Initial Environmental Examination

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Afghanistan: Energy Sector Development Investment Program (Tranche 7)

Annex 1: Critical Habitat Assessment

Prepared by the Da Afghanistan Breshna Sherkat for the Asian Development Bank.

PUL-E-HASHIMI – SHINDAND – FARAH TRANSMISSION LINE

AFGHANISTAN

CRITICAL HABITAT ASSESMENT

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EARTH ACTIVE

Registered Office:
4th floor, Holden House, Rathbone Place, W1T 1JU United Kingdom

Registered Company No.
11468960

EARTH ACTIVE
ESG Advisors

1. Overview

This report summarises the findings of the Critical Habitat Screening and Scoping process for the proposed Pul-e-Hashimi – Shindand - Farah transmission line, substations and distribution network. It identifies triggers for potential Critical Habitat in the Project Area of Impact (AoI). The assessment has been desk-based and involved a review of data from the Integrated Biodiversity Assessment tool (IBAT), the Project Initial Environmental Examination (IEE) and other reliable data sources.

The report is in compliance with the ADB Safeguard Policy Statement (SPS) 2009. Where further detail and guidance is required the IFC Guidance Note 6 (GN6) thresholds have been adopted to support the ADB criteria. The first stage is Screening during which all protected areas, habitats and species known or likely to be present within 50km of the proposed project alignment are identified, categorised by their nature conservation status and assessed on whether they are or likely to be present in the AoI. The second Scoping stage assesses each relevant ecological receptor against the seven Critical Habitat criteria in accordance with the ADB requirements and supporting IFC thresholds.

2. Project Understanding

The project will comprise of two components (see Figure 1):

Component 1:

(i) the 220kV double circuit transmission line from the Pul-e-Hashemi substation in the Herat province to the proposed Shindand substation, with a line length of 135 km
(ii) 220kV double circuit transmission line from the proposed 220/20kVShindand substation in the Herat province to the proposed 220/20kV Farah substation with a line length of 176 km; (iii) construction of the 220/20kV Shindand substation and expansion of 220/20kV Pul-e-Hashemi substation in the Herat province; and (iv) construction of the 220/20kV Farah substation in the Farah province

Component 2:

i) the design and construction of the distribution network in the Shindand area to provide 7,000 household connections
ii) The design and construction of the distribution network in the Farah area to provide 20,000 household connections

The transmission line will follow the major road between Farah and Herat for most of the route, occasionally diverting by a kilometre or two. The exception is the link to the Shindand substation at which point the transmission line diverts significantly from the road. Approximately 20% of the route crosses agricultural land and the rest crosses arid desert or semi-desert (see Figure 2). The topography is mainly flat but the elevation of the project route changes by approximately 100m along its alignment. The alignment crosses multiple small water channels in villages and 3 larger (highly seasonal) rivers. The overall climate of the project area is cold semi-arid under the Köppen climate classification.

Figure 1 – Project transmission line alignment and substation locations

Figure 2 - General environmental conditions of project area

3. Area of Influence & Area of Analysis

The Area of Influence (AoI) is a 1km buffer surrounding all project activities. The AoI is the area within which direct impacts on protected areas, habitats or species may occur during construction or operation (see IEE for more details). International best practice frequently cites 250m as an appropriate AoI for linear infrastructure projects (e.g. transmission lines or roads) as this is the distance significant adverse air and noise impacts are recorded. This assessment applies the precautionary approach and therefore adopts a wider AoI.

The AoI in a Critical Habitat Assessment informs an initial step early in the process to screen species. As this project researches protected sites, habitats and species within 50km either side of the

proposed route alignment, many hundreds of ecological receptors will be identified. These species are systematically screened to confirm if they are possible CH triggers and if they are likely to regularly occur near the project, i.e. in the AoI. It is therefore a tool to filter species that are likely to be near the project and therefore be affected. In accordance with the precautionary approach mobile species, including most birds are screened in as they may occur in the AoI when in flight but certain static species such as plants may be screened out if their requisite habitat type is not in the AoI.

All ecological receptors that are present or potentially present in the AoI are then assessed to determine if they meet the SPS CH criteria. If it is feasible that a species meets CH thresholds, and it is appropriate, an Ecologically Appropriate Area of Analysis (AoA) is established for this species. An AoA must and always will be species specific and will depend on the ecological characteristics of the species e.g. the species population, distribution, range, behaviour, habitat requirements, prey, seasonal mitigation and so on. An assessment is then made to confirm whether the AoA could support enough a great enough population to trigger CH.

4. Critical Habitat Requirements

Critical Habitat (CH) is defined in the ADB Safeguard Policy Statement (SPS) (2009) as a subset of both natural and modified habitat that has high biodiversity value and deserves particular attention. Critical Habitat is fundamentally based on the following seven criteria:

1. habitat required for the survival of critically endangered or endangered species
2. areas having special significance for endemic or restricted-range species
3. sites that are critical for the survival of migratory species
4. areas supporting globally significant concentrations or numbers of individuals of congregatory species
5. areas with unique assemblages of species or that are associated with key evolutionary processes or provide key ecosystem services
6. areas having biodiversity of significant social, economic, or cultural importance to local communities

The SPS also states that CH includes:

7. 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.

To help determine if Critical Habitat is present the International Finance Corporation (IFC) Guidance Note (GN) 6 has been adopted throughout this process. IFC GN6 gives specific numerical thresholds that can be applied to the Critical Habitat Requirements set by the ADB SPS. These thresholds are broadly based upon globally standardised numerical thresholds published in IUCN's *A Global Standard for the Identification of Key Biodiversity Areas* and *Red List Categories and Criteria*. The thresholds are indicative and serve as a guideline for decision-making only. There is no universally accepted or automatic formula for making determinations on critical habitat.

5. The Critical Habitat Process

The first stage of the assessment, Screening, is predominantly research based and identifies all protected areas, habitats and species present or potentially present within 50km of the proposed route alignment. The IBAT tool was used to provide much of the data. It was supplemented with

further research, for example more a more detailed review of the species present in relevant protected areas.

The data shows 422 species that have the potential to be present within 50km of the project. These, and their taxonomic groups and IUCN global threat status are presented in Table 1 below. There are no protected sites within 50km but Hari Rud valley, an Important Bird Area (IBA) is located 8km north-east of the project alignment at its closest point.

Table 1: Stage One results – species present or potentially present within 50km of the proposed route alignment.

Group	Critically Endangered	Endangered	Vulnerable	Near Threatened, Least Concern, Data Deficient	**Total**
Birds	2	4	8	224	**238**
Mammals	0	0	5	60	**65**
Reptiles	0	0	0	21	**21**
Amphibians	0	0	0	3	**3**
Fish	0	0	0	4	**4**
Invertebrates	0	0	0	42	**42**
Plants	0	0	0	48	**48**
Fungi	0	0	0	1	**1**
Total	**2**	**4**	**13**	**403**	**422**

The Screening stage concludes with an assessment of which of these species are present or potentially present in the AoI. For the 422 species identified above, the likelihood of them occurring in the AoI is informed by their typical ranges, habitat requirements, movement and migratory routes, breeding sites, populations distributions etc.

All ecological receptors that are present or potentially present in the AoI are then assessed to determine if they meet the SPS criteria. This is the Scoping stage.

The results of the Screening and Scoping stage are summarised below for each the seven SPS criteria. Each criteria concludes whether the proposed project triggers Critical Habitat.

1. Critical Habitat Requirement 1 – Endangered Species

ADB Requirement one for critical habitat is areas *required for the survival of critically endangered or endangered species*. The corresponding IFC GN(6) guidance for this requirement adds further detail to allow more accurate assessment, and is as follows:

a) Areas that support globally important concentrations of an IUCN Red-listed EN or CR species (≥0.5% of the global population AND ≥ 5 reproductive units GN16 of a CR or EN species).
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 GN72(a).
c) As appropriate, areas containing important concentrations of a nationally or regionally listed EN or CR species.

1.1 Screening

Criterion 1(a) - Globally Endangered and Critically Endangered Species

The following 6 globally endangered and critically endangered species were identified as being potentially present within 50km of the route, see Table 2.

Table 2 – Endangered and Critically Endangered Species potentially present.

Species name	Common name	IUCN Category	Taxonomic Class
1. *Gyps bengalensis*	White-rumped vulture	CR	Aves
2. *Vanellus gregarius*	Sociable lapwing	CR	Aves
3. *Aquila nipalensis*	Steppe eagle	EN	Aves
4. *Falco cherrug*	Saker falcon	EN	Aves
5. *Neophron percnopterus*	Egyptian vulture	EN	Aves
6. *Oxyura leucocephala*	White-headed duck	EN	Aves

Criterion1(b) – Globally Vulnerable Species

The following 13 globally vulnerable were identified as being potentially present within 50km of the route see Table 3.

Table 3 – Vulnerable Species potentially present.

Species name	Common name	IUCN Category	Taxonomic Class
1. *Aquila heliaca*	Eastern imperial eagle	VU	Aves
2. *Aythya ferina*	Common pochard	VU	Aves
3. *Chlamydotis macqueenii*	Asian houbara	VU	Aves
4. *Clanga clanga*	Greater spotted eagle	VU	Aves
5. *Gazella subgutturosa*	Goitered gazelle	VU	Mammalia
6. *Marmaronetta angustirostris*	Marbled teal	VU	Aves
7. *Otis tarda*	Great bustard	VU	Aves
8. *Ovis orientalis*	Mouflon	VU	Mammalia
9. *Panthera pardus*	Leopard	VU	Mammalia
10. *Streptopelia turtur*	European turtle-dove	VU	Aves
11. *Ursus thibetanus*	Asiatic black bear	VU	Mammalia
12. *Vormela peregusna*	Marbled polecat	VU	Mammalia
13. *Columba eversmanni*	Yellow-eyed pigeon	VU	Aves

Criterion 1(c) – Nationally endangered species

IFC guidance states that *as appropriate, areas containing important concentrations of a nationally or regionally listed EN or CR species* should be considered for Critical Habitat. These are summarised in National Red Lists. However, in order for a national/regional red list to be relevant to the Critical Habitat criteria it must have *adhered to IUCN guidance*. Although Afghanistan has a national red list, which lists both protected species and species of conservation significance, it does not seem to comply with IUCN guidelines. It does not use the categorisations VU, EN and CR, which are required for compliant assessments and therefore makes it unsuitable. Criterion 1(c) is thus not applicable for this Critical Habitat Assessment. However, the relevant threatened species will have been assessed adequately under Criteria 1 (a) and (b).

Screening Results

The initial Critical Habitat Screening Assessment concluded that 4 of the 19 species did not "regularly occur" in the Project Area of influence and were screened out. The remaining 15 species have the potential to meet the ADB SPS CH criteria and either regularly occur in the Project Area or, in accordance with the precautionary approach, were assumed to regularly occur. Further details on all 15 species are found in the table below.

Table 4- Results of the Criteria 1 screening assessment

Latin name	Common name	IUCN Category	Comments
Vanellus gregarius	Sociable lapwing	CR	Potentially occur in passage only. Although Migratory data suggests they pass to the east of the project alignment. They could migrate through the area although this is likely to be rare. No stopover locations have been identified where this species may be concentrated. Instead, individuals may pass over in passage during each migratory season and are thus more appropriately assessed under criterion 3 (areas critical for the survival of migratory species).
Aquila nipalensis	Steppe eagle	EN	Present in passage only. Steppe Eagle are more appropriately assessed under criterion, since a population is not concentrated in the area at any one point in time, but individuals may pass over during each whole migratory season.
Falco cherrug	Saker falcon	EN	Estimated 10-100 breeding in Afghanistan. It is likely that Saker falcon breed (or used to breed) in regions bordering Turkmenistan and Iran (Dixon 2009).
Neophron percnopterus	Egyptian vulture	EN	Potentially breeding in the area.
Oxyura leucocephala	White-headed duck	EN	Potentially resident in the Hamoun wetlands on the Iraqi border (>80km south of the project), although these have undergone severe habitat degradation in the last few decades. Potentially found over the subject area only in passage. Because of this White-headed duck are more appropriately assessed under Criteria 3.
Aquila heliaca	Eastern imperial eagle	VU	May migrate through the area. Eastern Imperial Eagle are more appropriately assessed under criterion 3, since their population is not concentrated in the area at any one point in time but during each migratory season.
Aythya ferina	Common pochard	VU	Potentially present in the Hamoun wetlands on the Iraqi border for overwintering, although these have undergone severe habitat degradation in the last few decades. Potentially found over the subject area only in passage. Common Pochard are more appropriately assessed under Criteria 3.
Chlamydotis macqueenii	Asian houbara	VU	Potentially present during winter or all year round. The region also forms part of the migratory route for birds migrating further south to Pakistan.
Clanga clanga	Greater spotted eagle	VU	Present likely only in passage, potentially overwinter. Greater Spotted Eagle are more appropriately assessed under criterion 3, since a population is not concentrated

			in the area at any one point in time, but individuals may pass over during each whole migratory season.
Gazella subgutturosa	Goitered gazelle	VU	Potentially present.
Marmaronetta angustirostris	Marbled teal	VU	Potentially present in the Hamoun wetlands overwintering. May migrate over the area. Marbled Teal are more appropriately assessed under Criteria 3.
Otis tarda	Great bustard	VU	Potentially present. May overwinter in the Northern parts of the project area.
Streptopelia turtur	European turtle-dove	VU	Potentially present and breeding in the area but very widespread species, minimum population 12 million.
Vormela peregusna	Marbled polecat	VU	Unlikely to be present in the project area according to distribution map. Very widespread species across much of Asia and the Middle East.
Columba eversmanni	Yellow-Eyed Pigeon	VU	Known to breed in the Hari Rud Valley, 20km from the AoI at the closest point. Possibly breeds in project area and is likely to migrate through it. 20 breeding pairs in 1949.

Eight species known to regularly occur or potentially regularly occur in the project AoI (Table 5) that assessed against criterion 1.

As shown in table 4, the other seven species are migratory and are only known to occur in the project area in passage. They do not overwinter in the project area nor do they use it as an important stop-off site during migration. Therefore, the project area does not *support globally important concentrations* of these species, and they are likewise more appropriately assessed under criterion 3, where the importance of the site as a potential bottleneck or stopover for migratory species as a whole is assessed.

1.2 Scoping

Critical Habitat thresholds are not met for any of these species. The local population sizes are not deemed large enough to meet the criteria set out in IFC GN6. Full justification of this for each species is detailed in Appendix A. **Thus, the project does not trigger Critical Habitat for Criterion 1, see Table 5.**

Table 5- Results of the Criteria 1 scoping assessment

Latin name	Common name	IUCN Category	Critical Habitat?
Falco cherrug	Saker falcon	EN	No
Neophron percnopterus	Egyptian vulture	EN	No
Chlamydotis macqueenii	Asian houbara	VU	No
Gazella subgutturosa	Goitered gazelle	VU	No
Otis tarda	Great bustard	VU	No
Columba eversmanni	Yellow-Eyed Pigeon	VU	No

Despite the species not triggering Critical Habitat it is recognised that these species are globally vulnerable or endangered and the project must ensure the protection of their conservation status at least and no deterioration of it. If present, avoidance or mitigation may be needed to prevent net harm or loss for these globally threatened species, particularly Endangered Saker Falcon and Egyptian Vulture. As such a Biodiversity Action plan is recommended. It will provide details of any further surveys and mitigation measures necessary.

2. Critical Habitat Requirement 2 – Restricted - range Species

ADB Requirement two for critical habitat is areas *having special significance for endemic or restricted-range species*. The IFC GN(6) defines a terrestrial restricted range species as that with an EOO (Extent of Occurrence) of less than 50,000km^2. The Critical habitat threshold this requirement is as follows:

a) Areas that regularly hold ≥10% of the global population size AND ≥10 reproductive units of a species.

The IBAT tool was used to identify any species potentially present within 50km of the alignment that was listed by the IUCN as having an EOO of less than 50,000km^2. None were found to be present. This is not surprising as Afghanistan, and central Asia as a whole, does not have high rates of endemism compared to other geographic locations, with the majority of species widely distributed but rare across their range. **Therefore, the project area does not contain Critical Habitat under Criterion 2.**

3. Critical Habitat Requirements 3 and 4 – Migratory and Congregatory species

ADB requirements 3 and 4 *sites that are critical for the survival of migratory species* and *areas supporting globally significant concentrations or numbers of individuals of congregatory species*.

The relevant IFC Thresholds are as follows:

a) Areas known to sustain, on a cyclical or otherwise regular basis, ≥ 1 percent of the global population of a migratory or congregatory species at any point of the species' lifecycle.

b) Areas that predictably support ≥10 percent of the global population of a species during periods of environmental stress.

Afghanistan is an important part of the Central Asian Flyway, with a large number of bird species migrating from breeding ground further North to overwintering sites particularly in Pakistan and India. Birds do migrate through the area, which seems to be part of a much wider migratory flyway (hundreds of kilometres wide) as birds are funnelled around the Hindu Kush and associated mountain ranges to the East. In order to assess whether the project area falls within Critical Habitat for Migratory species, the IUCN criteria used to assess Key Biodiversity Areas is referred to. For Migratory corridors the IUCN standard states that 'along migratory corridors, KBAs should be identified for stop-over or bottleneck sites rather than for the entire corridor'. In the same way, it would be inappropriate to designate the entirety of a broad flyway as Critical Habitat. Instead, areas that represent bottleneck sites or important stopovers should be designated as Critical habitat for Migratory species.

<u>Bottleneck sites</u>

There is no evidence from either satellite tagging data or topographic/geographic features that this area is a particular bottleneck within the broader flyway. Figures 4 – 7 show the migration routes of satellite tagged birds for four different species. Globally threatened species are preferentially researched given they are more likely to have smaller population sizes or be geographically restricted, and thus the area is more likely to sustain ≥ 1% of their global populations. Threatened species also tend to be more researched and thus satellite data was available for these species. Data on general migration routes for a wider range of species is not available for Afghanistan.

For all species researched the migration routes pass over a very wide corridor, with different individuals taking different routes, some over the mountains to the east, without any evidence that they pass through a bottleneck site. As well as the species shown in Figures 4 - 7, satellite data from European cranes and bird ringing data from a range of ducks and geese was also consulted. This is also supported by the general topography, which is fairly uniform and flat, with a few areas of higher relief but no steep valleys likely to bottleneck species (see Figure 3). There is therefore no indication that the area meets the criteria for KBA designation. Given this, and that it is part of a more extensive flyway of similar importance for a substantial distance, **it is not appropriate to consider the Project area to be Critical Habitat for criteria 3 migratory birds**.

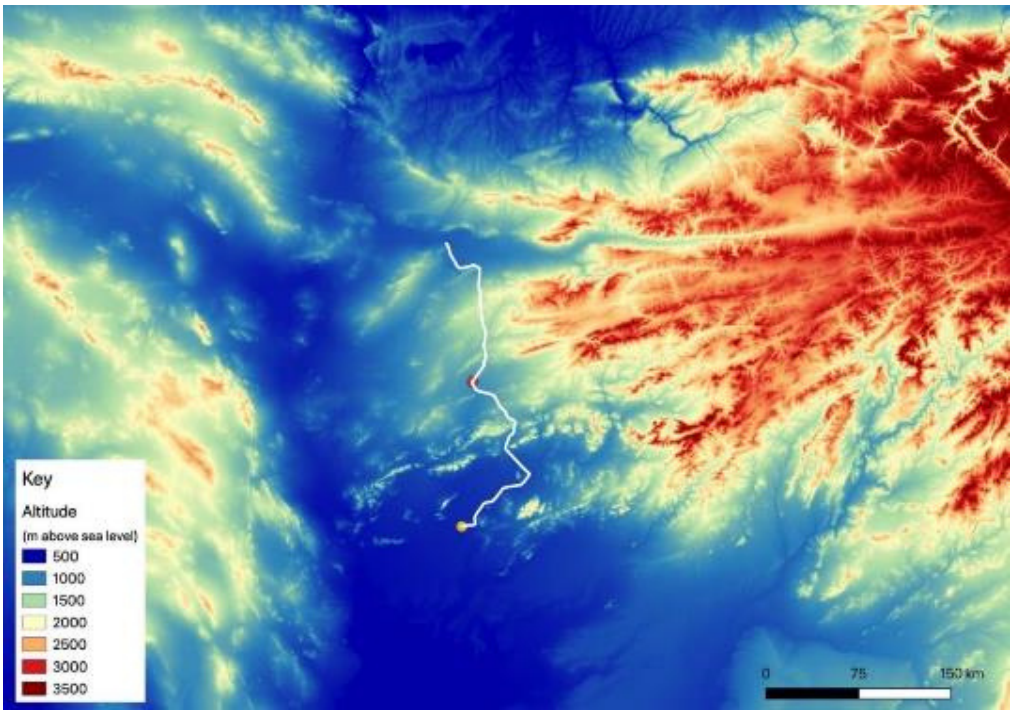
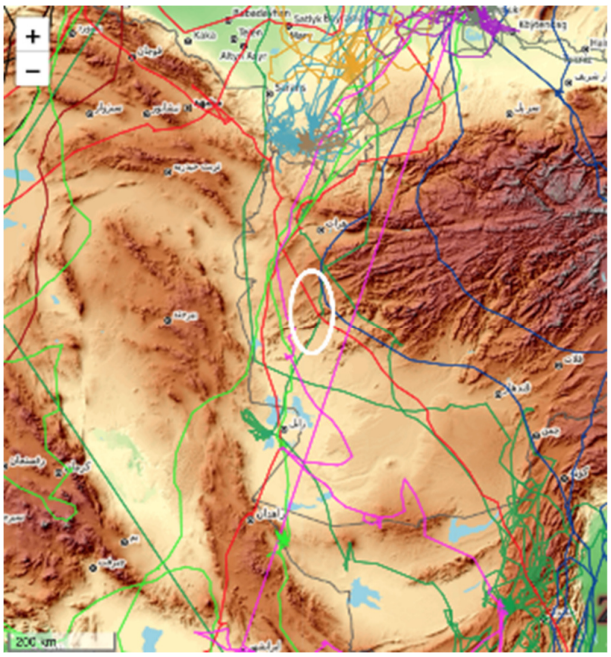
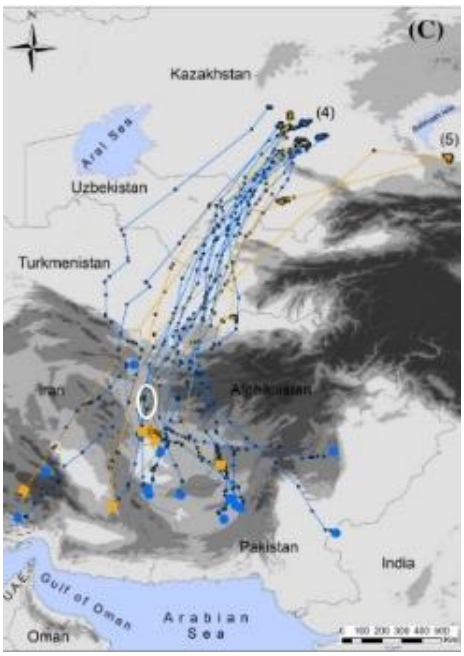
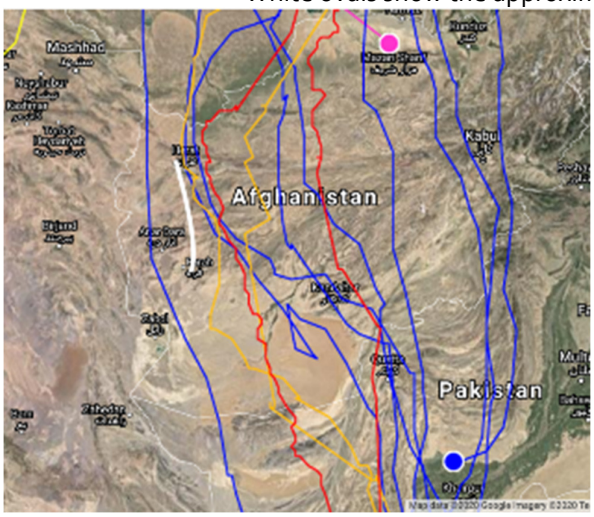


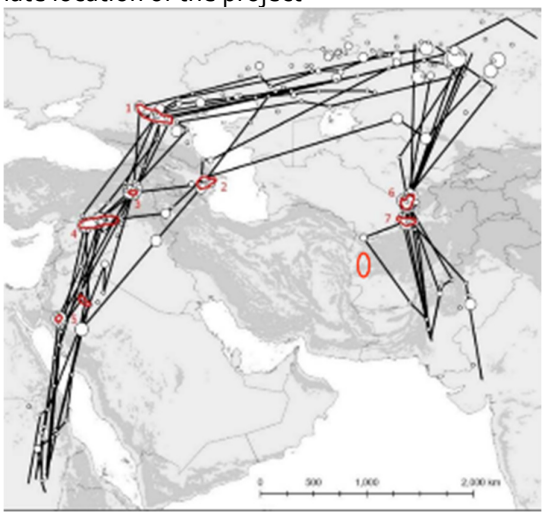
Figure 3: Altitude map and detailed route alignment (units are m above sea level)





Figures 4 and 5 – Steppe Eagle (left) and Asian Houbara (right) migratory routes. White ovals show the approximate location of the project





Figures 6 and 7 – Eastern Imperial and Greater spotted Eagle (left)and Sociable Lapwing (right) migratory routes. Red circle (right) shows approximate location of the project, white line (left) shows the approximate transmission line alignment.

Stopover sites/ sites supporting congregations

The landscape is largely barren and arid and no major standing water bodies have been identified which are used as stopovers for migratory waterbirds. Species such as the Houbara bustard are known to stop-off in desert and semi-desert habitat, however the important stopover for this species in Afghanistan is thought to be the Registan desert, around 200km to the South of the project. Raptor species may also stopover in the area but there is no reason to imply this region has a greater abundance of prey than the rest of the broad migration corridor and so it is very unlikely they stop over in significant concentrations. This is supported by the available data, including that from satellite tracking, which has nothing to suggest that the area is a significant stop-off for any species researched. This is further supported by the fact that the project area does not contain any KBAs or

IBAs designated for migratory or congregatory species. The IBA criteria A4 is equivalent to CH Criterion 3a - 'the site is known or thought to hold congregations of ≥1% of the global population of one or more species on a regular or predictable basis 'and so key stopover locations such as the Registan desert (Houbara Bustard) or the Hamoun wetlands (waterbirds) have been designated as IBAs, but are not in close proximity to the proposed project.

Therefore, the project area does not contain Critical Habitat under Criteria 3 and 4. Nonetheless, the data suggests that the wider area is of importance to migratory species. Transmission line developments in this migratory corridor present a risk to these species and the project should aim to mitigate potential impacts to at least no net loss. They may otherwise have disproportionate effects on the global population.

4. Critical Habitat Requirement 5 – Evolutionary processes and Ecosystem services

ADB Critical Habitat Requirement 5 is that Critical habitat includes *areas with unique assemblages of species or that are associated with key evolutionary processes or provide key ecosystem services.* As part of our precautionary approach and because the methods are informed by IFC GN6, the IFC 'Criterion 4 '*Highly Threatened or Unique Ecosystems'* has also been assessed.

The IFC GN6 states that areas associated with key evolutionary processes tend to have high spatial heterogeneity, which can lead to speciation via isolation or divergent evolution or environmental gradients, also known as ecotones, which produce transitional habitat and are associated with the process of speciation. The study area does not fit these criteria and indeed the landscape is actually relatively homogenous, with the unmodified habitat all being of a similar type. Further, the area is not thought to provide key ecosystem services. The AoI does cross multiple waterways, however these tend to be seasonal and flow when rainfall is high, as vegetation is sparse and so the area does not act as a good water catchment.

With regards IFC Criterion 4, no IUCN red listed ecosystems have been identified in Afghanistan, and therefore IFC guidance is instead to look to '*high priority area for conservation by regional or national systematic conservation planning'*. No habitat types of local or national conservation significance have been identified in the AoI. The AoI consists of barren, desert hills and plains with sparse vegetation as well a large areas of cultivated areas and multiple seasonal watercourses. All of these habitats are common across Afghanistan. Therefore, the project area does not constitute Critical Habitat under IFC Criterion 4 (IFC GN6 2019).

The project area does not contain Critical Habitat under Criterion 5.

5. Critical Habitat Requirement 6 – Community importance

ADB Critical Habitat Requirement 6 is that Critical habitat includes *areas having biodiversity of significant social, economic, or cultural importance to local communities.*

No Species of significant social, economic or cultural importance have been identified. Although hunting of wild species such as Houbara Bustard and Gazelle occurs these are not thought to be present in high enough numbers to constitute any significant economic importance. **Therefore, the project area does not contain Critical Habitat under Criterion 6.**

6. Critical Habitat Requirement 7 – Protected or designated areas

ADB Critical Habitat Requirement 7 is that Critical habitat includes *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*.

There are no protected areas within 50km of the project site. However, there is one Important Bird areas (IBA) within the 50km buffer zone.

IBAs do not technical trigger Critical Habitat under ADB guidelines. However, they have been assessed as part of the precautionary approach as they are internationally recognised sites which can support important bird concentrations and/or globally threatened species. Hari Rud valley IBA is approximately 8km from the project alignment at its closest point. The IBA is not within the Area of Impact for this project and thus no direct impacts are anticipated on the site. However, the biodiversity features that the site has been designated for may move beyond the IBA boundaries, and could require more detailed analysis if they potentially trigger other CH requirements. The Hari Rad Valley is designated for the Yellow-eyed Pigeon (VU), which did not come up on IBAT but has been assessed under Criterion 1 because of its Vulnerable status. **The project area does not contain Critical Habitat under Criterion 7.**

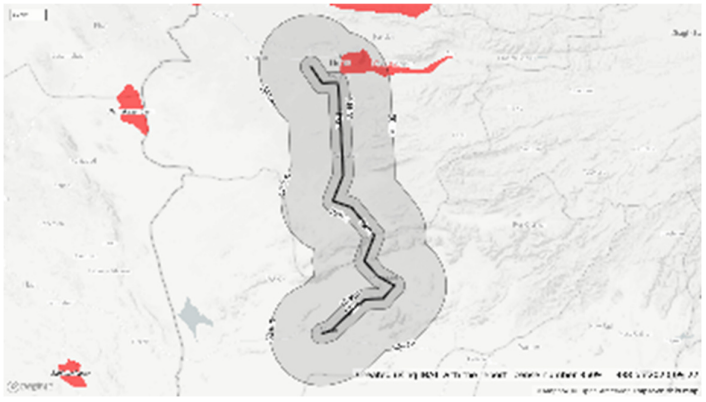


Figure 8 – proximity of Hari Rud valley IBA to the proposed project

Conclusions

The proposed Pul-e-Hashimi – Shindand - Farah transmission line, substations and distribution network does not trigger Critical Habitat. However, there is the confirmed presence of internationally vulnerable and potential presence of internationally endangered species in the area, which should be considered during the detailed design of the Project to avoid, reduce, minimise and potentially offset any potential adverse impacts.

The area is known to be within a migratory flyway for multiple species, including soaring species like eagles which can be vulnerable to collision with transmission lines. The area is also used by Asian Houbara when wintering and in Migration, and collision with transmission lines have been identified as a key threat to this species. Resident species may include the Endangered Saker Falcon and Egyptian Vulture, which are very vulnerable to electrocution on distribution lines. For Saker falcon this represents their single biggest threat in some countries - in Mongolia a study by Gombobaatar *et al.* (2004) found that electrocution was responsible for 54% of all adult saker mortality.

Further up to date data collection is recommended for one species, the Egyptian Vulture where data is lacking and global populations are declining rapidly. This should include long-term field surveys that would allow an adaptive management approach to be adopted.

Despite Critical Habitat not being triggered the project may adversely affect endangered or critically endangered species. As part of the precautionary approach a Biodiversity Action Plan / Species Management Plan should be prepared to help manage and monitor the possible impacts during construction and operation.

Appendix A – Criteria 1 detailed assessments

Saker Falcon

The saker falcon is globally categorised as Endangered (IUCN). Its minimum global population is estimated at 12,000 individuals (IUCN). It is relatively widely distributed, occurring across some of Europe and much of Asia, with the key breeding populations situated in China, Mongolia and Russia. It may breed in Afghanistan, as well as being found overwintering or in passage. There is minimal data on this species in Afghanistan. Dixon (2009) estimates that the population is between 10 and 100 individuals. ERWDA (now the Environment Agency Abu Dhabi) estimated the population in Afghanistan at 40 individuals. In the first half the 20th Century Sakers apparently bred commonly in the Pamir foothills of northern Afghanistan. The Saker was reported mainly as a wintering and passage bird in the Kabul region in the early 1970's, though it was thought they also possibly bred in the mountain regions west of the capital. It is likely that Sakers also breed (or used to breed) in regions bordering Turkmenistan and Iran where there are existing breeding populations. Many falcon trappers, often supplying Pakistani dealers, are active in the country, especially in northern, central and eastern Afghanistan. (Dixon 2009). Given the population is declining globally, and is known to be persecuted in Afghanistan (collection for the falconry trade) the current population is unlikely to have increased beyond this estimate. Therefore, it is very unlikely that 60 individuals (0.5% of the global population) are present in the AoI, given the country total is maximum 100 (likely less). This would represent the majority, if not the entirety, of the country's population, which is infeasible given the region represents a small part of Afghanistan, and breeding populations are known to occur (or previously occurred) in the Pamir foothills far to the east and potentially in the mountains around Kabul. It is true that the region is close to the Iran border, where Saker falcon may breed, and therefore the presence of breeding individuals is possible. However, the region is not thought to represent 0.5% of the global population and thus **the Project does not trigger critical habitat requirements for the Saker Falcon**. As the data on population size is only nationally and not regionally specific, and there is no data on the regional distribution of Saker Falcon in the study area then constructing an Area of Assessment is inappropriate for this species, as there is nothing to base its designation on.

Egyptian Vulture

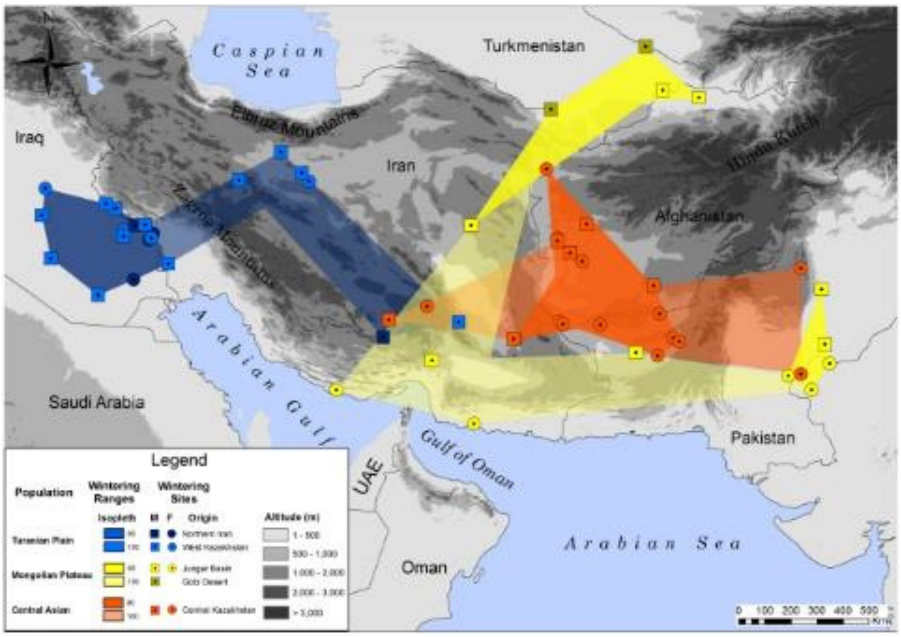
The Egyptian Vulture is globally categorised as Endangered (IUCN). Its minimum global population is estimated at 12,000 individuals (IUCN). It breeds (or used to breed) in Afghanistan but little other data could be found on the Egyptian Vulture's population or distribution in the country. There are thought to be 150-200 pairs in neighbouring Iran and 60-70 pairs in neighbouring Turkmenistan. This species typically nests on ledges or in caves on cliffs, crags and rocky outcrops and thus it's preferred territory in the country is expected to be the more mountainous regions of Central and Eastern Afghanistan, rather than the lower elevation of the AoI. Raptor species including vultures are known to suffer persecution by poisoning in Afghanistan, and this country tends to represent a low proportion of the global population of other raptor species (see Saker Falcon above). Furthermore, although the project area represents suitable habitat, although unlikely preferred nesting habitat, it is mainly arid semi-desert and food sources (carrion, small mammals and reptiles) are likely also present in low densities, and thus vultures may be present in low densities only. In order to meet Critical Habitat Requirements, the local population of Egyptian Vulture would need to exceed 60 individuals, which would be a globally important and notable concentration. Based on this reasoning it is unlikely that the AoI supports 0.5% of the global population (60 individuals) of Egyptian Vulture, and **thus it does not meet Critical Habitat Requirements under Criterion 1.** Further surveys or consultation with national experts will be necessary to verify this assessment and to provide further

detail for use in the Biodiversity Action Plan, including mitigation if the species is present (although likely in low numbers).

Asian Houbara

The Asian Houbara (or Houbara Bustard) is a ground-nesting bird that inhabits open, arid and sparsely vegetated steppe and semi-desert. The Houbara is distributed across Israel, Palestine, Jordan, Syria, Saudi Arabia, Yemen, Oman, U.A.E., Bahrain, Qatar, Iraq, Kuwait, Iran, Afghanistan, Pakistan, India, Turkmenistan, Uzbekistan, Tajikistan, Kyrgyzstan, Kazakhstan and Mongolia to China with the minimum global population estimated at 33,000. Different populations migrate to different extents, but in general birds breeding to the north in Kazakhstan and Mongolia migrate south to overwintering sites in southern Afghanistan, Pakistan and the middle east. Some populations in Iran, Turkmenistan and potentially Afghanistan are resident all year round. The Asian Houbara is thus known to be found in Afghanistan in passage on migration, for overwintering and potentially for breeding. Over 50% of the population breeds in Kazakhstan, which is the key stronghold for this species. The breeding population in Afghanistan is thought to be small, however the country is important for overwintering birds as well as birds stopping off in passage. Satellite tagged birds migrating from Kazakhstan made long stopovers in the Registan Desert (Afghanistan), the Kyzylkum Desert (Uzbekistan/Kazakhstan), the Muyunkum and Taukum Deserts (Kazakhstan) and to a lesser extent the Zhob Valley (Pakistan) (Combreau 1999). The Registan desert is around 200km south of the project alignment and is designated as an IBA for the Houbara Bustard. One bird of 5 tagged in the UAE wintered in north Afghanistan, although it was noted that this is 'where the species is not usually reported' (Launay 1999). A more recent paper by Combreau (2011) uses 15 years of satellite tagging data to determine the key migratory routes and overwintering locations of the Houbara bustard. On the western and southern edge of the Hindu-Kush, an area of ca. 400,000 km^2 mainly in Southwest Afghanistan and Northern Pakistan hosted wintering houbara originating from Central Kazakhstan. This overlaps with the southern part of the project area, although the majority of tracked birds overwinter further to the south (red squares and circles in the Figure below).

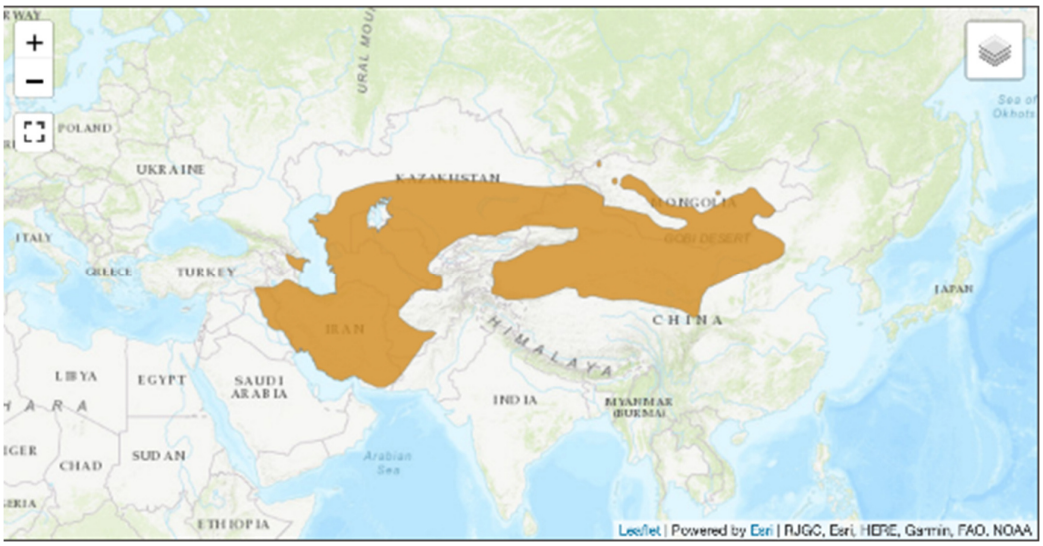
Although it is clear from this data that this species overwinters near the project area, it is infeasible that loss of this local population, which seems less important than other populations in Afghanistan, such as the Registan desert population, would lead to a change in the threat status of this relatively widespread species to Endangered. **Therefore, it does not meet Critical Habitat Requirements under Criterion 1.** Despite this, the project area is part of this species overwintering range, as well as part of its migratory route to sites further south. The species is also known to be especially vulnerable to collisions with powerlines, being a heavy bird and thus not a manoeuvrable flier. Therefore, although the project is not within Critical Habitat for this species a Biodiversity Action Plan is recommended, which may propose expert consultation and mitigation measures, to prevent net loss of this species as required by ADB.



Asian Houbara satellite tracking data maps

Goitered Gazelle

The minimum global population size is 42,000. It is a widely distributed species across much of Central Asia, Mongolia and China but rare across much of its range. More than 50% of the global population is thought to be found in Mongolia (IUCN). There is very little information on this species in Afghanistan, but it is likely rare due to persecution due to hunting, which has caused large declines in neighbours Pakistan and Turkmenistan. The project area represents a small part of the species global distribution and there is nothing to suggest that it is densely populated. Therefore, it is infeasible that the loss of the local population, which is very unlikely to represent a significant proportion of the global population, would result in the increase of this species' threat level to Endangered. **Therefore, it does not meet Critical Habitat Requirements under Criterion 1.**



Goitered Gazelle global distribution

Great Bustard

The great bustard is a large ground nesting bird. It has resident populations in Spain, whereas populations in Asia are partially migratory. Northern Afghanistan represents the southernmost tip of the overwintering range of birds breeding in Central Asia (part of Russia and Kazakhstan. According to Alonso and Palacín (2010) the Great Bustards world population was estimated to be 44100–57000 individuals in 2010, of which about 57–70% occur in Spain, 15–25% in European Russia, 4–10% in China, Mongolia and south-eastern Russia, 3–4% in Portugal, 3% in Hungary, 1–2% in Turkey, and smaller numbers in ten other countries. Thus, the percentage of the population that potentially overwinters in Central Asia (including Northern Afghanistan) is likely less than 5%. Indeed, Kessler and Smith (2014) suggest that there is only a remnant population of Great Bustard currently present in Central Asia such that even sightings of individual or small groups of continue to be 'noteworthy enough for publication'. They estimate that, in Turkmenistan, the number of overwintering individuals is just several dozen. Apart from one Great Bustard sighted in 2008 overwintering birds have not been recorded in Iran since 1971 (Kessler and Smith 2014). There is no recent data from Afghanistan, but as Central Asia supports such a small percentage of the global population, and birds overwintering in neighbouring Iran and Turkmenistan are incredibly rare, it is unlikely that they winter in Afghanistan in any significant numbers, if they are still present at all. On top of this, the preferred habitat of this species is Steppe Grassland, although it also uses agricultural areas. The region the project is situated in is too dry to support steppe grassland, instead it is mainly semi-desert. For these reasons it is infeasible that loss of the local population of Great Bustard would result in a change of its threat status from Vulnerable to Endangered and therefore, **it does not meet Critical Habitat Requirements under Criterion 1.** However, one of the major threats to this species is collision with transmission lines, as this species tends to fly at low altitudes and is heavy with low manoeuvrability in flight. Therefore, although the project is not within Critical Habitat for this species a Biodiversity Action Plan is recommended, which may propose expert consultation and mitigation measures, to prevent net loss of this species as required by ADB.

Yellow- eyed pigeon

The Hari Rud Valley IBA, which is 8km to the project AoI at its closest point, is designated for the yellow eyed pigeon. The IBA is deemed too far from project AoI to suffer from any direct impacts from either construction or operation. However, the yellow-eyed pigeon breeding in this site may regularly move 8km from their nesting and into the project AoI. The IBA was designated in 1994 but the population estimate for the Yellow-eyed Pigeon used was from 1949, which was of 20 breeding pairs. The IUCN distribution map for the yellow-eyed pigeon suggest that the breeding range is to the north of project area (including Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan and Tibet) and does not include the IBA. Either the IUCN distribution is inaccurate, which can be the case at a relatively small scale, or the IBA is no longer a breeding site for this species and they have disappeared since 1949. Either way, the IBA, which is 8km to the north of the project area is likely to represent the southernmost tip of the breeding range of this species, if indeed it still supports breeding pairs at all. Therefore, it seems unlikely that there is any significant concentration of birds breeding in the project area. They may still be found within the project AoI if they still breed within the Hari Rud valley, and may also pass over on migration. The local population is not thought to be large enough (unlikely more than 40 individuals if they are even still present) for its loss to change the threat status of this species from Vulnerable to Endangered, given its large breeding range, minimum population of 10,000 and likely restriction of breeding pairs to the Hari Rud IBA. **It does not meet Critical Habitat Requirements under Criterion 1.**