

# Sherabad Solar PV Project, Uzbekistan Critical Habitat Assessment

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## 1 INTRODUCTION

### 1.1 Purpose of Report

This report details the Critical Habitat Assessment (CHA) for the Sherabad Solar PV Project, which has been completed in line with IFC Performance Standard 6 (PS 6) and EBRD Performance Requirement 6 (PR 6) and the corresponding Guidance Notes (GN) as well as the ADB Safeguarding Policy Statement to identify if sections of the Project area are considered as Critical Habitat.

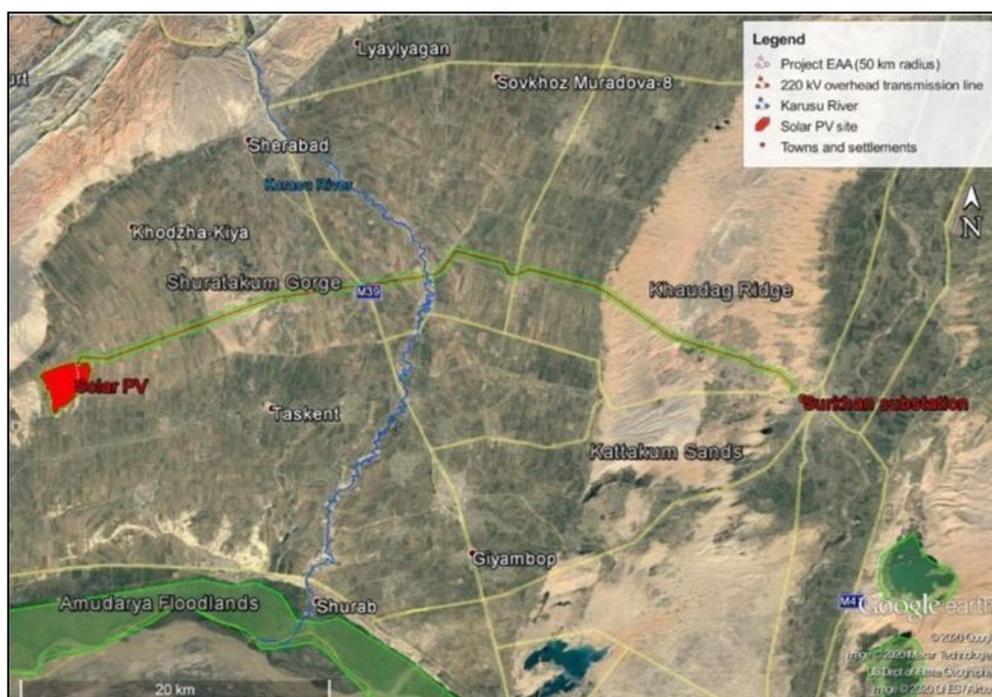
This CHA aims to:

- identify Critical Habitat qualifying species or habitats, Priority Biodiversity Features and Natural Habitat associated with the Project.
- Highlight future actions for the Project where applicable, including identification and filling of data gaps and the need for additional field surveys as well as outline details to be included in a Biodiversity Management Plan (BMP).

### 1.2 Project Background

The Sherabad Project Site consists of a Solar PV Site and Overhead Line (OHL) and is located in the Sherabad district of Surkhandarya Province. The new Overhead Line will run across Sherabad, Kizirik and Jarkurgan districts of Surkhandarya province, while the existing Surkhan substation is located in the Jarkurgan district. The Solar PV Site boundary and route of the associated Overhead Line is shown in *Figure 1*.

*Figure 1. Layout of the Project Site comprising the proposed Solar PV Site with a 50 m buffer and Overhead Line with 200 m buffer (green lines)*



Sherabad Solar PV Project is designed for a total 456.7 MWac installed power capacity and the Solar PV Site covers an area of approximately 631 ha.

Evacuation of the energy produced shall be made to the existing Surkhan substation located 51km from the Project generation substation.

This report has been carried out on a location where there are large gaps in available data due to the rarity of species and lack of historic local, regional, and national survey data. In certain specific cases the report ensures that a precautionary approach is taken when dealing with these species. In particular where wider population levels are unknown a precautionary assumption of low population levels is used and where species are not recorded within the survey area, but habitat is present that is suitable the species is considered to have potential to use the site over the lifetime of the project and is screened in.

## 2 ASSESSMENT FRAMEWORK AND METHODOLOGIES

### 2.1 Frameworks

#### 2.1.1 International Finance Corporation (IFC) Performance Standard (PS) 6

In accordance with IFC PS 6, habitats are divided into modified habitats, natural habitats, and critical habitats. Critical Habitats (CH) are a subset of either modified or natural habitats supporting high biodiversity value, including:

- Habitat of significant importance to critically endangered and/or endangered species (International Union for Conservation of Nature and Natural Resources (IUCN) Red List)
- Habitat of significant importance to endemic and/or restricted-range species
- Habitat supporting globally significant concentrations of migratory species and/or congregatory species
- Highly threatened and/or unique ecosystems
- Areas associated with key evolutionary processes

Since habitat destruction is recognised as a major threat to the maintenance of biodiversity and to assess likely significance of impacts, IFC PS 6 requires the following depending on habitat status:

**Modified Habitat:** exercise care to minimise any conversion or degradation of such habitat, depending on scale of project, identify opportunities to enhance habitat and protect and conserve biodiversity as part of operations.

**Natural Habitat:** developer will not significantly convert or degrade such habitat unless no financial/technical feasible alternatives exist, or overall benefits outweigh cost (including those to biodiversity), and conversion or degradation is suitably mitigated. Mitigation must achieve no net loss of biodiversity where feasible; offset losses through creation of ecologically comparable area that is managed for biodiversity, compensation of direct users of biodiversity.

**Critical Habitat:** in areas of CH, the Developer will not implement project activities unless there are no measurable adverse impacts on the ability of the critical habitat to support established populations of species described or on the functions of the critical habitat; no reduction in population of a recognised critically endangered or endangered species and lesser impacts mitigated as per natural habitats.

#### 2.1.2 European Bank for Reconstruction and Development (EBRD) Performance Requirement (PR) 6

The EBRD PR 6 sets objectives to protect and conserve biodiversity using a precautionary approach, utilise the mitigation hierarchy to achieve no net loss/net gains where appropriate, maintain ecosystem services, and promote good practice in the management and use of natural resources.

In addition to the Critical Habitat noted above, the PR 6 also builds on the requirements to preserve important areas of natural habitats, defining these as “Priority Biodiversity Features” (PBF), with a criterion-based qualitative approach also used to determine their significance.

## 2.2 Assessment Methods

### 2.2.1 General

The CHA comprises several steps in order to ensure the process is robust:

- Initial Screening – which involves making stakeholder consultation and/or an initial literature review *e.g.* Important Bird Areas in Uzbekistan; Red Data Book of Plants and Animals; IUCN Red List of Threatened Species and; World Database of Key Biodiversity Areas.
- Establishment of baseline which includes field data collection and verification of available information *e.g.* Habitat Survey; Bird Survey; Bat Survey; Invertebrate Survey; Reptile Survey.
- Critical habitat determination:
  - a) Determination of Ecologically Appropriate Area of Analysis.
  - b) Assessment against Critical Habitat criteria.

### 2.2.2 Literature review and stakeholder consultation

A literature review was performed in order to understand the baseline conditions of the Project as well as informing the CHA. Primary sources of Project-related information included reports / articles / books related to the site and on-line resources including but not limited to:

- Field data collection and verification of available information *e.g.* Habitat, flora and fauna surveys
- Red Data Book of Uzbekistan
- IUCN Red List of Threatened Species
- BirdLife International Important Bird and Biodiversity Areas (IBAs)
- World Database of Key Biodiversity Areas

Consultation with stakeholders has taken place and is ongoing. Where relevant, the outcomes of these discussions will be updated accordingly. Stakeholders consulted has included:

- Samarkand Regional Ecology Department (included the respective Heads from the Regional Department of Ecology, Biodiversity Division, Expertise Division and Air Protection Division) [26th November 2021].

### 2.2.3 Determination of Ecologically Appropriate Area of Analysis

IFC PS 6 requires identification of Ecologically Appropriate Area of Analysis (EAAA) to determine the presence of critical habitat for each species with regular occurrence in the Project’s area of influence, or ecosystem, covered by Criteria 1-4. The boundaries of an EAAA are determined by taking into account the distribution of species or ecosystems (within and sometimes extending beyond the project’s area of influence) and the ecological patterns, processes, features, and functions that are necessary for

maintaining them. This approach ensures that all important biodiversity within the project footprint and linked surrounding habitats are taken into consideration.

Criteria used to define CH under EBRD PR 6 are closely aligned to the IFC guidance and these require that the study area be defined by comparable parameters to the above. In essence any CH assessment must encompass all direct and indirect impacts within a broad landscape unit which is large enough to include features and functions relevant to the species being considered.

#### 2.2.4 Assessment against Critical Habitat criteria

##### *Criteria*

The CH determination refers to the evaluation of the area in question with respect to each of the five CH criteria defined in IFC PS 6 GN and the six defined in EBRD PR 6 GN. Each criterion is described in detail in paragraphs GN70–GN83 of IFC PS 6 GN and Section 3.7 of EBRD PR 6 GN as summarised in Tables 1 and 2 below. Definitions and quantitative thresholds for each criterion of the assessment in both guidance notes follow those set out in the IFC guidance as this is considered the most appropriate source by both IFC and EBRD at the time of writing:

*Table 1 – Critical Habitat Criteria as defined by IFC PS 6*

<b>Critical Habitat Criteria as defined by IFC PS 6</b>	<b>PS 6 Criterion Number</b>
<b>Critically Endangered (CR) and/or Endangered (EN) species</b>	1
<b>Endemic or restricted-range species</b>	2
<b>Migratory or congregatory species</b>	3
<b>Highly threatened and/or unique ecosystems</b>	4
<b>Key evolutionary processes</b>	5

*Table 2 – Critical Habitat Criteria as defined by EBRD PR 6*

<b>Critical Habitat Criteria as defined by EBRD PR 6</b>	<b>PR 6 Criterion Number</b>
<b>Highly threatened and/or unique ecosystems</b>	i
<b>Habitats of significant importance to endangered or Critically Endangered species</b>	ii
<b>Habitats of significant importance to endemic or range restricted species</b>	iii
<b>Habitats supporting globally significant concentrations of migratory or congregatory species</b>	iv
<b>Areas associated with key evolutionary processes</b>	v
<b>Ecological functions that are vital in maintaining the viability of biodiversity features described (as critical habitat features)</b>	vi

*PS 6 Criterion 1 and PR 6 Criterion ii: Critically Endangered (CR) and/or Endangered (EN) Species*

Species or areas supporting species threatened with global extinction and listed as Critically Endangered (CR) and Endangered (EN) on the IUCN Red List or local equivalent trigger CH under these criteria.

The principal thresholds for triggering CH are:

- a) the EAAA contains “globally important concentrations” of an IUCN CR or EN species, defined as at least 0.5% of the global population AND over 5 reproductive units.
- b) areas that support globally important concentrations 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 and meet the thresholds in (a).
- c) is as appropriate, areas containing important concentrations of a nationally or regionally listed EN or CR species.

*PS 6 Criterion 2 and PR 6 Criterion iii: Endemic and/or Restricted-Range Species and Supporting Habitats*

IFC GN6 - Paragraph 74 (2019) defines “endemic” as synonymous with “restricted range” species, and for terrestrial vertebrate and plant species, this criterion refers to species with a global range size of  $\leq 50,000 \text{ km}^2$ . In order to trigger CH under these criteria, the EAAA must contain  $\geq 10\%$  of the global population of such a species AND at least 10 reproductive units.

*PS 6 Criterion 3 and PR 6 Criterion iv: Migratory or Congregatory Species and Supporting Habitats*

Migratory species are defined as any species of which a significant proportion of its members cyclically and predictably move from one geographical area to another (including within the same ecosystem).

Congregatory species are defined as species whose individuals gather in large groups on a cyclical or otherwise regular and/or predictable basis. Examples of Congregatory species are:

- Species that form colonies.
- Species that form colonies for breeding purposes and/or where large numbers of individuals of a species gather at the same time for non-breeding purposes (for example, foraging and roosting).
- Species that utilize a bottleneck site where significant numbers of individuals of a species occur in a concentrated period of time (for example, for migration).
- Species with large but clumped distributions where a large number of individuals may be concentrated in a single or a few sites while the rest of the species is largely dispersed (for example, wildebeest or Argali distributions).
- Source populations where certain sites hold populations of species that make an inordinate contribution to recruitment of the species elsewhere (especially important for marine species) (IFC PS 6 GN76-77).

Thresholds for these criteria as per IFC PS 6 GN78 are the following:

- a) areas known to sustain, on a cyclical or otherwise regular basis,  $\geq 1$  percent of the global population of a migratory or congregatory species at any point of the species’ lifecycle.

- b) areas that predictably support  $\geq 10$  percent of the global population of a species during periods of environmental stress.

*PS 6 Criterion 4 and PR 6 Criterion i: Highly Threatened or Unique Ecosystems*

As per IFC PS 6 GN79, it is necessary to use the Red List of Ecosystems where formal IUCN assessments have been performed. Where formal IUCN assessments have not been performed, assessments may be made using systematic methods at the national/regional level, carried out by governmental bodies, recognized academic institutions and/or other relevant qualified organizations (including internationally recognized NGOs).

Thresholds for these criteria as per IFC PS 6 GN80 are the following:

- a) areas representing  $\geq 5$  percent of the global extent of an ecosystem type meeting the criteria for IUCN status of CR or EN.
- b) other areas, not yet assessed by IUCN, but determined to be of high priority for conservation by regional or national systematic conservation planning.

*PS 6 Criterion 5 and PR 6 Criterion v: Key Evolutionary Processes*

According to the GN81 of IFC PS 6, the structural attributes of a region, such as its topography, geology, soil, temperature, and vegetation, and combinations of these variables, can influence the evolutionary processes that give rise to regional configurations of species and ecological properties. In some cases, spatial features that are unique or idiosyncratic of the landscape have been associated with genetically unique populations or subpopulations of plant and animal species. Physical or spatial features have been described as surrogates or spatial catalysts for evolutionary and ecological processes, and such features are often associated with species diversification. By conserving species diversity within a landscape, the processes that drive speciation, as well as the genetic diversity within species, ensures the evolutionary flexibility in a system, which is especially important in a rapidly changing climate.

It should be noted that the IFC PS 6 GN provides qualitative guidance for assessing the projects against these criteria rather than quantitative thresholds, unlike PS 6 Criteria 1-4.

*EBRD PR 6 Criterion vi: Ecological Functions that are Vital to Maintaining the Viability of the Biodiversity Features Described.*

EBRD PR 6 describes this as “ecological functions without which critical biodiversity features could not persist.” Examples of these are given as riparian zones and rivers, dispersal or migration corridors, hydrological regimes, seasonal refuges or food sources, keystone or habitat-forming species.

As with PR 6 Criterion v this item holds a qualitative threshold rather than a quantitative one, and as such the likelihood of triggering CH should be informed by survey data and the use of relevant expert opinions.

### **2.2.5 Assessment against Priority Biodiversity Feature criteria**

Four criteria relating to the determination of PBF are presented within EBRD PR 6. As noted above there are no quantitative thresholds stated within the guidance for the determination of PBF and as such

background data, field data and expert opinion is used to complete a qualitative assessment. *Table 3* shows the criteria for defining PBFs with examples of each feature taken from the EBRD PR 6 guidance note.

*Table 3 – Priority Biodiversity Feature (PBF) Criteria as Defined by EBRD PR 6*

<b>Feature</b>	<b>PR 6 PBF Criterion Number</b>
<b>Threatened Habitats</b>	1
<b>Vulnerable Species</b>	2
<b>Significant biodiversity features identified by stakeholders or governments (e.g. IBAs or KBAs)</b>	3
<b>Ecological structure and functions that are vital to maintaining the viability of priority biodiversity features</b>	4

Examples of threatened habitats are given as: Habitats considered under pressure by national, regional or international assessments. They include natural and priority habitats identified under Annex I of the EU Habitats Directive.

Examples of Vulnerable species are given as: Species listed by the IUCN or any other national/regional lists (e.g., national Red Lists or Red Data Books) as Vulnerable or equivalent (N.B. in Uzbekistan the Vulnerable tier is split into Vulnerable: Rare and Vulnerable: Declining). These include animal and plant species of community interest identified under the EU Habitats Directive (Annex II).

Examples of Significant biodiversity features are given as: Key Biodiversity Areas and Important Bird and Biodiversity Areas

Examples of Ecological structure and functions needed to maintain the viability of priority biodiversity features are given as: Locations essential for priority biodiversity features, riparian zones and rivers, dispersal or migration corridors, hydrological regimes, seasonal refuges or food sources, keystone or habitat-forming species.

### 3 **BASELINE ECOLOGICAL INFORMATION**

#### 3.1 **Survey Timings and Methods**

##### 3.1.1 **General**

Ecological field visits were originally undertaken between 3rd-13th March 2020 to support the Critical Habitat and Impact Assessment report prepared by Suntrace for the Asia Development Bank (ADB). The following ecological survey reports were produced:

- Ten, A. et al. (2020). Ecological Survey/Season Bird Survey Report: prepared by Ten, A., Abduraupov, T., Beshko, N. and Soldatov, V.. Sherabad Solar IPP Project in Uzbekistan, Surkhandra Region - Annex 3 of the Critical Habitat and Assessment Report (Suntrace, 2020);
- Beshko, N. Yu. (2020). Evaluation of the Current State of the Flora and Vegetation in the Sherabad Solar IPP Project Territory – Annex 4 of the Critical Habitat Assessment Report (Suntrace, 2020); and
- Abduraupov, T.V. (2020). Evaluation of the Current State of Reptiles in the Sherabad Solar IPP Project Territory – Annex 5 of the Critical Habitat and Assessment Report (Suntrace, 2020).

Further ecological baseline surveys (habitat identification, floral survey, terrestrial fauna, and avifauna survey) within the Project site were completed by AECOM ecologists and local biodiversity specialists during a field survey visit on 29th & 30th November and 1st and 2nd December 2021 (referred to as the ‘Winter 2021 Baseline Survey’ herein). A second ecological baseline (habitat identification, floral survey, terrestrial fauna (including reptiles) and avifauna survey visit was undertaken within the Project site between April 1st-5th 2022 by local biodiversity specialists (referred to as the ‘Spring 2022 Baseline Survey’ herein). These surveys included:

- Walkover transect surveys for birds, reptiles, mammals, habitat categorization and rare and endemic species of plants within the Solar PV site. The area was traversed in a regular pattern in order to reduce the chances of missing any important biotic features.
- Drive-over and point count surveys for the aforementioned ecological features along the Overhead Line
- Walked transects at the Karasu River ravine for birds, reptiles, mammals, habitat categorization and rare and endemic species of plants for the Overhead Line route at the river crossing.
- Walked transects at the Khaudag Ridge Overhead Line crossing for birds, reptiles, mammals, habitats and rare and endemic species of plants for the Overhead Line route.

The Project Area of Influence (AOI) detailed within the Critical Habitat and Impact Assessment report is defined as a 50m buffer surrounding the Solar PV Site and new substation, with a 200m buffer around the Overhead Line route centre line.

Baseline ecological data was gathered by Aecom within a 50km radius from the Project Site; only faunal and habitat data considered to be of potential relevance to the aforementioned AOI has been included within this document.

### 3.1.2 Habitats and Flora

Habitat and floral surveys were undertaken by Beshko (2020) between the: 6th-9th March 2020. The results of the surveys were ground-truthed by local botanical specialists during the AECOM baseline surveys which were undertaken in 1st-5th April 2022, which therefore coincided with the spring growth season.

The aims of the Spring 2022 Baseline Survey, which was undertaken by local botanical specialists, are as follows:

- Determine the habitat type and plant species present at and around the proposed Project site and highlight any IUCN threatened species and/or species listed in the Red Data Book of Uzbekistan. The vegetation was sampled by the local botanical specialists along a transect route using 10mx10m quadrats, using the Drude method for assigning vegetation cover and describing the vegetation type formations.
- Identify any exotic (non-native) or potentially invasive flora species.
- Identify the potential direct or indirect impacts, whether they are beneficial, adverse or neutral, on the current vegetation communities or protected species as a result of the construction and operation of the proposed Project.
- Identify feasible mitigation strategies as counter measures for the potential impacts.

Plant species were identified, and distributions were checked using relevant literature. The conservation status of each of the plant species documented was researched using the IUCN databases. This was cross checked against the Uzbekistan Red List to determine the presence of species of conservation importance. The ground-truthing survey was undertaken in April 2022 and therefore within the optimal survey season (April-September) for undertaking habitat surveys.

The results of the April 2022 Baseline Survey were appraised by an experienced botanist/ habitat surveyor from the AECOM team involved with the Winter 2021 Baseline Survey visit.

### 3.1.3 Birds

Ornithological surveys were undertaken for ADB by Ten et al. (2020) between 6th-13th March 2020 and reported in the Critical Habitat and Impact Assessment report (Suntrace, 2020).

AECOM completed surveys during winter 2021 (November / December) and the 2022 spring migration period (2<sup>nd</sup> to 4<sup>th</sup> April) with early breeding activity recorded during the April surveys. AECOM also completed Asian Houbara surveys between 6<sup>th</sup> and 9<sup>th</sup> April 2022.

The aims of the Winter 2021 Baseline Survey and Spring 2022 Baseline Survey for birds were to:

- Carry out field work to identify the micro-habitats within the proposed Project's footprint and identify the avifauna that may reside or frequent the area.

- Provide the IUCN rating for each of the fauna species determined to be present and protected status in Uzbekistan for each of the avifauna species determined to be present or potentially occurring at the Project site.
- Identify direct or indirect impacts to the local avifauna that could be the result of the construction and operation of the proposed Project.
- Determine relevant mitigation measures.

There are numerous factors that could influence the presence of avian species within the region such as season, weather conditions, and food availability. In order to account for this the bird distributions were researched to formulate an index similar to that used for terrestrial fauna species. In addition, the breeding and migratory habits were researched using Bird Life International databases to derive the species' lists. Birds that could potentially frequent the proposed Project site have been classified according to their migratory, breeding and resident statuses. This scale uses the following terms:

- Resident: These birds reside and breed within the local areas on a more or less permanent basis though may move within their distribution zone
- Non-breeding migrant: These birds do not breed in this area however may be found in the region during certain periods/ seasons as they either use this area as a temporary or seasonal home range. This includes Eurasian wintering migrants.
- Breeding migrant: These birds frequent the region specifically to breed and raise their young, however following the breeding season will move on to other areas.

### 3.1.4 Mammals

Mammal surveys of the Solar PV Site have been completed during the 2020 Suntrace surveys and the AECOM baseline surveys undertaken in 2021 and 2022. AECOM also completed baseline mammal surveys at the Karasu River Overhead Line crossing point in April 2022.

The aims of the faunal study were to:

- Carry out field survey work to identify the terrestrial fauna that may reside or range within the region of the proposed Project site.
- Where possible, interview local residents regarding faunal species that may have been observed in the Project Site.
- Provide the IUCN Red Data rating and protected status in Uzbekistan for each of the fauna species determined to be present or potentially occurring at the Project site.
- Identify of any direct or indirect impacts, whether they are beneficial, adverse or neutral, on the current terrestrial biodiversity and provide relevant mitigation measures.

Considering that the activity patterns of many terrestrial species are hugely variable (i.e. many are nocturnal), it is possible that certain small species (particularly small mammals, reptiles, and amphibians) could have been overlooked during the daily site surveys.

### 3.1.5 Reptiles and Amphibians

As well as surveys completed in 2020, reptile surveys were undertaken at the Project Site by local herpetologist R. A. Nazarov between 1st-5th April and 22nd-26th April 2022; the findings are reported in Nazarov, R.A. (May 2022). The purpose of the surveys was to confirm presence/absence of reptile species of international and national conservation concern and an estimation of population density within the Project Site, to inform the ecological baseline, impact assessment and mitigation for this assessment.

The surveys were undertaken in April and therefore within the active season for reptiles and therefore easier to detect.

The surveys involved the surveyor walking a 12.4km line transect within the Solar PV Site and the Overhead Line route during the daytime and also on a single occasion during the night-time; observations of tortoises, tortoise burrows and tortoise signs were recorded within distance bands so that population densities could be calculated.

The diurnal species were counted at the routes with a varying width of the survey band. For the width calculation, the perpendicular distance from the transect line to the individual reptile was recorded.

The nocturnal species were counted using headlamps on a band with a fixed width. The census of representatives of the genus *Teratoscincus* were conducted by reddish reflections of the eyes, which were taken into account. Some individuals can be seen from over 100 m; however, a census conducted on a too wide registration band may lead to an underestimation of the population density. Therefore, the registration band was limited from 5 to 15 m in accordance with the relief and vegetation cover at the each location. Reptiles found outside these boundaries were not counted.

For the detection such cryptic species as Smooth Even-fingered Gecko (*Alsophylax laevis*) a method of recording of acoustic signals was used. The males of this species are able to produce the vocal signals for marking his territory and attracting females. Moreover, in some cases the male's respond to the vocal signals of the other males and electronic playback. This method was allowed to determine presence of this species in survey locations and make estimations of population density.

## 3.2 Results

### 3.2.1 General Site Description

The Project Site (the Solar PV Site and the 52km OHL grid connection) is located in the Surkhandarya region of Uzbekistan.

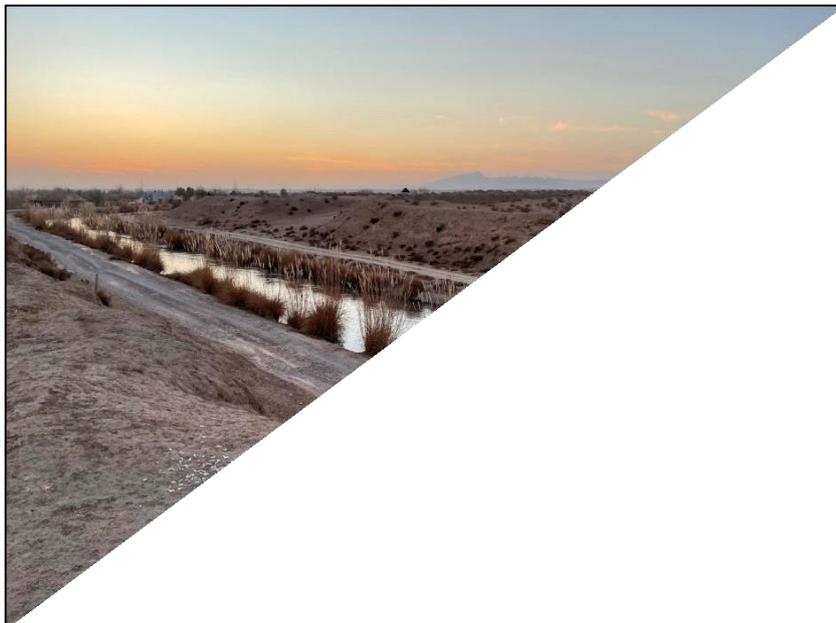
The Solar PV Site is situated in the Karakyr Upland, at the foot of the Kelif-Sherabad Ridge; the landscape is characterised by shallowly sloping sandy and loamy (mixed with stones, salt or gypsum) deposits which are intersected with localised shallow gullies formed by erosion. The Solar PV site is

bordered by a network of canals which separate the Karakyr Upland from irrigated agricultural lands; from the west, the territory is bordered by a shallow gully. A saltwort (*Salsola*) sub-shrub community has developed on historically cultivated land.

*Plate 1. Western side of the Solar PV site showing widespread historic agriculture (ridge and furrow plough-lines)*



*Plate 2. Irrigation canal on southern boundary*



The Overhead Line is routed from the on-site substation at the Solar PV to the existing Surkhan substation in the Jarkurgan district to the east. It follows an existing overhead line across agro-landscapes (cotton, wheat, alfalfa fields, orchards, vegetable gardens, tree lines, roads and network of drainage canals, households/settlements), Shuratakum Gorge, the Karasu River and the Khaudag Ridge.

The approximate lengths and distances from the PV site for the Overhead Line in terms of the landscape areas are as follows:

- Agro-landscape (0km at the Solar PV site to 9km).
- Shuratakum Gorge (9km to 13.3km).
- Agro-landscape (13.3km to 23.5km at Karusu River).
- Agro-landscape (23.5km to 36.2km).
- Khaudag Ridge (36.2km to 50.5km at Surkhan substation).

Habitat typical of the agro-landscapes along the Overhead Line, around the Shuratakum Gorge / Karasu River and the Khaudag Ridge are shown in the following Plates.

*Plate 3. Transmission line route from the Solar PV Site (agro-landscape)*



*Plate 4. Crossing point over the Shuratakum Gorge and Karasu River*



*Plate 5. Eastern side of the Khauldag Ridge*



### **3.2.2 Protected Areas**

The ecological survey findings identify one legally protected area in the region of analysis, the Surkhanskiy State Nature Reserve (IUCN Management Category Ia). This protected area is separated into two components, namely a small piece along the Amudarya flood-lands bordering Afghanistan 30 km south-east of the proposed solar site and a larger piece on the Kugitang Ridge located 22 km north-west of the solar site bordering Turkmenistan. The Kugitang State Nature Reserve exists in Turkmenistan adjacent to the northern component of the Surkhanskiy State Nature Reserve. These two components of the Surkhanskiy State Nature Reserve are located in fundamentally different habitats and

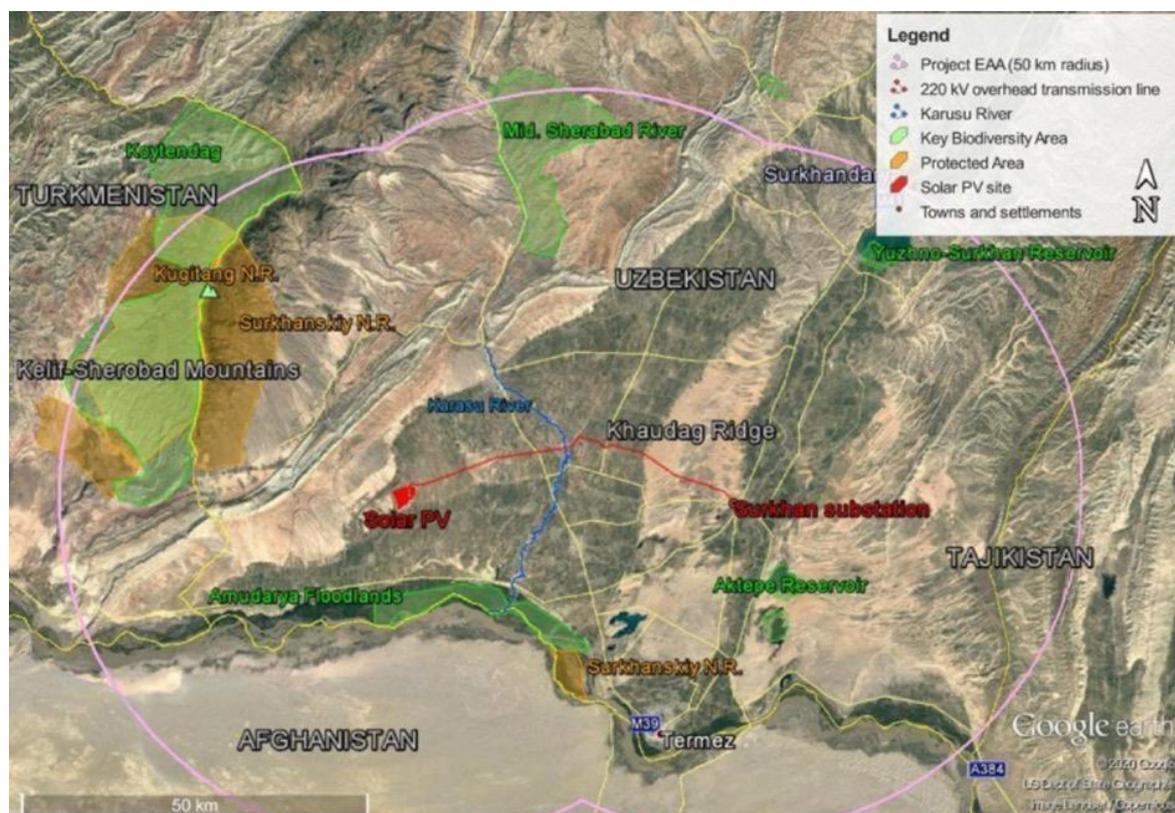
support different species compositions and ecological processes. Limited biodiversity movement or ecological connectivity is expected between these areas.

Overall, five Key Biodiversity Areas (KBAs) occur within 50km of the Project Site as follows:

- The Kugitang and Baysuntay Mountains KBA - >40km from the Project Site at its closest point;
- The Amudarya flood-lands KBA - >10km from the Project Site at its closest point;
- The Koyendag KBA occurs within Turkmenistan and overlaps the Kugitang State Nature Reserve;
- Aktepe reservoir - >10km from the Project Site at its closest point; and
- Yuzhno Surkhan reservoir ->45km from the Project Site at its closest point.

The project AOI does not intersect any of these protected areas / KBAs. These protected areas are associated with either mountainous terrain or wetlands, and therefore support ecosystems that differ substantially from ecosystems within the study area. These protected areas are therefore not expected to be influenced by the proposed development and are not considered critical habitat features associated with the project.

*Figure 2. Location of the proposed Solar PV Site and Transmission Line in southern Uzbekistan relative to Protected Areas, Key Biodiversity Areas Designated Site Search Area, defined by a 50 km radius (pink line) from the Project Site*



### *The Amudarya Floodlands IBA*

The Amudarya Floodlands IBA (near Termez) is sited in the first floodplain terrace of the Amudarya river between Kaptarhona and Sholiker villages (on the border with Afghanistan) and approximately 10km from the nearest part of the Project Site. Approximately 230 bird species have been recorded, including the globally threatened Dalmatian Pelican (*Pelecanus crispus*), Lesser White-fronted Goose (*Anser erythropus*), Ferruginous Duck (*Aythya nyroca*), Greater Spotted Eagle (*Aquila clanga*), Imperial Eagle (*Aquila heliaca*) and Black Grouse (*Tetrax tetrax*). Pygmy Cormorant (*Phalacrocorax pygmaeus*), Black Stork (*Ciconia nigra*), White Stork (*Ciconia ciconia*), White-tailed Eagle (*Haliaeetus albicilla*), Golden Eagle (*Aquila chrysaetos*) and Steppe Eagle (*Aquila nipalensis*) are included in the National Red Data Book. This site is internationally important for wintering and migratory waterbirds. The dominant species are: Greylag Goose (*Anser anser*), Mallard (*Anas platyrhynchos*), Common Crane (*Grus grus*) and Northern Lapwing (*Vanellus vanellus*). Marbled Duck (*Marmaronetta angustirostris*) has also been recorded.

Mammals recorded in the area include Golden Jackal (*Canis aureus*), wild cats (*Felis chaus* and *Felis manul*), Wild Boar (*Sus scrofa*) and the globally endangered Bukhara Deer (*Cervus hanglu bactrianus*). There are House Mice (*Mus domesticus*) and Green Toads (*Bufo viridis*) in the fields. Dice Snake (*Natrix tessellata*) can be seen in the canals. There are catfish, Crucian Carp (*Carassius carassius*), Common Carp (*Cyprinus carpio*) and the introduced Snakehead (*Channidae sp.*). There are also 2 rare species of Shovelnose Sturgeon (*Acipenseridae sp.*). There are reeds and tamarisk bushes on the banks. Wild poplar and clematis are reminders of former tugai forests. There are bushes of Iriantus along the canals and Karelinia in wet places. The majority of the site is covered with cultivated rice and winter wheat fields. Uncultivated fields are overgrown with reed and wormwood.

### *Middle reaches of the Sherabad River IBA*

The IBA is situated in the southern part of Uzbekistan in the valley of the Sherobad River and includes the adjacent mountains, 25 km to the north of Sherobad and approximately 25km from the nearest part of the Project Site. There is good habitat for breeding raptors and the IBA is situated on a branch of a migration flyway. Numerous migrating flocks of Common Crane (*Grus grus*) and Demoiselle Crane (*Grus virgo*) have been observed flying north along the Sherobad valley and above the eastern slopes of the Kugitang range. Three species European Roller (*Coracias garrulus*), Lesser Kestrel (*Falco naumanni*) and Saker Falcon (*Falco cherrug*) are included in the IUCN list of threatened species. Five species; See-see Partridge (*Ammoperdix griseogularis*), Eastern Rock Nuthatch (*Sitta tephronota*), Finsch's Wheatear (*Oenanthe finschii*), Plain Leaf Warbler (*Phylloscopus neglectus*) and Grey-necked Bunting (*Emberiza buchanani*) are representatives of the Iranian-Turanian mountains biome. *Ammoperdix griseogularis* can only be found in this region of Uzbekistan.

### *Flyways*

A number of important flyways cross Uzbekistan with the Project site lying on the Central Asian Flyway (CAF). Uzbekistan's natural and artificial wetlands are important for migrating and overwintering waterfowl (Lanovenko 2006). More than 50 migratory waterbird species have been recorded on Uzbek

wetlands, including at least nine which are globally threatened: Dalmatian Pelican, Lesser White-fronted Goose, White-headed Duck (*Oxyura leucocephala*), Ferruginous Duck, White-tailed Eagle, Red-breasted Goose (*Branta ruficollis*), Marbled Teal, Pallas's Sea Eagle (*Haliaeetus leucoryphus*) and Pygmy Cormorant. Notable migratory species potentially using the flyway in the vicinity of the project area include the IUCN Critically Endangered Sociable Lapwing (*Vanellus gregarius*).

The CAF is a broad front are there are no specific features within 20 km of the site which could attract migrating birds, with the exception of the Karasu River. The closest feature is the Amudarya Floodlands IBA approximately 10km from the site, which is attractive to migrating and wintering waterfowl, but the Project site does not contain any similar features that may attract such species. The Middle reaches of the Sherabad River IBA is situated on a branch of a migration flyway (e.g. northward spring movement of Common Crane and Demoiselle Crane).

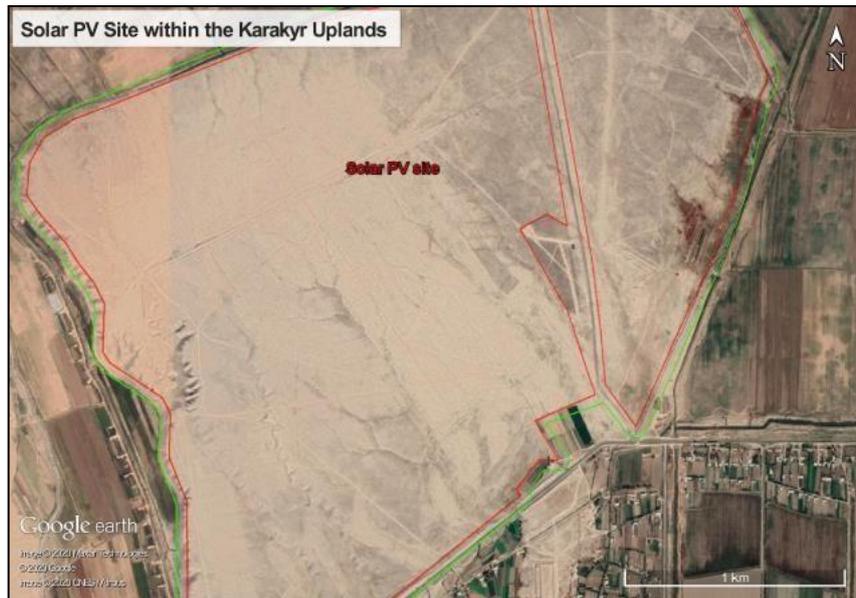
In summary, the proposed Project site is not located on a major bottle neck or geographical feature that would concentrate migrating species. The Karasu river valley has a north-south orientation and therefore there is potential that this geographical feature functions as a migratory corridor linking the Amudarya River (including the Amudarya Floodlands IBA), to the south, with the Middle reaches of the Sherabad River IBA, to the north; the latter supports migratory flyway ornithological features. However, the narrow and shallow river valley, which dissects an extensive flat plain, is not a geographical feature which is likely to coerce northward or southward migrating raptors, storks and cranes into concentrated migration along the Karasu Valley; migration is therefore likely to be on a broad front across the plain between the Amudarya River (flows along the Uzbekistan-Afghanistan border) and the Kelif-Sherabad Ridge upland area to the north.

### 3.2.3 Habitats and Flora

The GN6 states that the level of anthropogenic impact should be determined with respect to the greater landscape (GN27). Although patches of virgin lands are noted within the Karakyr Uplands, the area is disturbed and small patches of natural habitat are not recognised as the ecological functions there are heavily disturbed.

All habitats associated with the Solar PV Site has been classified as modified habitats in accordance with the PS6. This finding is consistent with a statement within the Ecology Survey Report (April 2020) that the Surkhan-Sherabad valley is an ancient agricultural oasis that has been used by human beings for many centuries, with many human settlements (mainly villages) located in the area. All areas suitable for farming are used to cultivate crops or as gardens, causing most of the study area consists of anthropogenic landscapes (agro-landscapes, residential and industrial landscape).

Figure 3. Proposed Solar PV site within the Karakyr Uplands showing evidence of disturbance from past cultivation and abundant pathways



Habitats associated with the Overhead Line are set out in the table below which shows the route is made up of modified and small areas of degraded natural habitats.

Table 4. Assessment of habitats within the Overhead Line route

Habitat	Description	PS6 Habitat Classification
Agro-landscapes	The affected part of the shallow Sherabad valley features an anthropogenic landscape of cotton, wheat and alfalfa fields, orchards, vegetable gardens, tree lines, roads, networks of irrigation canals and villages. Beshko (2020) <sup>1</sup> states that there is a low diversity of plant species within the Sherabad valley, with a total of 48 plant species, including cultivated plants and synanthropic weeds. Secondary associations of ruderal and segetal weeds are very localised along roads, canals and field borders. No naturally occurring IUCN listed threatened species or RDB of Uzbekistan threatened plant species recorded during baseline field surveys.	Modified Habitat
Shuratakum Gorge	As noted by Beshko (2020) <sup>1</sup> and confirmed during the AECOM surveys, this sandy loam habitat is not suitable for agriculture, but actively used for livestock grazing. The habitats observed during the 2021/22 AECOM field surveys are a predominantly a patchwork of fields which have been subject to historic cultivation and irrigation (modified habitat). There are localised areas of fixed sand dunes which form a hill in	Modified Habitat and Natural Habitat (degraded)

Habitat	Description	PS6 Habitat Classification
	<p>the northern part (degraded natural habitat). Asphalt and dirt roads dissect the area and groundwater open collectors have been excavated. The vegetation is degraded as a result of overgrazing. This habitat area is in close proximity to Khtay village.</p> <p>The CHIA classifies the habitat of the Shuratakum Gorge as Modified in terms of PS6 criteria. Although AECOM observed that Modified habitat is evident in the areas where there are historic fields and plough-lines (with irrigation channels), the localised areas of raised fixed dunes (which are unlikely to have been subject to agricultural modification) are considered a better fit to a Natural Habitat which has been heavily degraded by overgrazing.</p> <p>No IUCN listed threatened species and/or URDB threatened plant species were recorded during field surveys of the Khaudag.</p>	
Karasu River	<p>Secondary associations of ruderal and segetal weeds occupy small areas along roads, canals and field borders. Riparian and halophytic (tamarisk, camelthorn, reed) associations were recorded fragmentarily on the floodplain of the Karasu River.</p> <p>The Karasu riverbank is rich with clay cliffs, which are places for nesting birds and habitat for many reptiles e.g. Saw-scaled Viper (<i>Echis carinatus</i>). This habitat has been modified in some areas by mining for brick production, although the riparian habitat at the Overhead Line Karasu river crossing is considered to be a better fit to a degraded natural habitat rather than the modified habitat categorisation as detailed in the CHIA.</p> <p>No IUCN listed threatened species and/or URDB threatened plant species were recorded during field surveys of the Khaudag.</p>	Natural Habitat (degraded)
Khaudag	<p>As detailed in Beshko (2020)<sup>1</sup>, the Khaudag ridge is a low hill (553 m above sea level) with rare outcrops of the parent rock surrounded by the dune sand habitat of Kattakum. Habitats are generally natural landscapes degraded by grazing. Residents pasture their livestock and dispose of their rubbish here in an uncontrolled way. A small quarry pit exists at the existing power Overhead Line, providing raw material for a cement plant. Overgrazing is the main anthropogenic impact on the vegetation. Forty plant species were recorded,</p>	Natural Habitat (degraded)

Habitat	Description	PS6 Habitat Classification
	<p>with 17 aboriginal weeds and a single adventitious plant – ruderal weed <i>Xanthium spinosum</i>.</p> <p>As detailed in Beshko (2020)<sup>1</sup>, the vegetation forms a mosaic in relation to the spatial distribution of fixed sands and loose sand substrate. Plant associations include:</p> <ul style="list-style-type: none"> <li>• The bindweed-ephemeral-ephemeroid community (<i>Convolvulus hamadae</i>, <i>Carex pachystylis</i>, <i>Carex physodes</i>, <i>Poa bulbosa</i>, <i>Bromus tectorum</i>, <i>Hordeum murinum subsp. leporinum</i> and the psammophyte <i>Carex physodes</i>).</li> <li>• The Saltwort-bindweed-ephemeroid community (<i>Convolvulus hamadae</i>, <i>Salsola orientalis</i>, <i>Carex pachystylis</i>, <i>Carex physodes</i>, <i>Poa bulbosa</i>) associations, with small areas covered abundantly with camelthorn (<i>Alhagi kirghisorum</i>) and <i>Hulthemia persica</i>. There is no clear distinction (in terms of species structure and composition) between the aforementioned bindweed-ephemeral-ephemeroid and saltwort-bindweed-ephemeroid associations, with the exception in the relative proportions of <i>Salsola orientalis</i> and <i>Convolvulus hamadae</i>.</li> <li>• The ephemeral-ephemeroid-Calligonum community (<i>Calligonum microcarpum</i>, <i>Carex physodes</i>, <i>Poa bulbosa</i>, <i>Bromus tectorum</i>, <i>Hordeum murinum subsp. leporinum</i>). The shrub <i>Calligonum microcarpum</i> is a constant species forming a 50-100cm shrub canopy.</li> <li>• The ephemeral-bindweed-Calligonum (<i>Calligonum microcarpum</i>, <i>Convolvulus hamadae</i>, <i>Poa bulbosa</i>, <i>Bromus tectorum</i>, <i>Hordeum murinum subsp. leporinum</i>) associations are locally common.</li> <li>• Halophytes are abundant in the lower parts of the area at the foot of Khaudag and are represented by a Saltwort-tamarisk association, whose species composition, with occasional annual Saltworts, <i>Climacoptera sp.</i>, <i>Salsola sp.</i>, <i>Suaeda sp.</i>) or a general absence of vegetation in the most heavily salinised areas, such as the flat valley bottom solonchaks which occasionally intersect the Khaudag hill landscape. <p>The desert pasture vegetation occurring on the higher elevations of the Khaudag is degraded by varying intensities of overgrazing, with Harmala-ephemeral-ephemeroid and Harmala-Saltwort-ephemeroid associations (<i>Peganum harmala</i>, <i>Salsola orientalis</i>,</p> </li></ul>	

Habitat	Description	PS6 Habitat Classification
	<p><i>Carex pachystylis</i>, <i>Poa bulbosa</i>, <i>Bromus tectorum</i> and <i>Hordeum murinum subsp. leporinum</i>).</p> <p>The xerophytic communities observed during the AECOM surveys included camel thorn (Alhagi pseudoalhagi), perennial saltworts (<i>Salsola arbusculiformis</i>), bindweed (<i>Convolvulus olgae</i>), forbs in the pea and poppy family (<i>Astralegus sp.</i> and <i>Hypocoum parviflorum</i>), broad-leaved grasses and Siberian lily (<i>Ixiolirion tataricum</i>). There are localised salt lakes (solanchaks) which support halophytic species such as <i>Salicornia</i> spp.</p> <p>No IUCN listed threatened species and/or URDB threatened plant species were recorded during field surveys of the Khaudag.</p>	
<p>1 Beshko, N. Yu. (2020). Evaluation of the Current State of the Flora and Vegetation in the Sherabad Solar IPP Project Territory – Annex 4 of the Critical Habitat Assessment Report (Suntrace, 2020)</p> <p>2 Critical Habitat and Impact Assessment report (Suntrace, 2020).</p> <p>3 Nazarov, R.A. (May 2022). A Report on Potentially Affected Reptiles at the Project site in the Sherabad Region.</p>		

### 3.2.4 Fauna

The following faunal species of conservation concern were recorded on surveys undertaken to inform the ESIA. Some of the species listed below are considered to be potentially present in the Project AoI and this assessment has considered known ranges of each species as well as their specific habitat requirements.

Table 5. Species of conservation concern present or possibly present on the Solar PV Site and/or Overhead Line route

English Name	Scientific Names	Global Threat Status (IUCN)	National Threat Status (URDB)	Solar PV Site	Overhead Line
<b>Birds</b>					
Marbled Teal	<i>Marmaronetta angustirostris</i>	VU	EN:D	Possible flying over the site	Not recorded on surveys and no suitable habitat on site. Records from the Amudarya River approx. 18km south of Project AoI. Possible transit over
Common Pochard	<i>Aythya ferina</i>	VU	Not Listed	Possible flying over the site	Not recorded on surveys and no suitable habitat on site. Suitable habitat along

English Name	Scientific Names	Global Threat Status (IUCN)	National Threat Status (URDB)	Solar PV Site	Overhead Line
					Amudarya River and possible transit over
White-headed Duck	<i>Oxyura leucocephala</i>	EN	EN:1	Possible flying over the site	Not recorded on surveys and no suitable habitat on site. Possible presence along the Amudarya River, including previously breeding. Winter records fluctuate significantly (UzRDB)
Steppe Eagle	<i>Aquila nipalensis</i>	EN	VU:D	Possible flying over only	Recorded flying over during the Suntrace (2020) ecological surveys in very small numbers
Saker Falcon	<i>Falco cherrug</i>	EN	NT	Possible flying over only	Not recorded but listed as breeding species for IBA <30km from Project Site
Egyptian Vulture	<i>Neophron percnopterus</i>	EN	VU	Possible flying over only	Peak of 4 peak. Various locations
Eastern Imperial Eagle	<i>Aquila heliaca</i>	VU	VU	Possible flying over only	1 Shuratakum gorge
Eurasian Griffon Vulture	<i>Gyps fulvus</i>	LC	VU	Possible flying over only	2 Kattakum sands near OHL plus carcass under OHL
Pallas's Fish Eagle	<i>Haliaeetus leucoryphus</i>	EN	Not Listed	Possible flying over the site	No suitable habitat on site and not recorded during surveys but site within non-breeding range and Amudarya River suitable. Possible transit over the site.
Bearded Vulture	<i>Gypaetus barbatus</i>	NT	VU	Possible flying over only	1 Kattakum sands near OHP TL
Little Bustard	<i>Tetrax tetrax</i>	LC	VU	Possible flying over only	Probable signs (footprints/droppings) found in Khaudag
Asian Houbara	<i>Chlamydotis macqueenii</i>	VU	VU:D	Not recorded on specific surveys completed	Not recorded on specific surveys completed during core lekking period and site

English Name	Scientific Names	Global Threat Status (IUCN)	National Threat Status (URDB)	Solar PV Site	Overhead Line
				during core lekking period. Possible flying over only	habitat unsuitable. Within breeding/migratory range and possible transit over site
Great Bustard	<i>Otis tarda</i>	VU	CR	Possible flying over, however site and OHL are not in core wintering areas and site and OHL RoW are poor quality habitats for this species.	
<b>Mammals</b>					
Brandt's Hedgehog	<i>Paraechinus hypomelas</i>	LC	NT	Possible	Karasu River crossing
Marbled Polecat	<i>Vormela peregusna</i>	VU	VU	Possible	Possible
<b>Reptiles and amphibians</b>					
Southern Even-fingered Gecko	<i>Alsophylax laevis</i>	CR	VU:D	Absent	Possible in habitat around Karasu River crossing
Tajikistan (Sogdian) Toadhead Agama	<i>Phrynocephalus sogdianus</i>	EN	Not listed	Absent	Up to 30 present at Khaudag Ridge
Central Asian Tortoise	<i>Testudo horsfieldii</i>	VU	VU	Present	Possible
Boettiger Caspian Toad-headed Agama	<i>Phrynocephalus raddei boettgeri</i>	LC	VU:D	Absent	Present
Black Ocellated Racerunner	<i>Eremias nigrocellata</i>	LC	VU:D	Present	Present
Transcaspian Desert Monitor	<i>Varanus griseus caspius</i>	LC	VU:D	Possible	Present
Indian Gamma (Common Tree) Snake	<i>Boiga trigonata melanocephala</i>	LC	VU:R	Absent	Present
Afghan Awl-headed Snake	<i>Lytorhynchus ridgewayi</i>	LC	VU:R	Possible	Possible
Northern (Barred) Wolf Snake	<i>Lycodon striatus bicolor</i>	LC	VU:R	Absent	Possible
Tartar Sand Boa	<i>Eryx tataricus speciosus</i>	Spp. not listed	NT	Present	Present

## **4 CRITICAL HABITAT ASSESSMENT**

### **4.1 Introduction**

A Critical Habitat and Impact Assessment (CHA report) was prepared in August 2020 (Suntrace/ADB, August 2020), and has been further developed in this document.

The first stage of the CHA is to undertake a screening exercise where the species of conservation concern that have been recorded within the Project AoI or those considered to be potentially present are rapidly assessed against the thresholds for determination of CH. CHA screening has been undertaken for all species considered present or potentially present within the Project AoI that are of global conservation concern; Critically Endangered, Endangered and Vulnerable. Species with a global conservation status of Near Threatened have been excluded from the CHA screening unless they have a significant national or regional conservation status.

The species for which the screening exercise has been completed as well as the results of the screening are shown in *Table 5* below. Those species which are considered, at the screening stage, to potentially meet the CH thresholds or are of high international conservation concern are discussed later in this section.

Table 5. CHA Screening: Species requiring detailed consideration as part of CHA process

Common Name	IUCN Status	National Status	Status	Status PS / PR 6 Criterion				
				1 / ii	2 / iii	3 / iv	4 / i	5 / v
<b>Avifauna</b>								
Marbled Teal	NT (Global) VU (Europe)	EN:D	Breeding and migratory in Uzbek. Previously common along the Amudarya River	<p>Global population is 10,000 – 42,000 individuals.</p> <p>Possible 200 breeding pairs in country and up to 500 individuals in the winter, although poorly recorded in recent years.</p> <p>Total assumed national population is between 1.1 and 5% of global population however this species was not recorded on any surveys.</p> <p>Habitats in AoI not suitable for this species. Possible transit of the OHL AoI but numbers highly unlikely to exceed 10% of global population (threshold for VU / NT species) and as such threshold for CH not met.</p>	<p>Global population resulting in a large EOO so not range restricted.</p> <p>Criterion 2 not considered</p>	<p>Global population is 10,000 – 42,000 individuals.</p> <p>Possible 200 breeding pairs in country and up to 500 individuals in the winter, although poorly recorded in recent years.</p> <p>Total assumed national population is between 1.1 and 5% of global population however this species was not recorded on any surveys.</p> <p>Habitats in AoI not suitable for this species. Possible transit of the OHL AoI but numbers highly unlikely to exceed 10% of global population (threshold for VU / NT species) and as such threshold for CH not met.</p>		
Common Pochard	VU	Not Listed	Resident	<p>Global population is 760,000-790,000 individuals.</p> <p>Project AoI does not support habitat suitable for large</p>	<p>Global population resulting in a large EOO so not range restricted.</p> <p>Criterion 2 not considered</p>	<p>Global population is 760,000-790,000 individuals.</p> <p>Project AoI does not support habitat suitable for large aggregations of this species however</p>		

Common Name	IUCN Status	National Status	Status	Status PS / PR 6 Criterion					
				1 / ii	2 / iii	3 / iv	4 / i	5 / v	
				<p>aggregations of this species however transit through AoI is possible. Not recorded on any surveys and considered that any transitory movements highly unlikely to be of significant numbers.</p> <p>EAAA for a migratory species set at 50km<sup>2</sup> around the project site which supports waterbodies however not considered to be of importance for this species.</p> <p>Thresholds for CH not met.</p>		<p>transit through AoI is possible. No recorded on any surveys and considered that any transitory movements highly unlikely to be of significant numbers.</p> <p>EAAA for a migratory species set at 50km<sup>2</sup> around the project site which supports waterbodies however not considered to be of importance for this species.</p> <p>Thresholds for CH not met.</p>			
White-headed Duck	EN	EN:1	Breeding and wintering species in Uzbek	<p>Global population of between 5,300 and 8,700 individuals.</p> <p>Project AoI does not support habitat suitable for this species however transit through AoI is possible. Not recorded on any surveys and considered that any transitory movements highly unlikely to be of significant numbers.</p> <p>EAAA for a migratory (wintering) species set at 50km<sup>2</sup> around the project site which supports suitable</p>	<p>Global population resulting in a large EOO so not range restricted.</p> <p>Criterion 2 not considered</p>	<p>Global population of between 5,300 and 8,700 individuals.</p> <p>Project AoI does not support habitat suitable for this species however transit through AoI is possible. Not recorded on any surveys and considered that any transitory movements highly unlikely to be of significant numbers.</p> <p>EAAA for a migratory (wintering) species set at 50km<sup>2</sup> around the project site which supports suitable waterbodies however these are outside of core wintering area for this species (UzRDB)</p>			

Common Name	IUCN Status	National Status	Status	Status PS / PR 6 Criterion				
				1 / ii	2 / iii	3 / iv	4 / i	5 / v
				waterbodies however these are outside of core wintering area for this species (UzRDB)  Thresholds for CH not met.		Thresholds for CH not met.		
Egyptian Vulture	EN	VU	Resident in IBA (listed on citation)	Global population of 12,400 – 36,000 meaning 62 – 211 individuals required to meet criteria. Currently 135 pairs in country and not recorded breeding in Project AoI. Peak of 4 individuals recorded on surveys.  EAAA set at 50km <sup>2</sup> around project site and EAAA population will therefore not meet trigger in any season.	Global population resulting in a large EOO so not range restricted.  Criterion 2 not considered	Global population of 12,400 – 36,000 meaning minimum of 31 pairs within EAAA required to meet congregatory criteria (with respect to colonial breeding), and between 62 and 211 individuals to meet congregatory criteria (with respect to migration). Peak of 4 birds recorded within Project AoI and breeding not recorded. EAAA population will therefore not meet trigger in breeding season as AoI unlikely to be supporting breeding of this species (no suitable habitats), although breeding within EAAA possible but not in significant numbers.  The species is also not recorded in significant migratory numbers, to trigger the CH level. Criterion 3 is not triggered.	-	-
Saker Falcon	EN	NT	Breeding in IBA (listed on citation) but not recorded in Project AoI.	Global Population of 12,200-29,800 individuals meaning 61 individuals or 21 pairs required to meet criteria. Not recorded on surveys but known EAAA population of up to 5 pairs within Koytendag IBA.	Global population resulting in a large EOO so not range restricted.  Criterion 2 not considered	- Global Population of 12,200-29,800 individuals meaning 61 individuals or 21 pairs required to meet criteria.  Not recorded in Project AoI and therefore not considered to migrate in significant numbers	-	-

Common Name	IUCN Status	National Status	Status	Status PS / PR 6 Criterion				
				1 / ii	2 / iii	3 / iv	4 / i	5 / v
				EAAA population will therefore not meet trigger in any season.		sufficient to trigger CH level. Threshold for Criterion 3 is not met.		
Steppe Eagle	EN	VU:D	Recorded on site in low numbers during migration	<p>Global population of 50-75,000 meaning 250 individuals required to meet criteria.</p> <p>Recorded '<i>flying over the site in very low numbers</i>' (Suntrace surveys).</p> <p>EAAA population unlikely to meet trigger in any season.</p>	<p>Global population resulting in a large EOO so not range restricted.</p> <p>Criterion 2 not considered.</p>	<p>Global population of 50-75,000 meaning 500 individuals required to meet migratory criteria.</p> <p>This species was '<i>recorded flying over the site in very low numbers</i>' will therefore not meet trigger in any season-</p>		-
Pallas' Fish Eagle	EN	Not listed	Possible migration but not in core global EOO	<p>This species is irregular in Uzbek and was not recorded on any of the survey. Project AoI does not support suitable habitat for this species, although waterbodies are present in the EAAA (50km<sup>2</sup>) for a migratory species.</p> <p>Highly unlikely that irregular movement will result in significant populations of birds transiting AoI or EAAA and as such EAAA population unlikely to trigger CH in any season.</p>	<p>Global population resulting in a large EOO so not range restricted.</p> <p>Criterion 2 not considered</p>	<p>This species is irregular in Uzbek and was not recorded on any of the survey. Project AoI does not support suitable habitat for this species, although waterbodies are present in the EAAA (50km<sup>2</sup>) for a migratory species.</p> <p>Highly unlikely that irregular movement will result in significant populations of birds transiting AoI or EAAA and as such EAAA population unlikely to trigger CH in any season.</p>		

Common Name	IUCN Status	National Status	Status	Status PS / PR 6 Criterion					
				1 / ii	2 / iii	3 / iv	4 / i	5 / v	
Asian Houbara	VU	VU:D	Resident (breeding and wintering)	<p>Global population 33,000-67,000.</p> <p>Site potentially suitable for Asian Houbara, although presence was considered unlikely.</p> <p>Surveys were completed for this species during peak lekking period, and no birds were recorded.</p> <p>Thresholds for triggering CH would require &gt;10% of global population to be present in EAAA and this is not considered likely.</p> <p>Thresholds for CH not met.</p>					
Great Bustard	VU	CR	Wintering / migration. Presence in Uzbek is irruptive and highly dependent on winter temperatures throughout wintering range	<p>Global population of Great Bustard considered to be 31,000–36,000 birds however Central Asian population is significantly lower than this at around 1,000 to 1,500 individuals.</p> <p>Project AoI and EAAA (50km<sup>2</sup> for migratory birds) is not considered to be within the core wintering range of this species within Uzbek.</p>		<p>Global population of Great Bustard considered to be 31,000–36,000 birds however Central Asian population is significantly lower than this at around 1,000 to 1,500 individuals.</p> <p>Project AoI and EAAA (50km<sup>2</sup> for migratory birds) is not considered to be within the core wintering range of this species within Uzbek.</p> <p>Surveys completed during November / December did not record this species within the AoI or wider area.</p>			

Common Name	IUCN Status	National Status	Status	Status PS / PR 6 Criterion				
				1 / ii	2 / iii	3 / iv	4 / i	5 / v
				<p>Not recorded during baseline surveys completed in November / December.</p> <p>Considered unlikely given location of AoI and EAAA that Great Bustard would be present in numbers that would meet thresholds for CH to be triggered.</p> <p>Threshold for CH is not met.</p>		<p>Considered unlikely given location of AoI and EAAA that Great Bustard would be present in numbers that would meet thresholds for CH to be triggered.</p> <p>Threshold for CH is not met.</p>		
<p>No other bird species of global conservation (CR / EN) concern were recorded. Eastern Imperial Eagle, Eurasian Griffon, Bearded Vulture and Little Bustard are either IUCN VU or of national conservation concern (or both). All of these species were however recorded in very low numbers (Little Bustard only possible droppings recorded) and are therefore excluded from the CHA. All are considered as PBFs</p>								
<b>Mammals</b>								
<p>No species of significant global conservation (CR/EN) concern are considered present, or potentially present within the Project AoI. Marbled Polecat (IUCN: VU) is a PBF and is discussed accordingly in following sections.</p>								
<b>Reptiles</b>								
Southern Even-fingered Gecko	CR	VU:D	<p>PV Project site is outside species EAAA based on habitat types. Possible presence in suitable habitat Karasu river crossing. Closest known population from</p>	<p>EAAA calculated from closest known population (1950 - 1960s records) and encompasses 'suitable' habitat along river corridor. EAAA is 2km<sup>2</sup> and EOO (IUCN known range) is 84,750km<sup>2</sup>.</p> <p>Total EOO is unlikely to be occupied by this species due to habitat suitability and species only known from a few sites within this</p>	<p>IUCN published range of this species is over 50,000km so does not qualify as range restricted under Criterion 2</p>		-	-

Common Name	IUCN Status	National Status	Status	Status PS / PR 6 Criterion					
				1 / ii	2 / iii	3 / iv	4 / i	5 / v	
			7km south of the OHL route (1950/1960)	<p>range. Assuming that only 1% of EOO is occupied the AOO is 847.5km<sup>2</sup>. Using range sizes as proxy for population sizes EAAA supports 0.2% of global population (AOO) and Criterion 1 would therefore not be triggered.</p> <p>Whilst CH is not triggered, due to the conservation importance of this species it is discussed in more detail below.</p>					
Tajikistan Toadhead Agama	EN	VU:R	Up to 30 found along adjacent to OHL route at Khaudag Ridge. Habitats on site are suitable and contiguous to this population.	<p>Endemic of south-eastern Uzbekistan and south-western Tajikistan. In Uzbekistan lives only in the south of Surkhandarya region. IUNC Range (EOO) is 30,000km<sup>2</sup>.</p> <p>EAAA calculated as area of contiguous suitable sandy habitat around the OHL route at Khaudag Ridge. EAAA is 250km<sup>2</sup>.</p> <p>Using range sizes as proxy for population, EAAA is 0.83% of global range / population (EOO) and therefore Criterion 1 would be triggered.</p>	<p>Unknown, but occurs in Turkmenistan, southern Kazakhstan, Uzbekistan, northeast Iran and northeast Afghanistan.</p> <p>According to IUCN known global range of this species (EOO) is 30,000km<sup>2</sup> and is therefore considered to be range-restricted.</p> <p>EAAA is 0.83% of EOO and using range size as proxy for global range / population size Criteria 2 is not triggered.</p>			-	-

Common Name	IUCN Status	National Status	Status	Status PS / PR 6 Criterion				
				1 / ii	2 / iii	3 / iv	4 / i	5 / v
				AOO is likely to be significantly smaller than this, although assessing EAAA against AOO doesn't change the outcome of the assessment.	AOO is likely to be significantly smaller than this, although assessing EAAA against AOO doesn't change the outcome of the assessment.			
Central Asian Tortoise	VU	VU	A single individual (female) was recorded within the Solar PV site on both of the April 2022 survey visits (Nazarov, 2022).	Based on the results of the surveys and interviews with local residents, Nazarov suggests tortoises are very rare and that the habitats with the Solar PV site are unfavourable in terms of the supporting a sustainable population for this species. Therefore, the population density of tortoises within the Solar PV site is assessed as very low.  Project AoI will not support populations that if lost could result in Central Asian Tortoise moving from IUCN VU to EN or CR and therefore does not trigger CH under this criterion.			-	-
Other species of reptile of national conservation concern were recorded within the Project AoI and these are identified as PBF's and are discussed later in this report								

## 4.2 Determination of Critical Habitat

### 4.2.1 General

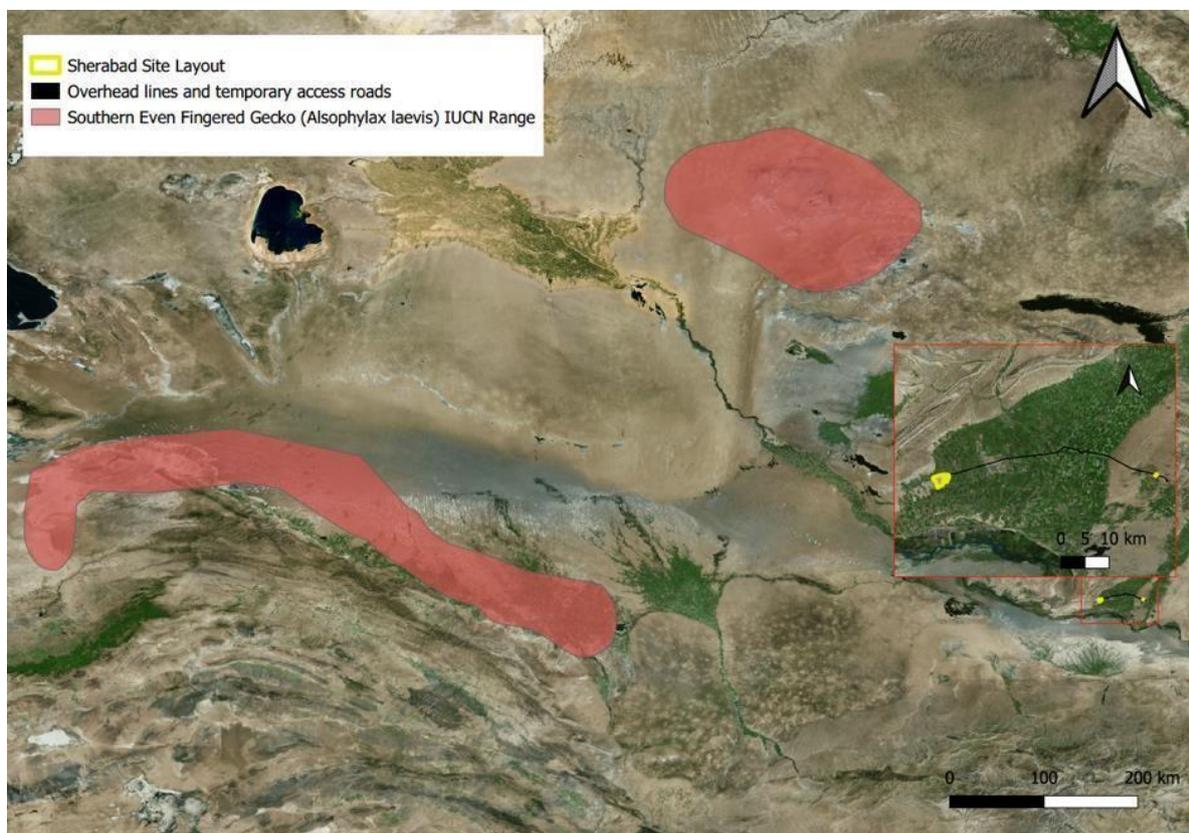
Based on the results of the CH Screening Exercise it has been determined that the only species for which CH is triggered is the Tajikistan Toadhead Agama which meets the IFC PS6 Criterion 1 thresholds and EBRD PR6 Criterion ii. All other species of conservation concern considered present, or potentially present, in the Project AoI do not meet the thresholds for CH. Due to the high conservation status of the Southern Even-fingered Gecko this species is discussed in more detail below.

### 4.2.2 Southern Even-fingered Gecko (*Alsophylax laevis*)

#### *Determination of EAAA*

The Southern Even-fingered Gecko is listed by the IUCN as Critically Endangered and has over recent years suffered significant population declines across its ranges mainly due to rapid expansion of urban areas and agricultural practices. Within Uzbekistan this species is sporadically distributed and is included on the Uzbek Red Data Book as Vulnerable. The global range (as mapped by the IUCN) includes populations within Uzbekistan and Turkmenistan and its global range is estimated to be 84,750km<sup>2</sup> (Figure 4). The published global range of this species does however not overlap with the Project AoI.

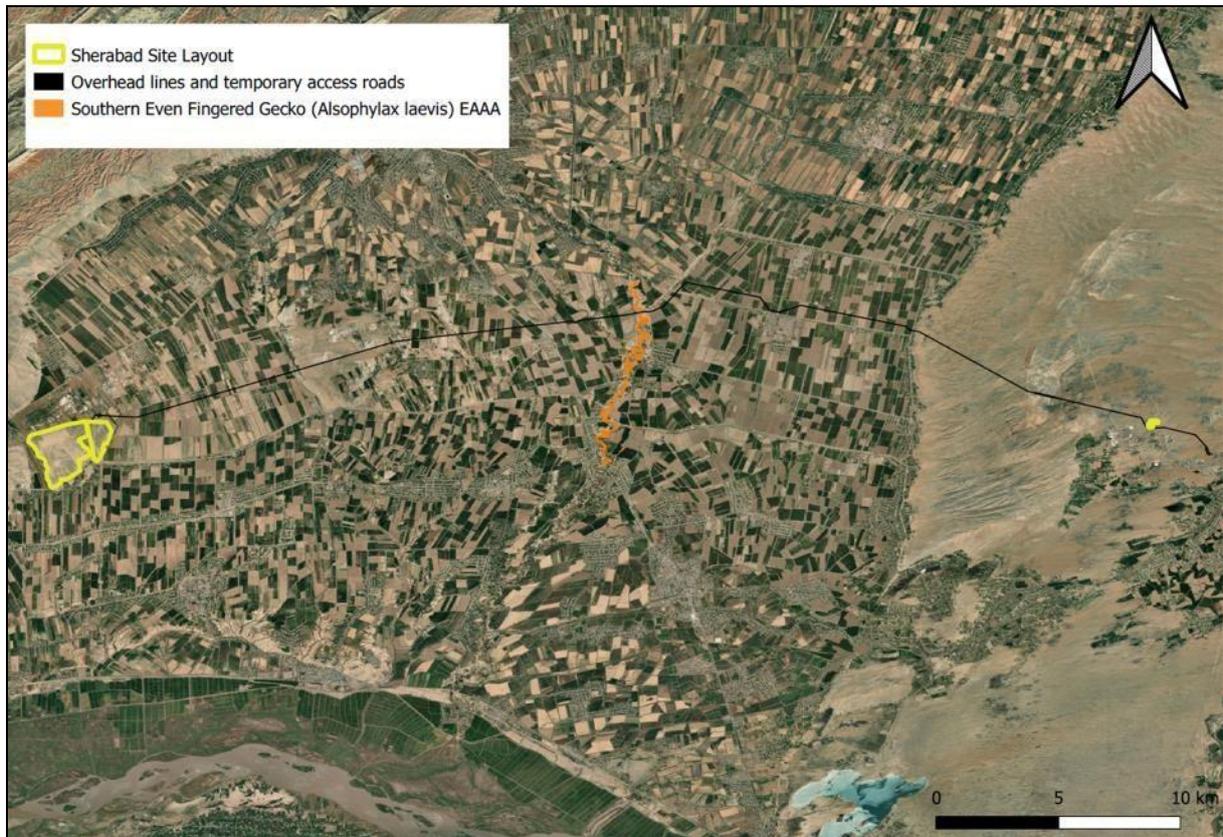
Figure 4. Global Range of Southern Even-fingered Gecko



According to Showler (2018) ‘*Much further south, it has been recorded at one locality in southern Surkhandarya approximately 15km NE of Termez city near the Surkhan Darya river at the following very approximate geographic coordinates: 37°21’N 67°27’E. In Surkhandarya (this species) inhabits takyr habitat in the sand desert zone at estimated elevations of 152m to 190m*’. The aforementioned location, to the east of the Surkhan Darya river, is approximately 19km to the SSE of the Project AOI at its closest point at the Surkhan substation; this location is therefore remote from the Project site. The Suntrace reptile report (2020) also states that six specimens of this species were obtained by O.P. Bogdanov (1955, 1956, 1960) by the Karasu (river), on the road from Termez to Sherabad, approximately 18km from Sherabad and 7km south of the nearest part of the Overhead Line.

Smooth Even-fingered Gecko was not recorded during any of the daytime or nocturnal reptile surveys and is likely absent from the Project area however there are difficulties detecting this elusive species. Nazarov (2020) suggested that the most suitable habitat for this species, within the AOI of the Project site, is the riparian habitat at the Karasu river valley crossing. The EAAA has therefore been assumed to cover all areas of potentially suitable riparian habitat from the closest known population (7km to the south), along the river corridor to the Overhead Line route and extending north in areas of contiguous riparian habitat. The EAAA to the north of the Project site stops where large areas of agricultural fields are present within the riparian corridor. It should however be noted that the closest known population of this species dates back to the 1955 – 1960 and that considerable urbanisation and agricultural intensification has occurred along the river corridor. Based on these assumptions the extent of the EAAA is calculated as being 2km<sup>2</sup> and is shown in *Figure 5*.

Figure 5. EAAA for Southern Even-fingered Gecko



#### Assessment against CH Criteria

The only eligible criterion for this species is Criterion 1 – Critically Endangered or Endangered species.

Population estimates for Southern Even-fingered Gecko are not available, either within Uzbekistan or across its global range and as such Area of Occupancy (global range) and the size of the EAAA have been used as proxies for determining whether this species meets the thresholds for CH, as set out in IFC PS6 GN.

The known global range is considered to be 84,750km<sup>2</sup> however not all of the global range is likely to support this species due to habitat suitability within this range. A precautionary approach has been taken which has assumed that only 1% of the EOO is likely to be occupied. This results in an AOO of 847.5km<sup>2</sup>. The EAAA covers an area of 2km<sup>2</sup>, and as such makes up 0.2% of the assumed and precautionary AOO. The threshold for triggering PS6 Criterion 1 and PR6 Criterion ii (0.5% of global population or in this case range) is not met.

Surveys completed to inform the ESIA did not record this species within the Project AoI and even if future surveys record this species within the Project site it is unlikely that CH would be triggered, however this species is a PBF species, and No Net Loss of this feature would need to be demonstrated.

### 4.2.3 Tajikistan (Sogdian) Toadhead Agama (*Phrynocephalus sogdianus*)

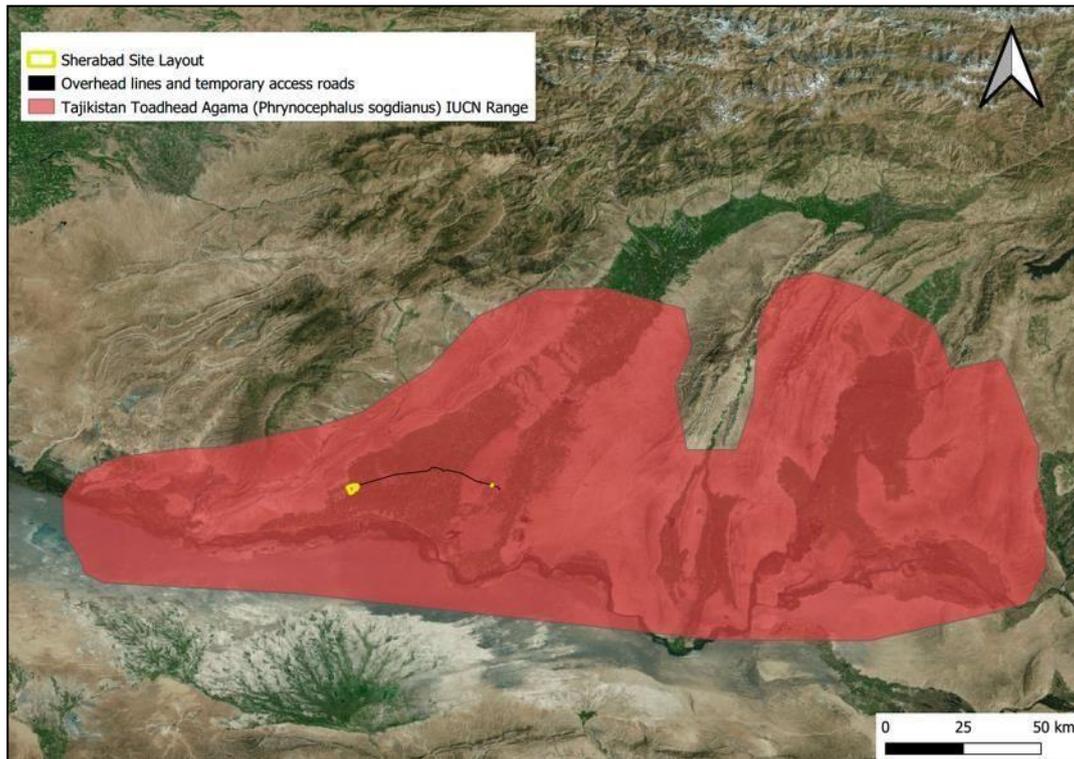
#### *Determination of EAAA*

Sogdian Toadhead Agama is listed as Tajikistan Toadhead Agama by the IUCN and as Endangered but is not included in the Uzbek Red Data Book. Population estimates are not available, either within Uzbekistan or across its global range, although it is stated on the IUCN RED List that up to 10 individuals per kilometre have been recorded in Tajikistan (T. Sattorov, unpubl. data) and agricultural development has led to the loss of more than 50% of its habitat within the last 10 years (T. Sattorov pers. comm. 2016), potentially corresponding to a comparable population decline.

**Bondarenko D. A., Ergashev U. H. 2022. Reptiles of the Southwestern Tajikistan desert plains: Spatial distribution, population density and communities structure. [in Russian] Current Studies in Herpetology 22 (1-2): 17** Population density of reptiles in four desert areas of southwestern Tajikistan was estimated in spring 2018–2019. The structure of reptile communities in seven typical landscapes was described. The highest species diversity and population density were observed in sandy landscapes. Seven species of psammobionts formed the basis of these reptile communities. Among them *Phrynocephalus interscapularis* (56.4), *Crossobamon eversmanni* (27.8), *Eremias lineolata* (15.6), *Eremias scripta* (13.0) had the highest distribution and high population density (individuals/hectare). The relationship of cohabitating species was considered. The highest total population density of reptiles (89.0 ind./ha) was discovered on sandy ridges along the Amu Darya. On the loamy plain the population density of four species was 8.4 ind./ha, and on the foothill plain 2.4 ind./ha. *Eremias nigrocellata* (2.0 ind./ha) dominated in reptile communities on solid ground. In total, 25 species of reptiles inhabit the desert plains of Southwestern Tajikistan. 17 out of 25 (68%) species are included in the national Red Data Book. The level of endemism and similarity of reptile fauna in desert areas were high. Fauna similarity indices calculated according to Sørensen were 0.9–0.8. These values indicate close contact and connection between desert communities. The formation of the reptile fauna in southwestern Tajikistan occurred as a result of dispersal of Turanian species across the left bank of the Amu Darya River from Turkmenistan. They moved to the right bank due to the changes in the riverbed at the Pleistocene Epoch. The absence of some reptile species (*Teratoscincus scincus*, *C. eversmanni*, *Phrynocephalus mystaceus*, *E. lineolata*, *Eremias grammica*, *E. scripta*, etc.) in Northern Afghanistan along the border with Tajikistan is explained by the lack of herpetological study of this territory. Their habitat in the area is highly probable. Isolation and autonomy of desert areas in the Amu Darya valley create the opportunity for formation of new taxonomic forms.

The known global range of this species is considered to be approximately 30,000km<sup>2</sup> (Figure 6). This species therefore meets the threshold, as set out in IFC PS6 GN and EBRD PR6 GN, for consideration as Range-Restricted as it has an Extent of Occurrence (EOO) of less than 50,000km<sup>2</sup>.

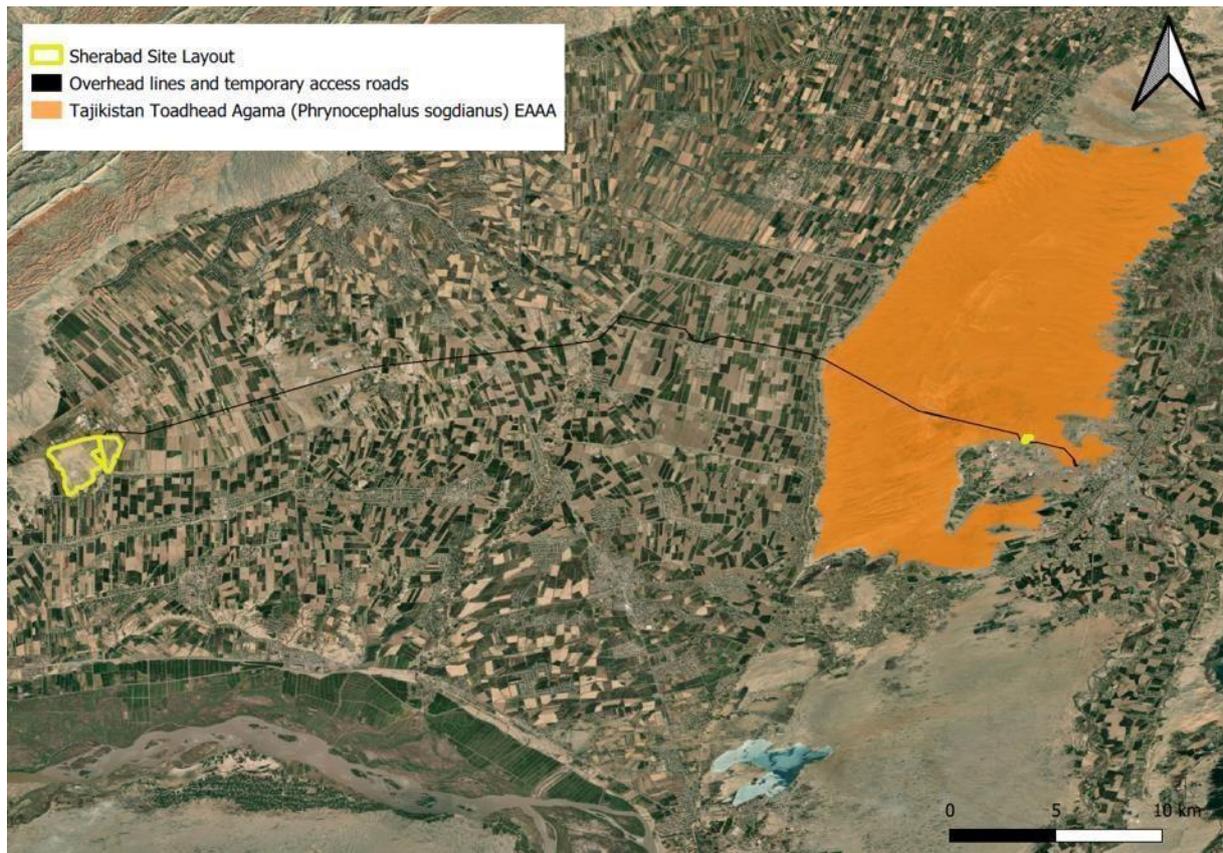
Figure 6. Global Range of Tajikistan Toadhead Agama



Tajikistan Toadhead Agama is a typical representative of psammophilic reptiles and lives only in sand dunes and semi-fixed sands. None were recorded in or around the Solar PV Site and habitats in this area are considered unsuitable. However, up to 30 individuals were found in sand dune/semi-fixed sand habitat in the vicinity of the Overhead Line route at the Khaudag Ridge during reptile surveys completed in April 2022. Habitats within the Overhead Line route in the Khaudag Ridge area are considered suitable for this species and are contiguous to the area where individuals were recorded in 2022.

The EAAA has therefore been determined to include areas of suitable habitat that are likely contiguous with the OHL route which are not separated or modified by agriculture or urbanisation. The extent of the EAAA is shown in *Figure 7* and is calculated to be 250km<sup>2</sup>.

Figure 7. Extent of EAAA for Tajikistan Toadhead Agama



#### Assessment against CH Criteria

Tajikistan Toadhead Agama is listed as IUCN Endangered but not included in the Uzbek Red Data Book. Due to its limited EOO (less than 50,000km<sup>2</sup>) it is considered as Range-Restricted. Therefore, this species is assessed against PS6 Criterion 1 and 2, and PR6 Criterion ii and iii.

There are no population estimates available for this species either within Uzbekistan or an estimated population figure across its range and as such Global Range (EOO) and size of EAAA have been used as a proxy for meeting the thresholds for CH under IFC Criterion 1 and Criterion 2, and EBRD Criterion ii and iii which are:

- Areas that regularly hold  $\geq 0.5\%$  of the global population size AND  $\geq 5$  reproductive units of a species. In absence of population data the area of the EAAA for this species has been assessed against the known global range of this species.
- The EAAA makes up 0.83% of the global range of this species and with 30 individuals recorded during surveys immediately adjacent to site it is therefore concluded that CH **has** been triggered under IFC Criterion 1 and EBRD Criterion ii for Tajikistan Toadhead Agama. CH under IFC Criterion 2/EBRD Criterion iii **is not** triggered on account of not more than 10% of population and 10 reproductive units not being exceeded.

The Area of Occurrence is likely to be significantly lower than the EOO, however assessing EAAA against AOO does not change the outcome of the assessment.

### 4.3 Priority Biodiversity Features

#### General

All species/habitats within the background data search and recorded on site, or those considered to be potentially present, have been assessed against the PBF guidelines as set out in EBRD PR6 GN, which provide a qualitative approach to the assessment. All criteria were considered for each species/habitat.

Species meeting the criteria for inclusion as Priority Biodiversity Features are presented in *Table 8* and discussed in subsequent sections.

*Table 8. Species considered to be Priority Biodiversity Features*

Species	Status (IUCN / UzRBD)	Criterion Reached
White-headed Duck	EN/EN:D	Criterion 2
Common Pochard	VU / Not Listed	Criterion 2
Marbled Teal	NT or VU / EN	Criterion 2
Saker Falcon	EN / EN	Criterion 2
Pallas's Fish Eagle	EN / Not Listed	Criterion 2
Steppe Eagle	EN / VU:D	Criterion 2
Egyptian Vulture	EN / VU:D	Criterion 2
Eastern Imperial Eagle	VU / VU:D	Criterion 2
Eurasian Griffon Vulture	LC / VU:D	Criterion 2
Little Bustard	LC / VU:D	Criterion 2
Bearded Vulture	NT / VU:R	Criterion 2
Asian Houbara	VU / VU:D	Criterion 2
Great Bustard	VU / CR	Criterion 2
Marbled Polecat	VU / VU:D	Criterion 2
Southern Even-fingered Gecko	IUCN CR, UzRBD VU:D	Criterion 2
Central Asian Tortoise	VU / VU:D	Criterion 2
Boettiger Caspian Toad-headed Agama	LC / VU:D	Criterion 2
Black Ocellated Racerunner	LC / VU:D	Criterion 2
Transcaspian Desert Monitor	LC / VU:D	Criterion 2
Indian-Gamma (Common Tree) Snake	LC / VU:R	Criterion 2
Afghan Awl-headed Snake	LC / VU:R	Criterion 2
Northern (Barred) Wolf Snake	LC / VU:R	Criterion 2
Tartar Sand Boa	LC / NT	Criterion 2

#### 4.3.1 Criterion 1 Threatened habitat

No habitat types or ecosystems were present or identified as being potentially present, that would be considered as priority habitats as such Criterion 1: Threatened Habitat has not been triggered.

### 4.3.2 Criterion 2 Vulnerable species

#### *Plant Species*

No plant species were recorded which would be considered as Priority Biodiversity Features under PBF Criterion 2.

#### *Bird Species*

White-headed Duck, Pallas's Fish Eagle, Egyptian Vulture, Saker Falcon and Steppe Eagle are listed as Endangered by the IUCN and whilst none of these species meet the thresholds for triggering Critical Habitat, they are all considered to be PBFs. An additional seven bird species that are IUCN Vulnerable are considered to qualify as PBF under Criterion 2 and these are Common Pochard, Eastern Imperial Eagle, Eurasian Griffon Vulture, Bearded Vulture, Little Bustard, Asian Houbara and Great Bustard.

#### *Mammal Species*

Marbled Polecat are present within and due to its national conservation status qualifies as a Priority Biodiversity Feature under PBF Criterion 2.

#### *Reptile Species*

Central Asian Tortoise was the only IUCN Vulnerable species recorded within the Project AoI however a number of other species which are of national conservation concern (VU) are considered to be present and are identified as being PBFs. These are; Boettiger Caspian Toad-headed Agama, Transcaspian Desert Monitor, Black Ocellated Racerunner Indian Gamma (Common Tree) Snake, Afghan Awl-headed Snake, Northern (Barred) Wolf Snake and Tartar Sand Boa.

### 4.3.3 Criterion 3 Significant feature as identified by stakeholders or governments

The Project AOI does not fall within any significant biodiversity features, nor is it within close proximity to nationally protected or internationally designated sites.

### 4.3.4 Criterion 4 Ecological structure and functions that are vital to maintaining the viability of priority biodiversity features

The Project Site does not contain areas of structure or function (e.g., major dispersal or migration corridors) vital for the maintenance of viable populations of Priority Biodiversity Features and as such Criterion 4 has not been triggered.

## **5 MITIGATION AND FUTURE MANAGEMENT**

### **5.1 General**

Direct impacts from the construction of the Project are likely to be limited to habitat loss within the PV site, although this is loss of modified and degraded habitat, and within the Overhead Line route as well as possible direct impacts on reptile and mammal species during the construction phase of the project.

Operational impacts of the project are likely limited to potential direct impacts on soaring species of birds (vultures and eagles) and as such mitigation measures set out in the ESIA (e.g bird deflectors along whole length of OHL) will be adhered to. Operational monitoring for reptiles and bird carcasses will also be completed along the route of the Overhead Line for a minimum of three years post construction. Due to the presence of PBF bird species the Projects BAP / BMP will set out an adaptive management strategy in case impacts on any PBF bird species are recorded.

Tajikistan Toadhead Agama (IUCN EN) is present within the Project EAAA and whilst it has not been recorded in the Solar PV Site, habitats along the Khaudag Ridge section of the Overhead Line are considered suitable with up to 30 individuals recorded in the same adjacent habitat. This is the only CH qualifying species, , the Project will commit to achieving net gain over the lifespan of the project.

For the bird, mammal and reptile species that qualify as PBFs, the Project is committed to achieve at least no net loss for PBFs over the lifespan of the scheme.

### **5.2 Mitigation and Monitoring**

#### **5.2.1 Biodiversity Management Plan (BMP)**

All CH qualifying species and PBFs will need to be included in the Biodiversity Management Plan (BMP). The BMP will fully detail all relevant construction mitigation measures (Construction BMP) and habitat restoration and operation mitigation and enhancement measures (Operation BMP) which will be completed during and after the construction period to achieve the objectives of Net Gain for Tajikistan Toadhead Agama and No Net Loss for PBFs.

As a minimum, for the Critical Habitat qualifying species, Tajikistan Toadhead Agama, further preconstruction surveys will be required and if present in working areas, a translocation (taking into account any local permits or restrictions which may be required) away from working areas to a suitable receptor site will also be required.

### 5.2.2 Biodiversity Monitoring and Evaluation Program (BMEP)

The BMEP should validate the accuracy of predicted impacts and risks to biodiversity values posed by the Project, and the predicted effectiveness of biodiversity management actions and should include the following:

- Baseline: measures of the status of biodiversity values prior to the Project's impacts
- Process: monitoring of the implementation of mitigation measures and management controls
- Outcomes: monitoring of the status of biodiversity values during the life of the project, compared to the baseline.

The BMEP should include a practical set of indicators (metrics) for the biodiversity values requiring mitigation and management. Specific thresholds (e.g. KPIs) should be set for monitoring results that will trigger a need to adapt the management plan(s) to address any deficiencies in performance.

Monitoring of populations of CH and PBF species known to be present on site will be undertaken to ensure that there are no long-term negative impacts as a result of the Project. On-going monitoring and reporting will be completed throughout the construction and operation phases of the Project in accordance with the relevant monitoring plans.

## 6 SUMMARY

Tajikistan Toadhead Agama is the only species that occurs or possibly occurs within the Project AOI that triggers CH due to its global conservation status as well as its global range / population. Although the species was not recorded within the Project Site, habitats at the eastern end of the Overhead Line route are suitable for this species and they were confirmed as present in the same habitat immediately adjacent to the route.

Southern Even-fingered Gecko was assessed against IFC Criterion 1 and EBRD Criterion ii, as this is an IUCN Critically Endangered species, however the threshold for CH was not met and it is likely the thresholds would not be met even if future surveys show that this species is present on the Project Site.

Pre-construction surveys, at appropriate times of the year, will need to be completed to establish presence/absence in proposed works areas and if found to be present in these areas or considered likely to occur in these areas during construction, additional mitigation (e.g. limited translocation to a suitable receptor site) will be required.

There are additional species of reptile and bird and mammal species that are considered to be PBFs and mitigation and monitoring for these species will be included in the BMP and BMEP.

It is considered that the Project has met the requirements as set out in IFC PS6 Paragraph 17 and the measures detailed above will be included in the BMEP and BMP documents. These documents will also set out measures designed to achieve No Net Loss for those species defined as PBFs and Net Gains for the CH qualifying Tajikistan Toadhead Agama.