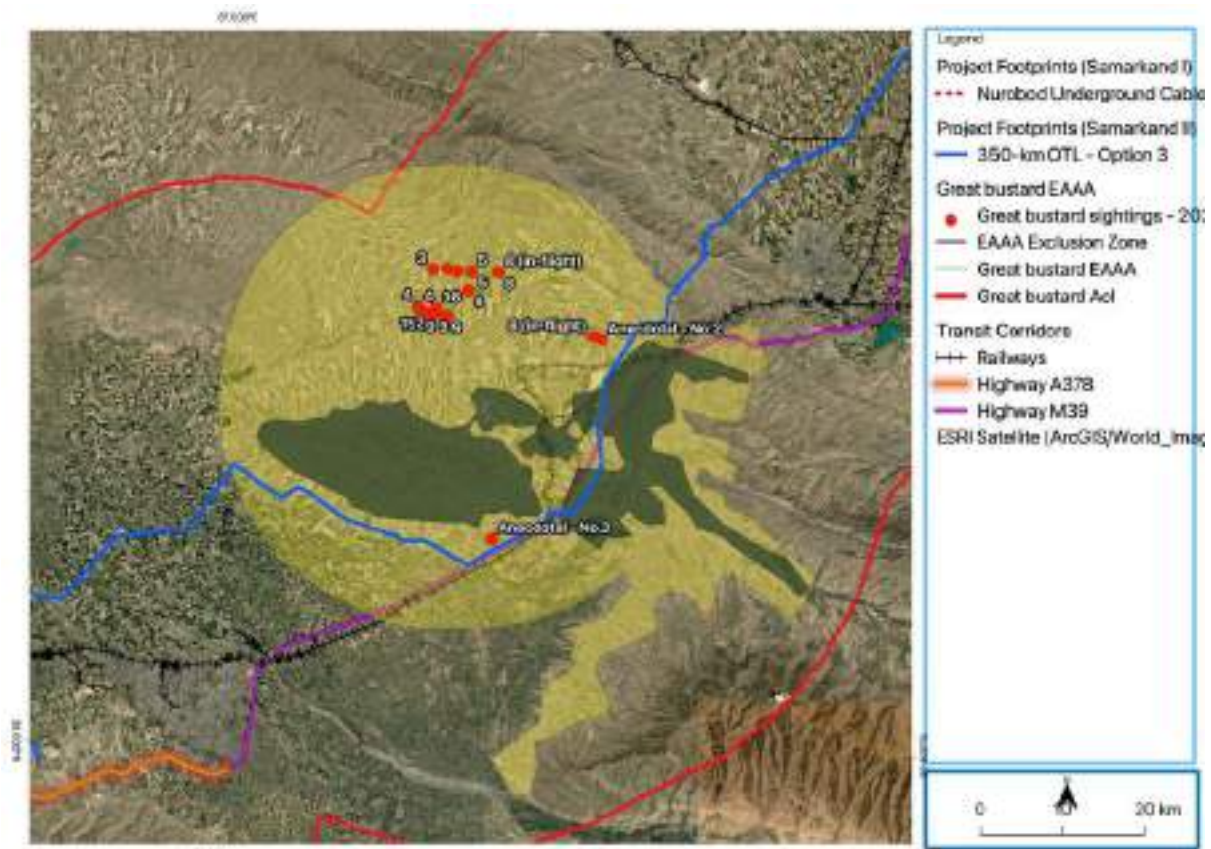


Figure 6-6 Final EAAA for the Great bustard in relation to the 500 kV OTL (zoomed in)

6.2.8.6 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 **Criterion 1**, the threshold for Endangered (EN) species is 0.5% of the global population, therefore the 0.5% criticality threshold would be 148 individuals.

Under **Criterion 3**, the threshold is 1% of the global population using the EAAA on a regular/cyclical basis during migrations. This would amount to 296 individuals.

A total of 185 observations were recorded in flocks ranging in size from 2 to 36 birds during the baseline studies spanning across Autumn - Spring migration seasons, and wintering surveys indicating presence within the EAAA. The total number of wintering Great Bustards the Forish and Gallaaral districts was estimated at 455 individuals during surveys in 2020-2021²⁷.

²⁷ Kashkarov, Roman & Ten, Anna & Mitropolskaya, Yuliya & Soldatov, V. (2023). Changes In The Modern Range Of The Great Bustard Otis Tarda In Uzbekistan Under The Influence Of Agricultural Transformation Of Landscapes And Climate. GEOGRAPHY, ENVIRONMENT, SUSTAINABILITY. 16. 10.24057/2071-9388-2022-091.

Baseline observations and secondary records indicate that the EAAA has suitable habitat to support a population of more than 148 individuals. Therefore, CH is triggered under Criteria 1 and Criteria 3. 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.

Net Gain is required, ensuring net positive impact for the species population and/or habitat. The ESIA will address this via the biodiversity impact assessment, mitigation program and residual significance analysis.

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 **Criteria 1 & 3**.

6.2.9.1 Ecology

This species inhabit 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

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 6-7 Map of Asian Houbara nest locations across Kazakhstan and Uzbekistan²⁸

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).

²⁸Azar, 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>

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 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 km².

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.

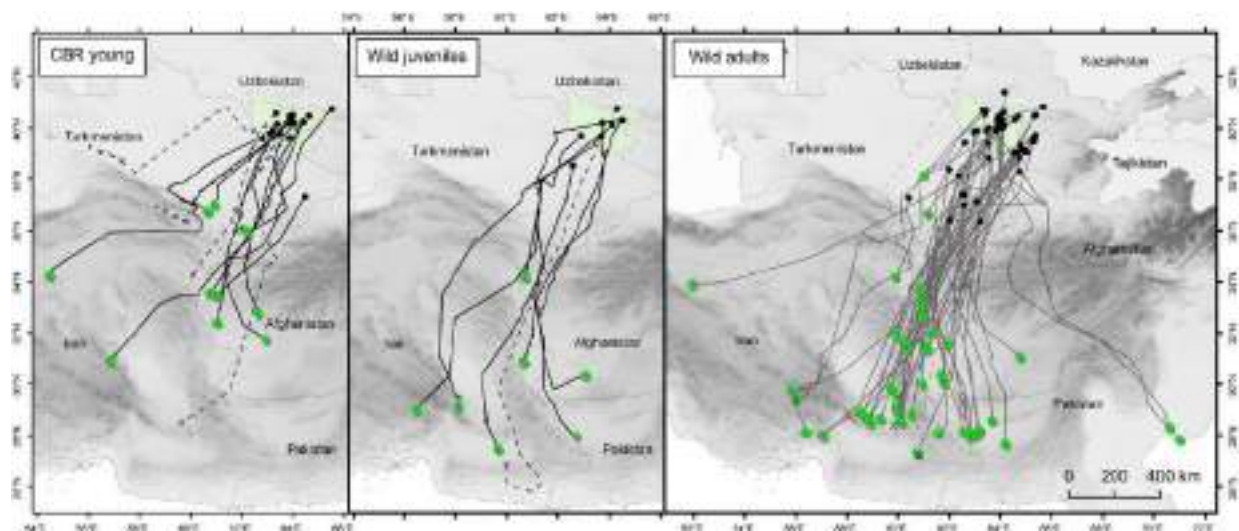


Figure 6-8 Map of Asian Houbara (Captive-bred vs Wild) autumn migration ²⁹

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

²⁹Burnside, 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>

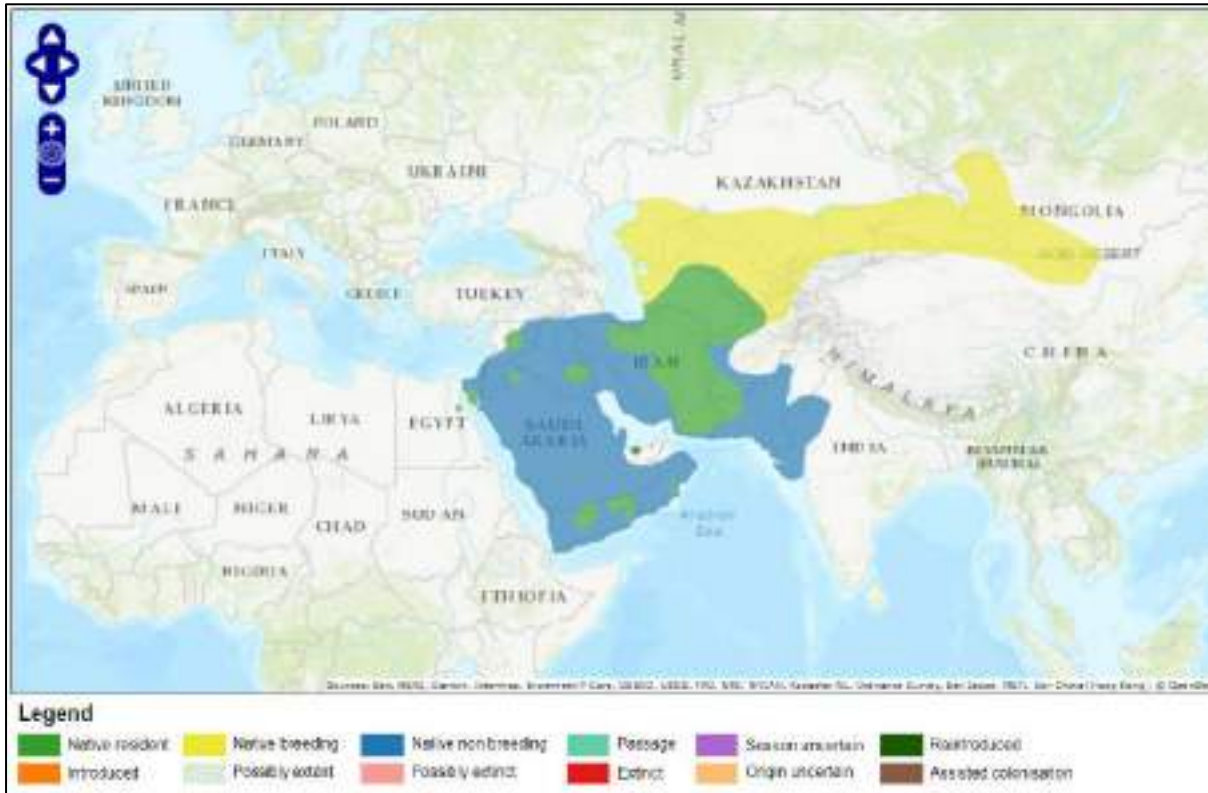


Figure 5-25 Distribution Map of Asian Houbara

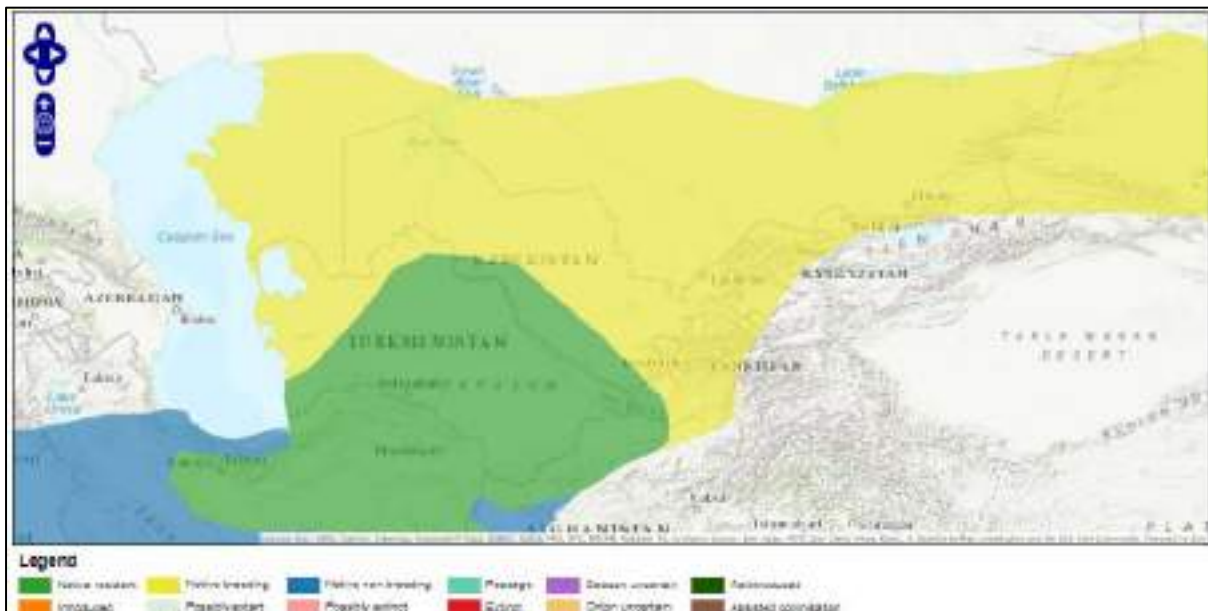


Figure 5-25 Distribution Map of Asian Houbara³⁰

This species generally prefers to inhabit arid and sandy, semi-desert as well as bare stony plains with shrubs. Non-breeding range for this species averages about 242 ± 178 km² in spring, and breeding birds utilized and average home range of 3.6 ± 2.0 km² for females and 10.0 km² for the male during the breeding period.³¹

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

6.2.9.5 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 width³².

The Aol buffer was scaled based on the mean documented home range of the . The Aol of the 350-km OTL was defined as a precautionary, 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 Aol buffer. Prior to the start of baseline surveys for the Asian houbara, a preliminary, blanket EAAA was taken as the entire extent of the Aol along the project corridor, as shown in Figure 6-9 below. The EAAA was subsequently refined based on secondary information regarding suitable habitats within Samarkand Region, and the classification of the habitat landscape at the reconnaissance stage.

³² 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

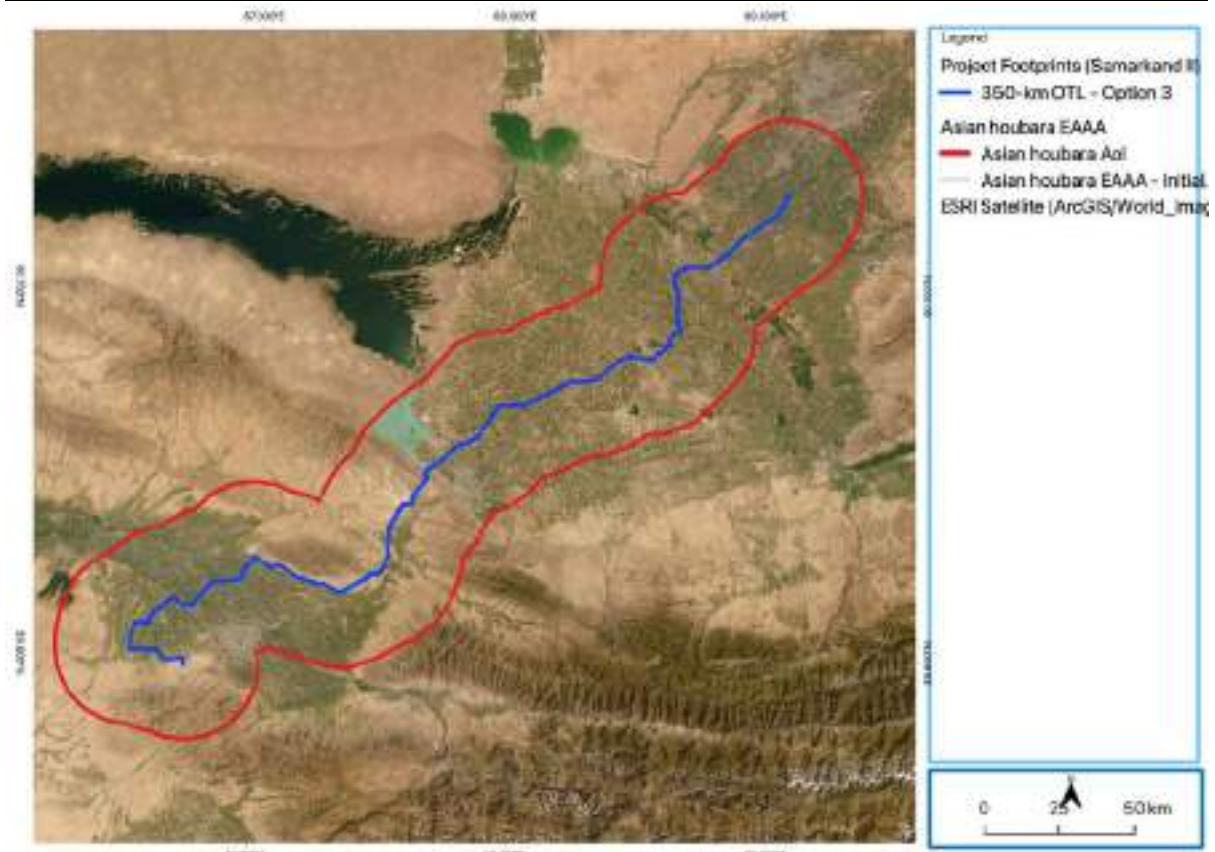


Figure 6-9 Area of Influence and preliminary EAAA for the Asian houbara in relation to the 350-km OTL

Migration monitoring (VP), winter-bird and specialized spring-time surveys were conducted along the interim EAAA, and the Spring-time point count surveys were focused on sections within potentially suitable habitat (i.e., flat, 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.

6.2.9.6 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 **Criteria 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 **Criteria 3**, 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 observation of the species on steppe grassland around Aydar Lake (30 km North of the OTL section in Jizzakh) indicates the potential for its occurrence within the project Aol. The lack of direct observations in the species' breeding season and scant information on the occurrence of the species within the Aol 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 and Priority Biodiversity Feature (PBF), considering Vulnerable conservation status (on IUCN and in the National Uzbekistan Red Data Book) and the secondary information on its occurrence in the EAAA.

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.

The CHA Screening exercise found that this species should be further investigated in the CHA against **Criteria 3**.

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).³³ 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 birds 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

³³ 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>

the valley habitats of Jaran Valley and Syr Darya, albeit recent populations have dropped significantly.

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 desert (Bukara Region), where a maximum count of 16 passage (migrating) bustards was recorded in 2015. In February 2024 (11th to 22nd), another wintering hotspot comprising wheat and alfalfa cropland was identified in Ulyanvo Fields in Zomin District (Jizzakh Region), through three separate sightings of 700, 3,000 and 3,500 birds. 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).

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 5-25 Distribution Map of Little Bustard

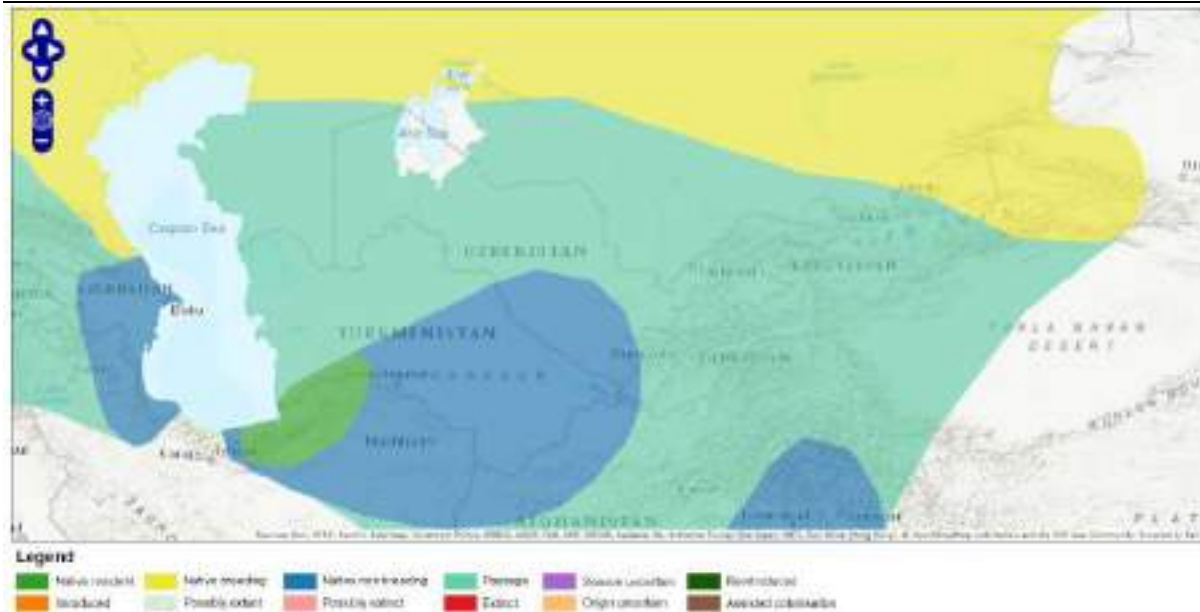


Figure 5-25 Distribution Map of Little Bustard³⁴

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 16 Vantage Points (VPs) sited within potentially suitable habitats along the 500 kV (350-km) OTL corridor. These surveys were aimed at capturing passage migrants and two migration seasons were covered (i.e., Autumn of 2023 and Spring of 2024). 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 was recorded migrating in the Spring (March 20-21 and March 29, 2024) of 2024 in an area adjacent to the 400MW PV Plant. This marks the largest official sighting of the Little bustard in Nurobod District and the wider Samarkand Region.

6.2.10.4 Analysis

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

³⁴ BirdLife International (2024) Species factsheet: Little Bustard *Tetrax tetrax*. Downloaded from <https://datazone.birdlife.org/species/factsheet/little-bustard-tetrax-tetrax> on 27/08/2024..

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 (Aol) of the 500 kV OTL can be defined as a precautionary 12-km buffer around the longitudinal span of the OTL route, 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. 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 route. 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 intersecting the Aol 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 Aol buffer.

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 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.

No records of Little bustard aggregation were identified along the Aol of the OTL corridor. Prior to the start of baseline surveys for the Little bustard, a preliminary, blanket EAAA was taken as the entire extent of the Aol along the OTL route. Migration monitoring (VP) and winter surveys were conducted along the preliminary EAAA, and wintering surveys were focused on the preliminary EAAA corridor in Jizzakh and Samarkand regions, where rainfed open cultivation is intertwined with temporary and permanent pastoral land.

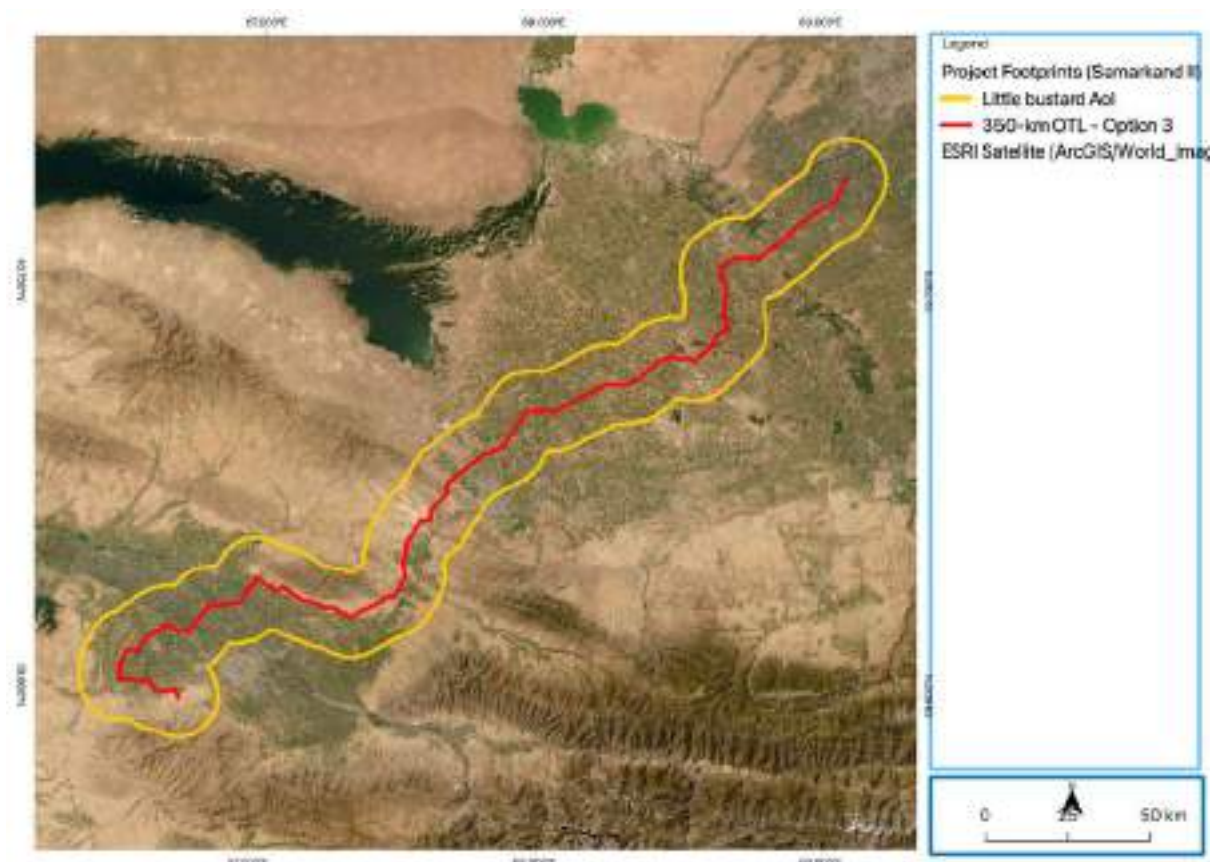


Figure 6-10 Area of influence and preliminary EAAA for the Little bustard in relation to the 500 kV OTL

Little bustards were not encountered at the VP locations throughout the Autumn (2023) and Spring (2024) seasons. However, lone individuals and flocks of 30 to 200 bustards were identified within the largely rainfed wheat fields along the 500 kV OTL in Jizzakh Region, with a total overall count of 312 individuals. A kernel polygon was derived from the sparse distribution of large to minor flocks and stretches of the rainfed winter crop farmland in the districts of Gallorol, Bulungur and Jomboy. This polygon was taken as the final/ validated EAAA for critical habitat determination.

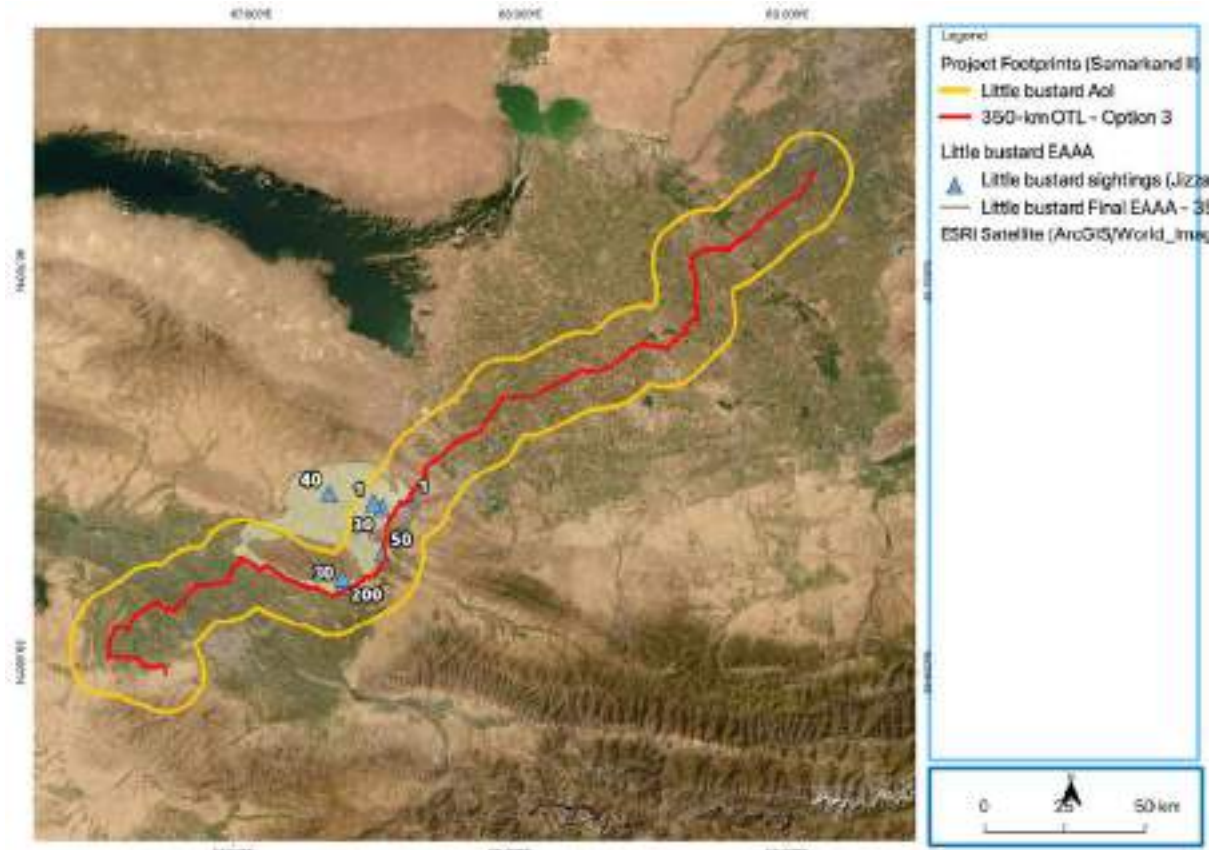


Figure 6-11 Final EAAA for the Little bustard in relation to the 500 kV OTL

Figure 5-26 EAAA and potential habitats for the Little Bustard in the PV plant site

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 **Criteria 3**, the threshold is 1% of the global population using the EAAA on a regular/cyclical basis during migrations. This would amount to 1000 individuals.

Little Bustard is not listed as a trigger species for any KBA/IBA within a 100km from the project footprint. A total of 312 individuals were recorded within the suitable habitat, which constitutes a distinct, limited EAAA along the OTL route. No sightings were made at VP locations along the remainder of the Aol, which spans a stretch of heavily irrigated, homogenous cereal and leucine cropland that is not suitable for Little bustards.

This annual population is lower than the precautionary, threshold population of 1,000 according to the Criterion 3 for critical habitat determination. The little bustard habitat along this OTL section is therefore not qualified as critical. 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.

6.2.10.5 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 **Criteria 1 & 3.**

6.2.10.6 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 Sudochoye 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).

6.2.10.7 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).

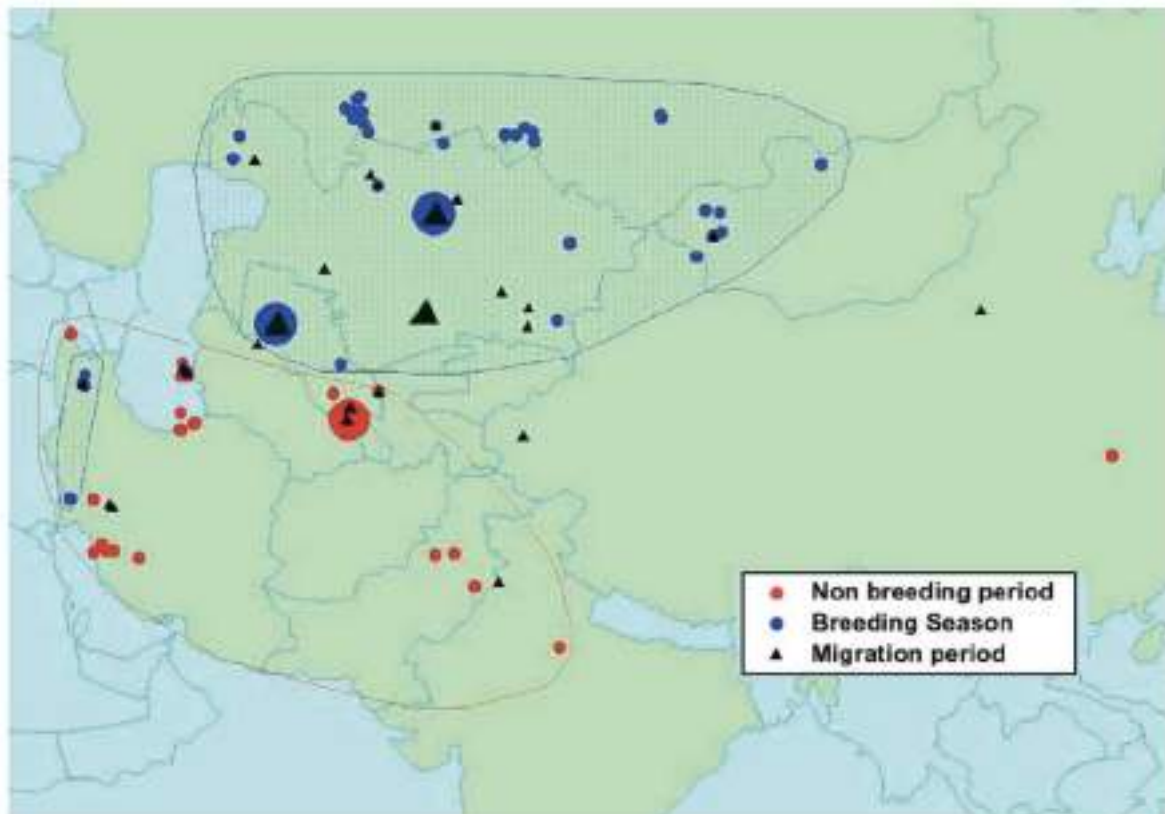


Figure 5-27 Distribution of White-headed duck in Central and South Asia in 1990-2004³⁵

It's EOO is 14,100,000km².

³⁵ 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.

The global population is estimated to number 7,900-13,100 individuals. In Uzbekistan the breeding populations in Sudochoye 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, near the project Aol 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.



Figure 5-28 Distribution Map of White-Headed Duck



Figure 5-28 Distribution Map of White-Headed Duck³⁶

6.2.10.8 Baseline Survey Results

No observations of this species were recorded during baseline surveys of the OHTL corridor.

6.2.10.9 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. The closest of these; Ayadarkul Lake is located over 60km northwest of the project footprint whereas Karakyr and Dengikul Lakes are located over 200km southwest.

The most important sites for White-headed Duck in Uzbekistan are the Sudochoye Wetlands and Dengizkul Lake located approximately 800km and 225km from the project site, respectively.

There are no known known wintering or passage areas mapped as IBAs within the project footprint and Aol (considered as a 20km buffer from the project footprint due to displacement). Therefore, due to the lack of suitable habitats and unlikelihood of presence in the project Aol, 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.

6.2.11 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 **Criteria 1 and 3**.

6.2.11.1 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

³⁶BirdLife International (2024) Species factsheet: *Oxyura leucocephala*. Downloaded from <https://datazone.birdlife.org/species/factsheet/white-headed-duck-oxyura-leucocephala> on 01/05/2024

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.

6.2.11.2 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)³⁷. Key stopover sites include the Manych depression in

³⁷ Sheldon, R. D.; Grishina, K. V.; Kamp, J.; Khrokov, V. V.; Knight, A.; Kushkin, M. A. 2006. Revising the breeding population estimate and distribution of the Critically Endangered Sociable Lapwing *Vanellus gregarius*.

south Russia and areas in Turkey such as the Muş Plain and Ceylanpınar, where significant flocks have been recorded (Sheldon 2014)³⁸.

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)³⁹. 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)⁴⁰.

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 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 km² (Birdlife Datazone, 2024).⁴¹

Surveys in 2006 within a 145,000 km² 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)⁴².

³⁸ Sheldon, R. 2014. The Sociable Lapwing - Final project report to the BirdLife International Preventing Extinctions Programme. BirdLife International Preventing Extinctions Programme.

³⁹ Donald, P.F., Azimov, N., Ball, E., Green, R.E., Kamp, J., Karryeva, S., Kashkarov, R., Kurbanov, A., Rustamov, E., Saparmuradov, J., Sheldon, R., Soldatov, V., Ten, A., Thorpe, R., Underhill, M., Urazaliyev, R. and Veyisov, A. 2016. A globally important migration staging site for Sociable Lapwings *Vanellus gregarius* in Turkmenistan and Uzbekistan. *Sandgrouse* 38: 82-95.

⁴⁰ 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

⁴¹ BirdLife International (2024) Species factsheet: *Vanellus gregarius*. Downloaded from <https://datazone.birdlife.org/species/factsheet/sociable-lapwing-vanellus-gregarius> on 24/04/2024.

⁴² BirdLife International. 2015. European Red List of Birds. Office for Official Publications of the European Communities, Luxembourg.

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 6-12 Geographical Distribution of the Sociable Lapwing

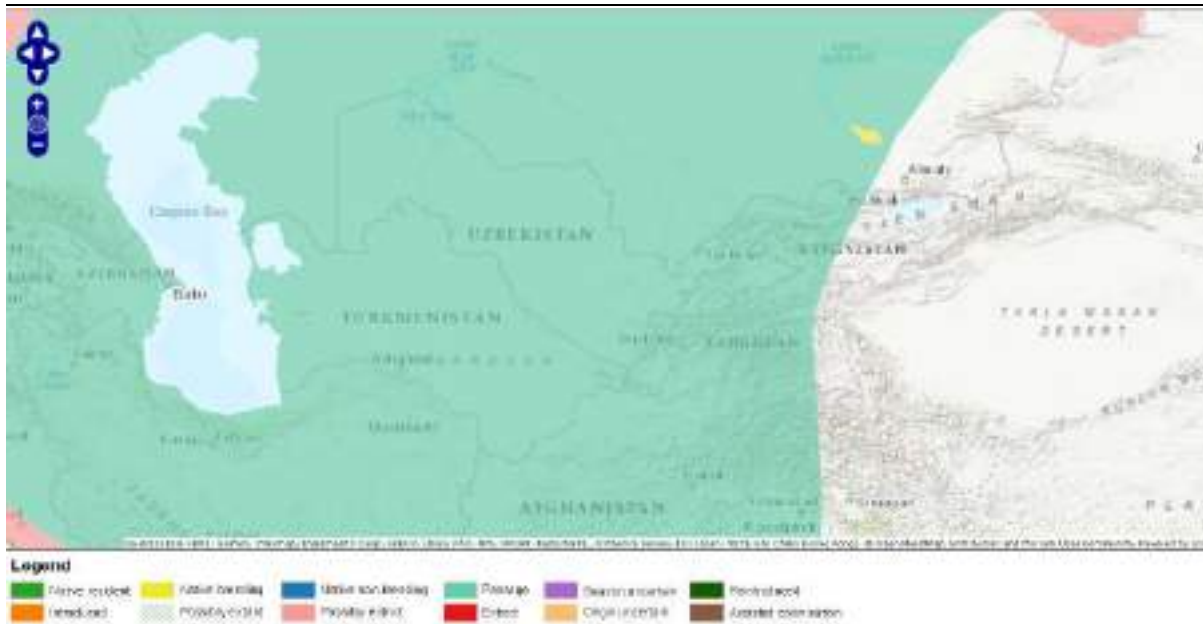


Figure 6-30 Geographical Distribution of the Sociable Lapwing ⁴³

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 observed (Sheldon 2013⁴⁴; Deomurari 2007⁴⁵). Smaller numbers winter regularly in Saudi Arabia, Oman, and the UAE, with vagrant records across Europe and potential overwintering in Iberia (de Juana 2011)⁴⁶.

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.

⁴³ BirdLife International (2024) Species factsheet: *Vanellus gregarius*. Downloaded from <https://datazone.birdlife.org/species/factsheet/sociable-lapwing-vanellus-gregarius> on 29/04/2024.

⁴⁴ Sheldon, R. 2013. The Sociable Lapwing - Interim short report to the BirdLife International Preventing Extinctions Programme. BirdLife International Preventing Extinctions Programme.

⁴⁵ Deomurari, A. 2007. Western India: Gujarat Kutch Birding and Wildlife Tour, November 2007..

⁴⁶ de Juana, E. 2011. The Sociable Lapwing in Europe. *British Birds* 104(2): 84-90.

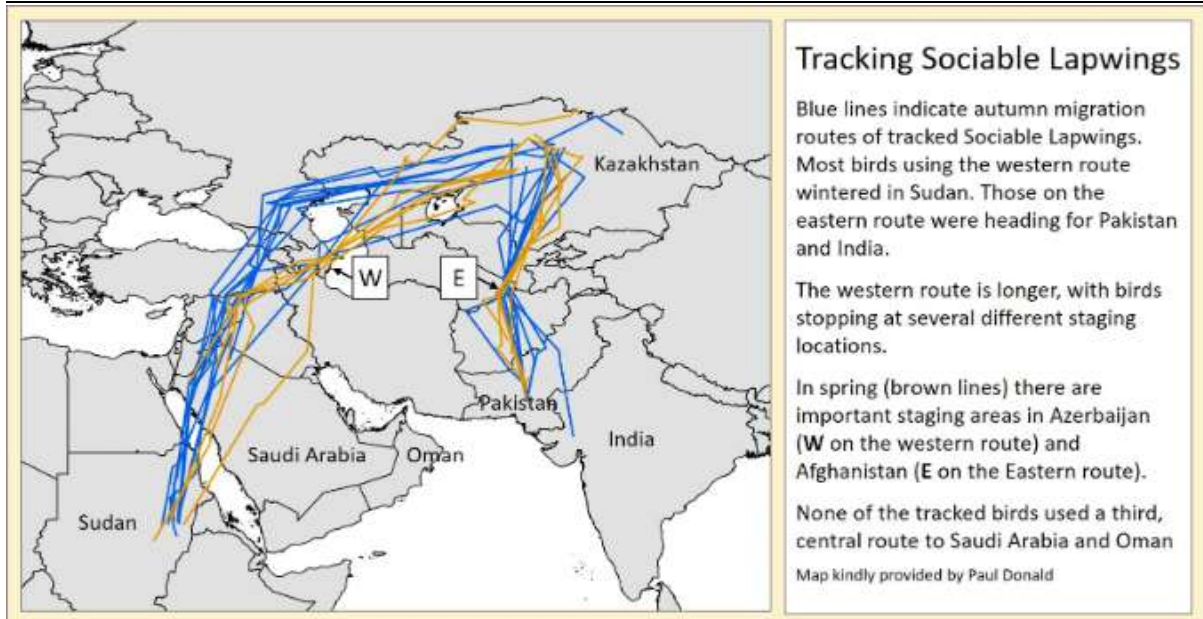


Figure 6-31 Migration Routes of the Sociable Lapwing: Western and Eastern Pathways from Central Kazakhstan.⁴⁷



Figure 6-32 Identified Migration Routes of Sociable Lapwing Based on Historical and GPS Tracking Data (Graham, A., (2021))

⁴⁷ Graham, A., (2021) Following Sociable Lapwings, *Wadertales*, Available at: <https://wadertales.wordpress.com/2021/01/03/following-sociable-lapwings/> Accessed 24 April, 2024.

6.2.11.3 Baseline Survey Results

No observations of this species were recorded during baseline surveys of the OHTL corridor.

6.2.11.4 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. The daily migratory movement has been measured at an approximate average of 534km per day and is likely to use the project airspace on migration to the closest stopover site, at Lake Talimarzhan located 155km to the south ⁴⁸. Records on eBird data also show that a number of observations have been noted in Karnachabul located 30km west in 2020 and 2021 and a single observation was made in Ayadarkul Lake in 2000 ⁴⁹.

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 Aol (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. Consults with the regional ornithologist imply that this species is unlikely to be observed in the Aol. Moreover, the presence of this species over 80 km west and 155km south of the project footprint potentially indicate a preference for these areas over the habitat conditions found within the project Aol.

Therefore, due to the unlikelihood of presence in the project Aol, 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.

6.2.12 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 **Criterion 1**.

⁴⁸ 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.

⁴⁹ 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>

6.2.12.1 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.

6.2.12.2 Distribution

The Yellow-eyed Pigeon primarily resides within its range but exhibits migratory behaviour, 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 2014⁵⁰; 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 km² (Birdlife Datazone, 2024). The following figures shows the geographical range of this species.

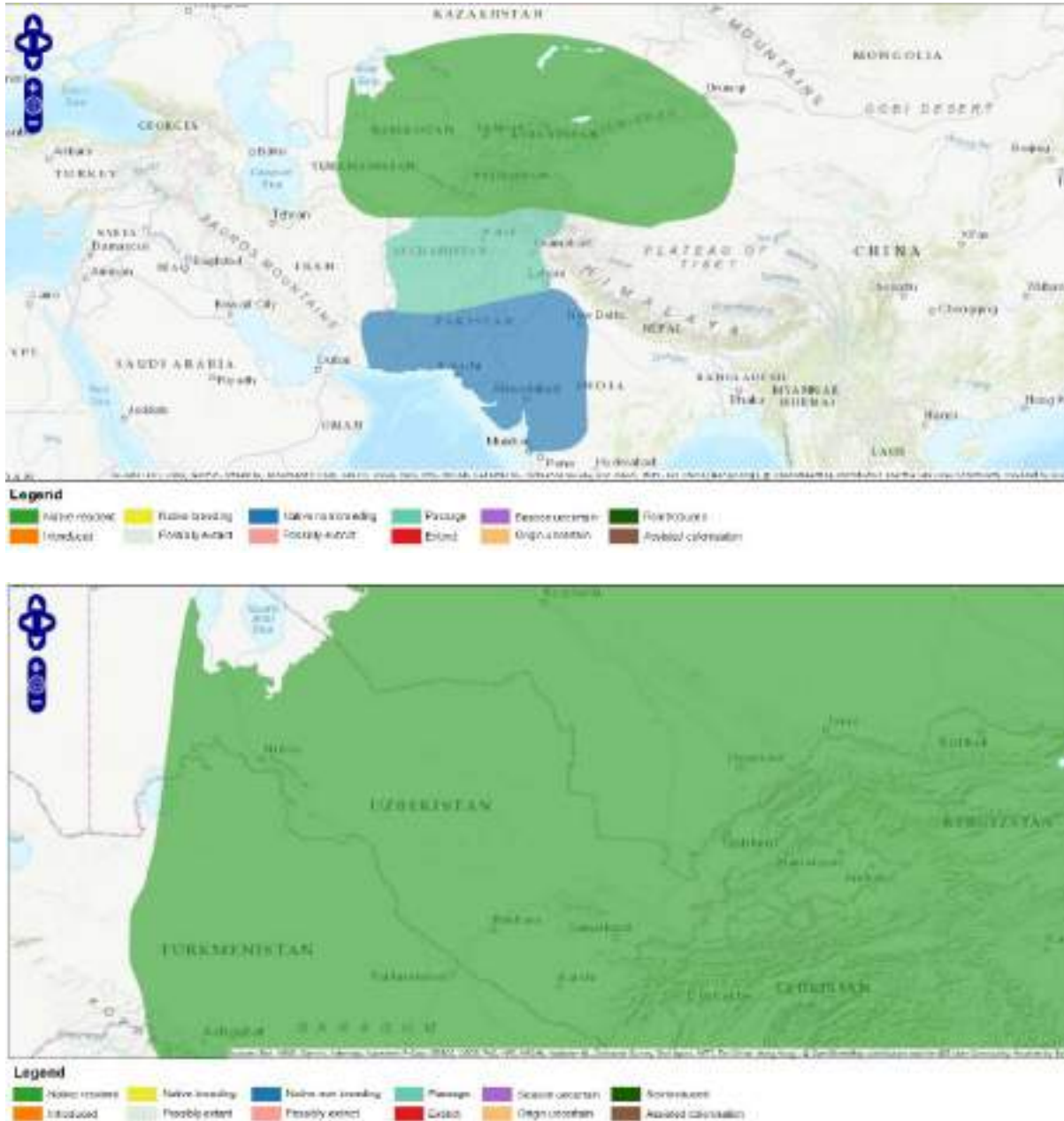


Figure 6-36 Geographical Distribution of the Yellow-eyed Pigeon ⁵¹

⁵⁰ 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.

⁵¹ BirdLife International (2024) Species factsheet: *Columba eversmanni*. Downloaded from <https://datazone.birdlife.org/species/factsheet/yellow-eyed-pigeon-columba-eversmanni> on 29/04/2024.

6.2.12.3 Baseline Survey Results

No observations of this species were recorded during baseline surveys of the OHTL corridor.

6.2.12.4 Analysis

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 sparse 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.⁵² 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.



Figure 6-37 EAAA and potential habitats for Yellow-eyed Pigeon on the OHTL route

⁵² 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.pabpiq1.01>

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 **Criteria 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.

Zero observations of this species were recorded during the baseline studies spanning across Autumn - Spring migration seasons, and wintering surveys.

There are no IBAs within the EAAA and Aol 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 **Criteria 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.

6.2.13 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.⁵³

The CHA Screening exercise found that this species should be further investigated in the CHA against **Criterion 1 & 3**.

6.2.13.1 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). 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

⁵³ Red Book of Uzbekistan (2019) Animal World Red Book of the Republic of Uzbekistan. Available at: <https://drive.google.com/file/d/19wwTZ6Ubk2zut9xwiG0dMRdSbBZKMJv0/view> Accessed on 24 April, 2024.

woody marshes (Tucker and Heath 1994). 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 meters in temperate zones and up to 1,000-1,300 meters 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.

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).

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.

6.2.13.2 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)⁵⁴. 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 Oreeel 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)⁵⁵.

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 European Turtle-Dove is a widespread 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).

The following figures shows the geographical range of this species.

⁵⁴ BirdLife International. 2015. European Red List of Birds. Office for Official Publications of the European Communities, Luxembourg.

⁵⁵ BirdLife International (2024) Species factsheet: *Streptopelia turtur*. Downloaded from <https://datazone.birdlife.org/species/factsheet/european-turtle-dove-streptopelia-turtur> on 24/04/2024.



Figure 6-34 Geographical Distribution of the European Turtle

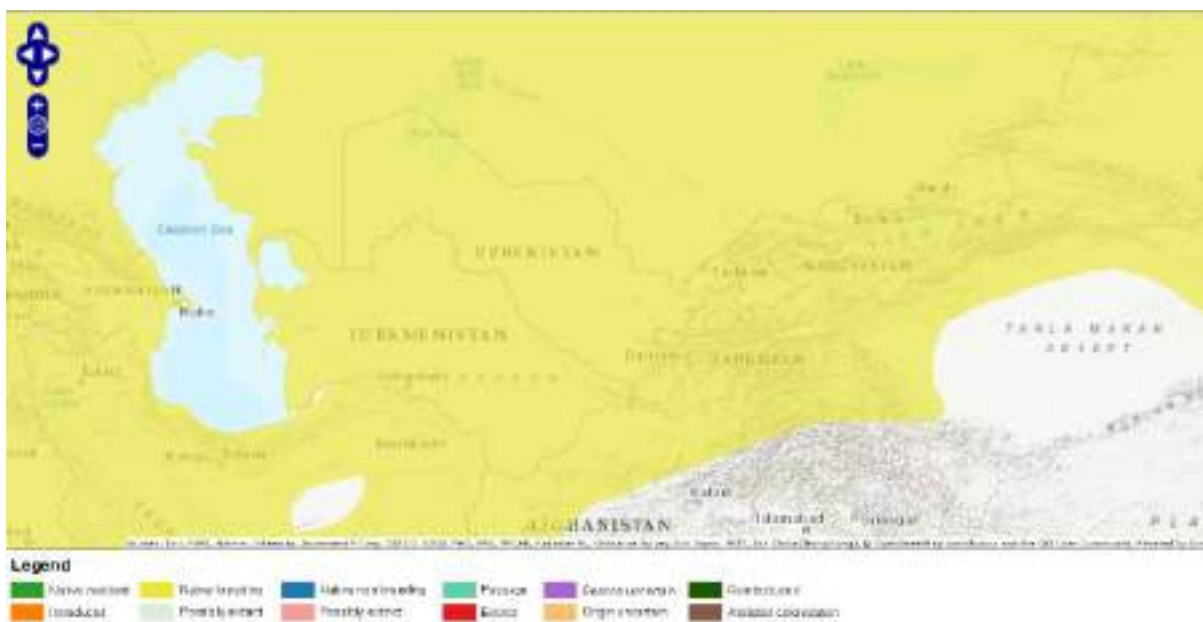


Figure 6-34 Geographical Distribution of the European Turtle-dove ⁵⁶

6.2.13.3 Baseline Survey Results

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.

⁵⁶ BirdLife International (2024) Species factsheet: *Streptopelia turtur*. Downloaded from <https://datazone.birdlife.org/species/factsheet/european-turtle-dove-streptopelia-turtur> on 29/04/2024.

6.2.13.4 Analysis

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 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 6-35 EAAA and potential habitats for European Turtle Dove on the OHTL route

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 **Criteria 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 **Criteria 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.

One observation of this species was recorded at VP13 during the baseline studies spanning across Autumn - Spring migration seasons, and wintering surveys. There are no IBAs within the EAAA and AoI 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 **Criteria 1 or Criteria 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.

6.2.14 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 **Criteria 1 & 3**.

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).

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.

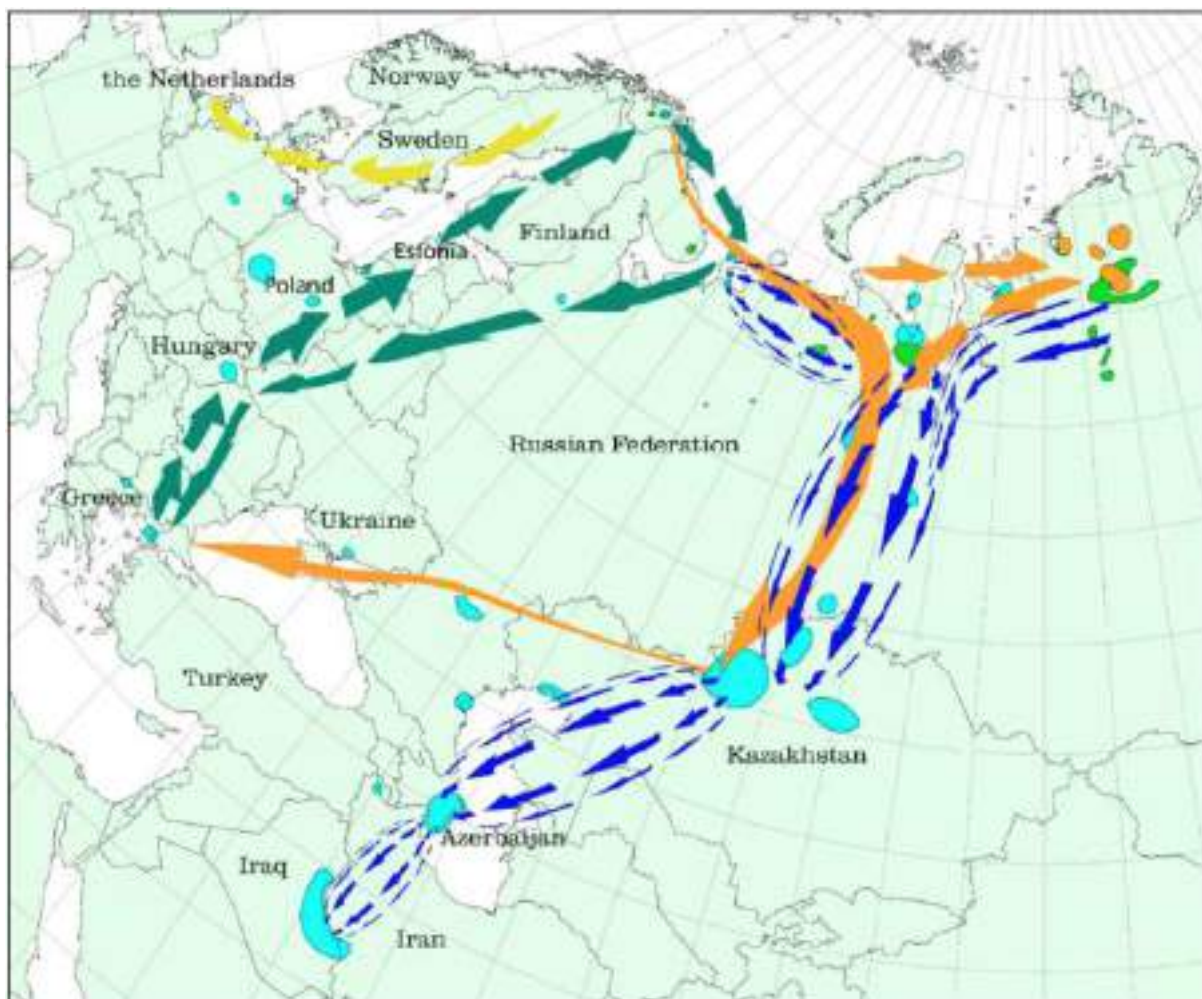


Figure 6-386-13 Mapped Migratory Routes of the Lesser White-fronted Goose in the Western Palearctic⁵⁷

⁵⁷ Aarvak, Tomas & Øien, Ingar & Shimmings, Paul. (2016). A critical review of Lesser White-fronted Goose release projects. NOF-BirdLife Norway. Report 6.

6.2.14.3 Baseline Survey Results

No observations of this species were recorded during baseline surveys of the OHTL corridor.

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 are the Dalverzin State Forestry and Hunting Management Area IBA for which it is a trigger species. The IBA located approximately 36km 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 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 **Criteria 1 & 3**.

6.2.15.1 Ecology & Conservation

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 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.

6.2.15.2 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 km².

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



Figure 5-6 Geographic Distribution of the Marbled Teal⁵⁹



Figure 5-7 Geographic Distribution of Marbled Teal within Uzbekistan¹²

6.2.15.3 Baseline Survey Results

No observations of this species were recorded during baseline surveys of the OHTL corridor.

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.

6.2.15.4 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 255km 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 Aol (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 Aol, 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.

6.2.16 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 **Criteria 1 & 3**.

6.2.16.1 Ecology & Conservation

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 (Nelson 2005).

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

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 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 as well as illegal hunting and trapping.

6.2.16.2 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 km².

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



Figure 5-6 Geographic Distribution of the Dalmatian Pelican⁶⁰



Figure 5-7 Geographic Distribution of Dalmatian Pelican within Uzbekistan¹²

6.2.16.3 Baseline Survey Results

No observations of this species were recorded during baseline surveys of the OHTL corridor.

⁶⁰ 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.

6.2.16.4 Analysis

Large lakes present important stopover sites during migration. No such habitats exist within the project footprint and Aol (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 Tuzkan Lakes IBAs for which it is a trigger species. These IBAs are located approximately 33km west project site.

Therefore, due to the absence of suitable habitat and subsequent unlikelihood of presence in the project Aol, 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 and SBV 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 identified several bat species that could potentially trigger criticality under the EBRD PR6 and IFC PS6 criteria. These criteria pertain to habitats of significant importance to endangered or critically endangered species, endemic or geographically restricted species, and migratory or congregatory species. In the regions of Jizzakh and Samarkand, literature suggests a diverse range of bat species, although studies are more prevalent in urban and mountainous areas of Samarkand. The comprehensive list compiled includes species that may not form colonies near power lines but may be observed during migrations or movements.

Table 6-1 lists the species potentially recorded in the project area, with their respective IUCN Red List status and inclusion in the Red Book of the Republic of Uzbekistan (2019). The identified species range from the Greater Horseshoe Bat (*Rhinolophus ferrumequinum*), commonly found in suitable habitats, to the Lesser Horseshoe Bat (*Rhinolophus hipposideros*), which is vulnerable and has sporadic records in the country. Other notable species include the Bukhara Whiskered Bat (*Myotis buharensis*), critically endangered and endemic to Uzbekistan, and the Hemprich's Long-eared Bat (*Otonycteris hemprichi*), listed as vulnerable in the Uzbekistan Red Data Book.

Table 6-1 List and status of bats species potentially inhabiting the project area

SPECIES	IUCN RED LIST	RED BOOK OF THE REPUBLIC OF UZBEKISTAN (2019)	PARAMETERS OF ULTRASOUND CALLS (REFERENCES)
<i>Rhinolophus bocharicus</i>	LC (Least concern)	absent	no data
<i>Rhinolophus ferrumequinum</i>	LC	absent	Benda et al. (2012)
<i>Rhinolophus hipposideros</i>	LC	Vulnerable, declining 2(VU:D)	Benda et al. (2012)
<i>Eptesicus ognevi</i> (formerly <i>Eptesicus bottae</i>)	LC	absent	Benda et al. (2012); Hackett et al. (2016)
<i>Eptesicus serotinus</i>	LC	absent	Benda et al. (2012)
<i>Hypsugo savii</i>	LC	absent	Benda et al. (2012)
<i>Myotis emarginatus</i>	LC	absent	Barataud (2015)
<i>Myotis blythii</i>	LC	absent	Benda et al. (2012)
<i>Myotis buharensis</i>	DD (data deficient)	Critically Endangered 1 (CR)	no data
<i>Nyctalus noctula</i>	LC	absent	Barataud (2015)
<i>Pipistrellus pipistrellus</i>	LC	absent	Benda et al. (2012)
<i>Vespertilio murinus</i>	LC	absent	Barataud (2015)
<i>Plecotus</i> sp. (Gritsina et al., 2013)	?	absent	Barataud (2015), Benda et al. (2012)
<i>Barbastella caspica</i> (<i>Barbastella leucomelas</i>)	LC	absent	Benda et al. (2012); Hackett et al. (2016)
<i>Pipistrellus kuhlii</i>	LC	absent	Benda et al. (2012)
<i>Otonycteris leucophaea</i>	DD	Vulnerable, naturally rare 2(VU:R)	no data
<i>Tadarida teniotis</i>	LC	Vulnerable, naturally rare 2(VU:R)	Benda et al. (2012)

7.2 Bat Survey Method

7.2.1 Roost Search Method

The bat roost survey conducted between February and March 2024 employed a detailed and systematic methodology, combining desktop analysis and on-the-ground fieldwork, to identify and assess potential bat roosting sites across the project area. This survey spanned several critical periods, specifically from February 8 to 11 in the Jizzakh and Samarkand regions, followed by surveys on March 12 and 13 in both the Samarkand and Bukhara regions, and concluding with additional fieldwork on March 20 and 21 exclusively in the Samarkand region. The overarching goal of these surveys was to ascertain the presence or absence of viable roosting sites for bats, employing a methodical strategy that included the analysis of detailed topographical maps and satellite imagery, alongside thorough field inspections of identified

sites. This dual-phased approach ensured a thorough investigation of the potential habitats within the specified regions, emphasizing the survey's commitment to confirming bat roosting locations through both preparatory desktop studies and targeted field examinations.

The initial stage of planning the survey methodology involved an in-depth analysis of topographic maps (at scales of 1:100,000 and 1:200,000) and Google Earth satellite imagery to pinpoint locations of potential bat roosts, primarily focusing on buildings. These identified locations, complete with GPS coordinates, were then uploaded to the LocusPro smartphone application for field use, ensuring precise navigation and site verification during the subsequent field surveys.

Navigational and data recording tasks were facilitated using a BV9900E smartphone equipped with the LocusPro app, preloaded with Google Hybrid maps for terrain navigation and track recording. The same smartphone model was used for photographic documentation. Additional field equipment included a torch, thick gloves, and a tape measure, essential for the safe and thorough examination of bat roosts. All findings and observations were systematically recorded in a notebook, with the LocusPro app serving to map surveyed roosts and bat sighting locations. This methodical approach, blending technological tools with field expertise, provided a robust framework for identifying and assessing bat roosts, thereby contributing valuable data towards understanding bat populations and habitat requirements in the project area.

7.2.2 Study Area & Bat Calls Recording

Bat activity was monitored using mobile bat detectors Echo Meter Touch (Wildlife Acoustics, USA) along two transects. The transects were surveyed twice, once in April (25th and 27th) and once in May (13th and 15th). The transects passed along the route at registration points with a step of about 400 meters. At each registration point, the bat ultrasonic calls were recorded for approximately 10 minutes. The detector recorded data from 19:50 to 23:40. As a result, the transects were surveyed twice – in April and May. 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. The total duration of recordings at each site was more than 1 hour in each month of recording.

7.2.3 Bat Calls Identification

A review of existing literature on bat populations in Uzbekistan indicates that up to 18 different bat species could potentially occur in the vicinity of the project area. Identification of bats from the acoustic recordings gathered during this study was performed by Dr. Denis Vasenkov, a professional bat biologist affiliated with the A. N. Severtsov Institute of Ecology and Evolution

of the Russian Academy of Sciences. With about 20 years of experience in bat research, including 10 years specializing in bat detector technology, Dr. Vasenkov has extensive experience in bat signal analysis in various regions including Uzbekistan, Kazakhstan, Russia, Ethiopia, and Vietnam. His proficiency with BatSound, SonoBat, and Kaleidoscope software, combined with his broad geographical experience, ensures accurate and reliable species identification.

For some bats of Uzbekistan, the parameters of ultrasonic calls are not known. Determination of these species according to ultrasonic calls is a complex process since manual identification is required. Kaleidoscope Pro Auto Analysis program with "preloaded" parameters of ultrasonic calls from "European" bats found in Uzbekistan was used for the primary processing of audio recordings. Subsequently, the BatSound 4 program was employed to measure the call parameters and verify the identification of bat calls made by the Kaleidoscope Pro Auto Analysis program.

7.3 Species Assessment

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 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 **Criteria 1, 2 & 3**.

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.

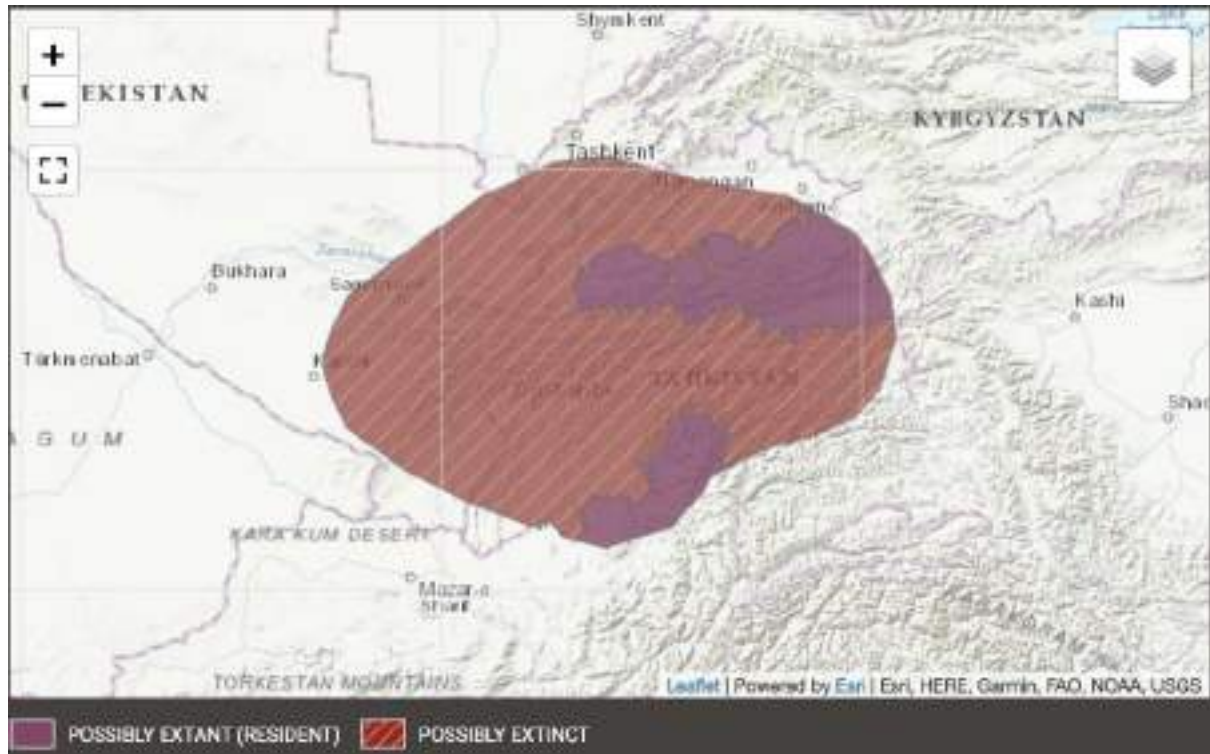


Figure 6-1 Geographic Distribution of Bokhara Whiskered Bat⁶¹

7.3.1.3 Baseline Survey Results

7.3.1.3.1 Survey Findings

This species was not observed during Bat Roost Searches conducted across the 350km OHTL in 2024.

7.3.1.3.2 Stakeholder Consultations

There have been no additional stakeholder consultations for this species.

7.3.1.4 Analysis

The Bokhara Whiskered Bat inhabits arid areas and caves. This species is considered possibly extinct in Uzbekistan as per IUCN. Due to the lack of known records in Uzbekistan, an EAAA cannot be applied for this species.

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

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.

Furthermore, the habitat types recorded during the roost search survey indicate a lack of suitable roosting habitat in the project Aol which is considered as the project footprint including a buffer of 50m due to the potential impact of habitat loss. Habitat loss is considered as the largest Aol for bats for the development of the project considering that operational impacts such as OHTL collision, electrocution and habitat fragmentation are unlikely to impact insectivorous bats.

Therefore, due to the unlikelihood of presence in the project Aol 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.

7.3.2 All Other Bats

The CHA Screening exercise found that 18 bat species should be further investigated in the CHA against **Criteria 3**. 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 6-2 List and status of non-priority bat species

No.	SPECIES	ECOLOGY & THREATS	DISTRIBUTION & POPULATION
1	Asian (Eastern) Barbastelle (<i>Barbastella leucomelas</i>)	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 (<i>Rhinolophus bocharicus</i>)	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 (<i>Pipistrellus pipistrellus</i>)	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 (<i>Eptesicus gobiensis</i>)	Inhabits desert, semi-desert and steppe habitats and dry areas. Low reproductive rate. 1 offspring. Insectivorous. Threatened by droughts.	Subspecies <i>E. g. gobiensis</i> likely found in Uzbekistan. No population estimates or EOO available.
5	Geoffroy's Bat (<i>Myotis emarginatus</i>)	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 (<i>Rhinolophus ferrumequinum</i>)	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 (<i>Rhinolophus hipposideros</i>)	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 km ² . No population estimates are available.
8	Lesser Mouse-eared Myotis (<i>Myotis blythii</i>)	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 = 23,471,950 km ² No population estimates available.
9	Long-eared Bat (<i>Plecotus strelkovi</i>)	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 (<i>Myotis nipalensis</i>)	Arid or mountainous habitats including forest, shrubland and desert. Single pup once a year. Likely non-migratory. Reproduces once a year.	Widely distributed across Central Asia. The EOO is noted as >20,000 km ² . No population estimates.

		No notable threats.	
11	Noctule Bat (<i>Nyctalus noctula</i>)	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 (<i>Eptesicus ognevi</i>)	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 (<i>Vespertilio murinus</i>)	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 (<i>Hypsugo savii</i>)	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 (<i>Eptesicus serotinus</i>)	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 (<i>Pipistrellus aladdin</i>)	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 (<i>Otonycteris leucophaeaei</i>)	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 <i>O. hemprichii</i> , this species roosts in rock fissures or in human constructions.	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.

		Insectivorous. This is a ground-gleaning species. No major threats.	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 (<i>Tadarida teniotis</i>)	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 pesticides. It is also potentially threatened by wind farms.	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.

7.3.2.1 Baseline Survey Results

7.3.2.1.1 Survey Findings

None of the bat species listed above were observed during Bat Roost Searches conducted across the 350km OHTL in 2024.

7.3.2.1.2 Stakeholder Consultations

There have been no additional stakeholder consultations for this species.

7.3.2.2 Analysis

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 Criterion 3. The habitat types recorded during the roost search survey indicate a lack of suitable roosting habitat in the project Aol which is considered as the project footprint including a buffer of 50m due to the potential impact of habitat loss.

Habitat loss is considered as the largest Aol for bats for the development of the project considering that operational impacts such as OHTL collision, electrocution and habitat fragmentation are unlikely to impact insectivorous bats. This does not eliminate species presence as it is possible that these species forage across the project area. However, given the minimal project footprint, impacts to foraging are considered minimal as the project operations are unlikely to impact foraging habitat.

Therefore, due to the lack of suitable roosting habitat in the Aol, an EAAA cannot be applied as a result of which CH will not be further assessed for these taxa.

8 HERPTILES

One reptile species was identified during CHA Screening that pertain to the CH and SBV 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

Field surveys to assess Herptiles was carried out between 28th and 30th August 2023. A combination of field surveys and desktop analysis was used to assess Herptile diversity.

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)⁶², V. M. Makeev, A. T. Bozhansky (1988)⁶³, D.A. Bondarenko, N.G. Chelintsev (1996)⁶⁴.

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

⁶² Dinesman L.T., Kaletskaya M.L. Methods of counting the number and geographical distribution of terrestrial vertebrates. Moscow: AN USSR, 1952 [in Russian]

⁶³ Makeev V.M., Bozhansky A.T., (1988). Some results herpetological inspections East Turkmenistan /Rare and little-studied animals of Turkmenistan. Ashgabat. Ylym. (in Russian).

⁶⁴ Bondarenko D.A., Chelintsev N.G. 1996. A comparative estimation of different methods of the line transect census of desert reptiles. Bulletin of Moscow Society of Naturalists, Biological series, 1996, vol.101, iss.3., pp. 26-35 (in Russian)

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 quantitative assessment of reptiles and amphibians was mainly based on the transect survey results. The transect method consists of 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:

$$D = \frac{n}{2LB}$$

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:

$$B = W(0,79F + 0,21F^4)$$

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

$$F = \frac{2y}{W}$$

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 (Kuzynkin, 1962⁶⁵): 0.1 – 0.9 – rare, 1.0 – 9.9 – common, 10.0 and higher – abundant.



Figure 7-1 Survey map including survey points and transects on Khalka substation and 350 km 550 kV OHTL

Table 7-1 Survey transect on Khalka substation and 350 km 550 kV OHTL

NAM E OF POIN T	DATE	START OF TRANSECT N, E (DD FORMAT)	END OF TRANSECT N, E (DD FORMAT)	LENGT H(KM)	BIOTOPE	T AIR °C	T SOIL °C	HUMIDIT Y %
PL-1	29/08/23	41.009074° 69.088070°	41.000085° 69.088619°	1.18	Agro-landscape, agricultural fields (potatoes, corn), irrigation canal	25,5	27,4	45
PL-2	29/08/23	40.927882° 69.013745°	40.921705° 68.999866°	1.36	Agro-landscape, agricultural fields (wheat, corn) poplar trees, mulberry trees	25,7	31,9	48

⁶⁵ Kuzynkin A.P. 1962. Zoogeography of the USSR. Scientific notes of the Moscow regional pedagogical institute. 109: 9-182 pp.

					along the roadside			
PL-3	29/08/23	40.867007° 68.899121°	40.859601° 68.890741°	1.07	Arable land, irrigation canal, poplars, substation.	26,5	35,4	40
PL-4	29/08/23	40.823383° 68.838828°	40.819106° 68.825991°	1.20	Syrdarya river bank, agrolandscape	27,5	51,4	42
PL-5	29/08/23	40.817258° 68.824683°	40.810098° 68.813126°	1.28	Syrdarya river bank with outcrops of sandy loam and saline soils overgrown with tamarisk	30,4	40,2	36
PL-6	29/08/23	40.784544° 68.680706°	40.784279° 68.678717°	1.14	Intersection with highway M-39, discharge collector, agrolandscape wheat, cotton	29,2	38,9	36
PL-7	29/08/23	40.687323° 68.657145°	40.675166° 68.656544°	1.33	Agrolandscape, agricultural fields (wheat, cotton), forest belts mulberry, poplar trees	31,4	40,2	34
PL-8	29/08/23	40.604429° 68.664132°	40.594365° 68.665601°	1.19	Agrolandscape, agricultural fields (wheat, cotton), canals	32,5	42,7	30
PL-9	29/08/23	40.535790° 68.591190°	40.532299° 68.580521°	1.04	Fallow lands, rural lands, agricultural fields (corn) tamarisk, alhagi	33,0	47,8	27
PL-10	29/08/23	40.445996° 68.240662°	40.440287° 68.234253°	1.16	Agrolandscape, cotton, fallow land	32,3	46,9	27
PL-11	29/08/23	40.282841° 67.877850°	40.273823° 67.873416°	1.14	Agrolandscape, wheat, mulberry, brackish soils	31,1	47,5	29

PL-12	29/08/23	40.171953° 67.695034°	40.158500° 67.692292°	1.52	Foothills of the Nurata Ridge, rock outcrops	29,4	38,4	30
PL-13	29/08/23	40.117938° 67.653120°	40.109239° 67.640821°	1.44	Dry slopes, sparse almond trees	28,7	37,7	30
PL-14	29/08/23	40.074335° 67.595727°	40.069893° 67.586395°	1.11	Agro-landscape, ravine, mulberry tree	28,3	36,5	31
PL-15	29/08/23	39.991426° 67.533282°	39.980926° 67.532629°	1.14	Agro-landscape, ravines, railway track	27,5	34,2	32
PL-16	29/08/23	39.859089° 67.457731°	39.852144° 67.447448°	1.18	Very transformed foothills, flooded from well downs, vegetable gardens and orchards	26,2	29,1	33
PL-17	30/08/23	39.811038° 67.322477°	39.815622° 67.312110°	1.03	Agro-landscape, dry slopes	33,1	41,3	25
PL-18	30/08/23	39.849533° 67.171532°	39.854307° 67.160080°	1.10	Agro-landscape, dry slopes	32,7	40,2	25
PL-19	30/08/23	39.905546° 67.011410°	39.900958° 67.002427°	1.28	Agro-landscape, dry slopes	32,5	40,4	26
PL-20	30/08/23	39.847503° 66.960472°	39.839299° 66.954797°	1.01	Agro-landscape	32,2	40,3	26
PL-21	30/08/23	39.831264° 66.901851°	39.829731° 66.887918°	1.17	Akdarya river bank, floodplain forest	31,5	32,3	34
PL-22	30/08/23	39.784889° 66.800132°	39.775917° 66.790644°	1.29	Karadarya river bank, floodplain forest	31,1	31,3	36
PL-23	30/08/23	39.750304° 66.655288°	39.740929° 66.653193°	1.24	A pond covered with reeds	32,8	33,4	31
PL-24	30/08/23	39.621763° 66.576407°	39.621429° 66.588599°	1.06	Agro-landscape, flooded fields, canal	31,3	38,6	29
PL-25	30/08/23	39.604790° 66.651092°	39.596863° 66.659992°	1.18	Agro-landscape, agricultural fields (corn, cotton) irrigation systems	29,5	40,3	28

8.2 Species Assessments

8.2.1 Central Asian/Russian 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 **Criteria 1**.

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 up to 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*.

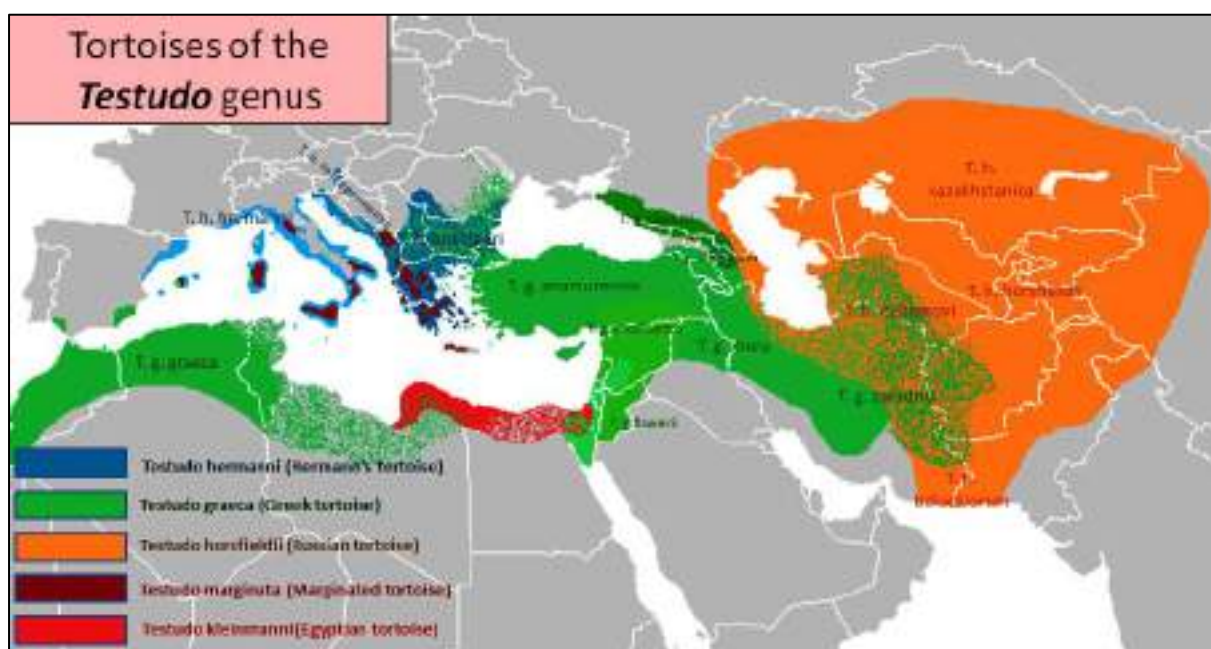


Figure 7-2 Distribution map of tortoise species of genus Testudo.

8.2.1.3 Baseline Survey Results

Survey Findings

No observations of this species were recorded during surveys, however ecologists noted it was not the optimal period of activity. Suitable habitat was observed and according to literature, the species is common in the survey area.

8.2.1.4 Analysis

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 Aol (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 encompasses has been mapped in the following figure.



Figure 7-3 EAAA and potential habitats for the Central Asian Tortoise on the OHTL route

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 observations, 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 **Criteria 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 Central Asian Tortoise were made during baseline surveys along the 350 km OHTL. However, as outlined by the ecologist leading the surveys, due the presence of suitable habitat along the 350 km OHTL it is probable that this species is present in the EAAA. Moreover, literature review suggests that the species is common in the survey area.

However, given the broader population distribution, it is unlikely that the EAAA contains suitable habitat to support a population that comprises of a globally important concentration the loss of which would trigger uplisting to CR/EN status.

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.

9 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 SBV or 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.

Five species of flora were identified and screened in for further investigation in this CHA.

9.1.1 *Tulipa micheliana*

Tulipa micheliana is a tulip species found in various areas of Uzbekistan. It is listed as Vulnerable (VU) on the Global IUCN Red List. It is not listed in the Uzbekistan Red Data Book.

The CHA Screening exercise found that this species should be further investigated in the CHA against **Criteria 1**.

9.1.1.1 Ecology & Conservation

This species grows in the foothills and lowlands across juniper woodlands, stony mountain steppe, and on the edge of cultivated land.

It is unsure exactly what threats this species faces, however this species has decreased in number and large portions of the population occurs in unprotected areas.

9.1.1.2 Distribution

This species is quite widespread occurring in multiple regions of southern Uzbekistan, the western Pamir-Alay of Tajikistan, north-eastern Iran and large parts of the Kopet Dag in Turkmenistan (Everett 2013).

The estimates global population is 10,000 mature individuals, with an estimated EOO of 298,410 km².

The following figures show the distribution of *Tulipa micheliana* in Uzbekistan and globally.

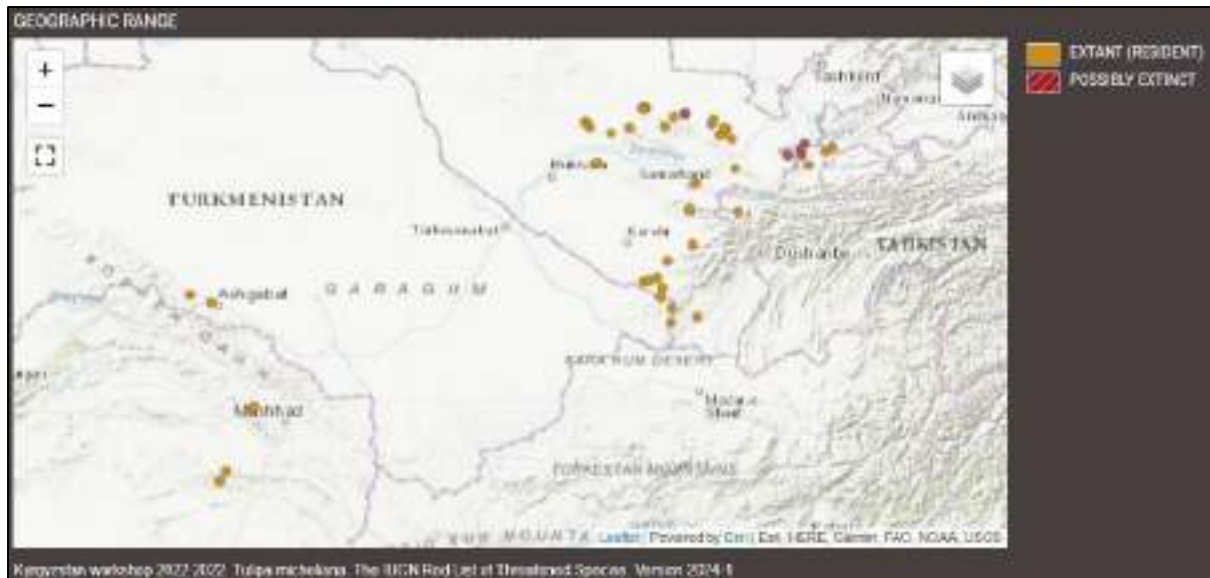


Figure 5-6 Geographic Distribution of the *Tulipa micheliana*⁶⁶

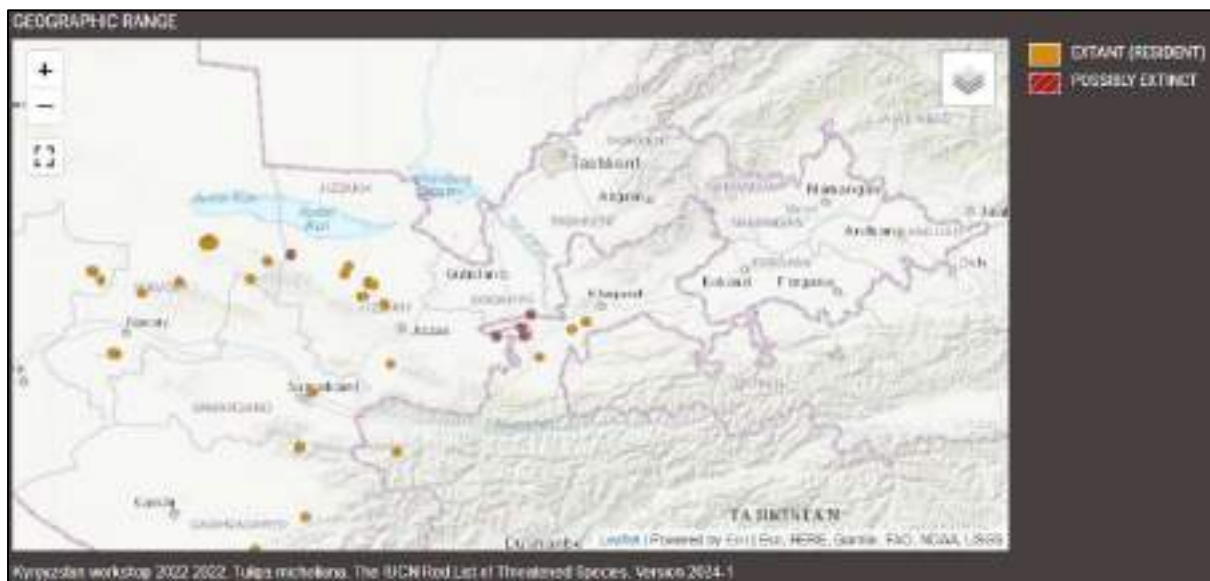


Figure 5-7 Geographic Distribution of *Tulipa micheliana* within Uzbekistan¹²

9.1.1.3 Baseline Survey Results

No individuals were recorded during baseline surveys of the OHTL corridor.

9.1.1.4 Analysis

Tulipa micheliana grows in the foothills and lowlands across juniper woodlands, stony mountain steppe, and on the edges of cultivated land. Expert consultations confirmed that the habitat

⁶⁶ 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.

typology and conditions within the project Aol (which is considered as a buffer of 10km from the habitat footprint due potential impacts to biosecurity) are not suitable for this species. Therefore, due to the unlikelihood of presence in the project Aol, 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.

9.1.2 *Phlomis nubilans*

Phlomis nubilans is a species found in Uzbekistan. It is not listed on the Global IUCN Red List. It is listed in the Uzbekistan Red Data Book as a rare and endemic species.

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

9.1.2.1 Ecology & Conservation & Distribution

This species grows on fine earth slopes in the middle belt of the mountains in the Nuratau and Aktau mountains.

The natural stock of this species is insignificant and the populations are disconnected. The most dense brushwood are reserved in the Gurdara Sintab, Ukhumsai gorges.

Based on the prediction of the extinction risk of all angiosperms (to species-level) using predictors relating to range size, human footprint, climate, and evolutionary history, a study has found that *Phlomis nubilans* is confident to be threatened (prediction of extinction).⁶⁷

Threats to this species include habitat loss due to intensification of agriculture and loss of land.

The following figures show the distribution of *Phlomis nubilans* in Uzbekistan.

⁶⁷ Bachman, S.P. *et al.* (2024) 'Extinction risk predictions for the world's flowering plants to support their conservation', *New Phytologist*, 242(2), pp. 797–808. doi:10.1111/nph.19592.

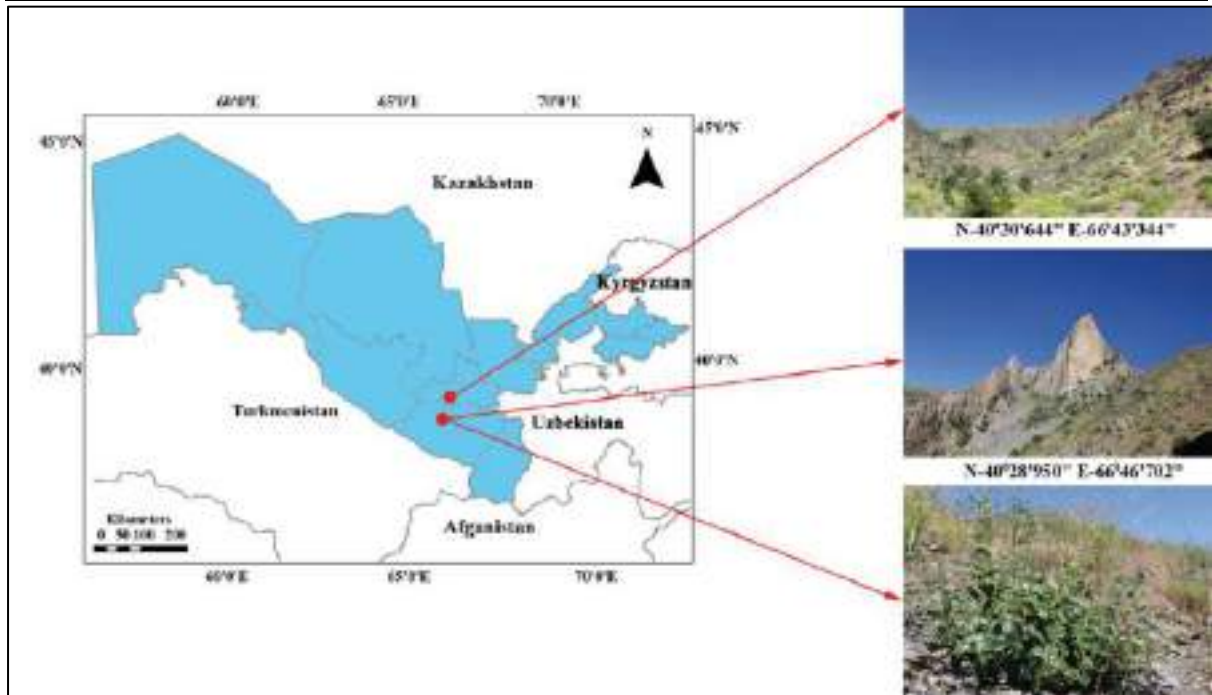


Figure 5-6 Known geographic Distribution of the *Phlomis nubilans*⁶⁸

This species is known to be endemic to the Nuratau and Aktau mountains in the Navoi region of Uzbekistan. It is also known that several populations are protected in the Nuratau state reserve. Based on the known distribution of this species a possible EOO could be discerned and is shown in the following figure.

⁶⁸ Akhmedov, Akbar & Beshko, Natalya & Keldiyorov, Xudoyor & Umurzakova, Zebo & Hasanov, Murtoza & Shoxira, Atayeva & Rasulova, Zebo & Shokhzod, Nematov & Maruf, Sherkulov & Jumayev, Numonjon. (2023). Ontogenetic Structure of Populations of *Phlomis nubilans* (Lamiaceae) in Uzbekistan Under Drought Climate. *Ekológia (Bratislava)*. 42. 349-353. 10.2478/eko-2023-0039.



Figure 5-6 Geographic distribution of the *Phlomis nubilans*

The estimated area of the EOO is 1,803 km².

There are no known global population estimations for this species.

9.1.2.2 Baseline Survey Results

78 of this species was recorded during the spring baseline botany surveys that was undertaken on March 16-17, and April 6-7, and April 20-21, 2024.

9.1.2.3 Analysis

EAAA

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

The total EAAA for flora 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 Aol for flora is considered as a buffer of 10km from the project footprint due to potential Impacts to biosecurity. The EAAA is considered as the known distribution of this species occurring within the project Aol.

The resulting EAAA has been mapped in the following figure.



Figure 9-37 EAAA of *Phlomis nubilans* on the OHTL route

Criticality

The global population is unknown; therefore, it is not possible to assess criticality using global population estimates. No published accounts of Extent of Occurrence exist for this species. Using habitat preferences and distribution data maps, the estimated EOO is 1,803 km².

78 observations of this species were recorded during the baseline studies.

Quantitative extrapolation can be done using favoured or suitable habitat cover as a proxy for species population. Using the quantitative thresholds for Criterion 2, the assessment proposes that this species would trigger critical habitat if the size of the EAAA is $\geq 10\%$ of the EOO. The estimated EOO is 1,803 km². The EAAA is approximately 42.6 km² which comprises of 2.3% of the EOO. Therefore, CH is not triggered.

Although this species does not trigger CH status, it is considered a Significant Biodiversity Value due to listing as rare and endemic in the Uzbekistan Red Book.

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

9.1.3 *Dianthus helenae*

Dianthus helenae is a species found in Uzbekistan. It is not listed on the Global IUCN Red List. It is not listed in the Uzbekistan Red Data Book; however this species is endemic to Uzbekistan.

The CHA Screening exercise found that this species should be further investigated in the CHA against **Criteria 2**.

9.1.3.1 Ecology & Conservation

Little is known about the ecology of this species however it is known that it is a subshrub and grows primarily in the temperate biome.⁶⁹

Based on the prediction of the extinction risk of all angiosperms (to species-level) using predictors relating to range size, human footprint, climate, and evolutionary history, a study has found that *Dianthus helenae* is predicted to not be threatened with extinction, however there is a low confidence in this prediction.⁷⁰

9.1.3.2 Distribution

Little is known about the distribution of this species. The native range of this species is Central Asia, however based on the inputs from botanical experts in Uzbekistan, it is believed that this species is endemic to the Nuratau Range.

This species is known to be endemic to the Nuratau mountains in the Navoi region of Uzbekistan. It is also known that several populations are protected in the Nuratau state reserve. Based on the known distribution of this species a possible EOO could be discerned and is shown in the following figure.

⁶⁹ The International Plant Names Index and World Checklist of Vascular Plants 2024. Published on the Internet at <http://www.ipni.org> and <https://powo.science.kew.org/>
⁷⁰ Bachman, S.P. et al. (2024) 'Extinction risk predictions for the world's flowering plants to support their conservation', *New Phytologist*, 242(2), pp. 797–808. doi:10.1111/nph.19592.



Figure 5-6 Geographic Distribution of the *Dianthus helenaе*

The estimated area of the EOO is 1,298 km².

There are no known global population estimations for this species.

9.1.3.3 Baseline Survey Results

This species was observed during the spring baseline botany surveys that was undertaken on March 16-17, and April 6-7, and April 20-21, 2024.

9.1.3.4 Analysis

EAAA

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

The total EAAA for flora 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 Aol for flora is considered as a buffer of 10km from the project footprint due to potential Impacts to biosecurity. The EAAA is considered as the known distribution of this species occurring within the project Aol. The resulting EAAA has been mapped in the following figure.

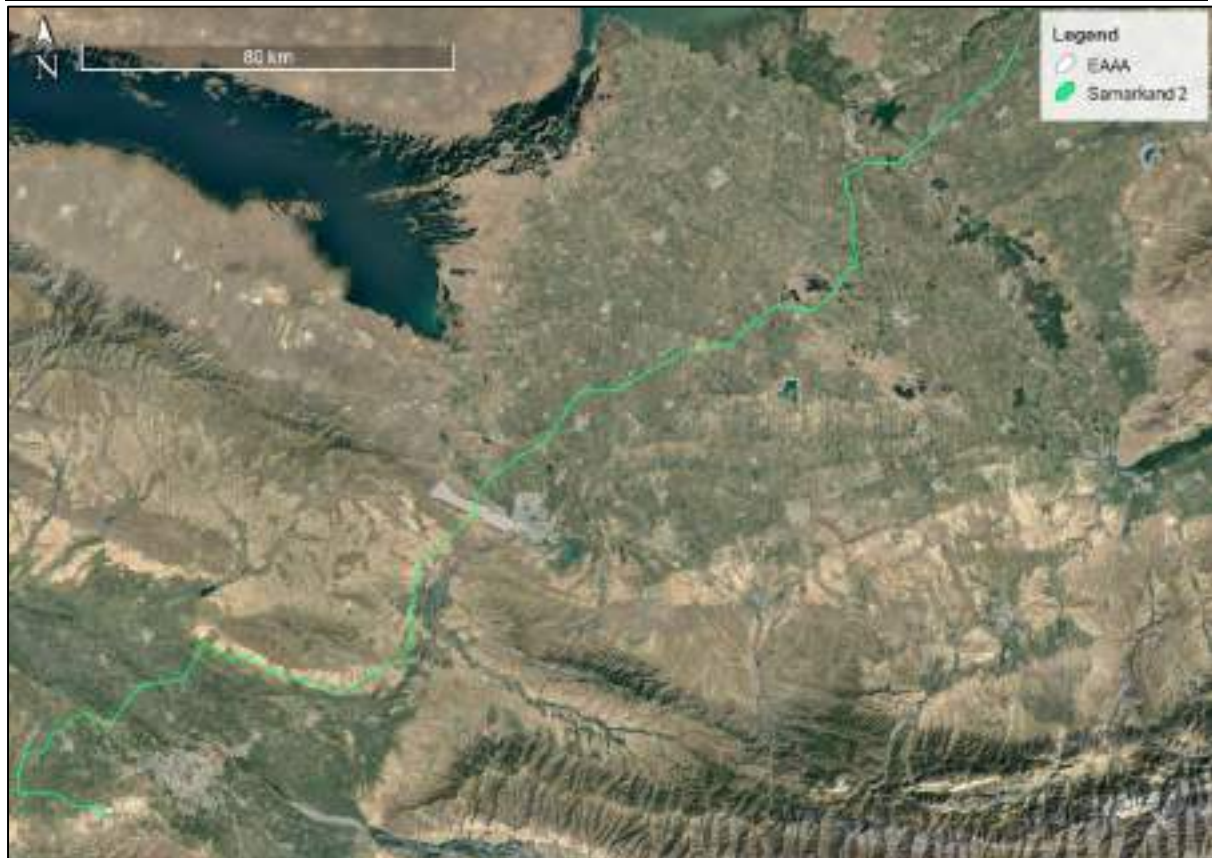


Figure 9-37 EAAA for *Dianthus helenaе* on the OHTL route

Criticality

The global population is unknown; therefore, it is not possible to assess criticality using global population estimates. No published accounts of Extent of Occurrence exist for this species. Using habitat preferences and distribution data maps, the estimated EOO is 1,298 km².

This species was recorded during the botanical baseline surveys.

Quantitative extrapolation can be done using favoured or suitable habitat cover as a proxy for species population. Using the quantitative thresholds for Criterion 2, the assessment proposes that this species would trigger critical habitat if the size of the EAAA is $\geq 10\%$ of the EOO. The estimated EOO is 1,298 km². The EAAA is approximately 42.6 km² which comprises of 3.2 % of the EOO. Therefore, CH is not triggered.

Although this species does not trigger CH status, it is considered a Significant Biodiversity Value due to listing as rare and endemic in the Uzbekistan Red Book.

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

9.1.4 Nanophyton saxatile

Nanophyton saxatile is a species found in Uzbekistan. It is not listed on the Global IUCN Red List. It is not listed in the Uzbekistan Red Data Book; however this species is endemic to Uzbekistan.

The CHA Screening exercise found that this species should be further investigated in the CHA against **Criteria 2**.

9.1.4.1 Ecology & Conservation

Little is known about the ecology of this species however it is known that it grows primarily in the temperate biome.⁷¹

Based on the prediction of the extinction risk of all angiosperms (to species-level) using predictors relating to range size, human footprint, climate, and evolutionary history, a study has found that *Nanophyton saxatile* is confident to be threatened (prediction of extinction).⁷²

9.1.4.2 Distribution

Little is known about the distribution of this species however it is endemic to Uzbekistan, more specifically to the Nuratau Ridge.

This species is known to be endemic to the Nuratau mountains in the Navoi region of Uzbekistan. It is also known that several populations are protected in the Nuratau state reserve. Based on the known distribution of this species a possible EOO could be discerned and is shown in the following figure.

⁷¹ The International Plant Names Index and World Checklist of Vascular Plants 2024. Published on the Internet at <http://www.ipni.org> and <https://powo.science.kew.org/>

⁷² Bachman, S.P. et al. (2024) 'Extinction risk predictions for the world's flowering plants to support their conservation', *New Phytologist*, 242(2), pp. 797–808. doi:10.1111/nph.19592.



Figure 5-6 Geographic Distribution of the *Nanophyton saxatile*

The estimated area of the EOO is 1,298 km².

There are no known global population estimations for this species.

9.1.4.3 Baseline Survey Results

This species was observed during the spring baseline botany surveys that was undertaken on March 16-17, and April 6-7, and April 20-21, 2024.

9.1.4.4 Analysis

EAAA

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

The total EAAA for flora 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 Aol for flora is considered as a buffer of 10km from the project footprint due to potential Impacts to biosecurity. The EAAA is considered as the known distribution of this species occurring within the project Aol. The resulting EAAA has been mapped in the following figure.



Figure 9-37 EAAA for *Nanophyton saxatile* on the OHTL route

Criticality

The global population is unknown; therefore, it is not possible to assess criticality using global population estimates. No published accounts of Extent of Occurrence exist for this species. Using habitat preferences and distribution data maps, the estimated EOO is 1,298 km².

This species was recorded during the botanical baseline surveys.

Quantitative extrapolation can be done using favoured or suitable habitat cover as a proxy for species population. Using the quantitative thresholds for Criterion 2, the assessment proposes that this species would trigger critical habitat if the size of the EAAA is $\geq 10\%$ of the EOO. The estimated EOO is 1,298 km². The EAAA is approximately 42.6 km² which comprises of 3.2 % of the EOO. Therefore, CH is not triggered.

Although this species does not trigger CH status, it is considered a Significant Biodiversity Value due to listing as rare and endemic in the Uzbekistan Red Book.

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

9.1.5 Prunus bucharica

Prunus bucharica (previously referred to as *Amygdalus bucharica*) is a flora species that is endemic to central Asia found in various areas of Uzbekistan. It is listed as Vulnerable (VU) on the Global IUCN Red List. It is not listed in the Uzbekistan Red Data Book.

The CHA Screening exercise found that this species should be further investigated in the CHA against **Criteria 1**.

9.1.5.1 Ecology & Conservation

Little is known about the ecology of this species; however it is found in a temperate biome. It grows in shrubby areas on mountain slopes; growing in stony and fine-earth soils. This species is a deciduous shrub or small tree and the fruits are generally harvested on a large scale for the production of almond oil. Furthermore it is occasionally cultivated for its seeds within its native range and is sometimes used as a rootstock for almonds, plums and peaches.⁷³

It is also known that this species is declining in Uzbekistan, largely due to grazing, collection of fruits for almond oil as well as poor regeneration.

9.1.5.2 Distribution

This species is native to Afghanistan, Kyrgyzstan and Uzbekistan and it has been introduced to Tadjikistan and Turkmenistan. There is no information regarding the EOO or global population estimate of this species and a map of its distribution is also not available.

Based on information from Kew⁷⁴ about the distribution of this, the below map is a rough estimation of global EOO of this species.

⁷³ http://mansfeld.ipk-gatersleben.de/pls/htmldb_pgrc/f?p=185:3:4292127278597336

⁷⁴ <https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:729524-1>



Figure 5-6 Possible global EOO of *Prunus bucharica*

The EOO of this species, based on the above map is 943,600 km² and there is no known information about global population estimates of this species.

Based on public observations, the below map indicates areas where this species were observed. These locations cannot be conclusively confirmed as it is a public database; however they do seem to bolster the findings of the EOO in the above shown map.



Figure 5-6 Possible occurrences of *Prunus bucharica*⁷⁵

9.1.5.3 Baseline Survey Results

One individual of this species was observed during the spring botany survey that was undertaken on March 16-17, and April 6-7, and April 20-21, 2024.

9.1.5.4 Analysis

EAAA

The total EAAA for flora 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.

Based on botanical baseline survey reports, this species prefers the xerophytic shrubland habitat type. These habitats as well as surrounding suitable areas within the project Aol (calculated as 10km buffer from the project footprint based on the impact of invasive species) are shown in the EAAA.

The resulting EAAA has been mapped in the following figure.

⁷⁵ *Amygdalus bucharica* Korsh. in GBIF Secretariat (2023). GBIF Backbone Taxonomy. Checklist dataset <https://doi.org/10.15468/39omej> accessed via GBIF.org on 2024-08-29.



Figure 5-6 EAAA and potential habitats for *Amygdalus bucharica* on the OHTL route

Criticality

The global population is unknown; therefore, it is not possible to assess criticality using global population estimates. No published accounts of Extent of Occurrence exist for this species. Using distribution data maps from the KEW database, the estimated EOO is 943,600 km².

Under **Criteria 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.

This species was observed during the baseline survey efforts.

This species is native to Afghanistan, Kyrgyzstan and Uzbekistan and it has been introduced to Tadjikistan and Turkmenistan. The estimated EOO is 943,600 km². Comparatively, the EAAA for this species in the current assessment is considered to encompass an area of 42.6 km². Given the small size of the EAAA and relatively large geographic distribution, it is unlikely that that EAAA populations of each species would comprise of a globally important concentration the loss of which would trigger uplisting to CR/EN status. Therefore, CH is not triggered.

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.

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

10 ICTHYOFAUNA

Ichthyologist Interview

The initial CHA Screening exercise identified a total of two ichthyofauna species listed on the IUCN Red List as Vulnerable (VU), 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 ichthyofauna.

The following table provides the information obtained from the specialist in relation to these three species.

SPECIES	COMMON NAME	IUCN RED LIST	NATIONAL RDB	CRITERION	OCCURRENCE	PROJECT SITE AND EAAA OCCURRENCE
IUCN Threatened Fish						
<i>Luciobarbus brachycephalus</i>	Aral Barbel	VU	EN	Criterion 1 (CR/EN)	Only occurs in a few reservoirs in the Amu Darya and Syr Darya	Could possibly occur
<i>Cyprinus carpio</i>	Eurasian Carp	VU	EN	Criterion 1 (CR/EN)	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.

11 CONCLUSION

The following species have triggered the designation of Critical Habitat within the project's area of influence:

- Great Bustard

Net Gain is required, ensuring net positive impact for the species population and/or habitat.

11.1 Final List of SBVs/PBFs

Some species have been classified as "Significant Biodiversity Values" (SBVs) and Priority Biodiversity Feature (PBF) which are defined in IFC PS6 and EBRD PR6 as requiring a No Net Loss residual impact, for those of EN or CR IUCN status.

The complete list of SBVs/PBFs for the project is as per the table below. The table includes SBV /PBF species that, though were not recorded during the baseline surveys, may possibly occur in the project area and are hence categorised as SBV under IFC PS6 and PBF under EBRD PR6.

Table 9-1 SBV/PBF Categorized after CHA Process

COMMON NAME	GLOBALY THREATENED	NATIONALLY THREATENED	RANGE-RESTRICTED (REGIONAL ENDEMIC)	MIGRATORY/ CONGREGATORY
Egyptian Vulture	✓ IUCN EN Status triggers SBV/PBF	✓ Listed as VU on RDB	Breeding Resident	Passage Migrant in Uzbekistan
Steppe Eagle	✓ IUCN EN Status triggers SBV/PBF	✓ Listed as VU on RDB	-	Passage Migrant in Uzbekistan
Saker Falcon	✓ IUCN EN Status triggers SBV/PBF	✓ Listed as EN on RDB	-	Passage Migrant in Uzbekistan
Greater Spotted Eagle	✓ IUCN VU Status triggers SBV/PBF	✓ Listed as VU on RDB	-	Passage Migrant in Uzbekistan
Eastern Imperial Eagle	✓ IUCN VU Status triggers SBV/PBF	✓ Listed as VU on RDB	-	Passage Migrant in Uzbekistan
Yellow Eyed Pigeon	✓ IUCN VU Status triggers SBV/PBF	✓ Listed as VU on RDB	Breeding Resident	Passage Migrant in Uzbekistan
European Turtle Dove	✓ IUCN VU Status triggers SBV/PBF	✓ Listed as VU on RDB	-	Full Migrant
Central Asian Tortoise	✓ IUCN VU Status triggers SBV/PBF	✓ Listed as VU on RDB	-	-

COMMON NAME	GLOBALLY THREATENED	NATIONALLY THREATENED	RANGE-RESTRICTED (REGIONAL ENDEMIC)	MIGRATORY/ CONGREGATORY
Phlomis nubilans	-	-	Native to Uzbekistan	-
Dianthus helenae	-	-	Native to Uzbekistan	-
Nanophyton saxatile	-	-	Native to Uzbekistan	-
Prunus bucharica	✓ IUCN VU Status triggers SBV/PBF	-	-	-

11.2 Requirements for Development

The project has triggered Critical Habitat (CH) for Great Bustard and has listed a number of Significant Biodiversity Values and Priority Biodiversity Features that will be assessed accordingly in the ESIA. Biodiversity management must be in place to ensure Net Gain (NG) for CH trigger and No Net Loss (NNL) for SBVs/PBFs as per ADB and EBRD requirements, respectively.

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ANNEX A – CRITICAL HABITAT SCREENING MATRICES