Environmental and Social Impact Assessment

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Uzbekistan: Samarkand I Solar PV and BESS Project

PART 4

Prepared by ACWA Power for the Asian Development Bank (ADB).

10.8 Avifauna

10.8.1 Context

In recognition of the importance of ensuring survey methods are fit-for-purpose, a number of specific types of methods and survey approaches have been used on differing sensitive groups of avifauna.

Within the Project areas, particularly along overhead transmission lines, Vantage Point surveying during important migratory activity periods was deemed necessary to understand risks of OTL related impacts such as collision and electrocution.

Certain elements of the proposed OTL alignments cross through areas considered suitable habitat for wintering populations of Great Bustard, and resident populations of Asian Houbara. In these areas, wintering surveying was carried out for Great Bustard, and breeding season surveying was carried out for Asian Houbara. More information is available in the subsequent sub-sections of this chapter.

Additionally, it was considered important to conduct breeding bird surveys, in particular with the aim to identify important nesting features for raptors in the region, many of which are of heightened conservation status and particularly susceptible to OTLs. Thus a separate raptor nest survey was also carried out in areas where suitable habitat and features are located within the reasonable area of influence.

10.8.2 Bird VP Methods

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

The VP survey methods followed the guidelines outlined by Scottish Natural Heritage (SNH) in 2017 for bird assessments, except for elements specifically related to collision risk modelling for wind farms. These surveys aimed to monitor bird species within the survey area, gathering data on their presence, behaviour, and abundance. Binoculars (at or over 8x magnification) and a 300mm Digital camera 300mm were used to observe and document avifauna species.

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

Table 10-46 Vantage Point locations and survey effort.

VP	Project Facility	Co-ordinates	Location Description	Survey Hours
VP14	70km OTL footprint	39.69826 66.552972	Agrolandscape	Autumn = 21 hrs Spring = 20 hrs
VP15	Nurobod BESS	39.577843 66.742028	Sazagan_1. Clay desert	Autumn = 21 hrs Spring = 20 hrs
VP16	70-km OTL	39.532496 66.509101	Clay hills with rain fed fields	Autumn = 21 hrs Spring = 20 hrs
VP17	70-km OTL	39.431038 66.131799	Djam-1. Clay hills with rain fed fields	Autumn = 21 hrs Spring = 20 hrs
VP18	70-km OTL	39.427017 65.976201	Tym. Clay desert. Solar site	Autumn = 21 hrs Spring = 20 hrs
VP19	11-km OTL	39.579068 66.79814	Clayed foothills	Autumn = 21 hrs Spring = 20 hrs

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

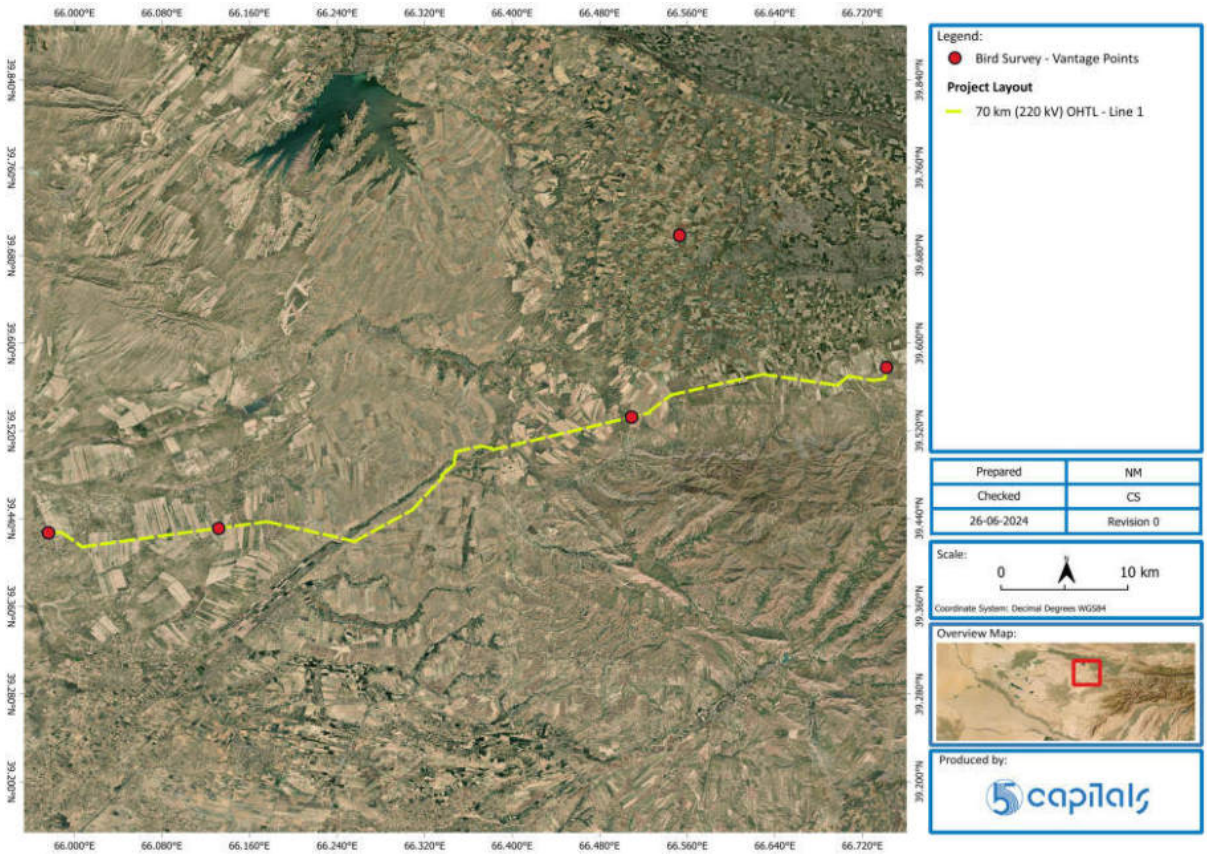

Figure 10-44 Bird VP locations surveyed along the 70-km OTL route

10.8.3 Great Bustard Winter Survey Methods

Surveying and data compilation of the Great Bustard incorporated a comprehensive analysis of literature to determine wintering patterns and habitats across Uzbekistan and neighbouring countries, and specialised survey methodology.

Literature reviews determined a historic migratory pattern southward for winter (Bostanjoglo, 1911; Gubin, 2010). However, land development in Kazakhstan seemingly led to shift in Great Bustard behaviour within Uzbekistan; transitioning from a passage migrant to a winter resident and rare breeder in specific steppe areas (Meklenburtsev, 1990; Kreuzberg-Mukhina, 2003).

Agricultural expansion during 1970's and 1980's led to habitat loss and Great Bustard population declines (Kashkarov et al., 2022), particularly in Jizzakh, Tashkent and Syrdarya. Some recovery in migrating and wintering populations in Uzbekistan were noted following positive land use changes after 1991.

Modern data on the distribution and abundance of Great Bustards during migration and winter in Uzbekistan remain sparse, largely comprising anecdotal or occasional records (Kashkarov et al., 2022). Notably, the habitat suitable for Great Bustards has diminished significantly, with no specialized census conducted in recent decades until the targeted survey in 2019 supported by the Eurasian Bustard Alliance, which confirmed wintering populations in the Pistalitau Range area (Forish District, Jizzakh region) (Ten et al., 2020). Further surveys in the winters of 2019-2020 and 2020-2021 in the Jizzakh, Samarkand, Kashkadarya, and Bukhara regions identified key wintering sites in Forish and Gallaaral Districts, recording a substantial number of individuals (Kashkarov et al., 2022).v

A winter avifauna survey was conducted between January 6th and February 13th 2024, to assess the Great Bustard populations

Given the species rarity, elusive behaviour and the fragmented nature of its populations, a complex and specialised methodology was required that emphasizes the importance of in-situ counts without extrapolation, and adheres to expert recommendations, notably those by Dr. Mimi Kessler (co-chief of the IUCN Bustard Specialist Group). The winter survey's design, inspired by standardized practices developed in Spain (Alonso et al., 1990), is tailored to be broadly applicable across the species' range.

The 2024 field survey was conducted between January 6 and February 13. The survey utilized two primary methods: a combined auto-transect method and point counts from elevated positions. In the combined auto-transect method, observers conducted slow drives through the survey areas (maximum speed of 30 km/h), making frequent stops every 1-3 km based on several factors including weather, terrain, bird density, and vegetation structure. This approach allows for a thorough coverage of the area while minimizing the risk of overlooking individuals

or groups. The second method, point counts from elevated spots, facilitates the observation of birds over a broad area, providing an advantageous perspective for spotting and recording data on the Great Bustard.

The following map shows the location of suitable Great Bustard wintering habitat near the Project facilities, which formed the focus of this survey.

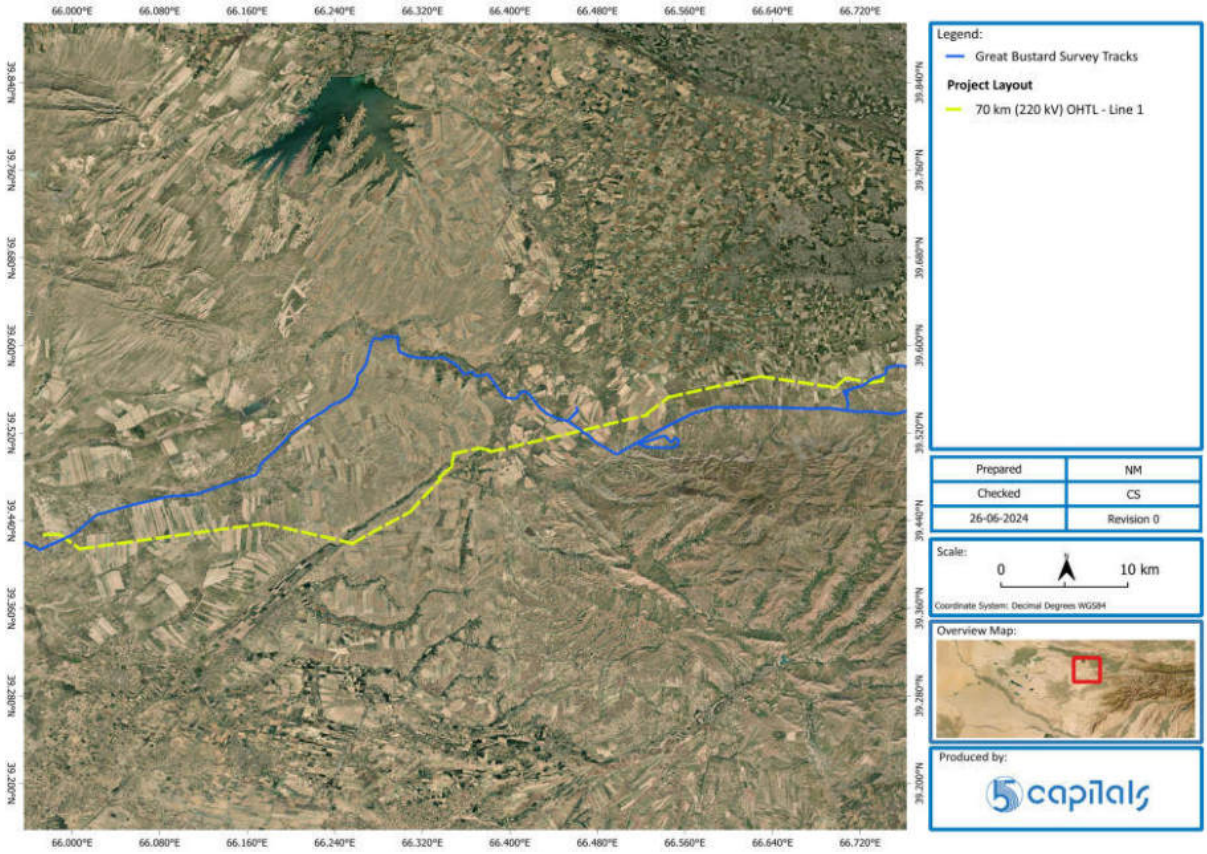

Figure 10-45 Samarkand project facilities and survey area of the winter Great Bustard survey marked by yellow.

Additionally, the survey placed importance on identifying the social and age composition of observed groups, which not only aids in understanding population structure but also in distinguishing between different groups to avoid duplicate counts. However, the average observation distance of 800-1,000 meters presented challenges in accurately determining sex and nearly impossible conditions for age identification during the 2024 surveys.

Weather conditions during the survey period were deemed suitable for conducting winter bird surveys, thereby not impeding the collection of accurate and reliable data.

The timing of the winter surveys was meticulously planned and executed in three rounds between January 5th and February 13th 2024, with specific dates set for each round to ensure a comprehensive assessment:

- January 5-15, 2024,
- January 27-31, 2024,
- February 10-13, 2024.

10.8.4 Asian Houbara Survey Methods

The Asian Houbara Survey was undertaken in the project area from March 20-29, 2024. The methodology implemented for this survey effort consisted of spring season point counts which takes advantage of the visual and acoustic observability of the males' courtship displays, given that Houbara are shy and cryptic at other times of year. During the peak breeding season in Uzbekistan (March–May) displaying males (and also floating males) are conspicuous and can be apparent from long distances. This provides an opportunity for male population assessment with a relatively high degree of accuracy (Koshkin et al, 2016).

Houbara point count surveys were conducted in potentially suitable Asian Houbara habitat within the project footprint and surroundings over two mobilizations, March 20-21 and March 29, 2024. Following a desktop review of satellite imagery, potentially suitable habitats were identified within the project areas of the 100MW PV, Nurobod BESS, 400MW PV, Pooling Station and the 70km OTL corridor, Each point count survey lasted 20-30 minutes and was undertaken by a single observer during the period of peak male display activity, i.e. within 3 h after sunrise or 2 h before sunset (Combreau and Launay 1996).

Weather conditions were generally good for counts, with the exception of several that were considered invalid due to high winds. All such invalidated surveys were subsequently repeated under suitable weather conditions within the same survey period.

10.8.5 Raptor Nest Survey

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

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

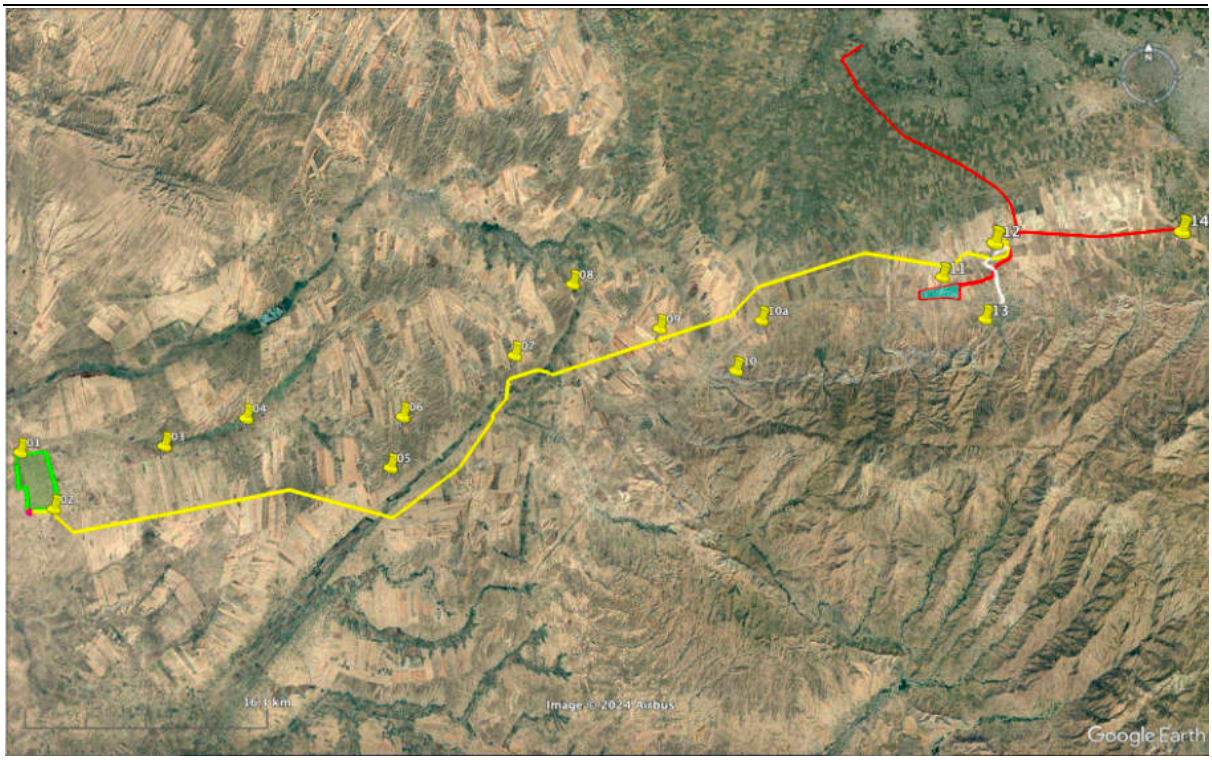

Figure 10-46 Map of suitable raptor nest locations used for surveying (Samarkand 1)

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

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

10.8.6 100 MW PV Plant

10.8.6.1 Survey Efforts

Migration Vantage Point surveys were conducted near the 100MW Plant footprint in Autumn (13th September to 8th November 2023) and Spring (5th March to 23rd April 2024). One location (VP15), approximately 4.5km from the 100MW PV Plant, was selected. The location was surveyed for 2-3 hours per visit across 7 visits, giving a total survey effort of 21 hours in autumn and 20 hours in Spring.

The VP location in relation to project facilities is shown in the following figure.

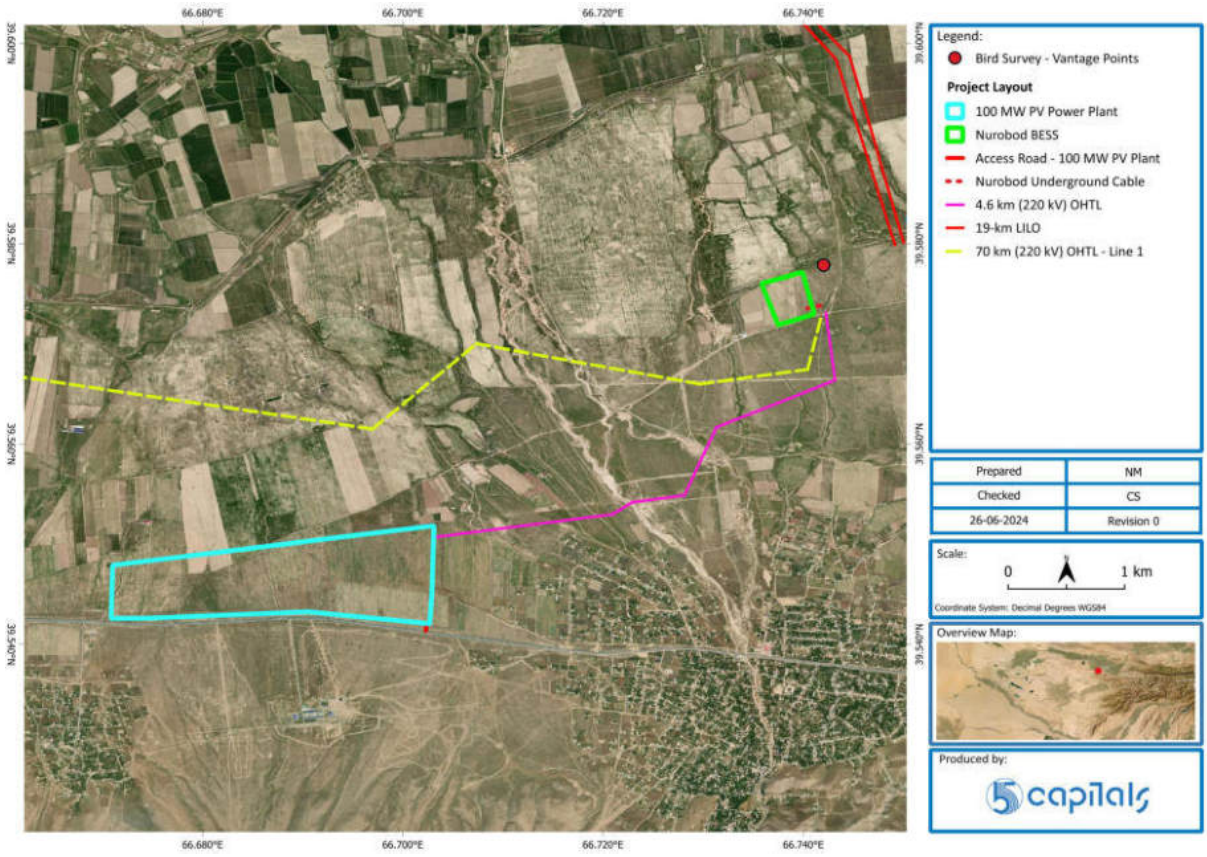

Figure 10-47 Location of Vantage Point used for Migration VP Surveys of 100 MW PV Plant

Table 10-47 Locations of Vantage Point used for Migration VP Surveys of the 100 MW PV Plant

POINT	N	E	AUTUMN DATES	SPRING DATES	SURVEY EFFORT
VP15	39.577843	66.742028	Sep 14th – Nov 8th	Mar 5th – Apr 23rd	Autumn = 21 hrs Spring = 20 hrs

Great Bustard surveys were conducted near the 100 MW PV Plant footprint using auto-transect counts on the 7th January 2024. The tracks covered during surveys are shown in the figure below.

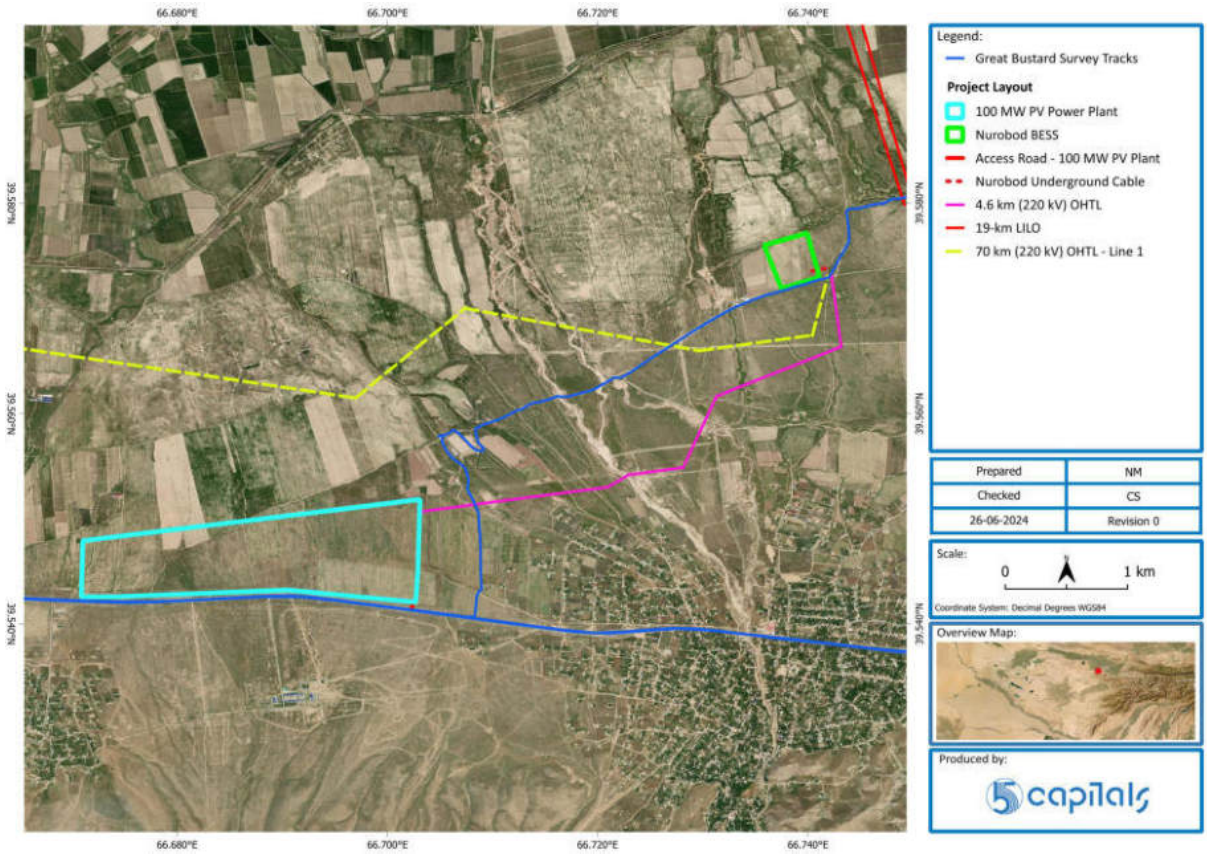

Figure 10-48 Map of Great Bustard Survey Transects in relation to the 100 MW PV Plant

Asian Houbara surveys were undertaken on March 20, 2024, at one location within the project area provided in the following figure. During the survey this location was determined to be unsuitable for breeding Asian Houbara.

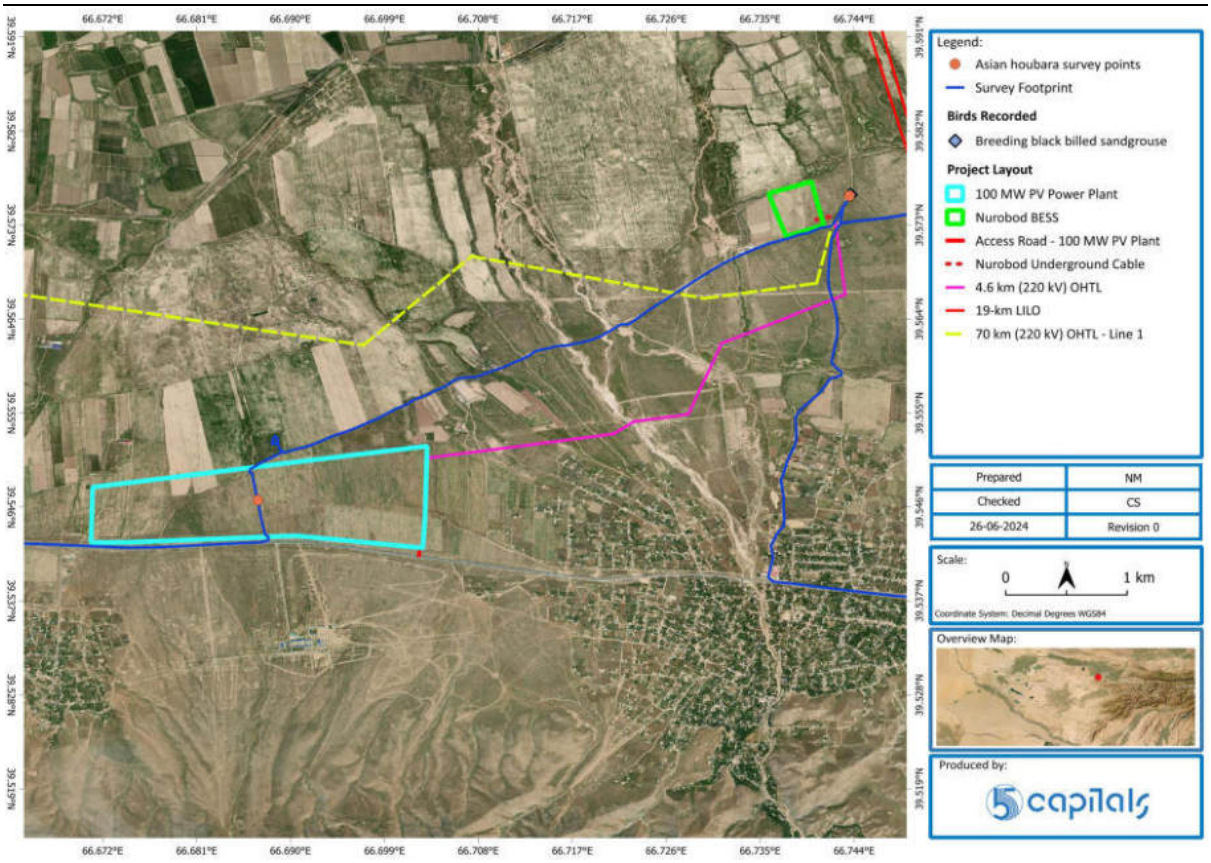

Figure 10-49 Asian Houbara Survey Point (Point 02a) at 100MW PV (Blue Polygon)

Table 10-48 Location of Point Count for Asian Houbara Survey at 100MW PV

POINT	N	E	MOB 1	MOB 2	NOTE
Point02a	39.546636	66.686862	20/03/2024	-	Unsuitable habitat for breeding Asian houbara

The raptor nest survey was carried out by a local expert between 26th and 28th April 2024. Within the 100MW PV Plant footprint and a 5km buffer, a total of 3 locations were determined to be suitable habitats for raptor nests and observed during surveys. One location was directly within the facility footprint, whilst the other two were approximately 2.5km away. The locations are shown on the figure below.

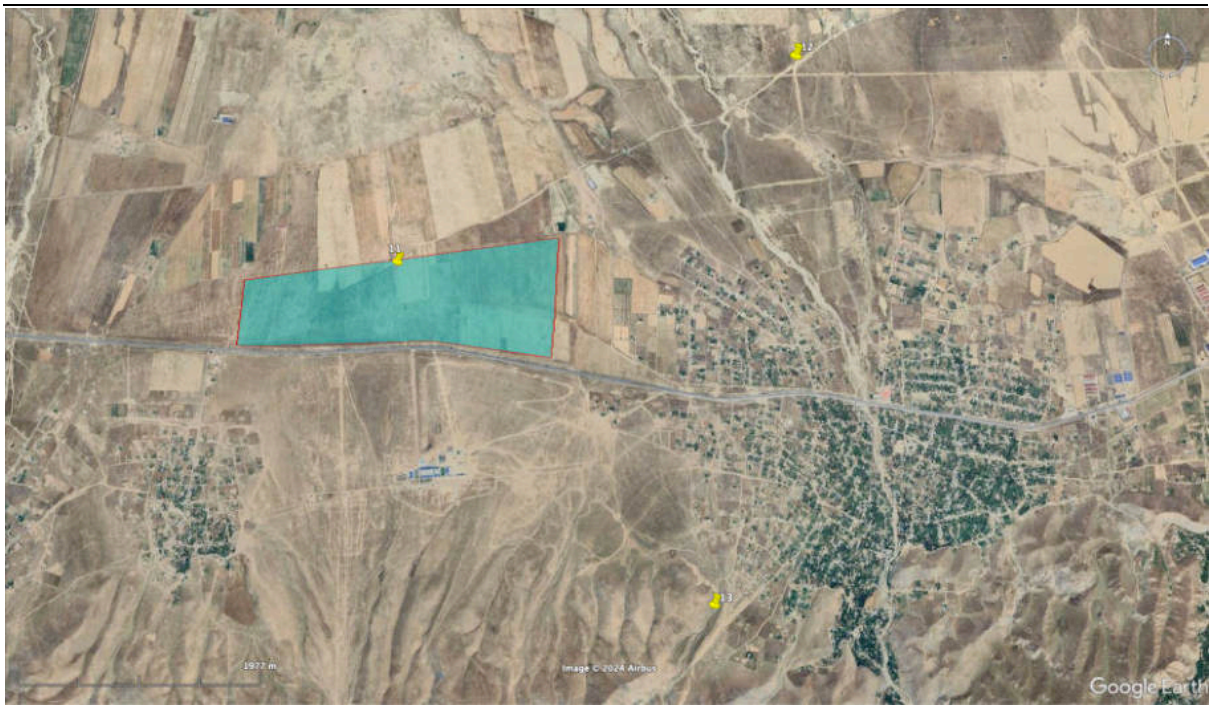

Figure 10-50 Raptor Nest Survey Locations on and near the 100 MW PV Plant (Blue Polygon)

Table 10-49 Locations of Raptor Nest Search near the 100 MW PV Plant

POINT	N	E	ROUND 1	ROUND 2
Point 11	39.437161	65.984657	21/03/2024	29/03/2024
Point 12	39.405917	65.869277	21/03/2024	29/03/2024
Pont 13	39.379658	65.895582	21/03/2024	29/03/2024

10.8.6.2 Results

During the Autumn VP survey, a total of 50 bird counts were recorded, identifying a total of 21 species. Of these, two species of elevated conservation concern were noted; One Steppe Eagle (*Aquila nipalensis*) and one Northern Lapwing (*Vanellus vanellus*). Steppe Eagles are classified as Endangered globally (IUCN RedList) and Vulnerable on a national level (UzRDB), whilst the Northern Lapwing is globally Near Threatened.

In subsequent Spring Migration surveys, a total of 45 bird counts were recorded, with 19 species identified. Of these, two species of elevated conservation concern were noted; 2 Egyptian Vultures (*Neophron percnopterus*) and 1 individual Griffon Vulture (*Gyps fulvus fulvus*). The Egyptian Vulture is globally Endangered (IUCN) and nationally Vulnerable (UzRDB). It was observed migrating across a broad area near the VP. The Griffon Vulture is classified as

Vulnerable in the UzRDB, and was observed making short-distance migrations across a broad area.

No observations of Great Bustards or Asian Houbara were made in the project area during the 2024 Winter Survey and Asian Houbara surveys respectively. Similarly, during the 2024 Raptor nest search, no Raptor species or nests (active or inactive) were recorded.

10.8.7 Nurobod BESS

10.8.7.1 Survey Efforts

Migration Vantage Point surveys were conducted near the 100MW Plant footprint in Autumn (13th September to 8th November 2023) and Spring (5th March to 23rd April 2024). One location (VP15), approximately 0.2km from the Nurobod BESS, was selected and surveyed for 2-3 hours per visit across 7 visits, giving a total survey effort of 21 hours per in Autumn and 20 hours in Spring.

The VP location in relation to project facilities is shown in the following figure.

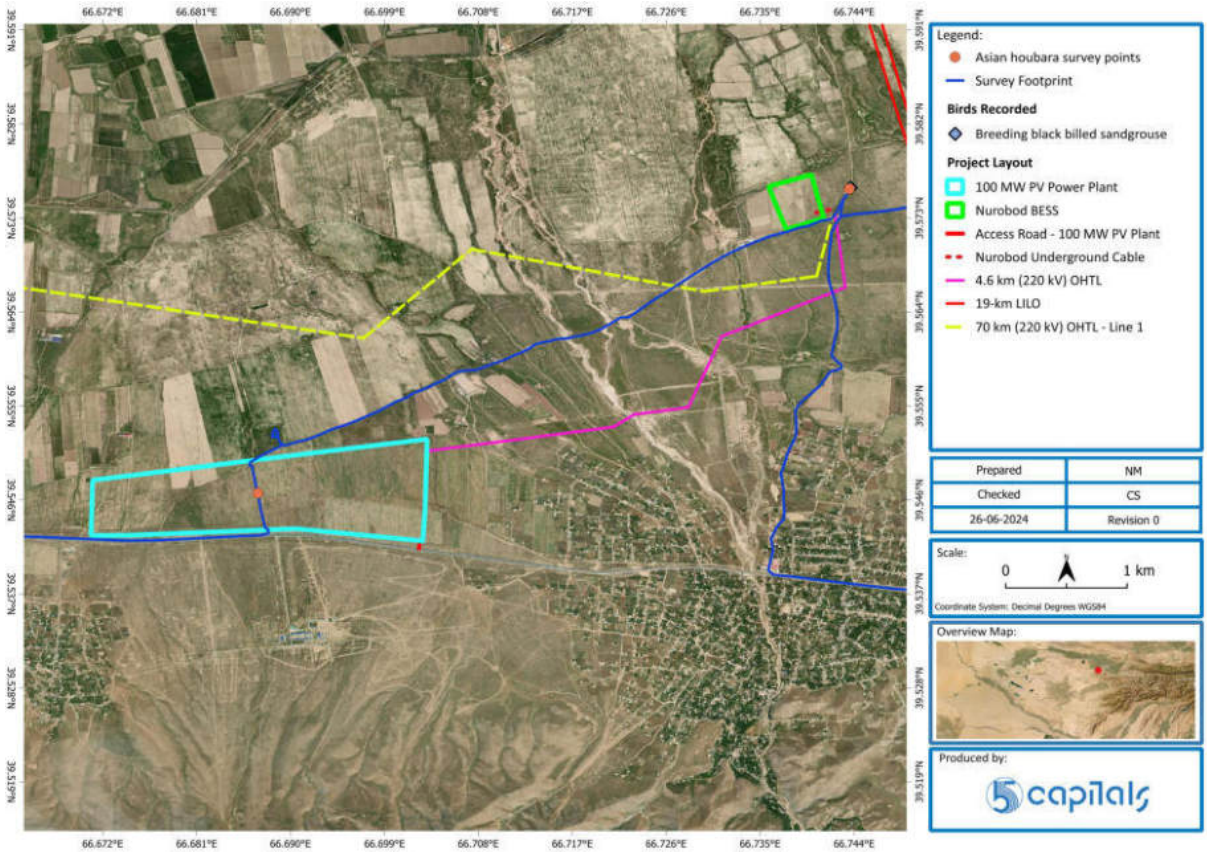

Figure 10-51 Location of VP in relation to Nurobod BESS (yellow polygon)

Table 10-50 Locations of Vantage Point used for Migration VP Surveys of the 100 MW PV Plant

Point	N	E	Autumn Dates	Spring Dates	Survey Effort
VP15	39.577843	66.742028	Sep 14th – Nov 8th	Mar 5th – Apr 25th	Autumn = 21 hrs Spring = 20 hrs

Great Bustard surveys were conducted near the Nurobod BESS footprint using auto-transect counts on the 7th January 2024. The tracks covered during surveys are shown in the figure below.

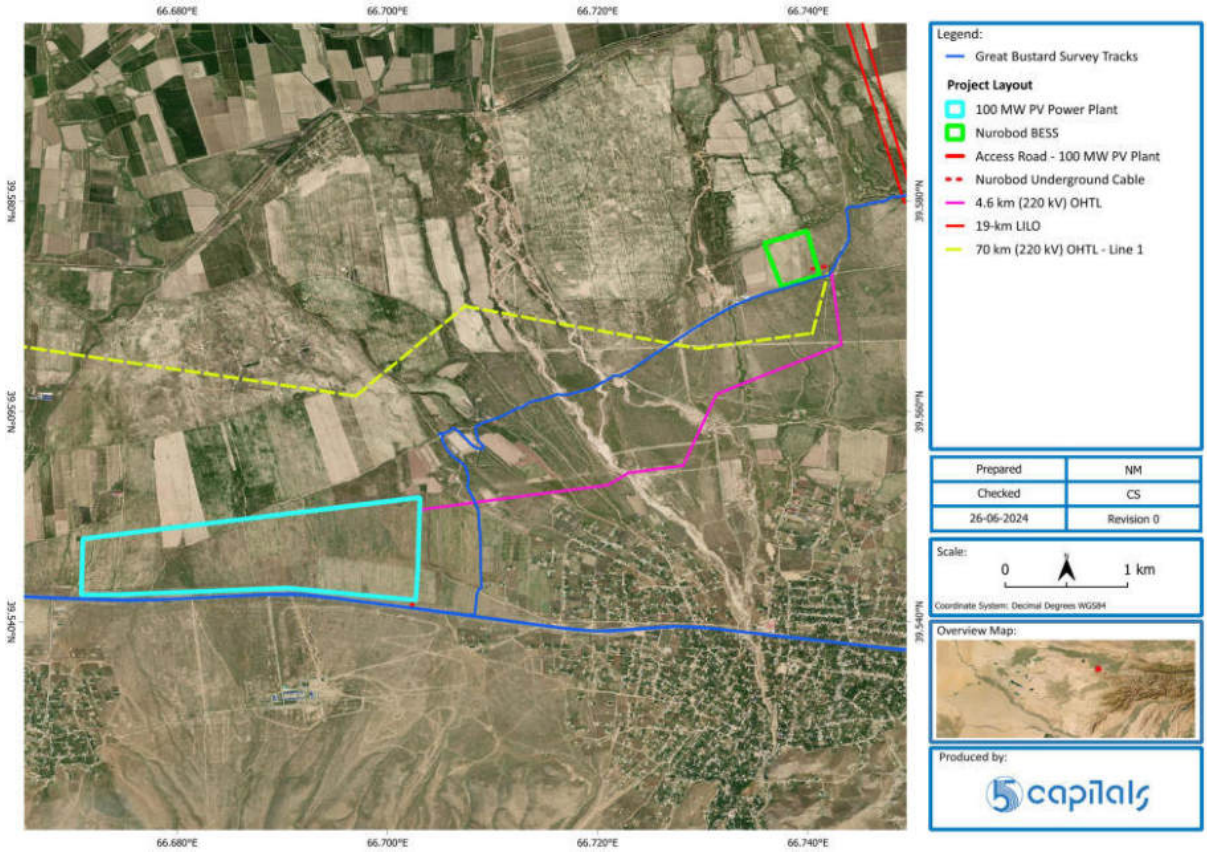

Figure 10-52 Great Bustard Survey Transect near the Nurobad BESS

Asian Houbara surveys were conducted on March 20, 2024, at one location (Point01a) within the project area, as shown in the following figure.

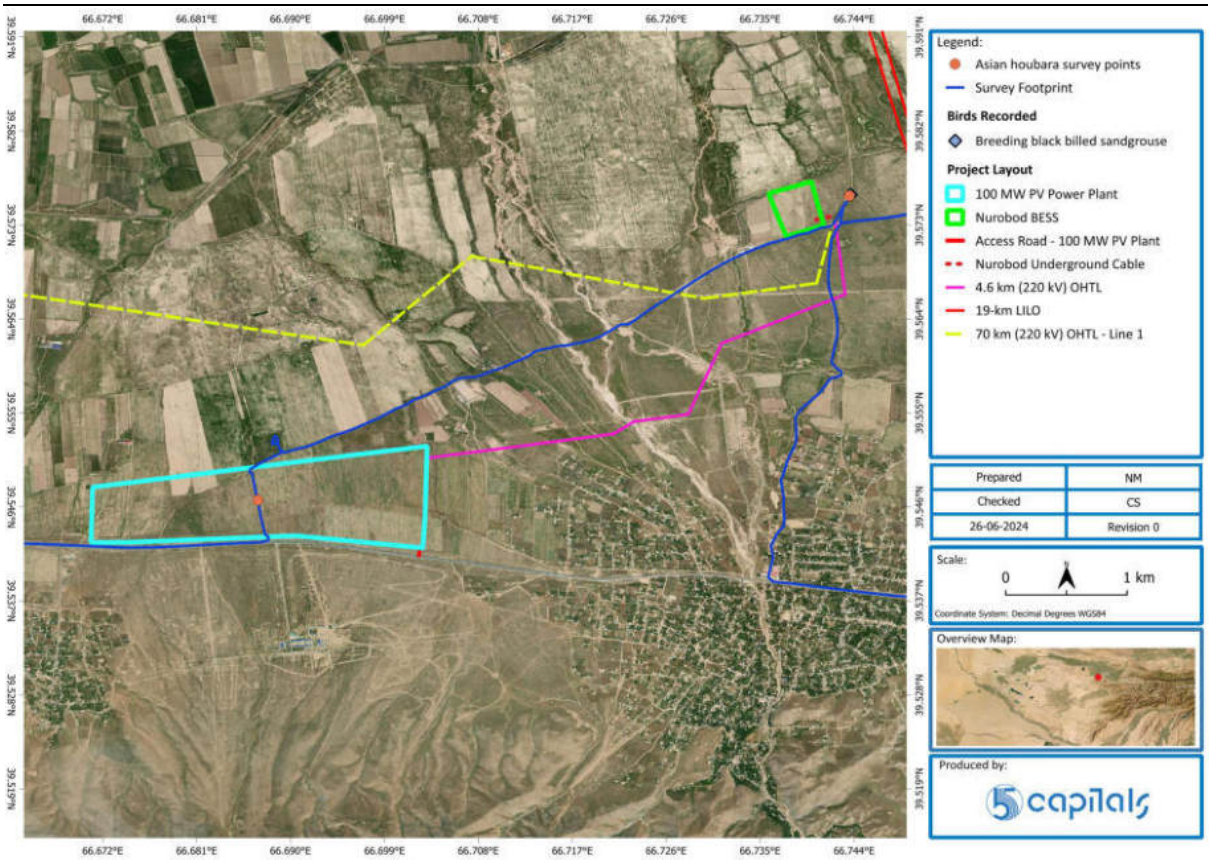

Figure 10-53 Asian Houbara Survey Point (Point 01a) at Nurobod BESS (Green Polygon)

Table 10-51 Location of Point Count for Asian Houbara Survey at Nurobod BESS

POINT	N	E	MOB 1	MOB 2	NOTE
Point01a	39.575788	66.743553	20/03/2024	-	Unsuitable habitat for breeding Asian houbara

The raptor nest survey was carried out by a local expert between 26th and 28th April 2024. Within the Nurabad BESS footprint and a 5km buffer one location (Point 12) was determined to be a suitable habitat for raptor nests and observed during surveys. The location is shown on the figure below.

Figure 10-54 Location of Raptor Nest Search for Nurobod BESS

Table 10-52 Locations of Raptor Nest Search at the Nurobod BESS

POINT	N	E	ROUND 1	ROUND 2
Point 12	39.405917	65.869277	21/03/2024	29/03/2024

10.8.7.2 Results

During the Autumn VP survey, a total of 50 bird counts were recorded, identifying a total of 21 species. Of these, two species of elevated conservation concern were noted; One Steppe Eagle (*Aquila nipalensis*) and one Northern Lapwing (*Vanellus vanellus*). Steppe Eagles are classified as Endangered globally (IUCN RedList) and Vulnerable on a national level (UzRDB), whilst the Northern Lapwing is globally Near Threatened.

In subsequent Spring Migration surveys, a total of 45 bird counts were recorded, with 19 species identified. Of these, two species of elevated conservation concern were noted; 2 Egyptian Vultures (*Neophron percnopterus*) and 1 individual Griffon Vulture (*Gyps fulvus fulvus*). The

Egyptian Vulture is globally Endangered (IUCN) and nationally Vulnerable (UzRDB). It was observed migrating across a broad area near the VP. The Griffon Vulture is classified as Vulnerable in the UzRDB, and was observed making short-distance migrations across a broad area.

No observations of Great Bustard, Asian Houbara or Raptor nests (active or inactive) were made in the project area during the associated surveys conducted in 2024.

10.8.8 70-km OTL, 4.9-km OTL

10.8.8.1 Survey Efforts

Migration Vantage Point surveys were conducted along the 70km and 4.9km OTL corridors in Autumn (14th September to 8th November 2023) and Spring (5th March to 23rd April 2024). Three locations (VP16, VP17, VP18), were selected across the 70km OTL and one along the 4.9km OTL (VP15). Each was surveyed for 2-3 hours per visit across 7 visits, giving a total survey effort of 21 hours per in Autumn and 20 hours in Spring, per VP.

The VP location in relation to project facilities is shown in the following figure.

Table 10-53 Locations of VPs surveyed along 70km and 4.9km OTLs

VP	Proximity to Project Facility	Co-ordinates	Location Description
VP15	0.5km from 4.9km OTL	39.577843 66.742028	Sazagan_1. Clay desert
VP16	On footprint of 70km OTL	39.532496 66.509101	Clay hills with rain fed fields
VP17	On footprint of 70km OTL	39.431038 66.131799	Djam-1. Clay hills with rain fed fields
VP18	On footprint of 70km OTL	39.427017 65.976201	Tym. Clay desert. Solar site

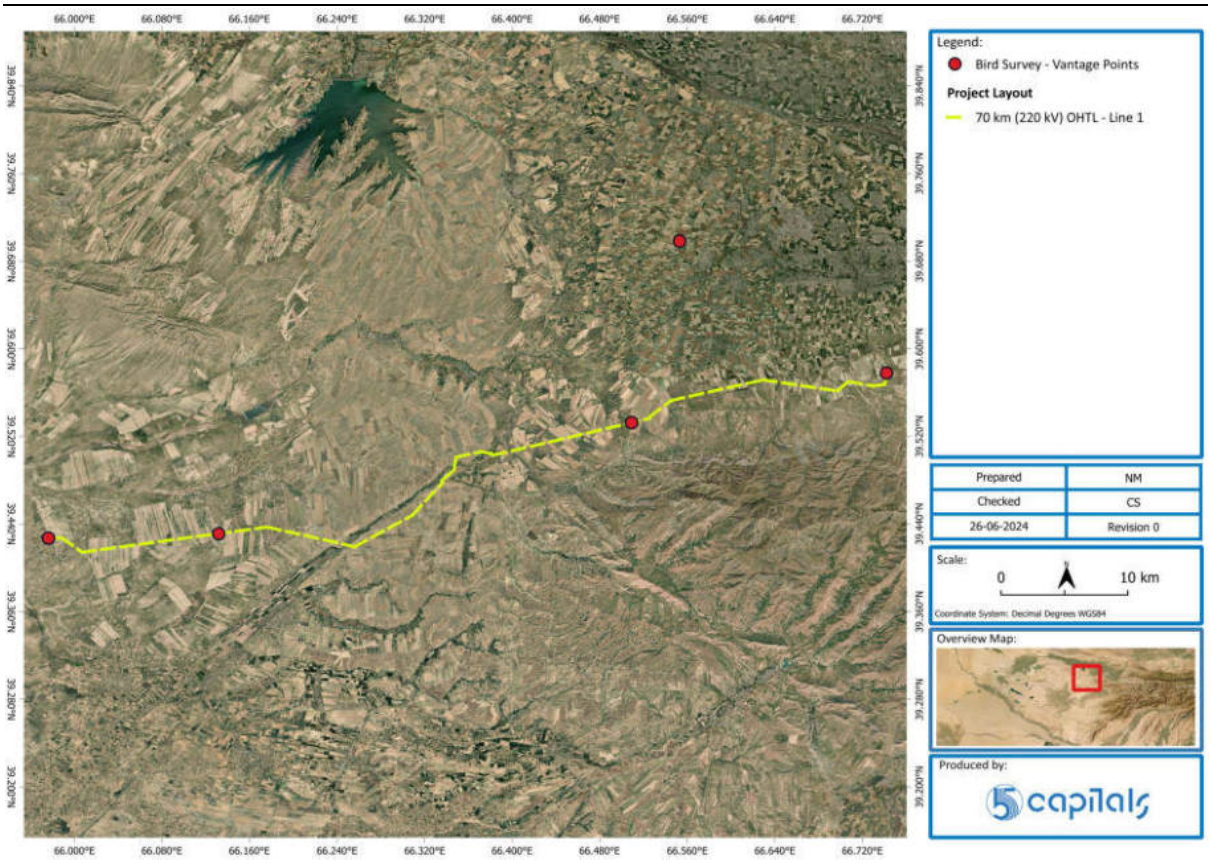

Figure 10-55 Locations of VPs along the 70km OTL (Yellow line) and 4.9km OTL (Red Line)

Great Bustard surveys were conducted along the 70km and 4.9km OTL corridor using auto-transect counts on the 7th and 8th January 2024. The tracks covered during surveys are shown in the figure below.

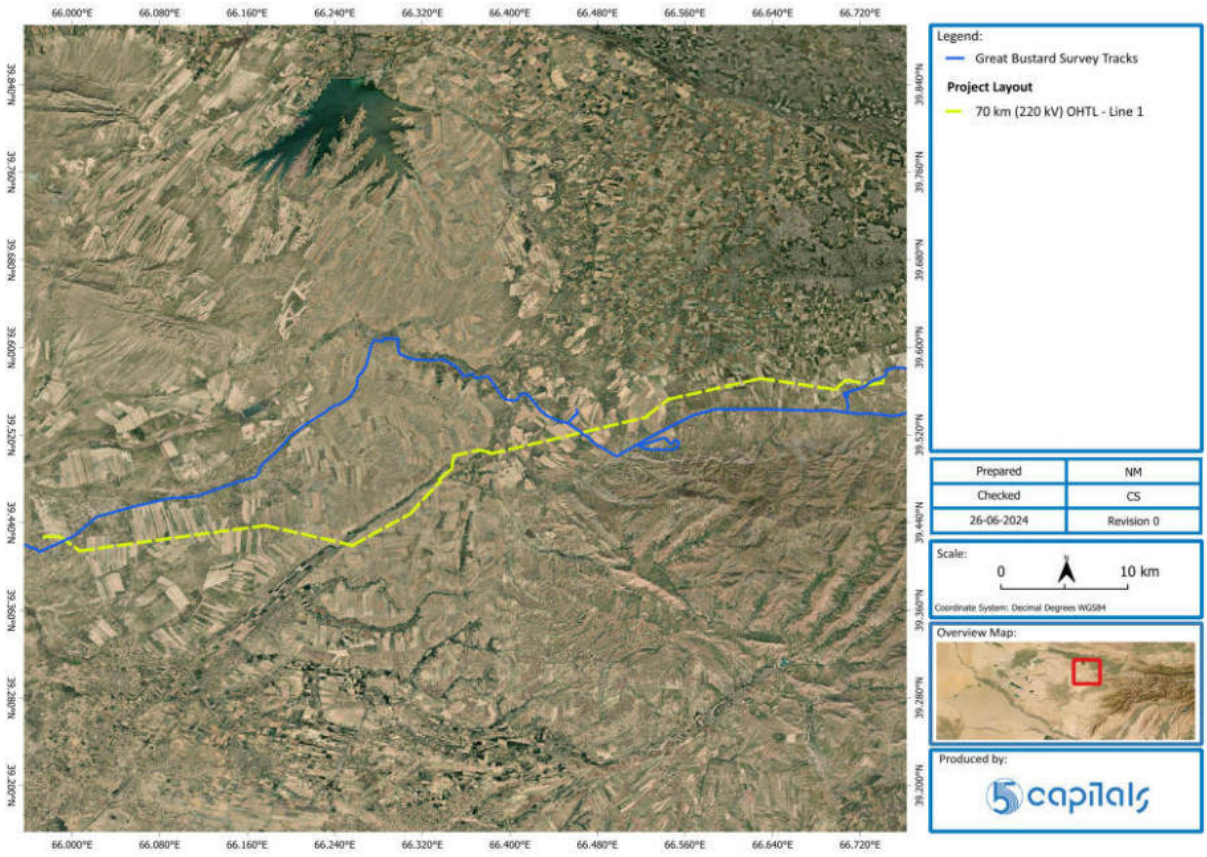

Figure 10-56 Great Bustard Survey Transect along 70km OTL

Asian Houbara surveys were undertaken across two mobilizations on March 21 and March 29, 2024, at five locations (Point01-Point05) within the project area provided in the following figure. During the survey three locations were determined to be unsuitable habitat for breeding Asian Houbara.

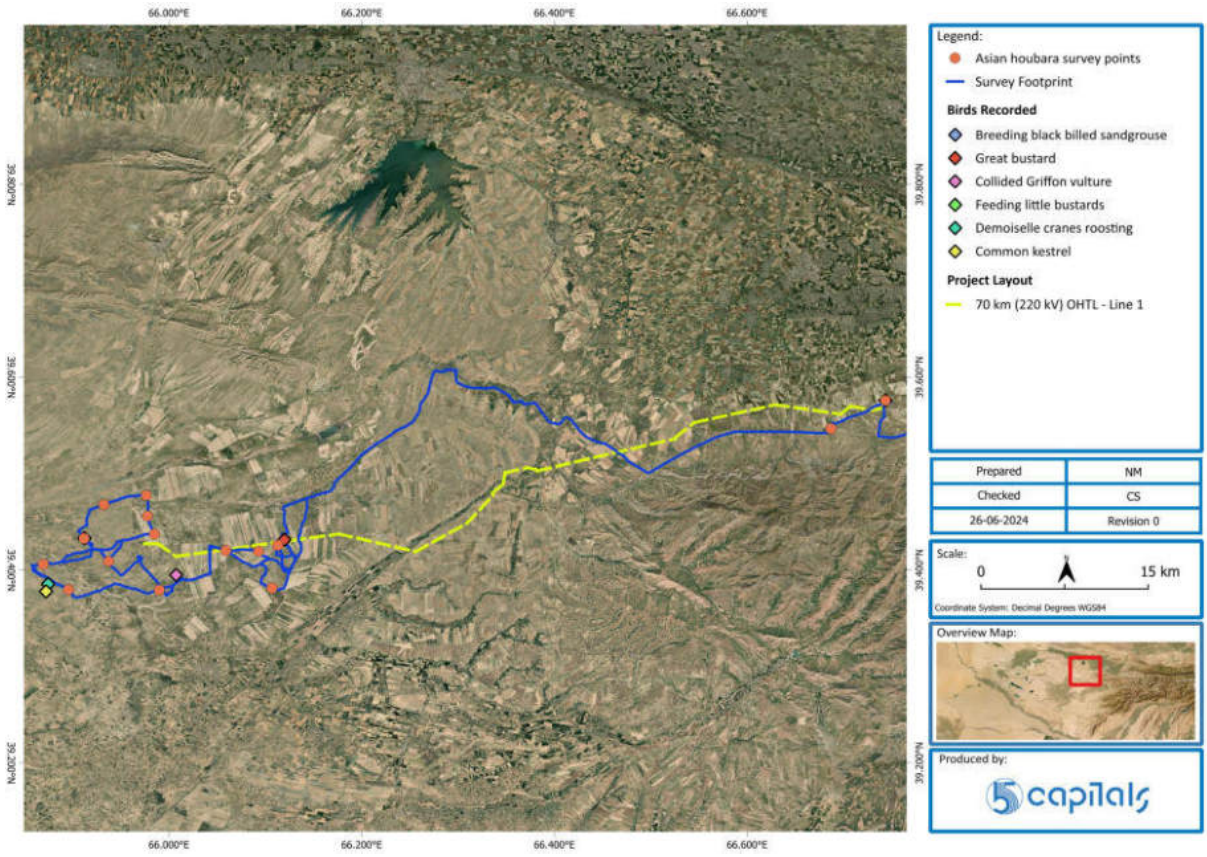

Figure 10-57 Asian Houbara Survey Point Counts (Points01-05) at along 70km OTL route

Table 10-54 Locations of Point Counts conducted for Asian Houbara Survey along the 70km OTL Corridor

Point	N	E	Mob 1	Mob 2	Note
Point01	39.425704	66.112718	20/03/2024		Unsuitable habitat for breeding Asian houbara
Point02	39.381274	66.106821	20/03/2024		Unsuitable habitat for breeding Asian houbara
Point03	39.419487	66.092786	21/03/2024		Unsuitable habitat for breeding Asian houbara
Point04	39.420208	66.058907	21/03/2024	29/03/2024	
Point05	39.379254	65.989839	21/03/2024	29/03/2024	

The raptor nest survey was carried out by a local expert between April 26th – 28th 2024 and covered the 70km OTL's footprint, including a 5km buffer. Within this area, a total of 14 locations (1-13 and 10a) were determined to be suitable habitats for raptor nests and were targeted during surveys.

These locations, in relation to the 70km OTL, are shown on the figure below.

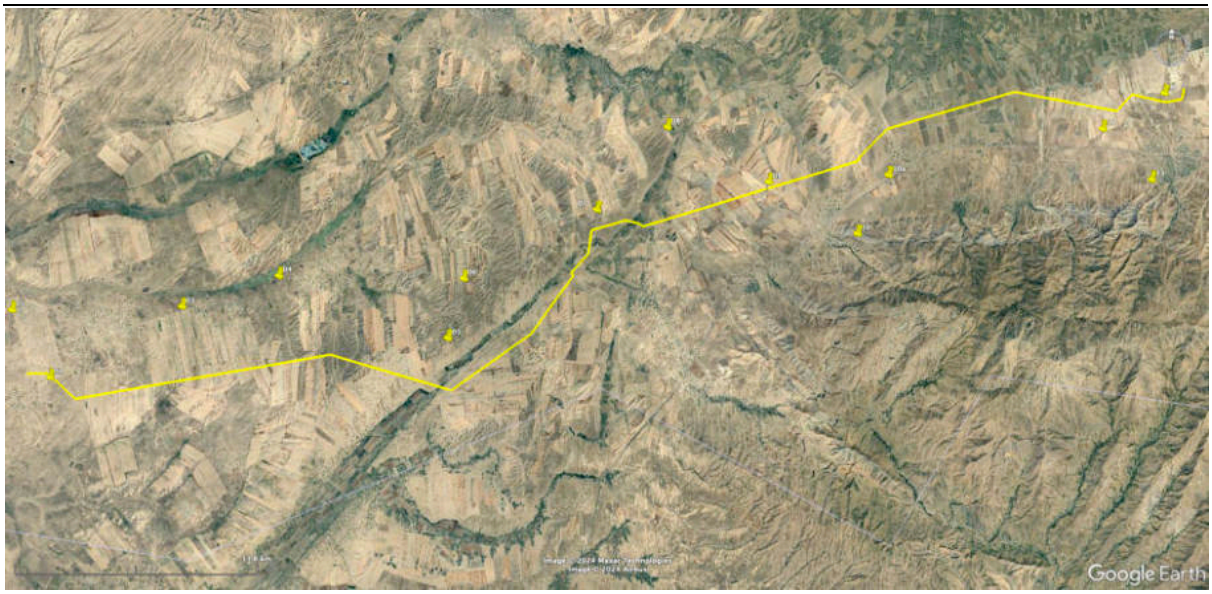

Figure 10-58 Locations of Raptor Nest Searches along the 70km OTL

Table 10-55 Locations of Raptor Nest Search along the 70km OTL

POINT	N	E	ROUND 1	ROUND 2
Point 01				
Point 02				
Point 03				
Point 04				
Point 05	39.44234	66.252388	26/04/2024	
Point 06				
Point 07				
Point 08				
Point 09				
Point 10	39.495672	66.523439	26/04/2024	
Point 10a	10a	39.52562	66.54422	
Point 11	39.437161	65.984657	21/03/2024	29/03/2024
Point 12	39.405917	65.869277	21/03/2024	29/03/2024
Pont 13	39.379658	65.895582	21/03/2024	29/03/2024

10.8.8.2 Results

The number of records and species counts recorded at each VP during Autumn and Spring surveys are summarised in the following table.

Table 10-56 Avifauna records from migration surveys along the 70km OTL

VP	AUTUMN			SPRING		
	NO. OF RECORDS	NO OF SPECIES	NO. OF CONSERVATION CONCERN	NO. OF RECORDS	NO. OF SPECIES	NO. OF CONSERVATION CONCERN

VP15	50	21	2	45	19	2
VP16	79	24	6	40	22	6
VP17	34	19	3	51	23	3
VP18	62	15	1	43	24	3

During Autumn surveys, the number of avifauna species recorded migrating at each VP ranged from 19 to 24. The highest level of activity (counts and species) was recorded at VP 16, located approximately halfway along the OTL near Sarikul. Of the species recorded, nine are of conservation concern, shown in the table below. The most abundant, with 4 individuals recorded across 3 of the VPs was the Steppe Eagle, a globally Endangered and nationally Vulnerable species. Other species considered highly vulnerable due to their conservation status and vulnerability to OTL structures, include the Egyptian Vulture, Eastern Imperial Eagle and Great Bustard.

Table 10-57_Threatened avifauna species observed at 70km OTL during Autumn VP Surveys

COMMON NAME	IUCN	UZRDB (2019)	VP 15	VP 16	VP 17	VP 18
Black Stork	LC	VU:R		1		
Cinereous Vulture	NT	NT		1		
Egyptian Vulture	EN	VU:D			1	
Pallid Harrier	NT	NT				1
Steppe Eagle	EN	VU:D	1	3	1	
Eastern Imperial Eagle	VU	VU:D		1		
Great bustard (Oral Data)	EN	CR		(1)		
Little Bustard	NT	VU:D		1	1	
Northern Lapwing	NT		1			

During Spring surveys, the number of avifauna species recorded migrating at each VP ranged from 19 to 24. The highest level of activity was recorded at VP 16, located approximately halfway along the OTL (near Sarikul). Of the species recorded, eight are of elevated conservation concern, either nationally and/or globally. The species recorded, their locations and conservation status are shown in the following table. Of notable conservation importance are the Egyptian Vulture and Steppe Eagle, both classified as globally Endangered and nationally Vulnerable and, as large raptors, they are both particularly vulnerable to the impacts of OTLs.

Table 10-58_Threatened avifauna species observed at 70km OTL during Spring VP Surveys

COMMON NAME	IUCN	UZRDB (2019)	VP 15	VP 16	VP 17	VP 18	OUT OF VP SURVEY

Lesser Kestrel	LC	NT		1	1		
Griffon Vulture	LC	VU:D	1	1	2	1	
Egyptian Vulture	EN	VU:D	2	1			
Pallid Harrier	NT	NT		1			
Steppe Eagle	EN	VU:D		1		1	
Eastern Imperial Eagle	VU	VU:D		1			
Demoiselle Crane	LC				2		
Great bustard*	EN	CR					X
Little Bustard*	NT	VU:D					X
Northern Lapwing	NT					1	

*These migrating individuals were recorded during Asian Houbara surveys and are discussed in more details in the subsequent sections

No observations of Great Bustard were made in the project area during the Great Bustard Winter Survey 2024. However, one migrating individual was recorded during the Asian Houbara Survey on March 20. 2024). The following figure shows the location of the observation.

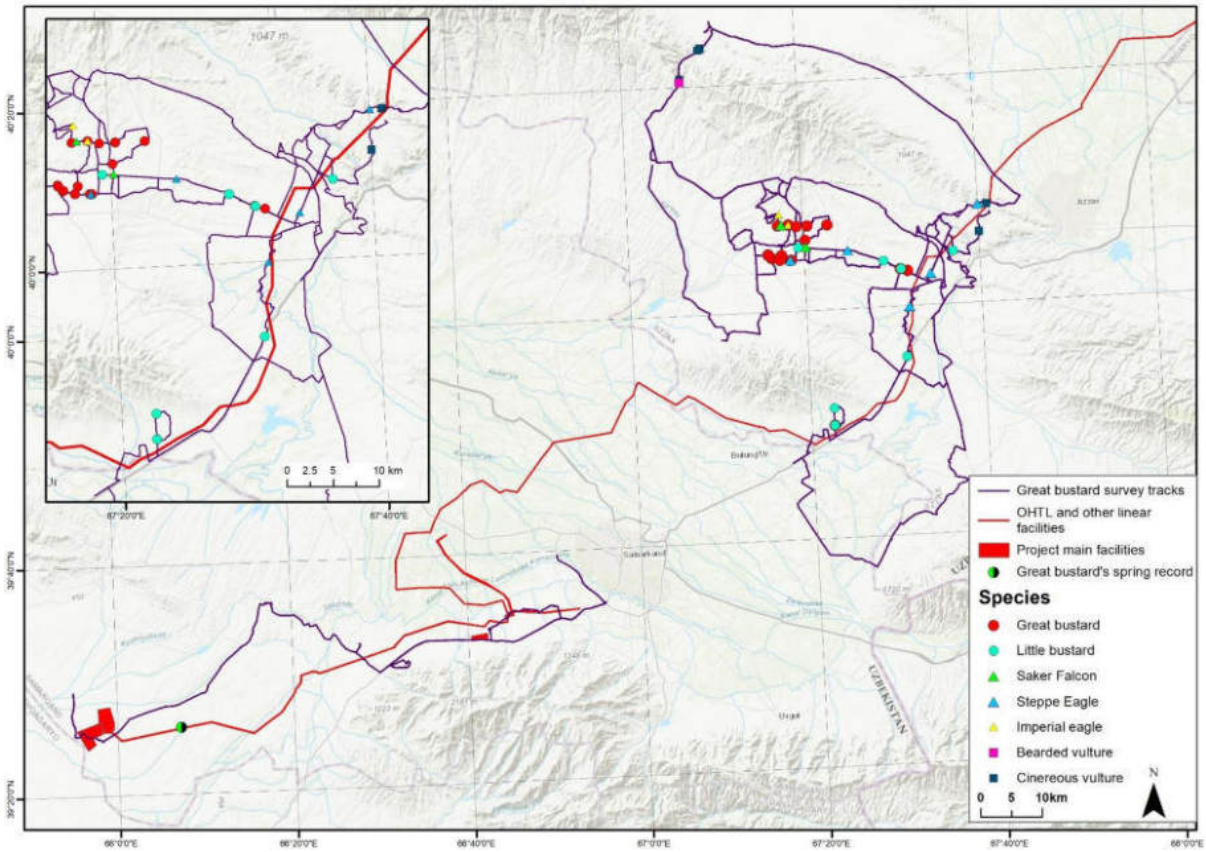

Figure 10-59 Great Bustard Spring Record (Green and black Circle)

No observations of Asian Houbara were made during the 2024 surveys of the project area. However, the following breeding and migrating species were recorded during the survey. Of note were the presence of Great Bustard (EN and Little Bustard (NT). On 20th March 2024, a

single migrating Great Bustard was recorded along the 70km OTL corridor but outside of the selected survey points (near VP17). In addition, a total of five Little Bustards were recorded on the 21st and 29th March 2024 at Points 3 and 5 respectively.

Table 10-59 Species recorded during the Asian Houbara Survey in 70km OTL Corridor in 2024

POINT	DATE	COMMON SPECIES	NUMBER	STATUS
Point01	20/03/2024	Black-bellied sandgrouse	60	migrating
Point01	20/03/2024	Crested lark	30	migrating
Point01	20/03/2024	Northern wheatear	1	breeding
Point01	20/03/2024	Rough-legged buzzard	1	migrating
N39.431247 E66.119518	20/03/2024	Great bustard	1	migrating
Point02	20/03/2024	Demoiselle crane	18	migrating
Point02	20/03/2024	Black-bellied sandgrouse	15	migrating
Point03	21/03/2024	Little bustard	4	migrating
Point03	21/03/2024	Black-bellied sandgrouse	20	migrating
Point03	21/03/2024	Harrier	1	migrating
Point04	21/03/2024	Common buzzard	1	migrating
Point04	21/03/2024	Merlin	1	migrating
Point04	29/03/2024	Rock dove	1	resident
Point05	21/03/2024	Black-bellied sandgrouse	4	breeding
Point05	29/03/2024	Little bustard	1	migrating
Point05	29/03/2024	Hen Harrier	1	migrating
Point05	29/03/2024	Common Kestrel	1	breeding

At each observation point the presence or absence of Raptors and/or their nests were recorded. In addition, chance encounters with other species of avifauna were noted, including any nests. All information from this survey is included in the table below.

Table 10-60 Observation at each survey location and avifauna species recorded near the Project site during Raptor nest search.

SURVEY POINT	CO-ORDINATES	OBSERVATION	SPECIES	STATUS	COUNT	DISTANCE TO PROJECT
1						3.5km from 70km OTL
2						0.5km from 70km OTL
3						3.5km from 70km OTL
4						4.5km from 70km OTL

-	39.442348, 66.251825	Nest on TL with 2 chicks	Common Raven *(Corvus corax)*		1	2.6km from 70km OTL
5						2.5km from 70km OTL
6						4.5km from 70km OTL
-	39.49444, 66.342812		Little Egret *(Egretta garzetta)*	UzRDB NT	1	0.5km to 70km OTL
7						0.75km from 70km OTL
8						4.5km from 70km OTL
9						On 70km OTL
10	39.495672 66.523439	Not suitable breeding habitat	NA			4.25km from 70km OTL
10a						2.1km from 70km OTL
11						1.5km from 70km OTL
12						0.09km from 70km OTL
13						4.8km from 70km OTL

During Raptor nest surveys, no raptor species were observed, or nests (active or old) sighted. Observation notes are detailed in the table below.

A Common Raven was found nesting approximately 2.5km from the OTL and a single Little Egret was sighted just 0.5km from the proposed OTL corridor. The Little Egret is listed as Near Threatened in the Uzbekistan Red Data Book. The locations of these records are shown in the following figure.

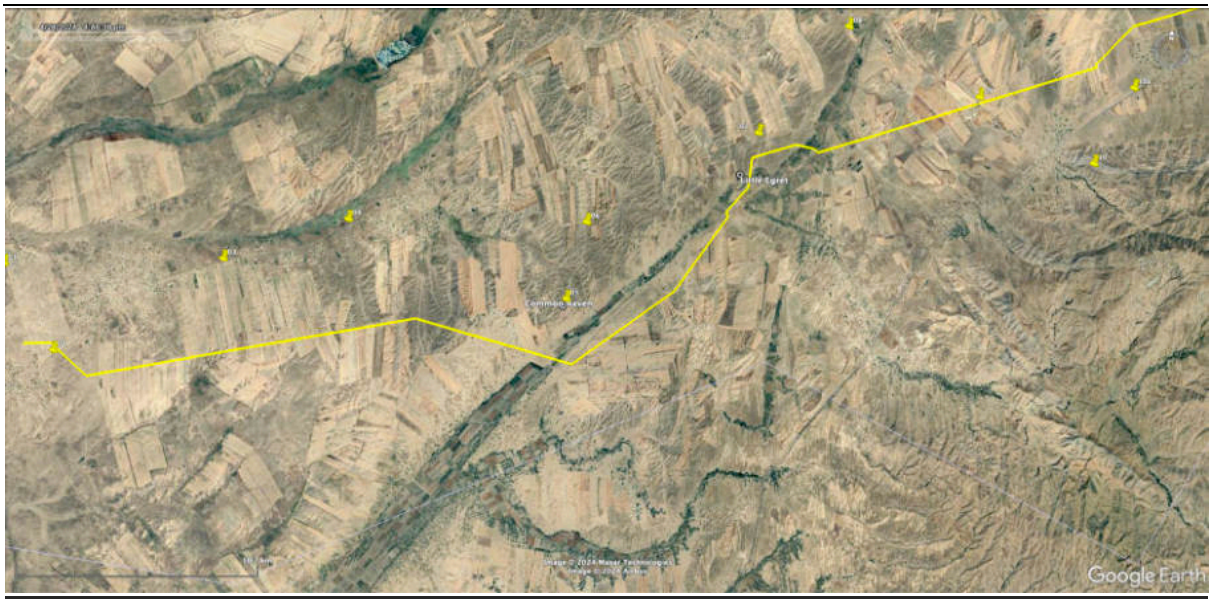

Figure 10-60 Locations of nesting birds observed along the 70km OTL Corridor

10.8.9 400 MW PV plant, Pooling station

10.8.9.1 Survey Efforts

Migration Vantage Point surveys were conducted near the 400 MW PV Plant in Autumn (15th September to 7th November 2023) and Spring (28th February to 30th April 2024). One location (VP18), approximately 0.18km from the 400MW PV Plant, was selected. The location was surveyed for 2-3 hours per visit, across 7 visits, giving a total survey effort of 21 hours per in Autumn and 20 hours in Spring, per VP.

The VP location in relation to project facilities is shown in the following figure.

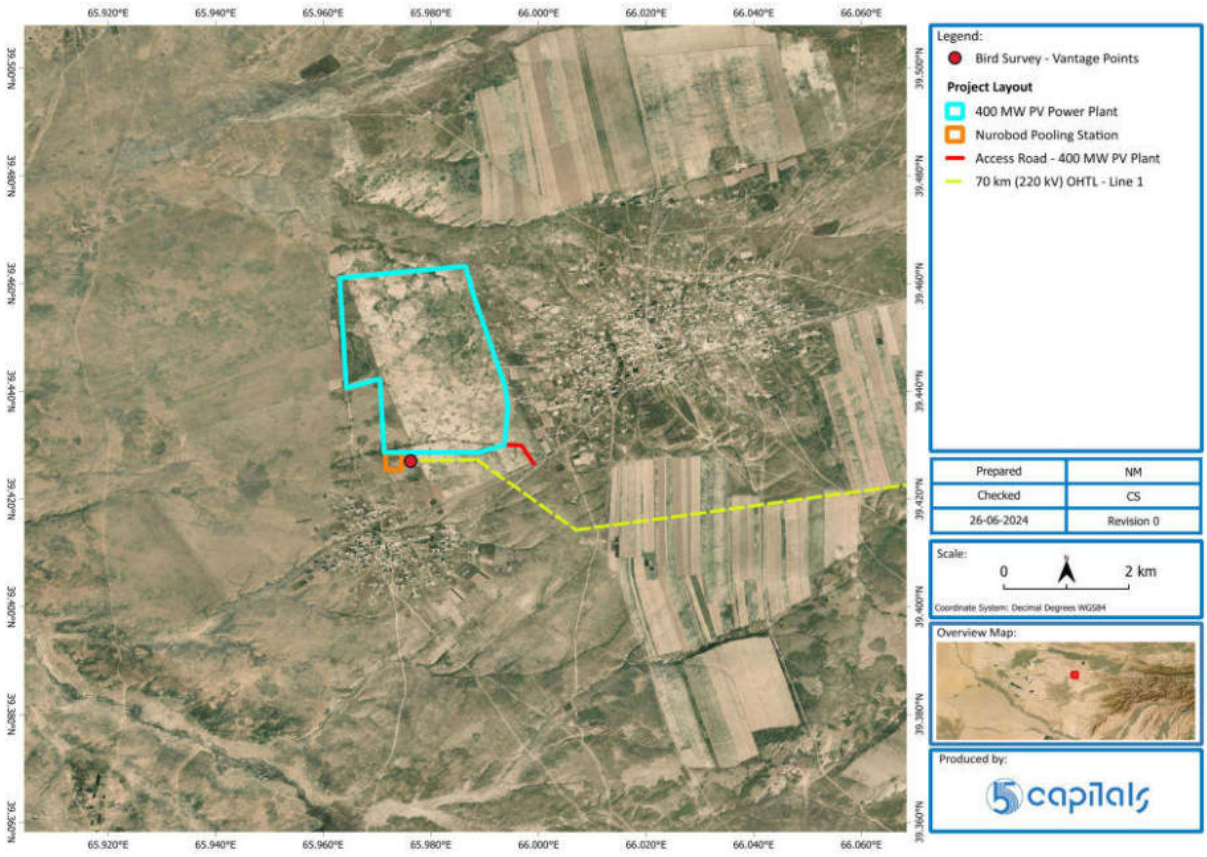

Figure 10-61 Location of migration survey VP near the 400MW PV Plant

Table 10-61 Locations of VP surveyed near to the 400 MW PV Plant facility

POINT	N	E	AUTUMN DATES	SPRING DATES	SURVEY EFFORT
VP18	39.427017	65.976201	Sep 15th – Nov 7th	Feb 28th - Apr 30th	Autumn = 21 hrs Spring = 20 hrs

Great Bustard surveys were conducted around the 400MW PV Plant footprint using auto-transect counts on the 8th January 2024. The tracks covered during surveys are shown in the figure bellow.

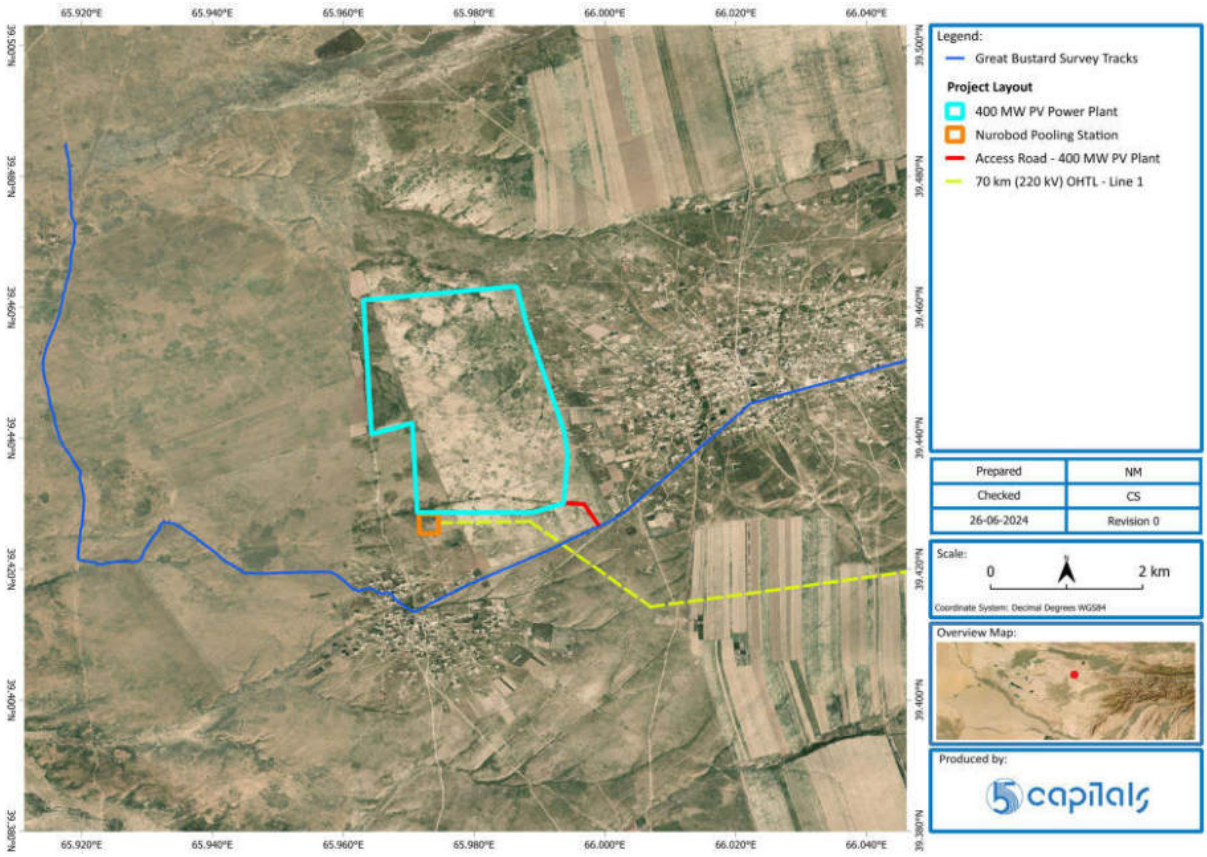

Figure 10-62 Great Bustard survey tracks near to the 400 MW PV Plant facility

Asian Houbara surveys were undertaken across two mobilizations on March 21 and March 29, 2024, at ten locations (Point04-Point13) within the project area provided in the following figure.

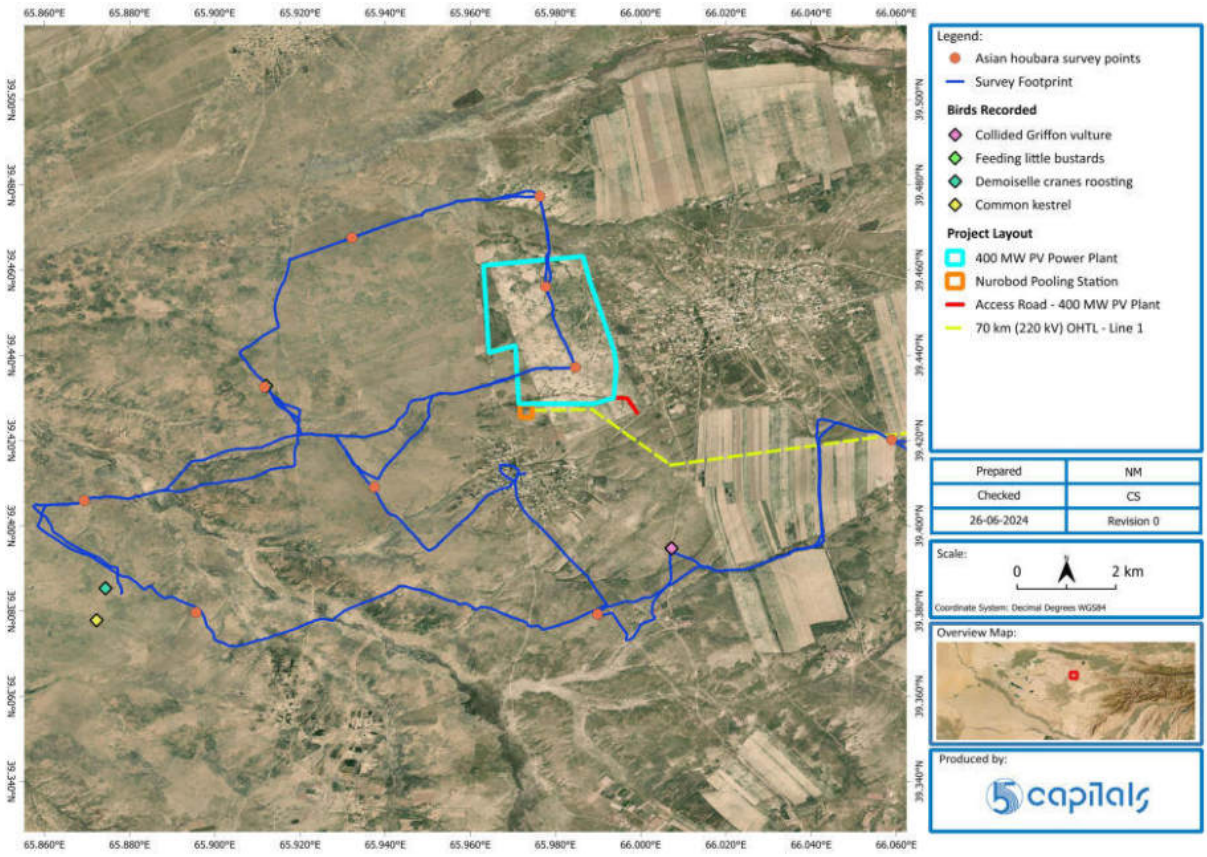

Figure 10-63 Asian Houbara Survey Point Counts (Points04-13) at 400MW Site

Table 10-62 Points Counts of Asian Houbara Survey at the 400 MW PV

POINT	N	E	MOB 1	MOB 2
Point04	39.420208	66.058907	21/03/2024	29/03/2024
Point05	39.379254	65.989839	21/03/2024	29/03/2024
Point06	39.409087	65.937431	21/03/2024	29/03/2024
Point07	39.432394	65.912392	21/03/2024	29/03/2024
Point08	39.4676	65.932175	21/03/2024	29/03/2024
Point09	39.477331	65.97628	21/03/2024	29/03/2024
Point10	39.456114	65.977649	21/03/2024	29/03/2024
Point11	39.437161	65.984657	21/03/2024	29/03/2024
Point12	39.405917	65.869277	21/03/2024	29/03/2024
Point13	39.379658	65.895582	21/03/2024	29/03/2024

The raptor nest survey was carried out by a local expert between April 26th – 28th 2024 and considered the 400MW PV Plant footprint and a 5km buffer. Within this area, two locations (Points 01 and 02) were determined to be suitable habitats for raptor nests and observed during surveys, shown on the figure below.

Figure 10-64 Map of Raptor Nest Searches performed near 400 MW PV Plant

Table 10-63 Locations of Raptor Nest Search near the 400 MW PV Plant

POINT	N	E	ROUND 1	ROUND 2
Point 01				
Point 02				

10.8.9.2 Results

During Autumn migration surveys, 62 bird counts were recorded, comprising of 15 species. Most of these species are not of elevated conservation concern, however, a single Pallid Harrier was recorded migrating. The Pallid Harrier is globally (IUCN) and nationally (UzRDB) considered Near Threatened.

In subsequent Spring Migration surveys, a total of 43 bird counts were recorded, with 24 species identified. Of these, three species of elevated conservation concern. The Griffon Vulture (*Gyps fulvus fulvus*) is classified as nationally Vulnerable (UzRDB) and was observed completing short-distance migrations. The Steppe Eagle (*Aquila nipalensis*) classified as globally Endangered (IUCN) and nationally Vulnerable (UzRDB) was observed migrating across a broad front. The Northern Lapwing (*Vanellus vanellus*) globally Near Threatened (IUCN), was also recorded at VP18.

No observations of Great Bustards, Asian Houbara or Raptor Nests (active or inactive) were made in the project area during the respective 2024 surveys.

However, the following breeding and migrating species were recorded during the March 2024 Asian Houbara survey. Notably, this included large numbers of migrating Little Bustard *(n = 2000)*, a globally Near Threatened (IUCN) and nationally Vulnerable (UzRDB) species.

Table 10-64 Species recorded during the Asian Houbara Survey in 400MW PV area in 2024

POINT	DATE	COMMON SPECIES	NUMBER	STATUS	NOTES
Point04	21/03/2024	Common buzzard	1	migrating	
Point04	21/03/2024	Merlin	1	migrating	
Point04	29/03/2024	Rock dove	1	resident	
Point05	21/03/2024	Black-bellied sandgrouse	4	breeding	
Point05	29/03/2024	Little bustard	1	migrating	
Point05	29/03/2024	Hen Harrier	1	migrating	
Point05	29/03/2024	Common Kestrel	1	breeding	
Point06	21/03/2024	no birds	-		
Point06	29/03/2024	Crested Lark	1	resident	
Point07	29/03/2024	Black-bellied sandgrouse	7	breeding	
Point07	29/03/2024	Crested Lark	1	breeding	local communities collecting mushrooms in the desert
Point07	21/03/2024	Little bustard	2000	migrating	
Point07	21/03/2024	Demoiselle crane	27	migrating	
Point07	21/03/2024	Black-bellied sandgrouse	5	breeding	
Point08	21/03/2024	Demoiselle crane	30	migrating	
Point08	21/03/2024	Greater Sand Plover	1	breeding	
Point08	29/03/2024	Long-legged buzzard	1		
Point08	29/03/2024	Black-bellied sandgrouse	4	breeding	
Point08	29/03/2024	Hen Harrier	1	migrating	
Point09	29/03/2024	Western marsh harrier	1	migrating	local communities collecting mushrooms in the desert

Point	Date	Common species	Number	Status	Notes
Point09	21/03/2024	Little bustard	1	migrating	
Point09	21/03/2024	Demoiselle crane	1	migrating	
Point10	21/03/2024	Long-legged buzzard	1		
Point10	21/03/2024	Harrier	1	migrating	
Point10	29/03/2024	Crested Lark	1	resident	
Point11	29/03/2024	Hen Harrier	1	migrating	
Point11	21/03/2024	Long-legged buzzard	1	breeding	
Point12	21/03/2024	Long-legged buzzard	1		
Point12	29/03/2024	Crested Lark	10	breeding	flocks of sheep
Point13	29/03/2024	no birds	-		many flocks of sheep
Point13	21/03/2024	Long-legged buzzard	1		
Point13	21/03/2024	Demoiselle crane	110	migrating	
Point13	21/03/2024	Common Kestrel	1		
Point13	21/03/2024	Black-bellied sandgrouse	20	migrating	
39°23'7.27"N 65°52'27.46"E	21/03/2024	Demoiselle crane	110	migrating	roosting place
39°22'40.18"N 65°52'19.86"E	22/03/2024	Common Kestrel	3	migrating	

10.8.10 11-km LILO OTL

10.8.10.1 Survey Efforts

Migration Vantage Point surveys were conducted near to the 11km LILO in Autumn (13th September to 8th November 2023) and Spring (5th March to 23rd April 2024). One location (VP15), approximately 0.8km from the start of the 11kmn LILO, was selected and surveyed for 2-3 hours per visit across 7 visits, giving a total survey effort of 21 hours per in Autumn and 20 hours in Spring.

The VP location in relation to project facilities is shown in the following figure.

Figure 10-65 Location of VP in relation to 11km LILO (Red Line)

Table 10-65 Locations of Vantage Point used for Migration VP Surveys of the 11km LILO

Point	N	E	Autumn Dates	Spring Dates	Survey Effort
VP15	39.577843	66.742028	Sep 14th – Nov 8th	Mar 5th – Apr 25th	Autumn = 21 hrs Spring = 20 hrs

Great Bustard surveys were conducted along the 11km LILO using auto-transect counts on the 7th January 2024. The tracks covered during surveys are shown in the figure below.

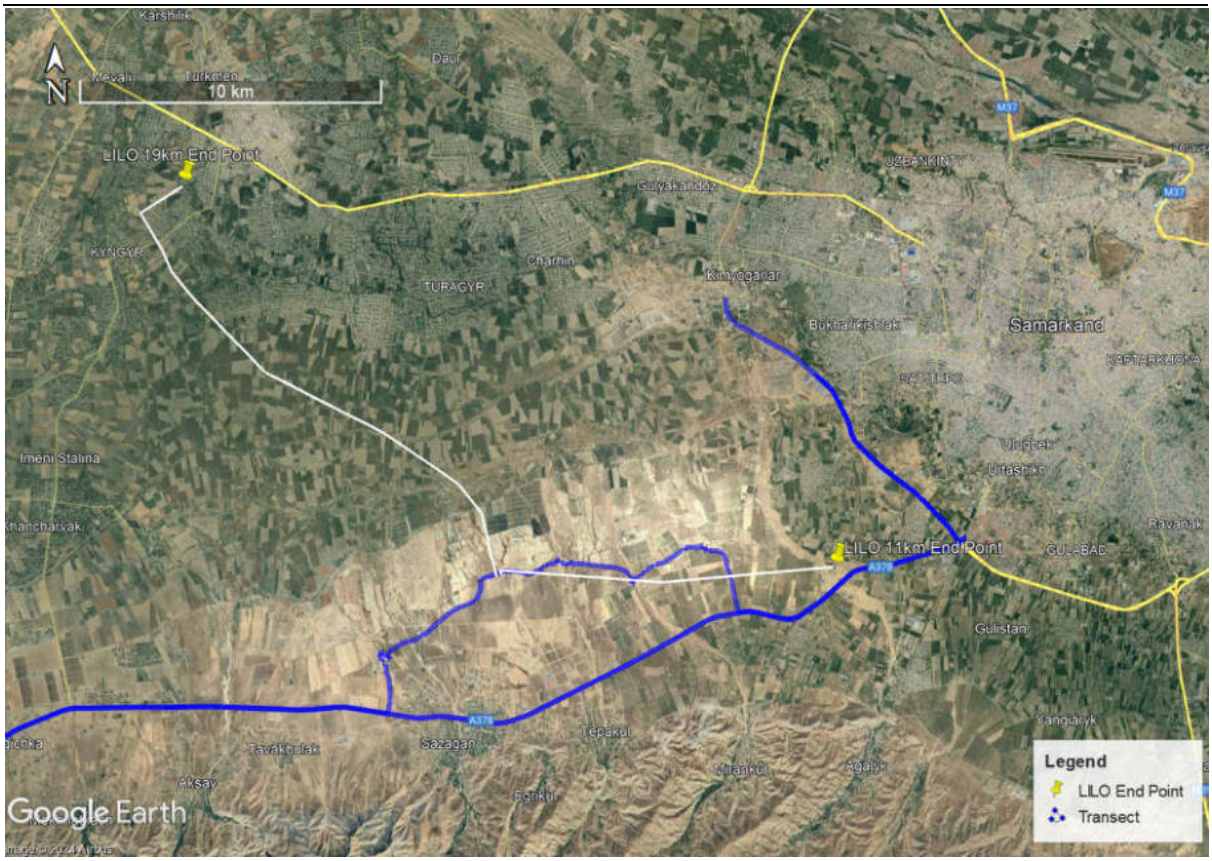

Figure 10-66 Great Bustard Survey Tracks along the 11km OTL

Asian Houbara surveys were undertaken on 20th March 2024, with one location chosen at the start of the 11km LILO. The survey tracks and sample point are shown in relation to the Project element below.

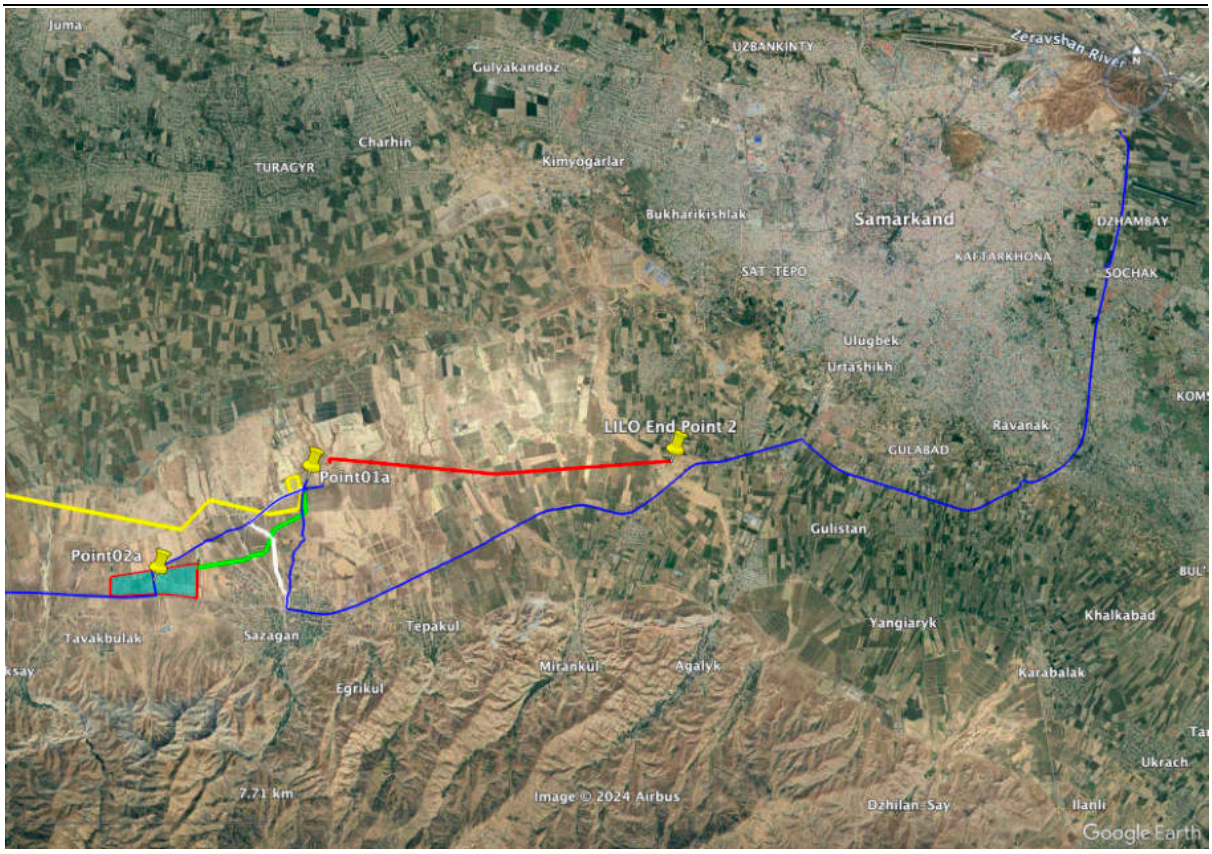

Figure 10-67 Map of survey tracks (blue lines) and sample point (01) for Asian Houbara survey along the 11km LILO (red line)

Table 10-66 Points Counts of Asian Houbara Survey at 11km LILO

POINT	N	E	MOB 1
Point01	39.575788	66.743553	20/03/2024

The Raptor Nest survey was conducted by a local expert between April 26th – 28th 2024. Within the 11km OTL corridor, and a 5km buffer of this area, sites were selected based on the presence of suitable habitat. Two locations were chosen, shown in the figure below.

Figure 10-68 Locations of Raptor Nest Surveys in relation to 11km LILO (Red Line)

Table 10-67 Locations of Raptor Nest Search at the 11km LILO

POINT	N	E	ROUND 1	ROUND 2
Point 12	39.405917	65.869277	21/03/2024	29/03/2024
Point 14	39.571127	66.873747	27/04/2024	

10.8.10.2 Results

During the Autumn VP survey, a total of 50 bird counts were recorded, identifying a total of 21 species. Of these, two species of elevated conservation concern were noted; One Steppe Eagle (*Aquila nipalensis*) and one Northern Lapwing (*Vanellus vanellus*). Steppe Eagles are classified as Endangered globally (IUCN RedList) and Vulnerable on a national level (UzRDB), whilst the Northern Lapwing is globally Near Threatened.

In subsequent Spring Migration surveys, a total of 45 bird counts were recorded, with 19 species identified. Of these, two species of elevated conservation concern were noted; 2 Egyptian Vultures (*Neophron percnopterus*) and 1 individual Griffon Vulture (*Gyps fulvus fulvus*). The Egyptian Vulture is globally Endangered (IUCN) and nationally Vulnerable (UzRDB). It was observed migrating across a broad area near the VP. The Griffon Vulture is classified as Vulnerable in the UzRDB, and was observed making short-distance migrations across a broad area.

No observations of Great Bustard, Asian Houbara or Raptor nests (active or inactive) were recorded during the respective 2024 surveys near the 11km LILO.

However, the following breeding and migrating species were recorded during the March 2024 Asian Houbara survey. These species are not of elevated conservation concern on global or national RedLists, however notably high numbers of Crested Lark and Black-bellied Sandgrouse were recorded.

Table 10-68 Species recorded during the Asian Houbara Survey near the 11km LILO in 2024

POINT	DATE	COMMON SPECIES	NUMBER	STATUS	NOTES
Point01a	20/03/2024	Crested Lark	1	resident	
Point01	20/03/2024	Black-bellied sandgrouse	60	migrating	
Point01	20/03/2024	Crested lark	30	migrating	
Point01	20/03/2024	Northern wheatear	1	breeding	
Point01	20/03/2024	Rough-legged buzzard	1	migrating	

10.8.11 19-km LILO OTL

10.8.11.1 Survey Efforts

Migration Vantage Point surveys were conducted near to the 19km LILO in Autumn (13th September to 8th November 2023) and Spring (5th March to 23rd April 2024). Two locations were selected; VP14 approximately 6.5km to the West of the Lilo end point, and VP15 located 0.7km from the LILO start. VPs were surveyed for 2-3 hours per visit across 7 visits, giving a total survey effort of 21 hours per in Autumn and 20 hours in Spring, per VP.

The VP location in relation to project facilities is shown in the following figure.

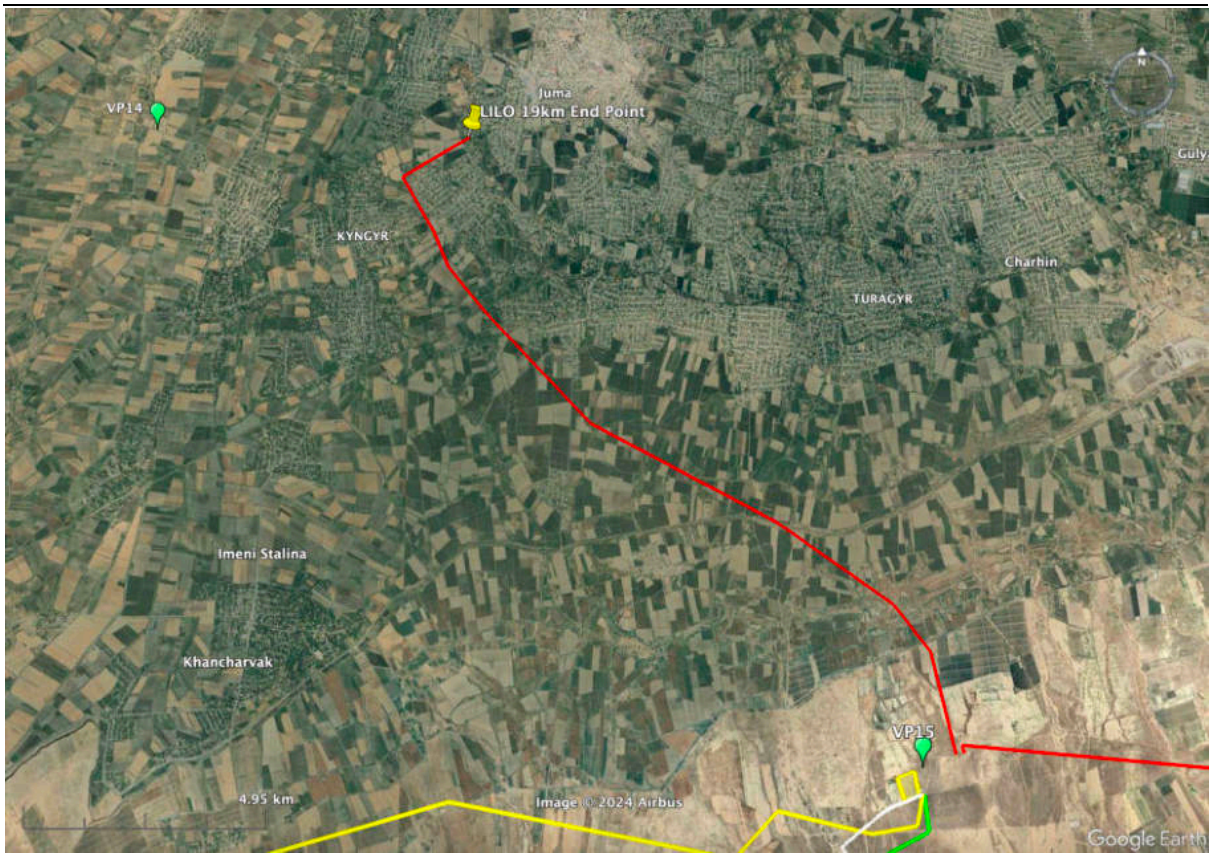

Figure 10-69 Location of VP in relation to 19km LILO (Red Line)

Table 10-69 Locations of Vantage Point used for Migration VP Surveys of the 11km LILO

Point	N	E	Autumn Dates	Spring Dates	Survey Effort
VP14	39.69826	66.552972	Sep 14th – Nov 8th	Mar 5th – Apr 25th	Autumn = 21 hrs Spring = 20 hrs
VP15	39.577843	66.742028	Sep 14th – Nov 8th	Mar 5th – Apr 25th	Autumn = 21 hrs Spring = 20 hrs

Great Bustard survey tracks did not cover the 19km LILO footprint itself, but followed potentially suitable habitats identified near to the facility. Auto-transect counts were performed on the 7th January 2024. The tracks covered during surveys are shown in the figure below.

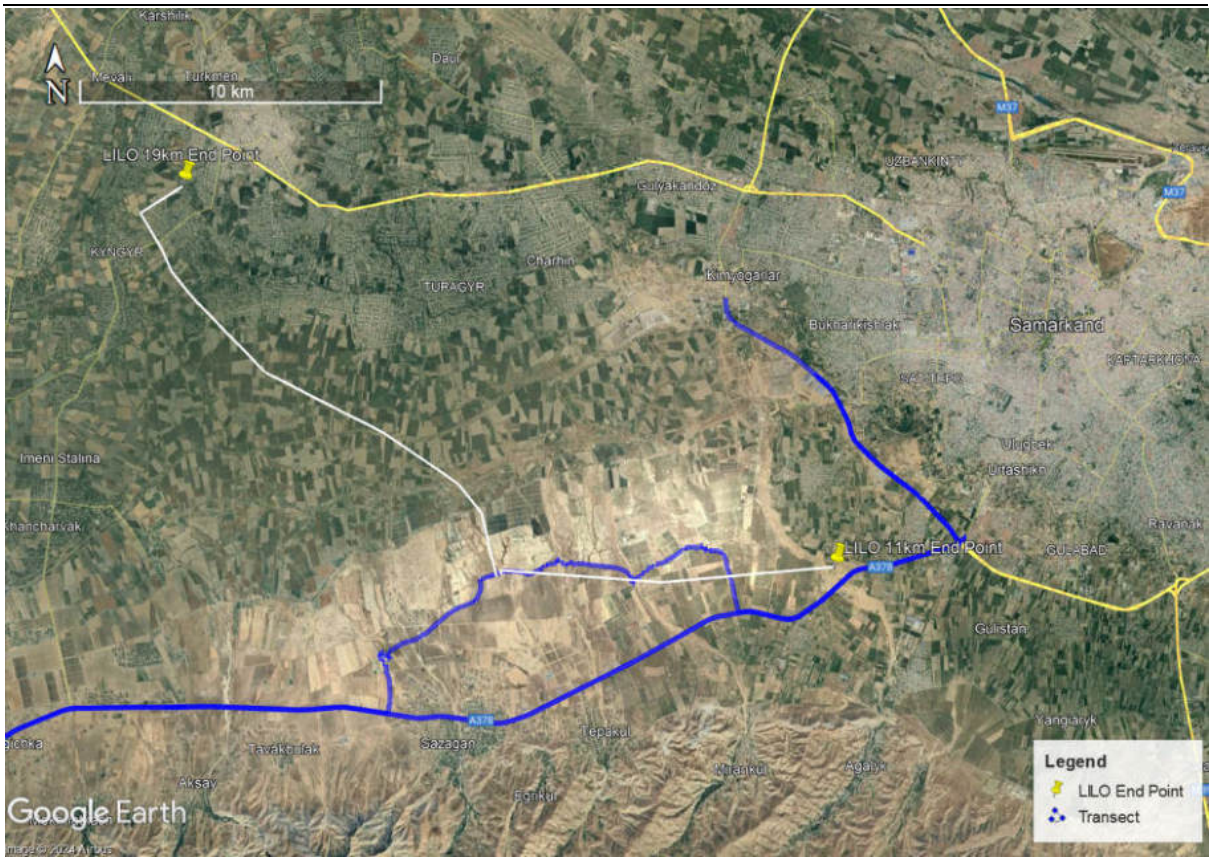

Figure 10-70 Great Bustard Survey Tracks along the 19km OTL

Asian Houbara surveys were undertaken on 20th March 2024, with one location chosen at the start of the 19km LILO. The survey point, and nearby tracks, are shown in relation to the Project element below.

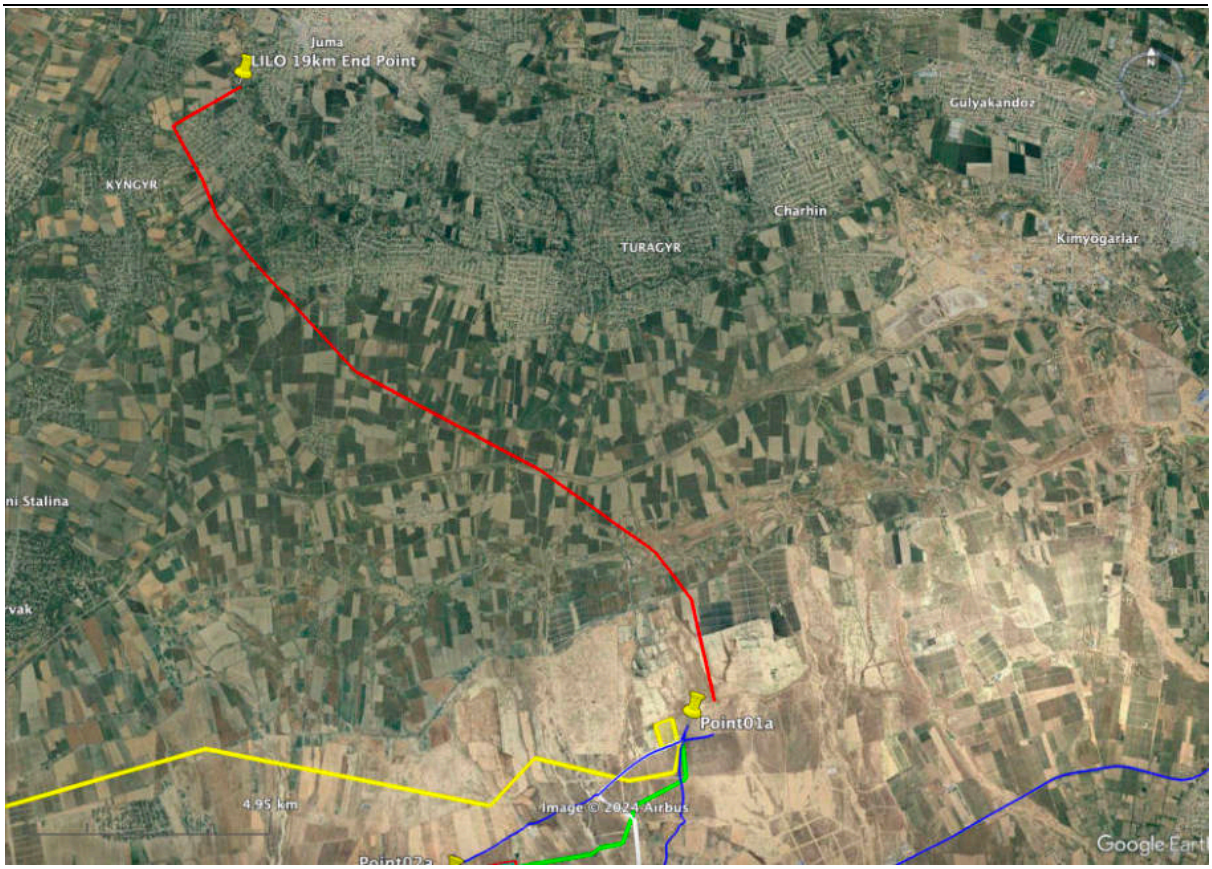

Figure 10-71 Map of survey tracks (blue lines) and sample point (01) for Asian Houbara survey along the 19km LILO (red line)

Table 10-70 Points Counts of Asian Houbara Survey at 19km LILO

POINT	N	E	MOB 1
Point01	39.575788	66.743553	20/03/2024

The Raptor Nest survey was conducted by a local expert between April 26th – 28th 2024. Within the 19km OTL corridor, and a 5km buffer of this area, sites were selected based on the presence of suitable habitat. One location, 2.3km from the LILO, was chosen as shown in the figure below.

Figure 10-72 Location of Raptor Nest Search in relation to 19km LILO (Red Line)

Table 10-71 Locations of Raptor Nest Search at the 19km LILO

POINT	N	E	ROUND 1	ROUND 2
Point 12	39.405917	65.869277	21/03/2024	29/03/2024

10.8.11.2 Results

During the Autumn VP survey, a total of 50 bird counts were recorded, identifying a total of 21 species. Of these, two species of elevated conservation concern were noted; One Steppe Eagle (*Aquila nipalensis*) and one Northern Lapwing (*Vanellus vanellus*). Steppe Eagles are classified as Endangered globally (IUCN RedList) and Vulnerable on a national level (UzRDB), whilst the Northern Lapwing is globally Near Threatened.

In subsequent Spring Migration surveys, a total of 45 bird counts were recorded, with 19 species identified. Of these, two species of elevated conservation concern were noted; 2 Egyptian Vultures (*Neophron percnopterus*) and 1 individual Griffon Vulture (*Gyps fulvus fulvus*). The Egyptian Vulture is globally Endangered (IUCN) and nationally Vulnerable (UzRDB). It was observed migrating across a broad area near the VP. The Griffon Vulture is classified as Vulnerable in the UzRDB, and was observed making short-distance migrations across a broad area.

No observations of Great Bustard, Asain Houbara or Raptor nests (active or inactive) were recorded during the respective 2024 surveys near the 19km LILO.

However, the following breeding and migrating species were recorded during the March 2024 Asian Houbara survey. These species are not of elevated conservation concern on global or national RedLists, however notably high numbers of Crested Lark and Black-bellied Sandgrouse were recorded.

Table 10-72 Species recorded during the Asian Houbara Survey near the 19km LILO in 2024

POINT	DATE	COMMON SPECIES	NUMBER	STATUS	NOTES
Point01a	20/03/2024	Crested Lark	1	resident	
Point01	20/03/2024	Black-bellied sandgrouse	60	migrating	
Point01	20/03/2024	Crested lark	30	migrating	
Point01	20/03/2024	Northern wheatear	1	breeding	
Point01	20/03/2024	Rough-legged buzzard	1	migrating	

10.9 Aquatic Ecology

10.9.1 Methodology

The project elements will not involve any direct planned physical impact on aquatic habitats including both natural rivercourses as well as modified irrigation channels. However, as a precaution, a CHA screening included possible aquatic fish species that may inhabit the aquatic streams in the region of the project elements, mainly the longer stretches of OTL, and a questionnaire was sent to a regional ichthyologist to ensure adequate understanding of the aquatic ecology of these species of concern for the CHA and ESIA.

10.9.2 70-km OTL, 4.9-km OTL

The 70 km Overhead Transmission Line (OTL) corridor project spans through the Samarkand region, impacting a mix of modified and natural habitats with a particular focus on aquatic-related environments. This includes areas adjacent to irrigation and drainage canals as well as the dry beds of temporary streams, all of which are crucial for the sustenance of specific flora and potentially fauna. The zones around irrigation and drainage canals are marked by the presence of mesophytic vegetation such as tamarisk, reed, and camel thorn, alongside various mesophytic weeds. These vegetative strips serve critical ecological functions, creating habitats along the boundary lines between fields and roadsides. The composition and coverage of vegetation in these canal zones significantly fluctuate based on local environmental conditions like soil type and humidity levels.

Further, the project corridor encloses dry beds of temporary streams, predominantly located in the corridor's eastern stretches near the villages of Khancharvak and Kyzylkarvan. Despite being classified under a habitat type that suggests minimal vegetation, these areas host sparse

vegetation including tamarisk and camel thorn among other annual and perennial plants. The degradation levels in these habitats are moderate to severe, primarily due to human activities such as gravel extraction.

The exploration of aquatic-related habitats within the 70 km OTL corridor indicates potential ecological niches for various species, albeit significantly influenced by human endeavors such as agriculture, infrastructure development, and gravel extraction. The transformation and deterioration of natural landscapes emphasize the necessity of integrating ecological considerations and conservation strategies into the project's planning and implementation stages to mitigate adverse impacts on these sensitive environments.

10.9.3 11-km LILO OTL

The 11 km LILO Overhead Transmission Line (OTL) project is situated within the Samarkand Region of Uzbekistan, a central area characterized by a blend of plain and mountainous terrains. This region, notable for its pivotal role in agriculture within Central Asia, encompasses the Zeravshan valley and its adjoining piedmont plains, bordered by the Nuratau and Zeravshan mountain ranges. The valley, recognized as one of the oldest agricultural oases, boasts some of Uzbekistan's most fertile lands, primarily dedicated to agricultural use, thus forming an anthropogenic landscape with limited natural floodplain ecosystems remaining.

The project area extends across the Zeravshan and Syrdarya rivers' middle reaches, incorporating alluvial valleys, terraces, and the eastern segments of the Nuratau Range and Khobduntau Range piedmonts. This diversity of geographical features creates a landscape ranging from flat, clayey plains to slightly inclined terrains dotted with dry stream beds, contributing to a varied ecological canvas. Particularly noteworthy is the small expanse of the South-western Kyzylkum desert within the project's vicinity, adding to the ecological diversity. The elevation varies significantly across the region, from the lower banks of the Syrdarya River to the higher piedmonts of the Khobduntau Range, indicating a broad range of potential impacts and considerations for the project's implementation.

10.9.4 19-km LILO OTL

The 19 km LILO Overhead Transmission Line (OTL) project is situated within the Samarkand Region of Uzbekistan, a central area characterized by a blend of plain and mountainous terrains. This region, notable for its pivotal role in agriculture within Central Asia, encompasses the Zeravshan valley and its adjoining piedmont plains, bordered by the Nuratau and Zeravshan mountain ranges. The valley, recognized as one of the oldest agricultural oases, boasts some of Uzbekistan's most fertile lands, primarily dedicated to agricultural use, thus forming an anthropogenic landscape with limited natural floodplain ecosystems remaining.

The project area extends across the Zeravshan and Syrdarya rivers' middle reaches, incorporating alluvial valleys, terraces, and the eastern segments of the Nuratau Range and Khobduntau Range piedmonts. This diversity of geographical features creates a landscape ranging from flat, clayey plains to slightly inclined terrains dotted with dry stream beds, contributing to a varied ecological canvas. Particularly noteworthy is the small expanse of the South-western Kyzylkum desert within the project's vicinity, adding to the ecological diversity. The elevation varies significantly across the region, from the lower banks of the Syrdarya River to the higher piedmonts of the Khobduntau Range, indicating a broad range of potential impacts and considerations for the project's implementation.

10.9.5 Species

10.9.5.1 Luciobarbus brachycephalus (Aral Barbel)

The Aral Barbel, classified as Vulnerable (VU) by the IUCN and Endangered (EN) in the National UzRDB, reflects significant conservation concerns under Criterion 1, highlighting its susceptibility due to population decline or habitat specificity. This species predominantly inhabits the lower regions of the Amudarya, pointing towards unique ecological niches and life history requirements. Regarding its association with the project's facilities, the expert's assessment indicates no substantial concentration of Aral Barbel within the area of influence of Samarkand 1 main project elements. This suggests a minimal direct impact on this species from the project's implementation, as its habitat is located away from the immediate areas of development.

The Aral Barbel prefers deep river sections with sandy and stony substrates for its habitat, thriving in turbid streams but rarely in stagnant waters. It primarily feeds on benthos organisms, including bivalves, aquatic plants, and chironomid larvae. For breeding, the species ascends rivers, with spawning initiated at water temperatures of 17-18°C from late April to August. Their fecundity ranges from 179-906 thousand eggs.

The main threats for the Aral Barbel as outlined by the regional ichthyologist include changes in water regimes due to flow regulation and pollution, alongside poaching and violations of reproduction conditions.

10.9.5.2 Luciobarbus conocephalus (Turkestan Barbel)

Identified as Data Deficient with a Vulnerable status on the national Red Data Book (UzRDB), the Turkestan Barbel's status reflects a notable lack of comprehensive data, underscoring the importance of cautious consideration in project areas. Despite being categorized under no specific criterion due to its data-deficient status, its noted rarity within the region prompts a protective stance toward potential habitat disruptions. The ichthyologist's feedback underscores that the principal components of Samarkand 1 are unlikely to host significant

concentrations of this rare species, minimizing direct impacts from project activities on its populations.

This species inhabits deep areas of flowing water reservoirs with sandy-stony substrates, feeding on a variety of benthos organisms. Spawning occurs in May-June at water temperatures of 20-27°C on rocky-pebbly substrates.

The main threats for the Turkestan Barbel as outlined by the regional ichthyologist include alterations in river water regimes, pollution, and the competitive impact of acclimatized fish, in addition to poaching.

10.9.5.3 Cyprinus carpio (Eurasian Carp)

The Eurasian Carp, holding a Vulnerable (VU) status on the IUCN Red List and not listed within the National UzRDB, is assessed under Criterion 1 due to potential population vulnerabilities.

The Eurasian Carp prefers quiet, stagnant, or slow-flowing waters with firm, clayey bottoms. It is a benthophage, feeding on a wide range of aquatic organisms and plants. The species is semi-anadromous, migrating for spawning, which typically occurs in late April-May.

The main threats for the Eurasian Carp as outlined by the regional ichthyologist is intraspecific competition of available resources. The common carp, a cultured form of the species, is displacing the wild carp due to widespread breeding and stocking in various water bodies.

10.9.5.4 Sabanejewia aralensis (Aral Goldside Loach)

The Aral Goldside Loach, although listed as Least Concern (LC) on the IUCN Red List, holds a Near Threatened (NT) status within the National Uzbekistan Red Data Book (UzRDB) under Criterion 1. This criterion typically signifies species that are facing a high risk of extinction in the wild due to rapid declines in population numbers or significant threats to their habitats. Despite these concerns, the ichthyologist's analysis indicates that there is no expected significant concentration of the Aral Goldside Loach related to feeding, migratory, or breeding activities within the areas of influence of the main project elements. This suggests that, based on current data and habitat preferences, the project's direct impacts on this species are anticipated to be minimal.

This species is found in shallow bays, springs, and areas with sandy-silty substrates. It feeds on small benthic invertebrates and algae, with spawning occurring in April-June on substrates covered with vegetation.

The main threats for the Aral Goldside Loach as outlined by the regional ichthyologist include changes in water regimes due to flow regulation and pollution, as well as the competitive impact of invasive fish.

10.10Identifying Ecological Receptors

10.10.1 Area of Influence

The area of influence is the area within which project activities may affect receptors. As different aspects carry differing spatial extents, the AoI varies considerably. The below provide the AoI that was considered for each type of predicted potential impact.

Determining Area of Influence (AoI) is based on subjective prediction of the likely direct and secondary impacts that could occur from the associated project activity based on professional opinion; informed by experience with the local ecosystem conditions, assumed methodology used to carry out project activities, and knowledge of the general biodiversity elements anticipated on site.

The purpose of determining the AoI of various impacts is twofold; firstly, it guides the identification of sensitive receptors that may be affected by the various impact types. Secondly, it allows the impact prediction methodology to ascertain relative magnitudes of various impacts as the extent of impact plays a large role in determining the significance of a particular impact on a specific receptor.

- The area of influence for **Habitat Loss** impacts depends on which areas will be temporarily used and which areas will be retained during operation.
    - For temporary loss arising from areas used only for construction purposes, the AoI buffer around the physical project footprint is considered to be up to 50m bounding all project elements as well as temporary construction facilities.
    - For permanent Habitat Loss, the AoI will be considered inclusive of the full project and operation footprint.
- The area of influence for **Direct Mortality** impacts from **clearing/excavation** during construction is inclusive of the full project construction footprint and buffer. The construction buffer around the physical project footprint is considered to be up to 50m bounding all project elements as well as temporary construction facilities.
- The AoI for **vehicular collision during construction** includes all temporary and permanent roadways, corridors, including both new and existing roads that will be used by construction vehicles, with a 50m buffer either side of the road – any fauna regularly using this habitat and/or crossing these areas are at risk.
- The AoI for '**take' during construction** extends to a 1km buffer around the construction footprint due to the potential for workers to wander away from the construction footprint to engage in 'take' activities – if not controlled.
- The AoI for **littering during construction** extends to a 500m buffer around the construction footprint, although windblown litter may possibly travel further, the assessment will focus on the immediate vicinity and species that may be impacted.

- The AoI for **biosecurity risks from accidental construction introduction** is at the time considered to include the footprint of the project inclusive of up to a 10km buffer. Although conceivably on a long-term temporal scale invasive spread can be much more than 10km, for the purposes of the types of potential invasives (namely weed/flora species) we assume that spread would not be able to go beyond 10km before rectification action is commenced.
- The AoI for **environmental quality aspects** such as air quality, noise and vibration, light pollution, contamination, soil compaction and erosion, and hydrological change are considered as per the individual AoIs treated elsewhere in the respective chapters of the ESIA.
- The AoI for **general disturbance** (leading to lowered survivorship and reproductive success) extends to a 1km buffer around the construction footprint. *Specific species may have more sensitivity and a larger buffer could be warranted, in which case it would be assessed separately for specific receptors in specific scenarios.*
- The AoI for **displacement** (resulting from anthropogenic avoidance and edge effect) and resulting resource competition extends beyond the footprint of the project inclusive of up to a 1km buffer depending upon the receptor, to account for the secondary impacts of displaced wildlife into adjacent territories. *Specific species may have more sensitivity and a larger buffer could be warranted, in which case it would be assessed separately for specific receptors in specific scenarios. The 1km buffer is a general starting point, and the AoI could be more or less depending on species, and sensitivity to construction activity vs. operational activity, and the connectivity of adjacent suitable habitats.*
- The AoI for **proliferation of generalist and/or invasive species** due to disturbance and subsequent displacement of native fauna extends beyond the footprint of the project inclusive of up to a 10km buffer. *Specific scenarios where previously inaccessible areas are opened up such as from creation of cleared alignments through forested canopy area, can result in larger areas of influence; the AoI would be assessed separately in these cases.*
- The AoI for **Habitat Fragmentation** impacts extends beyond the footprint of the project inclusive of a 5 km buffer, to account for the phenomenon of barrier effect.
- The AoI for **collision impacts** from birds or bats colliding with the PV panels includes the footprint of the PV array and a 50m buffer. The AoI for **collision impacts and electrocution impacts** from birds colliding or perching on OTL includes the airspace of the OTL alignment and a 50m buffer.

It should be noted that the Ecologically Appropriate Area of Analysis (EAAA) is a separate designation which is utilized in the Critical Habitat Assessment methodology and is not directly relevant to the impact assessment process which instead focuses on activity-specific impact areas. *Refer to the stand-alone CHA Report for EAAA designations.*

10.10.2 DFI Designations

IFC PS 6 on Biodiversity Conservation and Sustainable Management of Living Natural Resources establishes general requirements for the conservation of biodiversity and sustainable management of living natural resources covering aspects such as the assessment of issues and impacts relating to biodiversity. Specifically, it is necessary to determine baseline conditions and categorise the projects habitats as 'critical', 'modified' or 'natural' to undertake the necessary assessment. The Performance Standard defines the different habitats as follows:

- **Natural Habitat**: "Natural habitats are areas composed of viable assemblages of plant and/or animal species of largely native origin, and/or where human activity has not essentially modified an area's primary ecological functions and species composition";
- **Critical Habita**t: "Critical habitats are areas with high biodiversity value, including (i) habitat of significant importance to Critically Endangered and/or Endangered species; (ii) habitat of significant importance to endemic and/or restricted-range species; (iii) habitat supporting globally significant concentrations of migratory species and/or congregatory species; (iv) highly threatened and/or unique ecosystems; and/or (v) areas associated with key evolutionary processes"; and
- **Modified Habita**t: "Modified habitats are areas that may contain a large proportion of plant and/or animal species of non-native origin, and/or where human activity has substantially modified an area's primary ecological functions and species composition. Modified habitats may include areas managed for agriculture, forest plantations, reclaimed coastal zones, and reclaimed wetlands".

10.10.2.1 Critical Habitat

A detailed explanation of Critical Habitat designations is provided in Section 10.2.

Even if they do not meet any of the CH criteria, species or features can be treated as Significant Biodiversity Values (SBVs) as per Section 10.2.3. These designations are taken into account within this ESIA's Sensitive Receptor (SR) valuation and subsequent impact assessment exercise.

10.10.3 Sensitive Receptor Groupings

The following overview tables groups the conservation value of ecological receptors that may be impacted by project works. It includes species registered during the surveys as well as sensitive species that are anticipated to possibly occur within the relative Area of Influences.

Where relevant habitat designations and receptor designations have also been included within the tables.

Table 10-73 Sensitivity Receptors Tables

100MW PV - Ecological Sensitive Receptors		
Receptor Group name and example	**Value/ Sensitivity**	**Justification**
(Modified Habitats) Arable Land	Low	IUCN habitat type 14 Artificial – Terrestrial, specifically subtype 14.1 Arable Land. Used for rainfed cultivation of wheat, barley, and safflower.
(Modified Habitats) Fallow Land	Low	IUCN habitat type 14 Artificial – Terrestrial, subtype 14.2 Pasture Land. Abandoned agricultural land with secondary vegetation, contributing to biodiversity.
(Modified Habitats) Fruit Gardens and Vineyards	Low	IUCN habitat type 14 Artificial – Terrestrial, subtypes 14.3 Plantations and 14.4 Rural Gardens. Includes apple, apricot, and peach trees, as well as intercrops.
(Natural Habitats) Dry Grasslands	Medium	IUCN habitat type 4 Native grassland, subtype 4.4 Temperate grassland. Contains a variety of grasses and forbs, used as pasture land.
(Flora) Common Grassland and Shrub Species	Low	Recorded in multiple sample plots; no protective status on IUCN or UzRDB.
(Flora) Herbaceous Species	Low	Recorded in multiple sample plots; no protective status on IUCN or UzRDB.
(Flora) Invasive and Pioneer Species	Very Low	Recorded in multiple sample plots; no protective status on IUCN or UzRDB.
(Flora) Least Concern (LC) - Riparian and Moisture-Loving Species	Low	Species listed as Least Concern (LC) on IUCN Red List
(Flora) Weedy and Ruderal Species	Low	Alien species not listed on IUCN or UzRDB
(Flora) Cultivated Species	Low	Transcontinental, not threatened
(Flora) Cereal Crops	Very Low	Transcontinental, not threatened

100MW PV - Ecological Sensitive Receptors		
Receptor Group name and example	**Value/ Sensitivity**	**Justification**
(Herptiles) Vulnerable Species - Burrowing, Slow Mobility (i.e. Central Asian Tortoise)	High, SBV	Listed as Vulnerable and under CITES Appendix II, identified as common in the project area. Suitable habitat suggests a stable population presence.
(Herptiles) Near Threatened Species - Burrowing, Medium Mobility (i.e. Tatary Sand Boa, Central Asian Cobra)	Medium	Classified as Near Threatened by the UzRDB and under CITES Appendix II. Conservation efforts necessary, though not globally or locally vulnerable under PS/PR 6 criteria.
(Herptiles) Common Species - Burrowing, Medium Mobility (i.e. Gecko, Agama, Skink)	Low	Common, wide distribution, not listed on red lists, indicative of regional ecosystem.
(Herptiles) Common Species - Burrowing, Fast Mobility (i.e. racerunner, etc.)	Low	Common, observed during survey, indicative of regional ecosystem.
(Mammals) Nationally Uplisted Species - Large Mobile Mammal, Nocturnal (Corsac Fox, Steppe Polecat)	Medium	Observed as rare at the 100 MW PV Plant. Listed as Vulnerable and decreasing population trend in UzRDB. Presence indicates important habitat for the species.
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Tracks observed, common across surveyed areas. Indicates adaptability to various habitats within the project area.
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Most numerous species, widely distributed across various biotopes.
(Mammals) Common Species - Large Mobile Mammal, Nocturnal (Red Fox)	Low	Widespread across all biotopes, evidenced by burrows and tracks. Reflects adaptability to diverse ecological zones.
(Mammals) Rare / Not Numerous Species - Burrowing, Nocturnal (Libyan Jird)	Medium	Observed as sparse, with one colony. Indicates specific habitat preferences.
(Bats) Nationally Uplisted Species - Myotis sp.	Medium	*Observed calls of Pipistrellus pipistrellus in April and May, with significant increase in May (33 calls).*
(Bats) Rarer Species - Eptesicus sp.	Medium	*Observed calls of Eptesicus sp. (serotinus + ognevi) in May (33 calls), suggesting usage of the area.*
(Bats) Common Species - Pipistrellus pipistrellus	Low	*Observed calls of Myotis sp. in May (2 calls), suggesting occasional usage of the area.*

100MW PV - Ecological Sensitive Receptors		
Receptor Group name and example	**Value/ Sensitivity**	**Justification**
(Avifauna) Endangered Species - Raptors - Egyptian Vulture	Very High, SBV	Listed as Endangered (EN) by IUCN and Vulnerable (VU) on the Uzbekistan Red List (UzRDB, 2019), indicative of critical conservation value.
(Avifauna) Nationally Uplisted Species - Raptors - Griffon Vulture	High, SBV	Listed as Vulnerable (VU) by IUCN and on the Uzbekistan Red List (UzSPB, 2019), indicative of critical conservation value.
(Avifauna) Common Species - Residents - i.e. Crested Lark, etc.	Low	Common, resident species, observed at multiple points, indicative of local ecosystem.

NUROBOD BESS - Ecological Sensitive Receptors		
Receptor Group name and example	**Value/ Sensitivity**	**Justification**
Natural (Habitats) Dry Grassland	Medium	IUCN habitat type 4 Native grassland, subtype 4.4 Temperate grassland, characterized by sparse and uniform vegetation typical for disturbed areas and intensively grazed rangelands in Uzbekistan's piedmont plains. Habitat contains native vegetation including camel thorn and ephemerals. Impacted by grazing and pollution with garbage.
Modified (Habitats) Fallow Land	Low	IUCN habitat type 14 Artificial – Terrestrial, previously cultivated, now abandoned. Land is primarily used for crop farming. Occupied by secondary vegetation resulting from previous agricultural use, indicative of habitat modification. Exhibits sparse vegetation cover ranging from nearly nonexistent to 20%, with plants occurring in scattered patches or groups. The area comprises fallow lands with sparse vegetation indicative of human modification and low ecological value.
Modified (Habitats) Dry Bed of Temporary Streams	Medium	Habitat influenced by intermittent water flow, important for conservation and soil erosion prevention. Supports unique flora adapted to seasonal water availability.
Modified (Habitats) Settlements & Farmsteads	Very Low	Characterized by residential areas and small agricultural plots; contributes to local biodiversity and agrarian activities. Modified habitats influenced by human activities such as small-scale agriculture and habitation.

NUROBOD BESS - Ecological Sensitive Receptors		
Receptor Group Name and Example	**Value/ Sensitivity**	**Justification**
(Flora) Native Species - Grassland Species	Medium	Native species with no protective status on IUCN or UzRDB
(Flora) Least Concern (LC) Species	Medium	Species listed as Least Concern (LC) on IUCN Red List
(Flora) Alien Species - Weedy Species	Very Low	Alien species not listed on IUCN or UzRDB
(Flora) Native Fruit Trees	Low	Transcontinental, not threatened
(Flora) Native Agricultural Crops	Low	Transcontinental, not threatened
(Herptiles) Vulnerable Species - Burrowing, Slow Mobility (i.e. Central Asian Tortoise)	High, SBV	Anticipated presence, vulnerable species (VU) by UzRDB and IUCN, indicative of regional ecosystem, CITES Appendix II.
(Herptiles) Near Threatened Species - Burrowing, Medium Mobility (i.e. Tatary Sand Boa)	Medium	Rare, listed as Near-Threatened (NT) by UzRDB, indicative of regional ecosystem, CITES Appendix II.
(Herptiles) Common Species - Burrowing, Medium Mobility (i.e. Gecko, Agama, Skink)	Low	Common, wide distribution, not listed on red lists, indicative of regional ecosystem.

NUROBOD BESS - ECOLOGICAL SENSITIVE RECEPTORS		
RECEPTOR GROUP NAME AND EXAMPLE	**VALUE/ SENSITIVITY**	**JUSTIFICATION**
(Herptiles) Common Species - Burrowing, Fast Mobility (i.e. whipsnakes,etc)	Low	Common, wide distribution, not listed on red lists, indicative of regional ecosystem.
(Mammals) Nationally Uplisted Species - Burrowing, Nocturnal (Steppe Polecat)	Medium	Found near yellow ground squirrel settlements. Classified as Vulnerable in the UzRDB. The presence of burrows indicates potential habitat use. Conservation efforts are necessary.
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Commonly observed with tracks and droppings found along dirt roads and perimeters of barley fields.
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	The most frequently observed mammal in various biotopes, with conspicuous burrows and signs of activity.
(Mammals) Common Species - Large Mobile Mammal, Nocturnal (Red Fox)	Low	Common across all biotopes, evidenced by tracks, burrows, and droppings.
(Bats) Common Bats (Common Pipistrelle)	Low	Observed calls of Pipistrellus pipistrellus in May (7 calls), suggesting occasional usage of the area.
(Bats) Rarer Bats (Eptesicus sp.)	Medium	Observed calls of Eptesicus sp. (serotinus + ognevi) in April (8 calls) and May (13 calls), suggesting occasional usage of the area.
(Bats) IUCN Red List - DD - Bats (Myotis sp.)	Medium	Observed calls of Myotis sp. in April (1 call), suggesting occasional usage of the area.
(Avifauna) Endangered Species - Raptors (Egyptian Vulture)	Very High, SBV	Listed as Endangered (EN) by IUCN and Vulnerable (VU) on the Uzbekistan Red List (UzRDB, 2019), indicative of critical conservation value.
(Avifauna) Nationally Uplisted Species - Raptors (Griffon Vulture)	Medium	Listed as Vulnerable (VU) byn the Uzbekistan Red List (UzSPB, 2019), indicative of critical conservation value.
(Avifauna) Common Resident Species (Crested Lark, etc)	Low	Common, resident species, observed at multiple points, indicative of local ecosystem.

70KM OTL - Ecological Sensitive Receptors		
Receptor Group name and example	**Value/ Sensitivity**	**Justification**
(Natural Habitats) Dry bed of temporary stream, Dry grassland	Medium	Natural habitat with modest canopy cover (20-30%) and 13 species. Natural dry grasslands with canopy cover ranging from 0-30% and up to 13 species. No IUCN or UZBRDB species.
(Modified Habitats) Arable lands with non-irrigated agricultural crops	Low	Modified habitat with canopy cover ranging from 15-60% and up to 30 species. No IUCN or UZBRDB species.
(Modified Habitats) Vineyard, Boundary-strips, roadsides; Canals and drainage channels	Low	Intensively modified habitat with high canopy cover (80-90%) and high species diversity (45 species). No IUCN or UZBRDB species.
(Modified Habitats) Arable lands with irrigated agricultural crops; Boundary-strips, roadsides; Canals and drainage channels	Low	Intensively modified habitat with high canopy cover (70-80%) and high species diversity (45 species). No IUCN or UZBRDB species.
(Modified Habitats) Fruit garden; Boundary-strips, roadsides	Low	Modified habitat with moderate canopy cover (40-50%) and moderate species diversity (29 species). No IUCN or UZBRDB species.

70KM OTL - Ecological Sensitive Receptors		
Receptor Group name and example	**Value/ Sensitivity**	**Justification**
(Flora) Endangered (EN) Species (Exotic Non Native)	Medium	Among ornamental trees, planted in woodland belts, one introduced species, Gleditsia caspica, is included in the IUCN Red List as Endangered.
(Flora) Native Species	Medium	Native species with no protective status on IUCN or UzRDB
(Flora) Least Concern (LC)	Medium	Species listed as Least Concern (LC) on IUCN Red List
(Flora) Alien Species	Very Low	Alien species not listed on IUCN or UzRDB
(Flora) Native Fruit Trees	Low	Transcontinental, not threatened
(Flora) Native Agricultural Crops	Low	Transcontinental, not threatened

70KM OTL - Ecological Sensitive Receptors		
Receptor Group name and example	**Value/ Sensitivity**	**Justification**
(Herptile) Vulnerable Species - Slow Mobility (i.e. Central Asian Tortoise)	High, SBV	Listed as Vulnerable and under CITES Appendix II. Observed along the 70km OTL route, with a number of burrows and one carapace recorded. Habitat along the route is suitable, indicating likely higher densities.
(Herptile) Vulnerable Species - Medium Mobility (Caspian Monitor)	High	Vulnerable status and listed under CITES Appendix I. Recorded as rare, underlining the necessity of conservation actions within the project area where its habitat may be influenced.
(Herptile) Near Threatened Species - Medium Mobility (i.e. Tatary Sand Boa)	Medium	Classified as Near Threatened (NT) by the UzRDB and under CITES Appendix II. Conservation efforts are necessary, though current evidence does not classify it as globally or locally vulnerable under PS/PR 6 criteria.
(Herptile) Common Species - Medium Mobility (i.e.Gecko, Agama, Skink)	Low	Common, wide distribution, not listed on red lists, indicative of regional ecosystem.
(Herptile) Common Species - Fast Mobility (i.e. Racerunner, whip snake)	Low	Common, observed during survey, indicative of regional ecosystem.

70KM OTL - Ecological Sensitive Receptors		
Receptor Group name and example	**Value/ Sensitivity**	**Justification**
(Mammals) Nationally Uplisted Species - Large Mobile (i.e. Corsac Fox)	Medium	Corsac Fox recorded in transects 3, 7, and 8. Listed as Vulnerable and decreasing population trend in UzRDB. Steppe Polecat found in transect 3. Listed as Vulnerable in UzRDB.
(Mammals) Common Species - Insectivore, Nocturnal (i.e. Long-eared Hedgehog)	Low	Found in transects 1, 2, 5, 7, and 8. Common across surveyed areas, indicating adaptability to various habitats within the project area.
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Yellow Ground Squirrel found in all transects. Most numerous species, widely distributed across various biotopes. Zaisan Mole Vole found in all transects except 3. Common presence, showing a gradient in abundance across the transects.
(Mammals) Common Species - Large Mobile, Nocturnal (i.e. Red Fox)	Low	Found in transects 1, 2, 3, 6, 7, and 8. Widespread across all biotopes, evidenced by burrows and tracks. Reflects adaptability to diverse ecological zones.
(Mammals) Rarer Species - Insectivore (Brandt's Hedgehog)	Medium	Found in transect 8. Rare presence, indicating specific habitat preference or lower population density.

70KM OTL - Ecological Sensitive Receptors		
Receptor Group name and example	**Value/ Sensitivity**	**Justification**
(Mammals) Rarer Species - Burrowing (Lesser Jerboa, etc)	Medium	Found in transects 5, 7, and 8. Rare presence, indicating specialized habitat requirements or lower detectability.
(Mammals) Rarer Species - Nocturnal (i.e. Libyan Jird)	Medium	Libyan Jird found in transects 5 and 6. Sparse presence, indicating specific habitat preferences. Midday Jird found in transects 1, 4, 6, 7, and 8. Rare presence, indicating specialized habitat requirements or lower detectability. House Mouse found in transect 1. Sparse presence, indicating adaptability to various environments.
(Avifauna) Endangered Species - Raptors (Egyptian Vultre, Steppe Eagle)	Very High, SBV	Recorded during the survey, highlighting the need for habitat protection measures. Multiple observations during the survey, emphasizing the importance of the area for endangered species.
(Avifauna) Endangered Species - Groundbirds (Great Bustard)	Very High, SBV	Observed once migrating during the survey. EN
(Avifauna) Vulnerable Species - Raptors (Greater Spotted Eagle, Eastern Imperial Eagle)	High, SBV	Listed as Vulnerable (VU) by IUCN and on the Uzbekistan Red List (UzSPB, 2019), indicative of critical conservation value. Recorded during the survey, highlighting the area's importance for this vulnerable species. Various rare species observed, emphasizing the importance of conservation to prevent further population declines.

70KM OTL - Ecological Sensitive Receptors		
Receptor Group name and example	**Value/ Sensitivity**	**Justification**
(Avifauna) Near Threatened Species - Raptors (Cinereous Vulture, Pallid Harrier)	Medium	Recorded during the survey, underscoring the need for habitat conservation. Notable observation highlighting the need for conservation efforts.
(Avifauna) Near Threatened Species - Groundbirds(Little Bustard)	Medium	Observed during the survey, indicating the area's significance for near-threatened species. Observed during migration, underlining the area's importance for this near-threatened species.
(Avifauna) Near Threatened Species - Waterbirds - Northern Lapwing	Medium	Observed during the survey, indicating the area's significance for near-threatened species. Observed during migration, underlining the area's importance for this near-threatened species.
(Avifauna) Nationally Important Species - Waterbirds - Black Stork	Medium	Presence recorded, indicating the importance of habitat preservation.
(Avifauna) Common Species - Raptors (Rough-legged BUzzard, Common Buzzard, etc)	Low	Presence recorded, indicating the importance of habitat preservation.

70KM OTL - Ecological Sensitive Receptors		
Receptor Group name and example	**Value/ Sensitivity**	**Justification**
(Avifauna) Common / LC Species - Waterbirds (Migratory) (Little Egret, Etc.)	Low	Common species without heightened status
(Avifauna) Common Species (Others) - Lark, Wheatear, etc.	Low	Common species without heightened status
(Avifauna) Urban Speceis - Rock Dove	Very Low	Urban adapted species

4.9KM OTL- Ecological Sensitive Receptors		
Receptor Group name and example	**Value/ Sensitivity**	**Justification**
(Natural Habitats) Dry Grasslands, Dry Beds of Temporary Streams	Medium	These habitats are characterized by sparse and uniform vegetation typical for disturbed areas and intensively grazed rangelands, common in clayey piedmont plains and foothills of Uzbekistan.
(Modified Habitats) Arable Land, Fallow Land	Low	Dominated by human activity, these habitats consist of fallow lands and rainfed croplands, reflecting significant alterations to the natural landscape for agricultural purposes.

4.9KM OTL- Ecological Sensitive Receptors		
Receptor Group name and example	**Value/ Sensitivity**	**Justification**
(Flora) Native Species	Medium	Native species with no protective status on IUCN or UzRDB
(Flora) Least Concern (LC)	Medium	Species listed as Least Concern (LC) on IUCN Red List
(Flora) Alien Species	Very Low	All recorded species are typical and more or less common for piedmont plains and foothills of Uzbekistan occupied with rainfed crops and fallow lands
(Herptiles) Vulnerable Species - Slow Mobility (i.e. Central Asian Tortoise)	High, SBV	Listed as Vulnerable and under CITES Appendix II, identified as common in the project area. Suitable habitat suggests a stable population presence.
(Herptiles) Near Threatened Species - Medium Mobility (i.e. Tatary Sand Boa)	Medium	Classified as Near Threatened by the UzRDB and under CITES Appendix II. Conservation efforts necessary, though not globally or locally vulnerable under PS/PR 6 criteria.
(Herptiles) Common Species - Medium Mobility (i.e. Gecko, Agama, Skink)	Low	Common, wide distribution, not listed on red lists, indicative of regional ecosystem.
(Herptiles) Common Species - Fast Mobility (i.e. racerunner, whip snake)	Low	Common, observed during survey, indicative of regional ecosystem.
(Mammals) Nationally Uplisted Species - Larger Mobile, Nocturnal (Steppe Polecat)	Medium	Burrow found, indicating presence. Listed as Vulnerable in UzRDB. Associated with yellow ground squirrel settlements, suggesting critical conservation value.
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Tracks found. Common species observed along dirt roads and perimeters of barley fields, indicating adaptability to various habitats within the project area.
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	2 burrows found. Most frequently observed mammal, widely distributed across various biotopes, including flatlands and field outskirts.
(Mammals) Common Species - Large Mobile, Nocturnal (Red Fox)	Low	Burrow found. Common across all biotopes, evidenced by tracks, burrows, and droppings, reflecting adaptability to diverse ecological zones.
(Mammals) Rarer Species - Large Mobile (Asiatic Wildcat)	Medium	Track and burrow found. Sparse presence, indicating significant habitat requirement.
(Avifauna) Endangered Species - Raptors (Egyptian Vulture)	Very High, SBV	Observed, listed as Endangered by IUCN and Vulnerable by UzRDB, indicating significant conservation concerns.

4.9KM OTL- Ecological Sensitive Receptors		
Receptor Group name and example	**Value/ Sensitivity**	**Justification**
(Avifauna) Nationally Uplisted Species - Raptors (Griffon Vulture)	Medium	Observed, listed as Vulnerable by UzRDB, indicating the importance of the project area for this species.
(Avifauna) Common Species - Raptors (Upland Buzzard, Common Kestrel, etc)	Low	Observed multiple time
(Avifauna) Common Species - Migratory (Common Swift, Greater Short-toed Lark)	Low	Observed multiple times, indicating minimal impact from the project activities.
(Avifauna) Common Species - Residents, or Common Visitors (i.e. Crested LArk, Common Starling)	Low	Observed multiple times, indicating minimal impact from the project activities.
(Avifauna) Urban Species - Residents (Rock Pigeon, Common Raven)	Very Low	Observed multiple times, indicating minimal impact from the project activities.

400MW PV - Ecological Sensitive Receptors		
Receptor Group name and example	**Value/ Sensitivity**	**Justification**
Natural (Habitats) Dry Grasslands	Medium	IUCN habitat type 4 Native grassland, subtype 4.4 Temperate grassland, characterized by sparse and uniform vegetation typical for disturbed areas and intensively grazed rangelands in Uzbekistan's piedmont plains. Habitat exhibits sparse vegetation cover ranging from nearly nonexistent to 10-30%, with plants occurring in scattered patches or groups.
Modified (Habitats) Lands and Boundaries	Low	IUCN habitat type 14 Artificial – Terrestrial, previously cultivated, now abandoned. Land within the PV plant and pooling station sites is utilized for extensive grazing. Occupied by secondary vegetation resulting from previous agricultural use, indicative of habitat modification. Habitat exhibits sparse vegetation cover ranging from nearly nonexistent to 10-30%, with plants occurring in scattered patches or groups. Supports secondary succession and natural recovery processes.

400MW PV - Ecological Sensitive Receptors		
Receptor Group name and example	**Value/ Sensitivity**	**Justification**
Modified (Habitats) Young Fruit Garden	Low	Modified habitats influenced by human activities such as agriculture, grazing, ground roads, and pollution. Vegetation includes camel thorn-ephemeroid and apple plantations.
(Flora) Native Grassland and Shrub Species	Medium	Native species with no protective status on IUCN or UzRDB
(Flora) Native Moisture-Loving Species	Medium	Species listed as Least Concern (LC) on IUCN Red List
(Flora) Invasive and Alien Species	Very Low	Alien species not listed on IUCN or UzRDB
(Flora) Native Fruit Trees	Low	Transcontinental, not threatened
(Flora) Native Agricultural Crops	Low	Transcontinental, not threatened
(Herptiles) Vulnerable Species - Burrowing, Slow Mobility (i.e. Central Asian Tortoise)	High, SBV	Listed as Vulnerable and under CITES Appendix II, was identified as common in the project area. Suitable habitat suggests a stable population presence.
(Herptiles) Vulnerable Species - Burrowing, Medium Mobility (i.e. Caspian Monitor)	High	Vulnerable status and listed under CITES Appendix I. Recorded as rare, underlining the necessity of conservation actions within the project area where its habitat may be influenced.
(Herptiles) Near Threatened Species - Burrowing, Medium Mobility (i.e. Tatary Sand Boa)	Medium	Classified as Near Threatened (NT) by the UzRDB and under CITES Appendix II. Though rare, conservation efforts are necessary.

400MW PV - Ecological Sensitive Receptors		
Receptor Group name and example	**Value/ Sensitivity**	**Justification**
(Herptiles) Common Species - Burrowing, Medium Mobility (i.e. Gecko, Agama, Skink)	Low	Common, wide distribution, not listed on red lists, indicative of regional ecosystem.
(Herptiles) Common Species - Burrowing, Fast Mobility (i.e. whipsnakes,etc)	Low	Common, wide distribution, not listed on red lists, indicative of regional ecosystem.
(Mammals) Nationally Uplisted Species - Large Mobile (Corsac Fox, Steppe Polecat)	Medium	Corsac Fox observed as rare, recorded on phototrap, highlighting the need for conservation focus due to its Vulnerable status and decreasing population trend as noted in the UzRDB. Steppe Polecat found as a road kill 17 km to the east, suggesting its presence in the area. Classified as Vulnerable in the UzRDB, highlighting the need for conservation efforts.
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Tracks observed, common species observed along dirt roads and perimeters of barley fields, indicating adaptability to various habitats within the project area.
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Yellow Ground Squirrel numerous burrows observed, the most frequently seen mammal, indicating robust mammalian activity in the area. Zaisan Mole Vole commonly found in sparsely vegetated flatlands and terraces of former agricultural fields.
(Mammals) Common Species - Large Mobile, Nocturnal (Red Fox)	Low	Red Fox droppings and tracks found, indicating its widespread distribution and adaptability to the region's diverse ecological zones. Asiatic Wildcat sparse presence, indicating significant habitat requirement.
(Mammals) Rarer Species - Insectivore (Brandt's Hedgehog)	Medium	Rarely found, reflecting its presence in the area. Its Near Threatened status in UzRDB suggests a concern, though its observation indicates adaptability to the project environment.
(Bats) Common Bat Species (Lesser Noctule)	Low	Observed 31 pulses with 31 matching, 7 pulses with 7 matching, and 5 pulses with 5 matching for Lesser Noctule. Observed 24 pulses with 17 matching for Noctule. Identified as Nyctalus leisleri with alternates being Nyctalus noctula.
(Bats) Rarer Bat Species (Eptesicus sp., Tadarida sp.)	Medium	Observed calls of Eptesicus sp. (serotinus + ognevi) in April (8 calls), suggesting occasional usage of the area.; Observed calls of Tadarida teniotis*(listed as VU in UzRDB & LC on IUCN) in May 2024 (51 calls), suggesting usage of the area.
(Avifauna) Near Threatened Species - Groundbirds (Migratory) (Little Bustard)	Medium	Observed in large numbers (2000 individuals), indicating the area is significant for migratory stopover.

400MW PV - Ecological Sensitive Receptors		
Receptor Group name and example	**Value/ Sensitivity**	**Justification**
(Avifauna) Common Species - Raptors (Long-legged Buzzard, Western Marsh Harrier, etc)	Low	Observed in breeding and non-breeding contexts, indicating the presence of stable resident populations. Observed multiple times during migration, highlighting the importance of the area for migratory birds. Observed during migration, indicating the project area is part of its migratory route. Observed during migration, suggesting the area is used as a migratory stopover.
(Avifauna) Common Species - Waterbirds (Migratory) (Greater Sand Plover)	Low	Observed multiple times in significant numbers, indicating the area is an important migratory route. Observed breeding, indicating the area provides suitable habitat for this species.
(Avifauna) Common Resident Species (i.e. Lark, Sandgrouse..)	Low	Observed multiple times, indicating a stable resident population within the project area. Observed breeding within the project area, indicating the presence of suitable habitat for this species.

11KM OTL - Ecological Sensitive Receptors		
Receptor Group name and example	**Value/ Sensitivity**	**Justification**
(Natural Habitats) Dry Grasslands on Gentle Foothills, Dry Bed of Temporary Streams	Medium	These habitats support a variety of plant species, including both native and endemic taxa. The impact factors are primarily natural processes such as grazing and occasional flooding. They contribute significantly to the biodiversity and ecological significance of the region.
(Modified Habitats) Young Fruit Garden, Quarry, Fruit Garden; Boundary-strips, Roadsides, Fallow Lands	Low	These habitats are influenced by human activities such as agriculture, gravel and clay extraction, garbage dump, and abandonment of arable lands. They support a mix of native and alien plant species, indicating their modified nature.
(Flora) Endangered (EN) Species - Exotic/Nonnative	Medium	Among ornamental trees, planted in woodland belts, one introduced species, Gleditsia caspica, is included in the IUCN Red List as Endangered (EN).
(Flora) Native Species	Medium	Native species with no protective status on IUCN or UzRDB
(Flora) Least Concern (LC)	Medium	Species listed as Least Concern (LC) on IUCN Red List

11KM OTL - Ecological Sensitive Receptors		
Receptor Group name and example	**Value/ Sensitivity**	**Justification**
(Flora) Alien Species	Very Low	Alien species not listed on IUCN or UzRDB
(Flora) Native Fruit Trees	Low	Transcontinental, not threatened
(Flora) Native Agricultural Crops	Low	Transcontinental, not threatened
(Herptiles) Vulnerable Species - Slow Mobility (Central Asian Tortoise)	High	Although no signs were observed during the 2024 surveys, the likelihood of presence remains high due to suitable habitat conditions. Listed as Vulnerable (VU) and under CITES Appendix II.
(Mammals) Nationally Uplisted Species - Large Mobile (Steppe Polecat)	Medium	Found near yellow ground squirrel settlements. Classified as Vulnerable in the UzRDB. The presence of burrows indicates potential habitat use. Conservation efforts are necessary.
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Commonly observed with tracks and droppings found along dirt roads and perimeters of barley fields.
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	The most frequently observed mammal in various biotopes, with conspicuous burrows and signs of activity.
(Mammals) Rarer Species - Burrowing (i.e. Zaisan Mole Vole)	Medium	Commonly found in sparsely vegetated flatlands and on terraces of former agricultural fields.
(Mammals) Common Species - Large Mobile, Nocturnal (Red Fox)	Low	Common across all biotopes, evidenced by tracks, burrows, and droppings.
(Mammals) Rarer Species - Large Mobile, Nocturnal (Asiatic Wildcat)	Medium	Less common, detected in a dry riverbed. Highlights the significance of these habitats for its survival amidst regional developments.
(Avifauna) Endangered Species - Raptors (Steppe Eagle)	Very High, SBV	Observed multiple times, listed as Endangered by IUCN and Vulnerable by UzRDB, underscoring the area's importance for this species.
(Avifauna) Vulnerable Species - Raptors (Eastern Imperial Eagle)	High, SBV	Observed once, categorized as Vulnerable by both IUCN and UzRDB, indicating potential risks from the project activities.
(Avifauna) Near Threatened Species - Raptors (Hen Harrier)	Medium	Observed once, categorized as Near Threatened by IUCN and UzRDB, indicating potential risks from the project activities.
(Avifauna) Common Species - Raptors (i.e. Common Kestrel, Long-legged Buzzard)	Low	Observed once, not listed as threatened, indicating minimal impact from the project activities.

11KM OTL - Ecological Sensitive Receptors		
Receptor Group name and example	**Value/ Sensitivity**	**Justification**
(Avifauna) Common Species - Waterbirds (Migratory) (i.e. Green Sandpiper, Little Ringed Plover)	Low	Observed multiple times
(Avifauna) Common Species - Residents & Visitors (Rook, Jackdaw, etc.)	Low	Observed multiple times in significant numbers, indicating the area is an important migratory route. Observed breeding, indicating the area provides suitable habitat for this species.
(Avifauna) Urban Species (Rock Pigeon)	Very Low	Observed multiple times

19KM OTL - Ecological Sensitive Receptors		
Receptor Group name and example	**Value/ Sensitivity**	**Justification**
Dry beds of temporary streams	Medium	Natural habitat with very sparse vegetation, including solitary specimens of tamarisk, camel thorn, and other annual and perennial plants. This habitat is moderately to strongly degraded due to gravel extraction.
Arable lands with agricultural crops	Low	Modified habitat represented with intensive unmixed crops. Corresponds with EUNIS habitat type V1 Arable land and market gardens (V11 Intensive unmixed crops).
Fallow lands	Low	Abandoned non-irrigated arable lands with sandy-clayey soil and bluegrass-camel thorn community. Species composition is poor, and the canopy cover is sparse (0-20%).
Boundary-strips, roadsides, canals and drainage channels	Low	Modified habitat occupying narrow strips between fields, along roads and irrigation systems. Includes a variety of grasses, weeds, and mesophytic plants. Species composition, abundance, and canopy cover density vary depending on local conditions.
(Flora) Native Species	Medium	Native species with no protective status on IUCN or UzRDB
(Flora) Least Concern (LC)	Medium	Species listed as Least Concern (LC) on IUCN Red List

19KM OTL - Ecological Sensitive Receptors		
Receptor Group name and example	**Value/ Sensitivity**	**Justification**
(Flora) Alien Species	Very Low	Alien species not listed on IUCN or UzRDB
(Flora) Native Fruit Trees	Low	Transcontinental, not threatened
(Herptiles) Vulnerable Species - Slow Mobility (Central Asian Tortoise)	High, SBV	Although no signs were observed during the 2024 surveys, the likelihood of presence remains high due to suitable habitat conditions. Listed as Vulnerable (VU) and under CITES Appendix II.
(Mammals) Nationally Uplisted Species - Large Mobile Mammals (Steppe Polecat)	Medium	Found near yellow ground squirrel settlements. Classified as Vulnerable in the UzRDB. The presence of burrows indicates potential habitat use. Conservation efforts are necessary.
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Commonly observed with tracks and droppings found along dirt roads and perimeters of barley fields.
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	The most frequently observed mammal in various biotopes, with conspicuous burrows and signs of activity. Commonly found in sparsely vegetated flatlands and on terraces of former agricultural fields.
(Mammals) Rarer Species - Burrowing (i.e. Zaizan Mole Vole)	Medium	Status is LC, but less ubiquitous than other burrowing small mammals.
(Mammals) Common Species - Larger Mobile Mammals, Nocturnal (Red Fox)	Low	Common across all biotopes, evidenced by tracks, burrows, and droppings.
(Mammals) Rarer Species - Larger Mobile Mammals, Nocturnal (Asiatic Wildcat)	Medium	Less common, detected in a dry riverbed. Highlights the significance of these habitats for its survival amidst regional developments.
(Avifauna) Endangered Species - Raptors (Steppe Eagle)	Very High, SBV	Observed multiple times, listed as Endangered by IUCN and Vulnerable by UzRDB, underscoring the area's importance for this species.
(Avifauna) Vulnerable Species - Raptors (Eastern Imperial Eagle)	High, SBV	Observed once, categorized as Vulnerable by both IUCN and UzRDB, indicating potential risks from the project activities.
(Avifauna) Near Threatened Species - Raptors (Hen Harrier)	Medium	Observed once, categorized as Near Threatened by IUCN and UzRDB, indicating potential risks from the project activities.
(Avifauna) Common Species - Raptors (i.e. Common Kestrel, Long-legged Buzzard)	Low	Observed once, not listed as threatened, indicating minimal impact from the project activities.

19KM OTL - Ecological Sensitive Receptors		
Receptor Group name and example	**Value/ Sensitivity**	**Justification**
(Avifauna) Common Species - Waterbirds (Migratory) (i.e. Green Sandpiper, Little Ringed Plover)	Low	Observed multiple times
(Avifauna) Common Species - Residents & Visitors (Rook, Jackdaw, etc.)	Low	Observed multiple times in significant numbers, indicating the area is an important migratory route. Observed breeding, indicating the area provides suitable habitat for this species.
(Avifauna) Urban Species (Rock Pigeon)	Very Low	Observed multiple times

10.11Impacts, Mitigation, and Residual Significance

10.11.1 Construction Impacts

10.11.1.1 Impact – Habitat Loss

Habitat loss occurs in all areas where the permanent footprint of the project facilities are located; further, a wider buffer is often applicable due to edge effect, where the transition zone between anthropogenic land use and habitats is utilized less by sensitive species requiring core patches of habitat.

The full construction footprint will often include more than the exact physical footprint of built facilities, as it also includes areas used temporarily for offices, vehicle parking and maintenance, temporary access roads, supply and material laydown and preparation, as well as generators, batching plants, and other support facilities that are needed during the construction process. However, the exact locations and extent of all of the temporary use areas for construction are not yet confirmed. At this time, it is postulated that any areas used temporarily during construction but not needed for O&M will be fully rehabilitated and restored to original habitat conditions, integrating natural habitat species as much as possible, where appropriate. Therefore the assumption is that no significant remaining impact will occur at the temporary areas. This is supported by the calculation of permanent habitat loss that will occur for each project asset/facility, as well as the additional amount lost when an edge effect buffer which has been presented in the assessment.

Habitat loss can be minimized as much as possible, however, complete avoidance of loss is not possible in most development projects. For the project, considerations are integrated into the design to keep the size of access roads and facilities as minimal as possible.

Generally, the SS and BESS facilities are found in modified habitat mosaics with anthropogenic disturbance, and the overall footprint in the context of the wider habitat matrix is relatively small. Therefore habitat loss, while it will occur, is not considered to have significant residual impact, and does not require additional mitigation or compensation.

For the PV sites, they are much larger relatively, and the footprint of the PVs will result in uptake of natural habitat (albeit, highly degraded by grazing and anthropogenic activity, and consequently of poor ecological quality). Therefore some form of mitigation is required so that No Net Loss of natural habitat can be met.

The PV site layout will include opportunities for areas that can be set aside for habitat rehabilitation and restoration, in a way to allow for native vegetation to grow up (especially as it will be protected from grazing). Permanent fencing will be permeable to allow small fauna to move through the fence, and in key locations, under-fence piping or culverts will be buried to allow medium sized fauna to pass through the fencing as well.

Given the appropriate restorative and rehabilitative support, it is postulated that the biodiversity quality that can be present within the small patches of buffer habitat throughout can compensate in quality for the loss of larger tracts of natural degraded habitat that existed pre-project. In this way the magnitude of habitat loss has been tempered accordingly for these sites and it is not envisaged that additional compensation or offsets would be necessary.

The habitat loss arising from OTLs are negligible as it is restricted only to the OTL tower footprints, so no specific mitigation has been outlined for this either since none of the habitats affected are critical habitats.

Magnitude has also been downgraded for habitats where losses must be compensated on a socio-economic level, such as fruit orchards and agricultural crop fields.

100 MW PV Plant and Access Road Sites

Table 10-73 Habitat Loss Calculations for 100MW PV

Habitat	Type	Area in Ha	Buffer (sqm)	Distribution
fallow land	Modified Habitat	194.46	2076.73	89.80%
Arable land	Modified Habitat	21.93	1673.87	10.13%
woodland belts, boundary-strips, roadsides access road	Modified Habitat	0.02	357.87	0.01%
fallow land access road	Modified Habitat	0.03	193.62	0.02%
dry grassland on gentle foothills	Natural Habitat	0.11	43.17	0.05%

Table 10-74 Impact Assessment of Habitat Loss Impact for 100MW PV and final/residual significance

Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Modified Habitats) Arable Land	Low	Major	**Minor to moderate**	Major	**Minor to moderate**
(Modified Habitats) Fallow Land	Low	Major	**Minor to moderate**	Major	**Minor to moderate**
(Modified Habitats) Fruit Gardens and Vineyards	Low	Major	**Minor to moderate**	Moderate	**Minor**
(Natural Habitats) Dry Grasslands	Medium	Major	**Moderate to Major**	Moderate	**Moderate**

Nurobod BESS

Table 10-75 Habitat Loss Calculations for Nurobod BESS

Habitat	Type	Area in Sqm	Area in Ha	Buffer	Distribution
fallow land	Modified Habitat	167460.9847	16.74609847	8264.423292	100.00%

Table 10-76 Impact Assessment of Habitat Loss Impact for Nurobod BESS and final/residual significance

Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
Natural (Habitats) Dry Grassland	Medium	Minor	**Minor**	Minor	**Minor**

Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
Modified (Habitats) Fallow Land	Low	Minor	**Negligible to minor**	Minor	**Negligible to minor**
Modified (Habitats) Dry Bed of Temporary Streams	Medium	Minor	**Minor**	Minor	**Minor**
Modified (Habitats) Settlements & Farmsteads	Very Low	Minor	**Negligible to minor**	Negligible	**Negligible**

4.9km OTL

The precise location of OTL towers are not yet finalized as this will be provided once the EPC has been appointed. However, the habitat loss arising from OTLs are negligible as it is restricted only to the OTL tower footprints, so no specific mitigation has been outlined for this since none of the habitats affected are critical habitats.

Table 10-77 Impact Assessment of Habitat Loss Impact for 4.9km OTL and final/residual significance

Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Natural Habitats) Dry Grasslands, Dry Beds of Temporary Streams	Medium	Minor	**Minor**	Minor	**Minor**
(Modified Habitats) Arable Land, Fallow Land	Low	Minor	**Negligible to minor**	Minor	**Negligible to minor**

70km OTL

Table 10-78 Habitat Loss Calculations for 70km OTL

The precise location of OTL towers are not yet finalized as this will be provided once the EPC has been appointed. However, the habitat loss arising from OTLs are negligible as it is restricted only to the OTL tower footprints, so no specific mitigation has been outlined for this since none of the habitats affected are critical habitats.

Table 10-79 Impact Assessment of Habitat Loss Impact for 70km OTL and final/residual significance

Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Natural Habitats) Dry bed of temporary stream, Dry grassland	Medium	Minor	**Minor**	Minor	**Minor**
(Modified Habitats) Arable lands with non-irrigated agricultural crops	Low	Minor	**Negligible to minor**	Minor	**Negligible to minor**
(Modified Habitats) Vineyard, Boundary-strips, roadsides; Canals and drainage channels	Low	Minor	**Negligible to minor**	Minor	**Negligible to minor**
(Modified Habitats) Arable lands with irrigated agricultural crops; Boundary-strips, roadsides; Canals and drainage channels	Low	Minor	**Negligible to minor**	Minor	**Negligible to minor**
(Modified Habitats) Fruit garden; Boundary-strips, roadsides	Low	Minor	**Negligible to minor**	Minor	**Negligible to minor**

400 MW PV PLANT

Table 10-80 Habitat Loss Calculations for 400MW PV

HABITAT	TYPE	AREA IN HA	BUFFER	DISTRIBUTION
fallow land	Modified Habitat	685.32	21408.54	84.59%
dry grassland on gentle foothills (Pooling Station)	Natural Habitat	8.50	10561.37	1.05%
fallow land (Access road)	Modified Habitat	0.42	4266.15	0.05%
dry grassland on gentle foothills	Natural Habitat	115.97	25873.25	14.31%

Table 10-81 Impact Assessment of Habitat Loss Impact for 400MW PV and final/residual significance

RECEPTOR / GROUP	VALUE/ SENSITIVITY	MAGNITUDE	UNMITIGATED SIGNIFICANCE	MITIGATED MAGNITUDE	RESIDUAL SIGNIFICANCE
Natural (Habitats) Dry Grasslands	Medium	Major	**Moderate to Major**	Moderate	**Moderate**
Modified (Habitats) Lands and Boundaries	Low	Major	**Minor to moderate**	Major	**Minor to moderate**
Modified (Habitats) Young Fruit Garden	Low	Major	**Minor to moderate**	Moderate	**Minor**

11KM OTL

Table 10-82 Habitat Loss Calculations for 11km OTL

The precise location of OTL towers are not yet finalized as this will be provided once the EPC has been appointed. However, the habitat loss arising from OTLs are negligible as it is restricted only to the OTL tower footprints, so no specific mitigation has been outlined for this since none of the habitats affected are critical habitats.

Table 10-83 Impact Assessment of Habitat Loss Impact for 11km OTL and final/residual significance

Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Natural Habitats) Dry Grasslands on Gentle Foothills, Dry Bed of Temporary Streams	Medium	Minor	**Minor**	Minor	**Minor**
(Modified Habitats) Young Fruit Garden, Quarry, Fruit Garden; Boundary-strips, Roadsides, Fallow Lands	Low	Minor	**Negligible to minor**	Minor	**Negligible to minor**

19km OTL

Table 10-84 Habitat Loss Calculations for 19km OTL

The precise location of OTL towers are not yet finalized as this will be provided once the EPC has been appointed. However, the habitat loss arising from OTLs are negligible as it is restricted only to the OTL tower footprints, so no specific mitigation has been outlined for this since none of the habitats affected are critical habitats.

Table 10-85 Impact Assessment of Habitat Loss Impact for 19km OTL and final/residual significance

Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
Dry beds of temporary streams	Medium	Minor	**Minor**	Minor	**Minor**
Arable lands with agricultural crops	Low	Minor	**Negligible to minor**	Minor	**Negligible to minor**
Fallow lands	Low	Minor	**Negligible to minor**	Minor	**Negligible to minor**
Boundary-strips, roadsides, canals and drainage channels	Low	Minor	**Negligible to minor**	Minor	**Negligible to minor**

10.11.1.2 Impact – Direct Mortality (Construction Clearing)

Clearing of existing vegetation will result in direct loss and mortality of removed specimens. Further, wildlife such as burrowing rodents and herptiles may be directly crushed during earthworks, or may suffer stress-induced mortality.

The Central Asian Tortoise (*Testudo horsfieldii*), listed as Vulnerable under the IUCN Red List and CITES Appendix II as well as on the National Red Data Book, was identified at the 100 MW PV Plant, the Access Road sites, and within the 400 MW PV Plant areas.

Clearing existing vegetation and other excavation and ground preparation works during construction poses a significant risk to the Central Asian Tortoise and other fauna which burrow as a stress response.

Initial surveys did not align with the tortoise's active period, as they were in aestivation. Subsequent surveys in Spring 2024 recorded 533 in the 400 MW PV Plant and Pooling Station area, with densities of 0.66 individuals per hectare. The 696-meter access road to the 400 MW Solar PV area recorded 7 individuals, with a density of 16.76 individuals per hectare. These findings highlight the importance of tailored mitigation measures to protect the Central Asian Tortoise within these project areas.

The following mitigation measures will be implemented to reduce the impacts on floral species:

- The EPC contractor will commit to the restoration of habitat post-construction in unused land areas that are not required for O&M maintenance. The Habitat Restoration Plan will provide the restoration measures that will be undertaken for natural habitats, post-construction restoration via seeding, re-planting, and landscaping with native, high-value species, monitoring and reporting requirements of the plan. Of particular importance to note is that PV arrays have been shown to increase the ability of vegetation recolonization, so a properly developed and executed Habitat Restoration Plan can maximize the biodiversity value of the vegetation regrowth underneath and adjacent to/ amongst the PV panel arrays. This phenomena means that despite a relatively large land take, the actual habitat and flora losses can be substantially mitigated and the site can eventually have moderately high biodiversity value during the operational phase.

The following mitigation measures will be implemented to reduce the impacts on fauna species:

- Minimization of the built footprint in design and minimize the construction buffer zone

- For chance encounters with species such as other herptiles, rodents, and invertebrates, the EPC will commit to implementing a chance-find procedure with individual relocations as deemed necessary. The Chance Find Procedure will be included within the CESMP to provide general guidance on potential ecological triggers for work stoppage and will be implemented by the EPC contractor team with the Environmental Manager of the EPC to be responsible for implementation after training from a qualified external ecologist.
- For specific sites (i.e. 400MW PV site), where applicable and relevant; pre-construction/pre-clearance relocation of Central Asian Tortoise to alternate sites (selected based on suitability and carrying capacity). This has already been carried out for the 400PV site. **Refer to subsequent sub-sections for details related to specific sites.** Where this is necessary, documentation should include the Release Site Selection Report including Carrying Capacity Assessment, as well as the Reptile Relocation Plan covering the methods and reporting/monitoring requirements.

100 MW PV Plant and Access Road Sites

As the majority of flora species are of low value/sensitivity, loss of those species via clearing is considered to have minor magnitude and negligible to minor significance.

As the presence of the Central Asian Tortoise has not been confirmed within the site, but are considered as possibly likely, it is not necessary to carry out detailed pre-clearance/pre-construction relocation. However, the Chance Find Procedure for the ongoing construction period will be important to ensure that there is a protocol in place for chance finds of tortoises.

Table 10-86 Impact assessment of the potentially affected receptors at the 100 MW facility by construction clearing and their residual significance after the implementation of proposed mitigation measures

100MW PV - Impact Assessment of Unmitigated Impact from Direct Clearing during Construction; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Herptiles) Vulnerable Species - Burrowing, Slow Mobility (i.e. Central Asian Tortoise)	High	Major	**Major**	Minor	**Minor to moderate**

100MW PV - Impact Assessment of Unmitigated Impact from Direct Clearing during Construction; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Herptiles) Near Threatened Species - Burrowing, Medium Mobility (i.e. Tatary Sand Boa, Central Asian Cobra)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Herptiles) Common Species - Burrowing, Medium Mobility (i.e. Gecko, Agama, Skink)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Herptiles) Common Species - Burrowing, Fast Mobility (i.e. racerunner, etc.)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Major	**Minor to moderate**	Moderate	**Minor**
(Mammals) Rarer Species - Burrowing, Nocturnal (i.e. Libyan Jird)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Flora) Common Grassland and Shrub Species	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Flora) Herbaceous Species	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Flora) Invasive and Pioneer Species	Very Low	Negligible	**Negligible**	Negligible	**Negligible**
(Flora) Least Concern (LC) - Riparian and Moisture-Loving Species	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Flora) Weedy and Ruderal Species	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Flora) Cultivated Species	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Flora) Cereal Crops	Very Low	Minor	**Negligible to minor**	Negligible	**Negligible**

Nurobod BESS

As the majority of flora species are of low value/sensitivity, loss of those species via clearing is considered to have minor magnitude and negligible to minor significance.

As the presence of the Central Asian Tortoise has been confirmed within the site, but at very low densities (1 ind. In surrounding areas) it is not necessary to carry out detailed pre-clearance/pre-construction relocation. However, the Chance Find Procedure for the ongoing construction period will be important to ensure that there is a protocol in place for chance finds of tortoises.

Table 10-87 Impact assessment of the potentially affected receptors at the Nurobod BESS facility by construction clearing and their residual significance after the implementation of proposed mitigation measures

NUROBOD BESS - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM DIRECT CLEARING DURING CONSTRUCTION; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	**VALUE/ SENSITIVITY**	**MAGNITUDE**	**UNMITIGATED SIGNIFICANCE**	**MITIGATED MAGNITUDE**	**RESIDUAL SIGNIFICANCE**
(Herptiles) Vulnerable Species - Burrowing, Slow Mobility (i.e. Central Asian Tortoise)	High	Major	**Major**	Minor	**Minor to moderate**
(Herptiles) Near Threatened Species - Burrowing, Medium Mobility (i.e. Tatary Sand Boa)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Herptiles) Common Species - Burrowing, Medium Mobility (i.e. Gecko, Agama, Skink)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Herptiles) Common Species - Burrowing, Fast Mobility (i.e. whipsnakes,etc)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Major	**Minor to moderate**	Minor	**Negligible to minor**

NUROBOD BESS - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM DIRECT CLEARING DURING CONSTRUCTION; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	**VALUE/ SENSITIVITY**	**MAGNITUDE**	**UNMITIGATED SIGNIFICANCE**	**MITIGATED MAGNITUDE**	**RESIDUAL SIGNIFICANCE**
(Flora) Native Species - Grassland Species	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Flora) Least Concern (LC) Species	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Flora) Alien Species - Weedy Species	Very Low	Minor	**Negligible to minor**	Negligible	**Negligible**
(Flora) Native Fruit Trees	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Flora) Native Agricultural Crops	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**

70-KM OTL CORRIDOR

As the majority of flora species are of low value/sensitivity, loss of those species via clearing is considered to have minor magnitude and negligible to minor significance.

As the presence of the Central Asian Tortoise has been confirmed within the site, but at very low densities (1 ind. 9 burrows and 1 in adjacent area) it is not necessary to carry out detailed pre-clearance/pre-construction relocation. However, the Chance Find Procedure for the ongoing construction period will be important to ensure that there is a protocol in place for chance finds of tortoises.

Table 10-88 Impact assessment of the potentially affected receptors at the 40KM OTL Corridor by construction clearing and their residual significance after the implementation of proposed mitigation measures

70KM OTL - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM DIRECT CLEARING DURING CONSTRUCTION; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	**VALUE/ SENSITIVITY**	**MAGNITUDE**	**UNMITIGATED SIGNIFICANCE**	**MITIGATED MAGNITUDE**	**RESIDUAL SIGNIFICANCE**
(Herptile) Vulnerable Species - Slow Mobility (i.e. Central Asian Tortoise)	High	Major	**Major**	Minor	**Minor to moderate**
(Herptile) Vulnerable Species - Medium Mobility (Caspian Monitor)	High	Moderate	**Moderate to Major**	Minor	**Minor to moderate**
(Herptile) Near Threatened Species - Medium Mobility (i.e. Tatary Sand Boa)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Herptile) Common Species - Medium Mobility (i.e.Gecko, Agama, Skink)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Herptile) Common Species - Fast Mobility (i.e. Racerunner, whip snake)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Major	**Minor to moderate**	Moderate	**Minor**
(Mammals) Rarer Species - Burrowing (Lesser Jerboa, etc)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Flora) Endangered (EN) Species (Exotic Non Native)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Flora) Native Species	Medium	Minor	**Minor**	Negligible	**Negligible to minor**

70KM OTL - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM DIRECT CLEARING DURING CONSTRUCTION; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	**VALUE/ SENSITIVITY**	**MAGNITUDE**	**UNMITIGATED SIGNIFICANCE**	**MITIGATED MAGNITUDE**	**RESIDUAL SIGNIFICANCE**
(Flora) Least Concern (LC)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Flora) Alien Species	Very Low	Minor	**Negligible to minor**	Negligible	**Negligible**
(Flora) Native Fruit Trees	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Flora) Native Agricultural Crops	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**

4.9-KM OTL CORRIDOR

As the majority of flora species are of low value/sensitivity, loss of those species via clearing is considered to have minor magnitude and negligible to minor significance.

As the presence of the Central Asian Tortoise has been confirmed within the site, but at very low densities, it is not necessary to carry out detailed pre-clearance/pre-construction relocation. However, the Chance Find Procedure for the ongoing construction period will be important to ensure that there is a protocol in place for chance finds of tortoises.

Table 10-89 Impact assessment of the potentially affected receptors at the 4.9KM OTL Corridor by construction clearing and their residual significance after the implementation of proposed mitigation measures

4.9KM OTL - Impact Assessment of Unmitigated Impact from Direct Clearing during Construction; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Herptiles) Vulnerable Species - Slow Mobility (i.e. Central Asian Tortoise)	High	Major	**Major**	Minor	**Minor to moderate**
(Herptiles) Near Threatened Species - Medium Mobility (i.e. Tatary Sand Boa)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Herptiles) Common Species - Medium Mobility (i.e. Gecko, Agama, Skink)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Herptiles) Common Species - Fast Mobility (i.e. racerunner, whip snake)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Major	**Minor to moderate**	Moderate	**Minor**
(Flora) Native Species	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Flora) Least Concern (LC)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Flora) Alien Species	Very Low	Minor	**Negligible to minor**	Negligible	**Negligible**

400 MW PV Plant and pooling station, access roads

A significant population of Central Asian Tortoises was identified and quantified within the 400 MW PV plant site in April 2024. Based on the population densities recorded during the baseline assessment, a release site selection was undertaken to identify suitable habitats for the translocation of tortoises residing within the project site before construction. This information is detailed in the Tortoise Translocation Report issued in June 2024.

Following the identification of a suitable habitat with adequate carrying capacity, a tortoise translocation plan was developed and executed in May 2024. Key elements of the plan included:

- **Fencing Material and Construction**: The fencing was made of galvanized steel wire mesh with cell sizes of 3x3 cm. The fences were installed into 20 cm deep trenches dug by a tractor, with the erected height being 40 cm. The fencing perimeter was constructed without gaps, ensuring that tortoises could not re-enter the project area from adjacent habitats.
- **Execution of Translocation Activities**: Translocation activities took place before the tortoises entered hibernation, from May 21 to 30, 2024. Capture exercises were conducted between 09:00 and 12:00, and from 14:00 to 17:00, depending on weather conditions. The team walked transect routes approximately 20 meters apart, capturing all encountered tortoises. These tortoises were then placed into ventilated boxes and transported via existing dirt roads to the relocation site located 4-5 km north of the project site.
- **Local Engagement and Assistance**: Residents from nearby communities were hired and trained to assist in the relocation process. MEEPCC experts and consultants provided training on proper relocation procedures to ensure the safety and well-being of the tortoises.
- **Monitoring and Compliance**: The Ministry of Ecology, Environmental Protection, and Climate Change (MEEPCC) Samarkand Branch, along with local community representatives, supervised all field works. Following the completion of the relocation process, habitat restoration and post-restoration monitoring will be conducted to ensure that No Net Loss targets are met over time.

In total, 245 Central Asian tortoises were captured and moved to safe release locations approved by MEEPCC specialists. The entire process was monitored by MEEPCC representatives and the Chief of the Biodiversity Department, ensuring compliance with all ecological and procedural guidelines. The remaining receptors are managed through the Chance Find Procedure and Habitat Restoration Plan, ensuring effective mitigation of biodiversity impacts.

Table 10-90 Impact assessment of the potentially affected receptors at the 400 MW facility by construction clearing and their residual significance after the implementation of proposed mitigation measures

400MW PV - Impact Assessment of Unmitigated Impact from Direct Clearing during Construction; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Herptiles) Vulnerable Species - Burrowing, Slow Mobility (i.e. Central Asian Tortoise)	High	Major	**Major**	Minor	**Minor to moderate**
(Herptiles) Vulnerable Species - Burrowing, Medium Mobility (i.e. Caspian Monitor)	High	Moderate	**Moderate to Major**	Minor	**Minor to moderate**
(Herptiles) Near Threatened Species - Burrowing, Medium Mobility (i.e. Tatary Sand Boa)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Herptiles) Common Species - Burrowing, Medium Mobility (i.e. Gecko, Agama, Skink)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Herptiles) Common Species - Burrowing, Fast Mobility (i.e. whipsnakes,etc)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**

400MW PV - Impact Assessment of Unmitigated Impact from Direct Clearing during Construction; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Major	**Minor to moderate**	Moderate	**Minor**
(Flora) Native Grassland and Shrub Species	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Flora) Native Moisture-Loving Species	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Flora) Invasive and Alien Species	Very Low	Negligible	**Negligible**	Negligible	**Negligible**
(Flora) Native Fruit Trees	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Flora) Native Agricultural Crops	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**

11-km LILO OTL corridor

As the majority of flora species are of low value/sensitivity, loss of those species via clearing is considered to have minor magnitude and negligible to minor significance.

As the presence of the Central Asian Tortoise has not been confirmed within the site, but are considered as possibly likely based on available habitat, it is not necessary to carry out detailed pre-clearance/pre-construction relocation. However, the Chance Find Procedure for the ongoing construction period will be important to ensure that there is a protocol in place for chance finds of tortoises.

Table 10-91 Impact assessment of the potentially affected receptors at the 11KM OTL Corridor by construction clearing and their residual significance after the implementation of proposed mitigation measures

11KM OTL - Impact Assessment of Unmitigated Impact from Direct Clearing during Construction; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Herptiles) Vulnerable Species - Slow Mobility (Central Asian Tortoise)	High	Major	**Major**	Minor	**Minor to moderate**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Major	**Minor to moderate**	Moderate	**Minor**
(Mammals) Rarer Species - Burrowing (i.e. Zaisan Mole Vole)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Flora) Endangered (EN) Species - Exotic/Nonnative	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Flora) Native Species	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Flora) Least Concern (LC)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Flora) Alien Species	Very Low	Minor	**Negligible to minor**	Negligible	**Negligible**
(Flora) Native Fruit Trees	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Flora) Native Agricultural Crops	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**

19-km LILO OTL corridor

As the majority of flora species are of low value/sensitivity, loss of those species via clearing is considered to have minor magnitude and negligible to minor significance.

As the presence of the Central Asian Tortoise has not been confirmed within the site, but are considered as possibly likely based on available habitat, it is not necessary to carry out detailed pre-clearance/pre-construction relocation. However, the Chance Find Procedure for the ongoing construction period will be important to ensure that there is a protocol in place for chance finds of tortoises.

Table 10-92 Impact assessment of the potentially affected receptors at the 19KM OTL Corridor by construction clearing and their residual significance after the implementation of proposed mitigation measures

19KM OTL - Impact Assessment of Unmitigated Impact from Direct Clearing during Construction; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Herptiles) Vulnerable Species - Slow Mobility (Central Asian Tortoise)	High	Major	**Major**	Minor	**Minor to moderate**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Major	**Minor to moderate**	Moderate	**Minor**
(Mammals) Rarer Species - Burrowing (i.e. Zaizan Mole Vole)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Flora) Native Species	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Flora) Least Concern (LC)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Flora) Alien Species	Very Low	Minor	**Negligible to minor**	Negligible	**Negligible**

19KM OTL - Impact Assessment of Unmitigated Impact from Direct Clearing during Construction; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Flora) Native Fruit Trees	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**

10.11.1.3 Impact – Direct Mortality (Vehicle Collision)

Wildlife can be runover or collide with, motorized vehicles and equipment. Vehicle-related death from trucks and machinery are less of a concern for larger mammals such as Red Fox which are more likely to disperse in time to avoid collision (as the site vehicles will be traveling under speed restrictions and large equipment movement will be relatively slow).

Small to medium sized wildlife such as rodents, lizards, tortoises and snakes have a higher chance of mortality from vehicular and machinery collisions.

However, the following mitigation measures will be implemented to reduce the risks from these impacts:

- Ban against driving outside of delineated access roads and restricting driving and machinery operation to daylight hours;
- Strict speed controls which will be enforced by EPC HSE and Security teams; especially during the active period (Late Spring – April) for the Central Asian Tortoise in sites where applicable.

Table 10-93 Impact assessment of the potentially affected receptors at the 100 MW facility by vehicle collision and their residual significance after the implementation of proposed mitigation measures

100MW PV - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM DIRECT VEHICLE COLLISION DURING CONSTRUCTION; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	VALUE/ SENSITIVITY	MAGNITUDE	UNMITIGATED SIGNIFICANCE	MITIGATED MAGNITUDE	RESIDUAL SIGNIFICANCE
(Herptiles) Vulnerable Species - Burrowing, Slow Mobility (i.e. Central Asian Tortoise)	High	Moderate	**Moderate to Major**	Minor	**Minor to moderate**
(Herptiles) Near Threatened Species - Burrowing, Medium Mobility (i.e. Tatary Sand Boa, Central Asian Cobra)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Herptiles) Common Species - Burrowing, Medium Mobility (i.e. Gecko, Agama, Skink)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Herptiles) Common Species - Burrowing, Fast Mobility (i.e. racerunner, etc.)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Nationally Uplisted Species - Large Mobile Mammal, Nocturnal (Corsac Fox, Steppe Polecat)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**

100MW PV - Impact Assessment of Unmitigated Impact from Direct Vehicle Collision during Construction; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Large Mobile Mammal, Nocturnal (Red Fox)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Rarer Species - Burrowing, Nocturnal (Libyan Jird)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**

Nurobod BESS

Table 10-94 Impact assessment of the potentially affected receptors at the Nurobod BESS facility by vehicle collision and their residual significance after the implementation of proposed mitigation measures

Nurobod BESS - Impact Assessment of Unmitigated Impact from Direct Vehicle Collision during Construction; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Herptiles) Vulnerable Species - Burrowing, Slow Mobility (i.e. Central Asian Tortoise)	High	Moderate	**Moderate to Major**	Minor	**Minor to moderate**

NUROBOD BESS - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM DIRECT VEHICLE COLLISION DURING CONSTRUCTION; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	**VALUE/ SENSITIVITY**	**MAGNITUDE**	**UNMITIGATED SIGNIFICANCE**	**MITIGATED MAGNITUDE**	**RESIDUAL SIGNIFICANCE**
(Herptiles) Near Threatened Species - Burrowing, Medium Mobility (i.e. Tatary Sand Boa)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Herptiles) Common Species - Burrowing, Medium Mobility (i.e. Gecko, Agama, Skink)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Herptiles) Common Species - Burrowing, Fast Mobility (i.e. whipsnakes,etc)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Nationally Uplisted Species - Burrowing, Nocturnal (Steppe Polecat)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**

NUROBOD BESS - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM DIRECT VEHICLE COLLISION DURING CONSTRUCTION; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	**VALUE/ SENSITIVITY**	**MAGNITUDE**	**UNMITIGATED SIGNIFICANCE**	**MITIGATED MAGNITUDE**	**RESIDUAL SIGNIFICANCE**
(Mammals) Common Species - Large Mobile Mammal, Nocturnal (Red Fox)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**

4.9-KM LILO OTL CORRIDOR

Table 10-95 Impact assessment of the potentially affected receptors at the 4.9KM OTL by vehicle collision and their residual significance after the implementation of proposed mitigation measures

4.9KM OTL - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM DIRECT VEHICLE COLLISION DURING CONSTRUCTION; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	**VALUE/ SENSITIVITY**	**MAGNITUDE**	**UNMITIGATED SIGNIFICANCE**	**MITIGATED MAGNITUDE**	**RESIDUAL SIGNIFICANCE**
(Herptiles) Vulnerable Species - Slow Mobility (i.e. Central Asian Tortoise)	High	Moderate	**Moderate to Major**	Minor	**Minor to moderate**
(Herptiles) Near Threatened Species - Medium Mobility (i.e. Tatary Sand Boa)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**

4.9KM OTL - Impact Assessment of Unmitigated Impact from Direct Vehicle Collision during Construction; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Herptiles) Common Species - Medium Mobility (i.e. Gecko, Agama, Skink)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Herptiles) Common Species - Fast Mobility (i.e. racerunner, whip snake)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Nationally Uplisted Species - Larger Mobile, Nocturnal (Steppe Polecat)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Large Mobile, Nocturnal (Red Fox)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Rarer Species - Large Mobile (Asiatic Wildcat)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**

Table 10-96 Impact assessment of the potentially affected receptors at the 70KM OTL by vehicle collision and their residual significance after the implementation of proposed mitigation measures

70KM OTL - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM DIRECT VEHICLE COLLISION DURING CONSTRUCTION; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	VALUE/ SENSITIVITY	MAGNITUDE	UNMITIGATED SIGNIFICANCE	MITIGATED MAGNITUDE	RESIDUAL SIGNIFICANCE
(Herptile) Vulnerable Species - Slow Mobility (i.e. Central Asian Tortoise)	High	Moderate	**Moderate to Major**	Minor	**Minor to moderate**
(Herptile) Vulnerable Species - Medium Mobility (Caspian Monitor)	High	Minor	**Minor to moderate**	Negligible	**Minor**
(Herptile) Near Threatened Species - Medium Mobility (i.e. Tatary Sand Boa)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Herptile) Common Species - Medium Mobility (i.e.Gecko, Agama, Skink)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Herptile) Common Species - Fast Mobility (i.e. Racerunner, whip snake)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Nationally Uplisted Species - Large Mobile (i.e. Corsac Fox)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Insectivore, Nocturnal (i.e. Long-eared Hedgehog)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**

70KM OTL - Impact Assessment of Unmitigated Impact from Direct Vehicle Collision during Construction; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Large Mobile, Nocturnal (i.e. Red Fox)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Rarer Species - Insectivore (Brandt's Hedgehog)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Mammals) Rarer Species - Burrowing (Lesser Jerboa, etc)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Mammals) Rarer Species - Nocturnal (i.e. Libyan Jird)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**

400 MW PV Plant and pooling station, access roads

Slower motility fauna such as tortoises have been assessed as having higher magnitude of impact from vehicle collision. The highest unmitigated impact would be on Central Asian Tortoise, which will be subject to pre-construction/pre-clearance relocation.

As Central Asian Tortoise have been identified within the site, pre-clearance/pre-construction relocation should be undertaken. This will include: release site selection and carrying capacity assessment; barrier fencing where deemed relevant; pre-clearance/pre-construction relocation effort; and post-relocation monitoring; as well as a Chance Find Procedure for the ongoing construction period. Further, habitat restoration and post-restoration monitoring will showcase if No Net Loss targets have been met over time.

For all receptors, strict speed controls will increase the visibility of risky situations by drivers and should also help to provide more escape time for wildlife prior to collision with vehicles.

Table 10-97 Impact assessment of the potentially affected receptors at the 400 MW facility by vehicle collision and their residual significance after the implementation of proposed mitigation measures

400MW PV - Impact Assessment of Unmitigated Impact from Direct Vehicle Collision during Construction; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Herptiles) Vulnerable Species - Burrowing, Slow Mobility (i.e. Central Asian Tortoise)	High	Moderate	**Moderate to Major**	Minor	**Minor to moderate**
(Herptiles) Vulnerable Species - Burrowing, Medium Mobility (i.e. Caspian Monitor)	High	Minor	**Minor to moderate**	Negligible	**Minor**
(Herptiles) Near Threatened Species - Burrowing, Medium Mobility (i.e. Tatary Sand Boa)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Herptiles) Common Species - Burrowing, Medium Mobility (i.e. Gecko, Agama, Skink)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Herptiles) Common Species - Burrowing, Fast Mobility (i.e. whipsnakes,etc)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Nationally Uplisted Species - Large Mobile (Corsac Fox, Steppe Polecat)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**

400MW PV - Impact Assessment of Unmitigated Impact from Direct Vehicle Collision during Construction; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Large Mobile, Nocturnal (Red Fox)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Rarer - Insectivore (Brandt's Hedgehog)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**

11-km LILO OTL corridor

Table 10-98 Impact assessment of the potentially affected receptors at the 11KM OTL by vehicle collision and their residual significance after the implementation of proposed mitigation measures

11KM OTL - Impact Assessment of Unmitigated Impact from Direct Vehicle Collision during Construction; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Herptiles) Vulnerable Species - Slow Mobility (Central Asian Tortoise)	High	Moderate	**Moderate to Major**	Minor	**Minor to moderate**

11KM OTL - Impact Assessment of Unmitigated Impact from Direct Vehicle Collision during Construction; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Mammals) Nationally Uplisted Species - Large Mobile (Steppe Polecat)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Rarer Species - Burrowing (i.e. Zaisan Mole Vole)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Large Mobile, Nocturnal (Red Fox)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Rarer Species - Large Mobile, Nocturnal (Asiatic Wildcat)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**

Table 10-99 Impact assessment of the potentially affected receptors at the 19KM OTL by vehicle collision and their residual significance after the implementation of proposed mitigation measures

19KM OTL - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM DIRECT VEHICLE COLLISION DURING CONSTRUCTION; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	**VALUE/ SENSITIVITY**	**MAGNITUDE**	**UNMITIGATED SIGNIFICANCE**	**MITIGATED MAGNITUDE**	**RESIDUAL SIGNIFICANCE**
(Herptiles) Vulnerable Species - Slow Mobility (Central Asian Tortoise)	High	Moderate	**Moderate to Major**	Minor	**Minor to moderate**
(Mammals) Nationally Uplisted Species - Large Mobile Mammals (Steppe Polecat)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Rarer Species - Burrowing (i.e. Zaizan Mole Vole)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Larger Mobile Mammals, Nocturnal (Red Fox)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Rarer Species - Larger Mobile Mammals, Nocturnal (Asiatic Wildcat)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**

10.11.1.4 Impact – Direct Mortality ("Take")

The presence of site workers can lead to increased hunting, poaching, or gathering on site. Flora and vegetative matter might be gathered for consumption or for fuel; eggs taken from breeding bird nests; poaching of hare, ground birds or tortoise for consumption or for domestic trade; and persecution of raptors, snakes, and carnivores could potentially take place.

However, the following mitigation measures will be implemented to reduce the risk of these potential impacts:

- Strict controls forbidding the gathering, poaching or otherwise disturbance of any flora or fauna on site, included in induction training with a "One Strike Out" policy. Any incidents will be reported as per legal framework.
- Staff training such as toolbox talks on the importance of ecosystem integrity, especially focused on species of importance such as Central Asian Tortoise

100 MW PV Plant and Access Road Sites

Table 10-100 Impact assessment of the potentially affected receptors at the 100 MW facility by hunting/harvesting ("take") and their residual significance after the implementation of proposed mitigation measures

100MW PV - Impact Assessment of Unmitigated Impact from 'Take' during Construction; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Flora) Common Grassland and Shrub Species	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Flora) Herbaceous Species	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**

100MW PV - Impact Assessment of Unmitigated Impact from 'Take' during Construction; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Flora) Invasive and Pioneer Species	Very Low	Minor	**Negligible to minor**	Negligible	**Negligible**
(Flora) Least Concern (LC) - Riparian and Moisture-Loving Species	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Flora) Weedy and Ruderal Species	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Flora) Cultivated Species	Low	Moderate	**Minor**	Negligible	**Negligible to minor**
(Flora) Cereal Crops	Very Low	Minor	**Negligible to minor**	Negligible	**Negligible**
(Herptiles) Vulnerable Species - Burrowing, Slow Mobility (i.e. Central Asian Tortoise)	High	Moderate	**Moderate to Major**	Negligible	**Minor**
(Herptiles) Near Threatened Species - Burrowing, Medium Mobility (i.e. Tatary Sand Boa, Central Asian Cobra)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Herptiles) Common Species - Burrowing, Medium Mobility (i.e. Gecko, Agama, Skink)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Herptiles) Common Species - Burrowing, Fast Mobility (i.e. racerunner, etc.)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**

100MW PV - Impact Assessment of Unmitigated Impact from 'Take' during Construction; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Rare / Not Numerous Species - Burrowing, Nocturnal (Libyan Jird)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Avifauna) Endangered Species - Raptors - Egyptian Vulture	Very High	Minor	**Moderate to Major**	Negligible	**Minor**
(Avifauna) Nationally Uplisted Species - Raptors - Griffon Vulture	High	Minor	**Minor to moderate**	Negligible	**Minor**

Nurobod BESS site

Table 10-101 Impact assessment of the potentially affected receptors at the Nurobod BESS facility by hunting/harvesting ("take") and their residual significance after the implementation of proposed mitigation measures

Nurobod BESS - Impact Assessment of Unmitigated Impact from 'Take' during Construction; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Flora) Native Species - Grassland Species	Medium	Minor	**Minor**	Negligible	**Negligible to minor**

NUROBOD BESS - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM 'TAKE' DURING CONSTRUCTION; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	VALUE/ SENSITIVITY	MAGNITUDE	UNMITIGATED SIGNIFICANCE	MITIGATED MAGNITUDE	RESIDUAL SIGNIFICANCE
(Flora) Least Concern (LC) Species	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Flora) Alien Species - Weedy Species	Very Low	Minor	**Negligible to minor**	Negligible	**Negligible**
(Flora) Native Fruit Trees	Low	Moderate	**Minor**	Negligible	**Negligible to minor**
(Flora) Native Agricultural Crops	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Herptiles) Vulnerable Species - Burrowing, Slow Mobility (i.e. Central Asian Tortoise)	High	Moderate	**Moderate to Major**	Negligible	**Minor**
(Herptiles) Near Threatened Species - Burrowing, Medium Mobility (i.e. Tatary Sand Boa)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Herptiles) Common Species - Burrowing, Medium Mobility (i.e. Gecko, Agama, Skink)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Herptiles) Common Species - Burrowing, Fast Mobility (i.e. whipsnakes,etc)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**

NUROBOD BESS - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM 'TAKE' DURING CONSTRUCTION; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	VALUE/ SENSITIVITY	MAGNITUDE	UNMITIGATED SIGNIFICANCE	MITIGATED MAGNITUDE	RESIDUAL SIGNIFICANCE
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Endangered Species - Raptors (Egyptian Vulture)	Very High	Minor	**Moderate to Major**	Negligible	**Minor**
(Avifauna) Nationally Uplisted Species - Raptors (Griffon Vulture)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**

4.9-KM LILO OTL CORRIDOR

Table 10-102 Impact assessment of the potentially affected receptors at the 4.9KM OTL Corridor by hunting/harvesting ("take") and their residual significance after the implementation of proposed mitigation measures

4.9KM OTL - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM 'TAKE' DURING CONSTRUCTION; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	VALUE/ SENSITIVITY	MAGNITUDE	UNMITIGATED SIGNIFICANCE	MITIGATED MAGNITUDE	RESIDUAL SIGNIFICANCE
(Flora) Native Species	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Flora) Least Concern (LC)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Flora) Alien Species	Very Low	Minor	**Negligible to minor**	Negligible	**Negligible**

4.9KM OTL - Impact Assessment of Unmitigated Impact from 'Take' during Construction; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Herptiles) Vulnerable Species - Slow Mobility (i.e. Central Asian Tortoise)	High	Moderate	**Moderate to Major**	Negligible	**Minor**
(Herptiles) Near Threatened Species - Medium Mobility (i.e. Tatary Sand Boa)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Herptiles) Common Species - Medium Mobility (i.e. Gecko, Agama, Skink)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Herptiles) Common Species - Fast Mobility (i.e. racerunner, whip snake)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Endangered Species - Raptors (Egyptian Vulture)	Very High	Minor	**Moderate to Major**	Negligible	**Minor**
(Avifauna) Nationally Uplisted Species - Raptors (Griffon Vulture)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**

4.9KM OTL - Impact Assessment of Unmitigated Impact from 'Take' during Construction; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Avifauna) Common Species - Raptors (Upland Buzzard, Common Kestrel, etc)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Common Species - Migratory (Common Swift, Greater Short-toed Lark)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Common Species - Residents, or Common Visitors (i.e. Crested LArk, Common Starling)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Urban Species - Residents (Rock Pigeon, Common Raven)	Very Low	Minor	**Negligible to minor**	Negligible	**Negligible**

70-km LILO OTL corridor

Table 10-103 Impact assessment of the potentially affected receptors at the 70KM OTL Corridor by hunting/harvesting ("take") and their residual significance after the implementation of proposed mitigation measures

70KM OTL - Impact Assessment of Unmitigated Impact from 'Take' during Construction; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Flora) Endangered (EN) Species (Exotic Non Native)	Medium	Moderate	**Moderate**	Negligible	**Negligible to minor**

70KM OTL - Impact Assessment of Unmitigated Impact from 'Take' during Construction; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Flora) Native Species	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Flora) Least Concern (LC)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Flora) Alien Species	Very Low	Minor	**Negligible to minor**	Negligible	**Negligible**
(Flora) Native Fruit Trees	Low	Moderate	**Minor**	Negligible	**Negligible to minor**
(Flora) Native Agricultural Crops	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Herptile) Vulnerable Species - Slow Mobility (i.e. Central Asian Tortoise)	High	Moderate	**Moderate to Major**	Negligible	**Minor**
(Herptile) Vulnerable Species - Medium Mobility (Caspian Monitor)	High	Minor	**Minor to moderate**	Negligible	**Minor**
(Herptile) Near Threatened Species - Medium Mobility (i.e. Tatary Sand Boa)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Herptile) Common Species - Medium Mobility (i.e.Gecko, Agama, Skink)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Herptile) Common Species - Fast Mobility (i.e. Racerunner, whip snake)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Rarer Species - Insectivore (Brandt's Hedgehog)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Mammals) Rarer Species - Burrowing (Lesser Jerboa, etc)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Mammals) Rarer Species - Nocturnal (i.e. Libyan Jird)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**

70KM OTL - Impact Assessment of Unmitigated Impact from 'Take' during Construction; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Mammals) Common Species - Insectivore, Nocturnal (i.e. Long-eared Hedgehog)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Endangered Species - Raptors (Egyptian Vulture, Steppe Eagle)	Very High	Minor	**Moderate to Major**	Negligible	**Minor**
(Avifauna) Endangered Species - Groundbirds (Great Bustard)	Very High	Moderate	**Major**	Negligible	**Minor**
(Avifauna) Vulnerable Species - Raptors (Greater Spotted Eagle, Eastern Imperial Eagle)	High	Minor	**Minor to moderate**	Negligible	**Minor**
(Avifauna) Near Threatened Species - Raptors (Cinereous Vulture, Pallid Harrier)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Avifauna) Near Threatened Species - Groundbirds(Little Bustard)	Medium	Moderate	**Moderate**	Negligible	**Negligible to minor**
(Avifauna) Near Threatened Species - Waterbirds - Northern Lapwing	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Avifauna) Nationally Important Species - Waterbirds - Black Stork	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Avifauna) Common Species - Raptors (Rough-legged BUzzard, Common Buzzard, etc)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Common / LC Species - Waterbirds (Migratory) (Little Egret, Etc.)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Common Species (Others) - Lark, Wheatear, etc.	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Urban Speceis - Rock Dove	Very Low	Minor	**Negligible to minor**	Negligible	**Negligible**

400 MW PV Plant and pooling station, access roads

Management staff should be made aware of high value species such as Central Asian Tortoise that may be attractive for poaching in order to deter such activity. Zero tolerance policy should be instituted (one strike out) and any poaching activity should be reported to the appropriate governing authority.

Table 10-104 Impact assessment of the potentially affected receptors at the 400 MW facility by hunting/harvesting ("take") and their residual significance after the implementation of proposed mitigation measures

400MW PV - Impact Assessment of Unmitigated Impact from 'Take' during Construction; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Flora) Native Grassland and Shrub Species	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Flora) Native Moisture-Loving Species	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Flora) Invasive and Alien Species	Very Low	Minor	**Negligible to minor**	Negligible	**Negligible**
(Flora) Native Fruit Trees	Low	Moderate	**Minor**	Negligible	**Negligible to minor**
(Flora) Native Agricultural Crops	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Herptiles) Vulnerable Species - Burrowing, Slow Mobility (i.e. Central Asian Tortoise)	High	Moderate	**Moderate to Major**	Negligible	**Minor**
(Herptiles) Vulnerable Species - Burrowing, Medium Mobility (i.e. Caspian Monitor)	High	Minor	**Minor to moderate**	Negligible	**Minor**

400MW PV - Impact Assessment of Unmitigated Impact from 'Take' during Construction; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Herptiles) Near Threatened Species - Burrowing, Medium Mobility (i.e. Tatary Sand Boa)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Herptiles) Common Species - Burrowing, Medium Mobility (i.e. Gecko, Agama, Skink)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Herptiles) Common Species - Burrowing, Fast Mobility (i.e. whipsnakes,etc)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Rarer Species - Insectivore (Brandt's Hedgehog)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**

400MW PV - Impact Assessment of Unmitigated Impact from 'Take' during Construction; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Avifauna) Near Threatened Species - Groundbirds (Migratory) (Little Bustard)	Medium	Moderate	**Moderate**	Negligible	**Negligible to minor**
(Avifauna) Common Species - Raptors (Long-legged Buzzard, Western Marsh Harrier, etc)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Common Species - Waterbirds (Migratory) (Greater Sand Plover)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Common Resident Species (i.e. Lark, Sandgrouse..)	Low	Moderate	**Minor**	Negligible	**Negligible to minor**

11-km LILO OTL corridor

Table 10-105 Impact assessment of the potentially affected receptors at the 11KM OTL Corridor by hunting/harvesting ("take") and their residual significance after the implementation of proposed mitigation measures

11KM OTL - Impact Assessment of Unmitigated Impact from 'Take' during Construction; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Flora) Endangered (EN) Species - Exotic/Nonnative	Medium	Moderate	**Moderate**	Negligible	**Negligible to minor**
(Flora) Native Species	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Flora) Least Concern (LC)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Flora) Alien Species	Very Low	Minor	**Negligible to minor**	Negligible	**Negligible**
(Flora) Native Fruit Trees	Low	Moderate	**Minor**	Negligible	**Negligible to minor**
(Flora) Native Agricultural Crops	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Herptiles) Vulnerable Species - Slow Mobility (Central Asian Tortoise)	High	Moderate	**Moderate to Major**	Negligible	**Minor**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Rarer Species - Burrowing (i.e. Zaisan Mole Vole)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Avifauna) Endangered Species - Raptors (Steppe Eagle)	Very High	Minor	**Moderate to Major**	Negligible	**Minor**
(Avifauna) Vulnerable Species - Raptors (Eastern Imperial Eagle)	High	Minor	**Minor to moderate**	Negligible	**Minor**

11KM OTL - Impact Assessment of Unmitigated Impact from 'Take' during Construction; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Avifauna) Near Threatened Species - Raptors (Hen Harrier)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Avifauna) Common Species - Raptors (i.e. Common Kestrel, Long-legged Buzzard)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Common Species - Waterbirds (Migratory) (i.e. Green Sandpiper, Little Ringed Plover)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Common Species - Residents & Visitors (Rook, Jackdaw, etc.)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Urban Species (Rock Pigeon)	Very Low	Minor	**Negligible to minor**	Negligible	**Negligible**

19-km LILO OTL corridor

Table 10-106 Impact assessment of the potentially affected receptors at the 19KM OTL Corridor by hunting/harvesting ("take") and their residual significance after the implementation of proposed mitigation measures

19KM OTL - Impact Assessment of Unmitigated Impact from 'Take' during Construction; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Flora) Native Species	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Flora) Least Concern (LC)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**

19KM OTL - Impact Assessment of Unmitigated Impact from 'Take' during Construction; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Flora) Alien Species	Very Low	Minor	**Negligible to minor**	Negligible	**Negligible**
(Flora) Native Fruit Trees	Low	Moderate	**Minor**	Negligible	**Negligible to minor**
(Herptiles) Vulnerable Species - Slow Mobility (Central Asian Tortoise)	High	Moderate	**Moderate to Major**	Negligible	**Minor**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Rarer Species - Burrowing (i.e. Zaizan Mole Vole)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Avifauna) Endangered Species - Raptors (Steppe Eagle)	Very High	Minor	**Moderate to Major**	Negligible	**Minor**
(Avifauna) Vulnerable Species - Raptors (Eastern Imperial Eagle)	High	Minor	**Minor to moderate**	Negligible	**Minor**
(Avifauna) Near Threatened Species - Raptors (Hen Harrier)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Avifauna) Common Species - Raptors (i.e. Common Kestrel, Long-legged Buzzard)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Common Species - Waterbirds (Migratory) (i.e. Green Sandpiper, Little Ringed Plover)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Common Species - Residents & Visitors (Rook, Jackdaw, etc.)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Urban Species (Rock Pigeon)	Very Low	Minor	**Negligible to minor**	Negligible	**Negligible**

10.11.1.5 Impact – Littering

Improper management of solid waste such as plastic containers and plastic bags, may result in wind-blown litter, which are a danger to wildlife due to entanglement or ingestion.

However, the following mitigation measures will be implemented to reduce the risk of these potential impacts:

- Preparation of a Waste Management Plan as one of the supplementary plans to the CESMP;
- Training will be provided to staff such as tool box meetings which include waste management
- Strict waste management supervision and controls under the HSE Team;
- Zero tolerance for littering on site;
- Daily inspections and clean-up of litter by EPC/sub-contractor(s) responsible.

100 MW PV PLANT AND ACCESS ROAD SITES

Table 10-107 Impact assessment of the potentially affected receptors at the 100 MW facility by littering and their residual significance after the implementation of proposed mitigation measures

100MW PV - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM LITTERING DURING CONSTRUCTION; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	VALUE/ SENSITIVITY	MAGNITUDE	UNMITIGATED SIGNIFICANCE	MITIGATED MAGNITUDE	RESIDUAL SIGNIFICANCE
(Herptiles) Vulnerable Species - Burrowing, Slow Mobility (i.e. Central Asian Tortoise)	High	Minor	**Minor to moderate**	Negligible	**Minor**
(Herptiles) Near Threatened Species - Burrowing, Medium Mobility (i.e. Tatary Sand Boa, Central Asian Cobra)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**

100MW PV - Impact Assessment of Unmitigated Impact from Littering during Construction; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Herptiles) Common Species - Burrowing, Medium Mobility (i.e. Gecko, Agama, Skink)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Herptiles) Common Species - Burrowing, Fast Mobility (i.e. racerunner, etc.)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Nationally Uplisted Species - Large Mobile Mammal, Nocturnal (Corsac Fox, Steppe Polecat)	Medium	Moderate	**Moderate**	Negligible	**Negligible to minor**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Large Mobile Mammal, Nocturnal (Red Fox)	Low	Moderate	**Minor**	Negligible	**Negligible to minor**
(Mammals) Rarer Species - Burrowing, Nocturnal (Libyan Jird)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**

100MW PV - Impact Assessment of Unmitigated Impact from Littering during Construction; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Avifauna) Endangered Species - Raptors - Egyptian Vulture	Very High	Minor	**Moderate to Major**	Negligible	**Minor**
(Avifauna) Nationally Uplisted Species - Raptors - Griffon Vulture	High	Minor	**Minor to moderate**	Negligible	**Minor**
(Avifauna) Common Species - Residents - i.e. Crested Lark, etc.	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**

Nurobod BESS

Table 10-108 Impact assessment of the potentially affected receptors at the Nurobod BESS facility by littering and their residual significance after the implementation of proposed mitigation measures

Nurobod BESS - Impact Assessment of Unmitigated Impact from Littering during Construction; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Herptiles) Vulnerable Species - Burrowing, Slow Mobility (i.e. Central Asian Tortoise)	High	Minor	**Minor to moderate**	Negligible	**Minor**

NUROBOD BESS - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM LITTERING DURING CONSTRUCTION; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	VALUE/ SENSITIVITY	MAGNITUDE	UNMITIGATED SIGNIFICANCE	MITIGATED MAGNITUDE	RESIDUAL SIGNIFICANCE
(Herptiles) Near Threatened Species - Burrowing, Medium Mobility (i.e. Tatary Sand Boa)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Herptiles) Common Species - Burrowing, Medium Mobility (i.e. Gecko, Agama, Skink)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Herptiles) Common Species - Burrowing, Fast Mobility (i.e. whipsnakes,etc)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Nationally Uplisted Species - Burrowing, Nocturnal (Steppe Polecat)	Medium	Moderate	**Moderate**	Negligible	**Negligible to minor**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**

Nurobod BESS - Impact Assessment of Unmitigated Impact from Littering during Construction; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Mammals) Common Species - Large Mobile Mammal, Nocturnal (Red Fox)	Low	Moderate	**Minor**	Negligible	**Negligible to minor**
(Avifauna) Endangered Species - Raptors (Egyptian Vulture)	Very High	Minor	**Moderate to Major**	Negligible	**Minor**
(Avifauna) Nationally Uplisted Species - Raptors (Griffon Vulture)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Avifauna) Common Resident Species (Crested Lark, etc)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**

4.9-km LILO OTL corridor

Table 10-109 Impact assessment of the potentially affected receptors by littering and their residual significance after the implementation of proposed mitigation measures

4.9KM OTL - Impact Assessment of Unmitigated Impact from Littering during Construction; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Herptiles) Vulnerable Species - Slow Mobility (i.e. Central Asian Tortoise)	High	Minor	**Minor to moderate**	Negligible	**Minor**
(Herptiles) Near Threatened Species - Medium Mobility (i.e. Tatary Sand Boa)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Herptiles) Common Species - Medium Mobility (i.e. Gecko, Agama, Skink)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Herptiles) Common Species - Fast Mobility (i.e. racerunner, whip snake)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Nationally Uplisted Species - Larger Mobile, Nocturnal (Steppe Polecat)	Medium	Moderate	**Moderate**	Negligible	**Negligible to minor**

4.9KM OTL - Impact Assessment of Unmitigated Impact from Littering during Construction; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Large Mobile, Nocturnal (Red Fox)	Low	Moderate	**Minor**	Negligible	**Negligible to minor**
(Mammals) Rarer Species - Large Mobile (Asiatic Wildcat)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Avifauna) Endangered Species - Raptors (Egyptian Vulture)	Very High	Minor	**Moderate to Major**	Negligible	**Minor**
(Avifauna) Nationally Uplisted Species - Raptors (Griffon Vulture)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**

4.9KM OTL - Impact Assessment of Unmitigated Impact from Littering during Construction; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Avifauna) Common Species - Raptors (Upland Buzzard, Common Kestrel, etc)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Common Species - Migratory (Common Swift, Greater Short-toed Lark)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Common Species - Residents, or Common Visitors (i.e. Crested Lark, Common Starling)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Urban Species - Residents (Rock Pigeon, Common Raven)	Very Low	Minor	**Negligible to minor**	Negligible	**Negligible**

70-km LILO OTL corridor

Table 10-110 Impact assessment of the potentially affected receptors by littering and their residual significance after the implementation of proposed mitigation measures

70KM OTL - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM LITTERING DURING CONSTRUCTION; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	VALUE/ SENSITIVITY	MAGNITUDE	UNMITIGATED SIGNIFICANCE	MITIGATED MAGNITUDE	RESIDUAL SIGNIFICANCE
(Herptile) Vulnerable Species - Slow Mobility (i.e. Central Asian Tortoise)	High	Minor	**Minor to moderate**	Negligible	**Minor**
(Herptile) Vulnerable Species - Medium Mobility (Caspian Monitor)	High	Minor	**Minor to moderate**	Negligible	**Minor**
(Herptile) Near Threatened Species - Medium Mobility (i.e. Tatary Sand Boa)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Herptile) Common Species - Medium Mobility (i.e.Gecko, Agama, Skink)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Herptile) Common Species - Fast Mobility (i.e. Racerunner, whip snake)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Nationally Uplisted Species - Large Mobile (i.e. Corsac Fox)	Medium	Moderate	**Moderate**	Negligible	**Negligible to minor**

70KM OTL - Impact Assessment of Unmitigated Impact from Littering during Construction; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Mammals) Common Species - Insectivore, Nocturnal (i.e. Long-eared Hedgehog)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Large Mobile, Nocturnal (i.e. Red Fox)	Low	Moderate	**Minor**	Negligible	**Negligible to minor**
(Mammals) Rarer Species - Insectivore (Brandt's Hedgehog)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Mammals) Rarer Species - Burrowing (Lesser Jerboa, etc)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Mammals) Rarer Species - Nocturnal (i.e. Libyan Jird)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Avifauna) Endangered Species - Raptors (Egyptian Vulture, Steppe Eagle)	Very High	Minor	**Moderate to Major**	Negligible	**Minor**
(Avifauna) Endangered Species - Groundbirds (Great Bustard)	Very High	Minor	**Moderate to Major**	Negligible	**Minor**

70KM OTL - Impact Assessment of Unmitigated Impact from Littering during Construction; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Avifauna) Vulnerable Species - Raptors (Greater Spotted Eagle, Eastern Imperial Eagle)	High	Minor	**Minor to moderate**	Negligible	**Minor**
(Avifauna) Near Threatened Species - Raptors (Cinereous Vulture, Pallid Harrier)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Avifauna) Near Threatened Species - Groundbirds(Little Bustard)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Avifauna) Near Threatened Species - Waterbirds - Northern Lapwing	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Avifauna) Nationally Important Species - Waterbirds - Black Stork	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Avifauna) Common Species - Raptors (Rough-legged Buzzard, Common Buzzard, etc)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Common / LC Species - Waterbirds (Migratory) (Little Egret, Etc.)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**

70KM OTL - Impact Assessment of Unmitigated Impact from Littering during Construction; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Avifauna) Common Species (Others) - Lark, Wheatear, etc.	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Urban Species - Rock Dove	Very Low	Minor	**Negligible to minor**	Negligible	**Negligible**

400 MW PV Plant and pooling station, access roads

Table 10-111 Impact assessment of the potentially affected receptors at the 400 MW facility by littering and their residual significance after the implementation of proposed mitigation measures

400MW PV - Impact Assessment of Unmitigated Impact from Littering during Construction; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Herptiles) Vulnerable Species - Burrowing, Slow Mobility (i.e. Central Asian Tortoise)	High	Minor	**Minor to moderate**	Negligible	**Minor**
(Herptiles) Vulnerable Species - Burrowing, Medium Mobility (i.e. Caspian Monitor)	High	Minor	**Minor to moderate**	Negligible	**Minor**

400MW PV - Impact Assessment of Unmitigated Impact from Littering during Construction; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Herptiles) Near Threatened Species - Burrowing, Medium Mobility (i.e. Tatary Sand Boa)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Herptiles) Common Species - Burrowing, Medium Mobility (i.e. Gecko, Agama, Skink)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Herptiles) Common Species - Burrowing, Fast Mobility (i.e. whipsnakes,etc)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Nationally Uplisted Species - Large Mobile (Corsac Fox, Steppe Polecat)	High	Moderate	**Moderate to Major**	Negligible	**Minor**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**

400MW PV - Impact Assessment of Unmitigated Impact from Littering during Construction; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Mammals) Common Species - Large Mobile, Nocturnal (Red Fox)	Low	Moderate	**Minor**	Negligible	**Negligible to minor**
(Mammals) Rarer Species - Insectivore (Brandt's Hedgehog)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Avifauna) Near Threatened Species - Groundbirds (Migratory) (Little Bustard)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Avifauna) Common Species - Raptors (Long-legged Buzzard, Western Marsh Harrier, etc)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Common Species - Waterbirds (Migratory) (Greater Sand Plover)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Common Resident Species (i.e. Lark, Sandgrouse..)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**

11-km LILO OTL corridor

Table 10-112 Impact assessment of the potentially affected receptors by littering and their residual significance after the implementation of proposed mitigation measures

11KM OTL - Impact Assessment of Unmitigated Impact from Littering during Construction; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Herptiles) Vulnerable Species - Slow Mobility (Central Asian Tortoise)	High	Minor	**Minor to moderate**	Negligible	**Minor**
(Mammals) Nationally Uplisted Species - Large Mobile (Steppe Polecat)	Medium	Moderate	**Moderate**	Negligible	**Negligible to minor**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Rarer Species - Burrowing (i.e. Zaisan Mole Vole)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Large Mobile, Nocturnal (Red Fox)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**

11KM OTL - Impact Assessment of Unmitigated Impact from Littering during Construction; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Mammals) Rarer Species - Large Mobile, Nocturnal (Asiatic Wildcat)	Medium	Moderate	**Moderate**	Negligible	**Negligible to minor**
(Avifauna) Endangered Species - Raptors (Steppe Eagle)	Very High	Minor	**Moderate to Major**	Negligible	**Minor**
(Avifauna) Vulnerable Species - Raptors (Eastern Imperial Eagle)	High	Minor	**Minor to moderate**	Negligible	**Minor**
(Avifauna) Near Threatened Species - Raptors (Hen Harrier)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Avifauna) Common Species - Raptors (i.e. Common Kestrel, Long-legged Buzzard)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Common Species - Waterbirds (Migratory) (i.e. Green Sandpiper, Little Ringed Plover)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**

11KM OTL - Impact Assessment of Unmitigated Impact from Littering during Construction; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Avifauna) Common Species - Residents & Visitors (Rook, Jackdaw, etc.)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Urban Species (Rock Pigeon)	Very Low	Minor	**Negligible to minor**	Negligible	**Negligible**

19-km LILO OTL corridor

Table 10-113 Impact assessment of the potentially affected receptors by littering and their residual significance after the implementation of proposed mitigation measures

19KM OTL - Impact Assessment of Unmitigated Impact from Littering during Construction; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Herptiles) Vulnerable Species - Slow Mobility (Central Asian Tortoise)	High	Minor	**Minor to moderate**	Negligible	**Minor**
(Mammals) Nationally Uplisted Species - Large Mobile Mammals (Steppe Polecat)	Medium	Moderate	**Moderate**	Negligible	**Negligible to minor**

19KM OTL - Impact Assessment of Unmitigated Impact from Littering during Construction; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Rarer Species - Burrowing (i.e. Zaizan Mole Vole)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Larger Mobile Mammals, Nocturnal (Red Fox)	Low	Moderate	**Minor**	Negligible	**Negligible to minor**
(Mammals) Rarer Species - Larger Mobile Mammals, Nocturnal (Asiatic Wildcat)	Medium	Moderate	**Moderate**	Negligible	**Negligible to minor**
(Avifauna) Endangered Species - Raptors (Steppe Eagle)	Very High	Minor	**Moderate to Major**	Negligible	**Minor**
(Avifauna) Vulnerable Species - Raptors (Eastern Imperial Eagle)	High	Minor	**Minor to moderate**	Negligible	**Minor**

19KM OTL - Impact Assessment of Unmitigated Impact from Littering during Construction; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Avifauna) Near Threatened Species - Raptors (Hen Harrier)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Avifauna) Common Species - Raptors (i.e. Common Kestrel, Long-legged Buzzard)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Common Species - Waterbirds (Migratory) (i.e. Green Sandpiper, Little Ringed Plover)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Common Species - Residents & Visitors (Rook, Jackdaw, etc.)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Urban Species (Rock Pigeon)	Very Low	Minor	**Negligible to minor**	Negligible	**Negligible**

10.11.1.6 Impact – Introduction of Invasive Species or Pathogens

Soil imports, intentional or via previously used excavation and earthworks equipment, may contain pathogens that can spread and infect native vegetation and fauna that do not have natural defence mechanisms.

Exotic seeds in soil imports can allow the spread of invasive, weedy species which outcompete native species. Secondary impacts may occur on wildlife which utilize the reduced native vegetation for foraging or shelter.

However, the following mitigation measures will be implemented to minimize the magnitude of these potential impacts:

- Soil imports will be taken from local quarry or borrow pit as close to the site as reasonably practical to avoid risk of foreign seeds and invasive species; Soil imports from outside of the area will undergo checks to prevent accidental introduction of exotic species / pathogens.
- Plant and machinery will require an HSE certificate of inspection, issued by the EPC, before coming onto site and this will include necessary cleaning /washing to reduce risks of importing invasive species in mud taken from urban sites.
- Of importance to note is that a total of 10 invasive alien flora species have already been identified within the project areas. The clearance methodology should include appropriate biosecurity controls for the removal and disposal of vegetative material from these species. Further the Chance Find Procedure should include elucidation on the same species for identification and appropriate management for additional chance finds during construction.

100 MW PV PLANT AND ACCESS ROAD SITES

Table 10-114 Impact assessment of the potentially affected receptors at the 100 MW facility by invasive species and their residual significance after the implementation of proposed mitigation measures

100MW PV - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM INTRODUCTION OF INVASIVE SPECIES OR PATHOGENS DURING CONSTRUCTION; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	VALUE/ SENSITIVITY	MAGNITUDE	UNMITIGATED SIGNIFICANCE	MITIGATED MAGNITUDE	RESIDUAL SIGNIFICANCE
(Flora) Common Grassland and Shrub Species	Low	Moderate	**Minor**	No change	**Neutral**
(Flora) Herbaceous Species	Low	Moderate	**Minor**	No change	**Neutral**
(Flora) Invasive and Pioneer Species	Very Low	No change	**Neutral**	No change	**Neutral**
(Flora) Least Concern (LC) - Riparian and Moisture-Loving Species	Low	Moderate	**Minor**	No change	**Neutral**
(Flora) Weedy and Ruderal Species	Low	Negligible	**Negligible to minor**	No change	**Neutral**

100MW PV - Impact Assessment of Unmitigated Impact from introduction of invasive species or pathogens during Construction; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Flora) Cultivated Species	Low	Moderate	**Minor**	No change	**Neutral**
(Flora) Cereal Crops	Very Low	Moderate	**Minor**	No change	**Neutral**

Nurobod BESS

Table 10-115 Impact assessment of the potentially affected receptors at the Nurobod BESS facility by invasive species and their residual significance after the implementation of proposed mitigation measures

Nurobod BESS - Impact Assessment of Unmitigated Impact from introduction of invasive species or pathogens during Construction; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Flora) Native Species - Grassland Species	Medium	Moderate	**Moderate**	No change	**Neutral**
(Flora) Least Concern (LC) Species	Medium	Moderate	**Moderate**	No change	**Neutral**
(Flora) Alien Species - Weedy Species	Very Low	Negligible	**Negligible**	No change	**Neutral**
(Flora) Native Fruit Trees	Low	Moderate	**Minor**	No change	**Neutral**
(Flora) Native Agricultural Crops	Low	Moderate	**Minor**	No change	**Neutral**

4.9-km LILO OTL corridor

Table 10-116 Impact assessment of the potentially affected receptors at the 4.9KM OTL by invasive species and their residual significance after the implementation of proposed mitigation measures

4.9KM OTL - Impact Assessment of Unmitigated Impact from introduction of invasive species or pathogens during Construction; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Flora) Native Species	Medium	Moderate	**Moderate**	No change	**Neutral**
(Flora) Least Concern (LC)	Medium	Moderate	**Moderate**	No change	**Neutral**
(Flora) Alien Species	Very Low	Negligible	**Negligible**	No change	**Neutral**

70-km LILO OTL corridor

Table 10-117 Impact assessment of the potentially affected receptors at the 70KM OTL by invasive species and their residual significance after the implementation of proposed mitigation measures

70KM OTL - Impact Assessment of Unmitigated Impact from introduction of invasive species or pathogens during Construction; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Flora) Endangered (EN) Species (Exotic Non Native)	Medium	Moderate	**Moderate**	No change	**Neutral**
(Flora) Native Species	Medium	Moderate	**Moderate**	No change	**Neutral**
(Flora) Least Concern (LC)	Medium	Moderate	**Moderate**	No change	**Neutral**
(Flora) Alien Species	Very Low	Negligible	**Negligible**	No change	**Neutral**
(Flora) Native Fruit Trees	Low	Moderate	**Minor**	No change	**Neutral**
(Flora) Native Agricultural Crops	Low	Moderate	**Minor**	No change	**Neutral**

Strict biosecurity measures should be implemented in the CESMP procedures on site. The on-site Ecologist should also be well versed in dangerous invasive species already present in the region which have the potential to spread, in order to identify outbreaks. The resultant risk, given application of these measures, is relatively low.

Table 10-118 Impact assessment of the potentially affected receptors at the 400 MW facility by invasive species and their residual significance after the implementation of proposed mitigation measures

400MW PV - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM INTRODUCTION OF INVASIVE SPECIES OR PATHOGENS DURING CONSTRUCTION; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	VALUE/ SENSITIVITY	MAGNITUDE	UNMITIGATED SIGNIFICANCE	MITIGATED MAGNITUDE	RESIDUAL SIGNIFICANCE
(Flora) Native Grassland and Shrub Species	Medium	Moderate	**Moderate**	No change	**Neutral**
(Flora) Native Moisture-Loving Species	Medium	Moderate	**Moderate**	No change	**Neutral**
(Flora) Invasive and Alien Species	Very Low	No change	**Neutral**	No change	**Neutral**
(Flora) Native Fruit Trees	Low	Moderate	**Minor**	No change	**Neutral**
(Flora) Native Agricultural Crops	Low	Moderate	**Minor**	No change	**Neutral**

11-KM LILO OTL CORRIDOR

Table 10-119 Impact assessment of the potentially affected receptors at the 11KM OTL by invasive species and their residual significance after the implementation of proposed mitigation measures

11KM OTL - Impact Assessment of Unmitigated Impact from introduction of invasive species or pathogens during Construction; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Flora) Endangered (EN) Species - Exotic/Nonnative	Medium	Moderate	**Moderate**	No change	**Neutral**
(Flora) Native Species	Medium	Moderate	**Moderate**	No change	**Neutral**
(Flora) Least Concern (LC)	Medium	Moderate	**Moderate**	No change	**Neutral**
(Flora) Alien Species	Very Low	Negligible	**Negligible**	No change	**Neutral**
(Flora) Native Fruit Trees	Low	Moderate	**Minor**	No change	**Neutral**
(Flora) Native Agricultural Crops	Low	Moderate	**Minor**	No change	**Neutral**

19-km LILO OTL corridor

Table 10-120 Impact assessment of the potentially affected receptors at the 19KM OTL by invasive species and their residual significance after the implementation of proposed mitigation measures

19KM OTL - Impact Assessment of Unmitigated Impact from introduction of invasive species or pathogens during Construction; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Flora) Native Species	Medium	Moderate	**Moderate**	No change	**Neutral**
(Flora) Least Concern (LC)	Medium	Moderate	**Moderate**	No change	**Neutral**
(Flora) Alien Species	Very Low	Negligible	**Negligible**	No change	**Neutral**
(Flora) Native Fruit Trees	Low	Moderate	**Minor**	No change	**Neutral**

10.11.1.7 Impact – Environmental Quality Degradation

Impacts on environmental aspects such as air quality, noise soundscape, lighting, contamination, soil health, and hydrological regime changes can undoubtedly have impact on the ecosystem and inhabiting biodiversity.

Dust can coat vegetation, reducing photosynthesis and respiration ability, causing desiccation. Emissions of pollutants such as NOx, Sox, PM and CO can lower survivorship and increase susceptibility of affected wildlife to disease.

Construction noise and vibration can cause acoustic masking, disturbance and displacement, and general reduction in survivorship and reproductive success in a variety of fauna. Most heavily impacted are acoustic communicators such as bird and bat species and a growing body of research is also investigating acoustic impacts on herpetofauna.

Night-time lighting can impact nocturnal wildlife behaviour. It can act as an attractant, which can cause congregation and higher predation rates or change movement and migration behaviour; act as a repellent which causes displacement, or interfere with the circadian cycle and cause lower survivorship and reproductive success. However, lighting will be required only at specific work areas and not across the wider area or along access roads, thereby limiting lighting to relatively small areas, and only when and where night work is required.

Fuels and solvents will be used during construction activities and maintenance. Improper use, storage and handling can result in chemical spills and contamination of the soil and groundwater. Flora and fauna that come into contact may become ill or die.

During construction earthworks and vehicle movement, soils may become compacted, which prohibits vegetation regrowth and use for burrowing. Further, removal of vegetation may cause an increase in wind-driven soil erosion, leading to loss of native soils.

During construction, soil compaction, grading, or installation of impermeable surfaces may lead to:

- Change to surface runoff patterns and subsequent impact on downstream hydrological cycle
- Change to infiltration rates and patterns and subsequent impact on groundwater aquifers

Further, any unlikely events necessitating dewatering for deep excavation, will result in drawdown impacts on the affected aquifer. All of the above can lead to secondary impacts on vegetation within the hydrological catchment area.

General best practice dictates a number of measures that will ensure that dust, air quality, and noise and vibration and light pollution are controlled adequately, as outlined in respective ESIA sections, and will inform control plans within the eventual CESMP, as well as preventative and emergency response plans for contamination. Any specific soil and hydrological impacts can be managed both preventatively as well as remediated post-construction.

Certain species in specific locations could require more consideration, such as seasonal or timing restrictions, or the application of acoustic barriers or set-backs. **Where relevant, more specifics are provided in the subsequent sub-sections.**

100 MW PV PLANT AND ACCESS ROAD SITES

For 100MW PV Plant site, environmental degradation from project construction activities is rated as Moderate magnitude since there are already anthropogenic disturbances present within the site, which is comprised mostly of modified habitats.

General best-practices for air, noise, lighting, contamination, soil and hydrological impacts that will be integrated into the CESMP will be sufficient to reduce the magnitude of degradation impact on the majority of ecological receptors to a minor or negligible residual significance.

The sole exception is Egyptian Vulture. However, raptors of conservation concern (particularly SBVs) will be subject to additional population monitoring throughout construction and restoration phases. This monitoring paired with adaptive management approaches will ensure that any significant impacts are managed appropriately. Therefore, the assigned mitigated magnitude for this receptor has been downgraded to negligible, resulting in a minor residual significance.

Table 10-121 Impact assessment of the potentially affected receptors at the 100 MW facility by environmental quality degradation and their residual significance after the implementation of proposed mitigation measures

100MW PV - Impact Assessment of Unmitigated Impact from degredation of environmental quality (air, noise, light, soil, etc) during Construction; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Flora) Common Grassland and Shrub Species	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Flora) Herbaceous Species	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Flora) Invasive and Pioneer Species	Very Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Flora) Least Concern (LC) - Riparian and Moisture-Loving Species	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Flora) Weedy and Ruderal Species	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Flora) Cultivated Species	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Flora) Cereal Crops	Very Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Herptiles) Vulnerable Species - Burrowing, Slow Mobility (i.e. Central Asian Tortoise)	High	Moderate	**Moderate to Major**	Minor	**Minor to moderate**

100MW PV - Impact Assessment of Unmitigated Impact from degredation of environmental quality (air, noise, light, soil, etc) during Construction; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Herptiles) Near Threatened Species - Burrowing, Medium Mobility (i.e. Tatary Sand Boa, Central Asian Cobra)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Herptiles) Common Species - Burrowing, Medium Mobility (i.e. Gecko, Agama, Skink)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Herptiles) Common Species - Burrowing, Fast Mobility (i.e. racerunner, etc.)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Mammals) Nationally Uplisted Species - Large Mobile Mammal, Nocturnal (Corsac Fox, Steppe Polecat)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Mammals) Common Species - Large Mobile Mammal, Nocturnal (Red Fox)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Mammals) Rare / Not Numerous Species - Burrowing, Nocturnal (Libyan Jird)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Bats) Nationally Uplisted Species - Myotis sp.	Medium	Moderate	**Moderate**	Minor	**Minor**

100MW PV - Impact Assessment of Unmitigated Impact from degredation of environmental quality (air, noise, light, soil, etc) during Construction; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Bats) Rarer Species - Eptesicus sp.	Medium	Moderate	**Moderate**	Minor	**Minor**
(Bats) Common Species - Pipistrellus pipistrellus	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Avifauna) Endangered Species - Raptors - Egyptian Vulture	Very High	Moderate	**Major**	Negligible	**Minor**
(Avifauna) Nationally Uplisted Species - Raptors - Griffon Vulture	High	Moderate	**Moderate to Major**	Minor	**Minor to moderate**
(Avifauna) Common Species - Residents - i.e. Crested Lark, etc.	Low	Moderate	**Minor**	Minor	**Negligible to minor**

Nurobod BESS

For Nurobod BESS site, environmental degradation from project construction activities is rated as Moderate magnitude since there are already anthropogenic disturbances present within the site, which is comprised mostly of modified habitats.

General best-practices for air, noise, lighting, contamination, soil and hydrological impacts that will be integrated into the CESMP will be sufficient to reduce the magnitude of degradation impact on the majority of ecological receptors to a minor or negligible residual significance.

There is one exception:

Egyptian Vulture: Raptors of conservation concern (particularly SBVs) will be subject to additional population monitoring throughout construction and restoration phases. This monitoring paired with adaptive management approaches will ensure that any significant impacts are managed

appropriately. Therefore, the assigned mitigated magnitude for this receptor has been downgraded to negligible, resulting in a minor residual significance.

Table 10-122Impact assessment of the potentially affected receptors at the Nurobod BESS facility by environmental quality degradation and their residual significance after the implementation of proposed mitigation measures

NUROBOD BESS - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM DEGREDATION OF ENVIRONMENTAL QUALITY (AIR, NOISE, LIGHT, SOIL, ETC) DURING CONSTRUCTION; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	**VALUE/ SENSITIVITY**	**MAGNITUDE**	**UNMITIGATED SIGNIFICANCE**	**MITIGATED MAGNITUDE**	**RESIDUAL SIGNIFICANCE**
(Flora) Native Species - Grassland Species	Medium	Moderate	**Moderate**	Minor	**Minor**
(Flora) Least Concern (LC) Species	Medium	Moderate	**Moderate**	Minor	**Minor**
(Flora) Alien Species - Weedy Species	Very Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Flora) Native Fruit Trees	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Flora) Native Agricultural Crops	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Herptiles) Vulnerable Species - Burrowing, Slow Mobility (i.e. Central Asian Tortoise)	High	Moderate	**Moderate to Major**	Minor	**Minor to moderate**
(Herptiles) Near Threatened Species - Burrowing, Medium Mobility (i.e. Tatary Sand Boa)	Medium	Moderate	**Moderate**	Minor	**Minor**

NUROBOD BESS - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM DEGREDATION OF ENVIRONMENTAL QUALITY (AIR, NOISE, LIGHT, SOIL, ETC) DURING CONSTRUCTION; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	**VALUE/ SENSITIVITY**	**MAGNITUDE**	**UNMITIGATED SIGNIFICANCE**	**MITIGATED MAGNITUDE**	**RESIDUAL SIGNIFICANCE**
(Herptiles) Common Species - Burrowing, Medium Mobility (i.e. Gecko, Agama, Skink)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Herptiles) Common Species - Burrowing, Fast Mobility (i.e. whipsnakes,etc)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Mammals) Nationally Uplisted Species - Burrowing, Nocturnal (Steppe Polecat)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Mammals) Common Species - Large Mobile Mammal, Nocturnal (Red Fox)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Bats) Common Bats (Common Pipistrelle)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Bats) Rarer Bats (Eptesicus sp.)	Medium	Moderate	**Moderate**	Minor	**Minor**

Nurobod BESS - Impact Assessment of Unmitigated Impact from degredation of environmental quality (air, noise, light, soil, etc) during Construction; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Bats) IUCN Red List - DD - Bats (Myotis sp.)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Avifauna) Endangered Species - Raptors (Egyptian Vulture)	Very High	Moderate	**Major**	Negligible	**Minor**
(Avifauna) Nationally Uplisted Species - Raptors (Griffon Vulture)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Avifauna) Common Resident Species (Crested Lark, etc)	Low	Moderate	**Minor**	Minor	**Negligible to minor**

4.9-km LILO OTL corridor

For 4.9-km OTL, environmental degradation from project construction activities is rated as Moderate magnitude since there are already anthropogenic disturbances present within the site, which is comprised mostly of modified habitats.

General best-practices for air, noise, lighting, contamination, soil and hydrological impacts that will be integrated into the CESMP will be sufficient to reduce the magnitude of degradation impact on the majority of ecological receptors to a minor or negligible residual significance.

The sole exception is Egyptian Vulture. However, raptors of conservation concern (particularly SBVs) will be subject to additional population monitoring throughout construction and restoration phases. This monitoring paired with adaptive management approaches will ensure that any significant impacts are managed appropriately. Therefore, the assigned mitigated magnitude for this receptor has been downgraded to negligible, resulting in a minor residual significance.

Table 10-123 Impact assessment of the potentially affected receptors by environmental quality degradation and their residual significance after the implementation of proposed mitigation measures

4.9KM OTL - Impact Assessment of Unmitigated Impact from degredation of environmental quality (air, noise, light, soil, etc) during Construction; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Flora) Native Species	Medium	Moderate	**Moderate**	Minor	**Minor**
(Flora) Least Concern (LC)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Flora) Alien Species	Very Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Herptiles) Vulnerable Species - Slow Mobility (i.e. Central Asian Tortoise)	High	Moderate	**Moderate to Major**	Minor	**Minor to moderate**
(Herptiles) Near Threatened Species - Medium Mobility (i.e. Tatary Sand Boa)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Herptiles) Common Species - Medium Mobility (i.e. Gecko, Agama, Skink)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Herptiles) Common Species - Fast Mobility (i.e. racerunner, whip snake)	Low	Moderate	**Minor**	Minor	**Negligible to minor**

4.9KM OTL - Impact Assessment of Unmitigated Impact from degredation of environmental quality (air, noise, light, soil, etc) during Construction; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Mammals) Nationally Uplisted Species - Larger Mobile, Nocturnal (Steppe Polecat)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Mammals) Common Species - Large Mobile, Nocturnal (Red Fox)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Mammals) Rarer Species - Large Mobile (Asiatic Wildcat)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Avifauna) Endangered Species - Raptors (Egyptian Vulture)	Very High	Moderate	**Major**	Negligible	**Minor**

4.9KM OTL - Impact Assessment of Unmitigated Impact from degredation of environmental quality (air, noise, light, soil, etc) during Construction; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Avifauna) Nationally Uplisted Species - Raptors (Griffon Vulture)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Avifauna) Common Species - Raptors (Upland Buzzard, Common Kestrel, etc)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Avifauna) Common Species - Migratory (Common Swift, Greater Short-toed Lark)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Avifauna) Common Species - Residents, or Common Visitors (i.e. Crested LArk, Common Starling)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Avifauna) Urban Species - Residents (Rock Pigeon, Common Raven)	Very Low	Moderate	**Minor**	Minor	**Negligible to minor**

70-km LILO OTL corridor

For 70-km OTL, environmental degradation from project construction activities is rated as Moderate magnitude since there are already anthropogenic disturbances present within the site, which is comprised mostly of modified habitats.

General best-practices for air, noise, lighting, contamination, soil and hydrological impacts that will be integrated into the CESMP will be sufficient to reduce the magnitude of degradation impact on the majority of ecological receptors to a minor or negligible residual significance.

There are two exceptions:

Egyptian Vulture: Raptors of conservation concern (particularly SBVs) will be subject to additional population monitoring throughout construction and restoration phases. This monitoring paired with adaptive management approaches will ensure that any significant impacts are managed appropriately. Therefore, the assigned mitigated magnitude for this receptor has been downgraded to negligible, resulting in a minor residual significance.

Great Bustard (*considered possible to occur based on habitat and distribution, but surveys to date did not record*): Great Bustard will also be subject to population monitoring throughout construction and restoration phases. This monitoring paired with adaptive management approaches will ensure that any significant impacts are managed appropriately. Therefore, the assigned mitigated magnitude for this receptor has been downgraded to negligible, resulting in a minor residual significance.

Table 10-124 Impact assessment of the potentially affected receptors by environmental quality degradation and their residual significance after the implementation of proposed mitigation measures

70KM OTL - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM DEGREDATION OF ENVIRONMENTAL QUALITY (AIR, NOISE, LIGHT, SOIL, ETC) DURING CONSTRUCTION; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	**VALUE/ SENSITIVITY**	**MAGNITUDE**	**UNMITIGATED SIGNIFICANCE**	**MITIGATED MAGNITUDE**	**RESIDUAL SIGNIFICANCE**
(Flora) Endangered (EN) Species (Exotic Non Native)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Flora) Native Species	Medium	Moderate	**Moderate**	Minor	**Minor**

70KM OTL - Impact Assessment of Unmitigated Impact from degredation of environmental quality (air, noise, light, soil, etc) during Construction; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Flora) Least Concern (LC)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Flora) Alien Species	Very Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Flora) Native Fruit Trees	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Flora) Native Agricultural Crops	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Herptile) Vulnerable Species - Slow Mobility (i.e. Central Asian Tortoise)	High	Moderate	**Moderate to Major**	Minor	**Minor to moderate**
(Herptile) Vulnerable Species - Medium Mobility (Caspian Monitor)	High	Moderate	**Moderate to Major**	Minor	**Minor to moderate**
(Herptile) Near Threatened Species - Medium Mobility (i.e. Tatary Sand Boa)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Herptile) Common Species - Medium Mobility (i.e.Gecko, Agama, Skink)	Low	Moderate	**Minor**	Minor	**Negligible to minor**

70KM OTL - Impact Assessment of Unmitigated Impact from degredation of environmental quality (air, noise, light, soil, etc) during Construction; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Herptile) Common Species - Fast Mobility (i.e. Racerunner, whip snake)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Mammals) Nationally Uplisted Species - Large Mobile (i.e. Corsac Fox)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Mammals) Common Species - Insectivore, Nocturnal (i.e. Long-eared Hedgehog)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Mammals) Common Species - Large Mobile, Nocturnal (i.e. Red Fox)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Mammals) Rarer Species - Insectivore (Brandt's Hedgehog)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Mammals) Rarer Species - Burrowing (Lesser Jerboa, etc)	Medium	Moderate	**Moderate**	Minor	**Minor**

70KM OTL - Impact Assessment of Unmitigated Impact from degredation of environmental quality (air, noise, light, soil, etc) during Construction; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Mammals) Rarer Species - Nocturnal (i.e. Libyan Jird)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Avifauna) Endangered Species - Raptors (Egyptian Vulture, Steppe Eagle)	Very High	Moderate	**Major**	Negligible	**Minor**
(Avifauna) Endangered Species - Groundbirds (Great Bustard)	Very High	Moderate	**Major**	Negligible	**Minor**
(Avifauna) Vulnerable Species - Raptors (Greater Spotted Eagle, Eastern Imperial Eagle)	High	Moderate	**Moderate to Major**	Minor	**Minor to moderate**
(Avifauna) Near Threatened Species - Raptors (Cinereous Vulture, Pallid Harrier)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Avifauna) Near Threatened Species - Groundbirds(Little Bustard)	Medium	Moderate	**Moderate**	Minor	**Minor**

70KM OTL - Impact Assessment of Unmitigated Impact from degredation of environmental quality (air, noise, light, soil, etc) during Construction; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Avifauna) Near Threatened Species - Waterbirds - Northern Lapwing	Medium	Moderate	**Moderate**	Minor	**Minor**
(Avifauna) Nationally Important Species - Waterbirds - Black Stork	Medium	Moderate	**Moderate**	Minor	**Minor**
(Avifauna) Common Species - Raptors (Rough-legged Buzzard, Common Buzzard, etc)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Avifauna) Common / LC Species - Waterbirds (Migratory) (Little Egret, Etc.)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Avifauna) Common Species (Others) - Lark, Wheatear, etc.	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Avifauna) Urban Species - Rock Dove	Very Low	Moderate	**Minor**	Minor	**Negligible to minor**

400 MW PV Plant and pooling station, access roads

General best-practices for air, noise, lighting, contamination, soil and hydrological impacts that will be integrated into the CESMP will be sufficient to reduce the magnitude of degradation impact on the majority of ecological receptors to a minor or negligible residual significance.

Table 10-125 Impact assessment of the potentially affected receptors at the 400 MW facility by environmental quality degradation and their residual significance after the implementation of proposed mitigation measures

400MW PV - Impact Assessment of Unmitigated Impact from degredation of environmental quality (air, noise, light, soil, etc) during Construction; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Flora) Native Grassland and Shrub Species	Medium	Moderate	**Moderate**	Minor	**Minor**
(Flora) Native Moisture-Loving Species	Medium	Moderate	**Moderate**	Minor	**Minor**
(Flora) Invasive and Alien Species	Very Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Flora) Native Fruit Trees	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Flora) Native Agricultural Crops	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Herptiles) Vulnerable Species - Burrowing, Slow Mobility (i.e. Central Asian Tortoise)	High	Moderate	**Moderate to Major**	Minor	**Minor to moderate**
(Herptiles) Vulnerable Species - Burrowing, Medium Mobility (i.e. Caspian Monitor)	High	Moderate	**Moderate to Major**	Minor	**Minor to moderate**

400MW PV - Impact Assessment of Unmitigated Impact from degredation of environmental quality (air, noise, light, soil, etc) during Construction; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Herptiles) Near Threatened Species - Burrowing, Medium Mobility (i.e. Tatary Sand Boa)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Herptiles) Common Species - Burrowing, Medium Mobility (i.e. Gecko, Agama, Skink)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Herptiles) Common Species - Burrowing, Fast Mobility (i.e. whipsnakes,etc)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Mammals) Nationally Uplisted Species - Large Mobile (Corsac Fox, Steppe Polecat)	High	Moderate	**Moderate to Major**	Minor	**Minor to moderate**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Moderate	**Minor**	Minor	**Negligible to minor**

400MW PV - Impact Assessment of Unmitigated Impact from degredation of environmental quality (air, noise, light, soil, etc) during Construction; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Mammals) Common Species - Large Mobile, Nocturnal (Red Fox)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Mammals) Rarer Species - Insectivore (Brandt's Hedgehog)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Bats) Common Bat Species (Lesser Noctule)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Bats) Rarer Bat Species (Eptesicus sp., Tadarida sp.)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Avifauna) Near Threatened Species - Groundbirds (Migratory) (Little Bustard)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Avifauna) Common Species - Raptors (Long-legged Buzzard, Western Marsh Harrier, etc)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Avifauna) Common Species - Waterbirds (Migratory) (Greater Sand Plover)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Avifauna) Common Resident Species (i.e. Lark, Sandgrouse..)	Low	Moderate	**Minor**	Minor	**Negligible to minor**

11-KM LILO OTL CORRIDOR

For 11-km OTL, environmental degradation from project construction activities is rated as Moderate magnitude since there are already anthropogenic disturbances present within the site, which is comprised mostly of modified habitats.

General best-practices for air, noise, lighting, contamination, soil and hydrological impacts that will be integrated into the CESMP will be sufficient to reduce the magnitude of degradation impact on the majority of ecological receptors to a minor or negligible residual significance.

The sole exception is Egyptian Vulture. However, raptors of conservation concern (particularly SBVs) will be subject to additional population monitoring throughout construction and restoration phases. This monitoring paired with adaptive management approaches will ensure that any significant impacts are managed appropriately. Therefore, the assigned mitigated magnitude for this receptor has been downgraded to negligible, resulting in a minor residual significance.

Table 10-126 Impact assessment of the potentially affected receptors by environmental quality degradation and their residual significance after the implementation of proposed mitigation measures

11KM OTL - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM DEGREDATION OF ENVIRONMENTAL QUALITY (AIR, NOISE, LIGHT, SOIL, ETC) DURING CONSTRUCTION; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	**VALUE/ SENSITIVITY**	**MAGNITUDE**	**UNMITIGATED SIGNIFICANCE**	**MITIGATED MAGNITUDE**	**RESIDUAL SIGNIFICANCE**
(Flora) Endangered (EN) Species - Exotic/Nonnative	Medium	Moderate	**Moderate**	Minor	**Minor**
(Flora) Native Species	Medium	Moderate	**Moderate**	Minor	**Minor**
(Flora) Least Concern (LC)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Flora) Alien Species	Very Low	Moderate	**Minor**	Minor	**Negligible to minor**

11KM OTL - Impact Assessment of Unmitigated Impact from degredation of environmental quality (air, noise, light, soil, etc) during Construction; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Flora) Native Fruit Trees	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Flora) Native Agricultural Crops	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Herptiles) Vulnerable Species - Slow Mobility (Central Asian Tortoise)	High	Moderate	**Moderate to Major**	Minor	**Minor to moderate**
(Mammals) Nationally Uplisted Species - Large Mobile (Steppe Polecat)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Mammals) Rarer Species - Burrowing (i.e. Zaisan Mole Vole)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Mammals) Common Species - Large Mobile, Nocturnal (Red Fox)	Low	Moderate	**Minor**	Minor	**Negligible to minor**

11KM OTL - Impact Assessment of Unmitigated Impact from degredation of environmental quality (air, noise, light, soil, etc) during Construction; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Mammals) Rarer Species - Large Mobile, Nocturnal (Asiatic Wildcat)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Avifauna) Endangered Species - Raptors (Steppe Eagle)	Very High	Moderate	**Major**	Negligible	**Minor**
(Avifauna) Vulnerable Species - Raptors (Eastern Imperial Eagle)	High	Moderate	**Moderate to Major**	Minor	**Minor to moderate**
(Avifauna) Near Threatened Species - Raptors (Hen Harrier)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Avifauna) Common Species - Raptors (i.e. Common Kestrel, Long-legged Buzzard)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Avifauna) Common Species - Waterbirds (Migratory) (i.e. Green Sandpiper, Little Ringed Plover)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Avifauna) Common Species - Residents & Visitors (Rook, Jackdaw, etc.)	Low	Moderate	**Minor**	Minor	**Negligible to minor**

11KM OTL - Impact Assessment of Unmitigated Impact from degredation of environmental quality (air, noise, light, soil, etc) during Construction; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Avifauna) Urban Species (Rock Pigeon)	Very Low	Moderate	**Minor**	Minor	**Negligible to minor**

19-km LILO OTL corridor

For 19-km OTL, environmental degradation from project construction activities is rated as Moderate magnitude since there are already anthropogenic disturbances present within the site, which is comprised mostly of modified habitats.

General best-practices for air, noise, lighting, contamination, soil and hydrological impacts that will be integrated into the CESMP will be sufficient to reduce the magnitude of degradation impact on the majority of ecological receptors to a minor or negligible residual significance.

The sole exception is Egyptian Vulture. However, raptors of conservation concern (particularly SBVs) will be subject to additional population monitoring throughout construction and restoration phases. This monitoring paired with adaptive management approaches will ensure that any significant impacts are managed appropriately. Therefore, the assigned mitigated magnitude for this receptor has been downgraded to negligible, resulting in a minor residual significance.

Table 10-127 Impact assessment of the potentially affected receptors by environmental quality degradation and their residual significance after the implementation of proposed mitigation measures

19KM OTL - Impact Assessment of Unmitigated Impact from degredation of environmental quality (air, noise, light, soil, etc) during Construction; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Flora) Native Species	Medium	Moderate	**Moderate**	Minor	**Minor**

19KM OTL - Impact Assessment of Unmitigated Impact from degredation of environmental quality (air, noise, light, soil, etc) during Construction; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Flora) Least Concern (LC)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Flora) Alien Species	Very Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Flora) Native Fruit Trees	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Herptiles) Vulnerable Species - Slow Mobility (Central Asian Tortoise)	High	Moderate	**Moderate to Major**	Minor	**Minor to moderate**
(Mammals) Nationally Uplisted Species - Large Mobile Mammals (Steppe Polecat)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Mammals) Rarer Species - Burrowing (i.e. Zaizan Mole Vole)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Mammals) Common Species - Larger Mobile Mammals, Nocturnal (Red Fox)	Low	Moderate	**Minor**	Minor	**Negligible to minor**

19KM OTL - Impact Assessment of Unmitigated Impact from degredation of environmental quality (air, noise, light, soil, etc) during Construction; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Mammals) Rarer Species - Larger Mobile Mammals, Nocturnal (Asiatic Wildcat)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Avifauna) Endangered Species - Raptors (Steppe Eagle)	Very High	Moderate	**Major**	Negligible	**MInor**
(Avifauna) Vulnerable Species - Raptors (Eastern Imperial Eagle)	High	Moderate	**Moderate to Major**	Minor	**Minor to moderate**
(Avifauna) Near Threatened Species - Raptors (Hen Harrier)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Avifauna) Common Species - Raptors (i.e. Common Kestrel, Long-legged Buzzard)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Avifauna) Common Species - Waterbirds (Migratory) (i.e. Green Sandpiper, Little Ringed Plover)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Avifauna) Common Species - Residents & Visitors (Rook, Jackdaw, etc.)	Low	Moderate	**Minor**	Minor	**Negligible to minor**

19KM OTL - Impact Assessment of Unmitigated Impact from degredation of environmental quality (air, noise, light, soil, etc) during Construction; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Avifauna) Urban Species (Rock Pigeon)	Very Low	Moderate	**Minor**	Minor	**Negligible to minor**

10.11.2 Construction and/or Operational Impacts

The following impacts are expected to be plausible to occur during construction or operation phases.

10.11.2.1 Impact – Lowered Survivorship / Reproductive Success Due to Disturbance

The presence of anthropogenic activity is disturbing to many sensitive species, which can result in reduced survivorship, reproductive success, and ultimately, population decline.

Species particularly sensitive include bustards, wildcat, polecat, and other similarly secretive and shyer species, although most wildlife which is not already habituated to anthropogenic disturbance is anticipated to be negatively affected. Particularly, breeding birds with colonies present will be negatively affected if works occur during the breeding season.

However, the following mitigation measures will be implemented to minimize the magnitude of these potential impacts:

- Minimize construction footprint buffer zones and temporary laydown areas.
- If any breeding activity of sensitive species is noted (will be elucidated in the Chance Find Procedure), take measures to put buffer zones in place and avoid disturbing work within the buffer zone(s) for the duration of active breeding**. These will be assessed and narrated in more details in subsequent sub-sections for particular sites or receptors, where applicable.**
- The EPC contractor will commit to the restoration of habitat post-construction in unused land areas that are not required for O&M maintenance. The Habitat Restoration Plan will provide the restoration measures that will be undertaken for natural habitats, post-construction restoration via seeding, re-planting, and landscaping with native, high-value species, monitoring and reporting

requirements of the plan. Of particular importance to note is that PV arrays have been shown to increase the ability of vegetation recolonization, so a properly developed and executed Habitat Restoration Plan can maximize the biodiversity value of the vegetation regrowth underneath and adjacent to/ amongst the PV panel arrays. This phenomena means that despite a relatively large land take, the actual habitat and flora losses can be substantially mitigated and the site can eventually have moderately high biodiversity value during the operational phase.

100 MW PV PLANT AND ACCESS ROAD SITES

Table 10-128 Impact assessment of the potentially affected receptors at the 100MW PV by reduced survivorship and reproductive success due to disturbance and their residual significance after the implementation of proposed mitigation measures

100MW PV - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM DISTURBANCE CAUSING LOWERED SURVIVORSHIP/REPRODUCTIVE SUCCESS; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	VALUE/ SENSITIVITY	MAGNITUDE	UNMITIGATED SIGNIFICANCE	MITIGATED MAGNITUDE	RESIDUAL SIGNIFICANCE
(Herptiles) Vulnerable Species - Burrowing, Slow Mobility (i.e. Central Asian Tortoise)	High	Minor	**Minor to moderate**	Negligible	**Minor**
(Herptiles) Near Threatened Species - Burrowing, Medium Mobility (i.e. Tatary Sand Boa, Central Asian Cobra)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Herptiles) Common Species - Burrowing, Medium Mobility (i.e. Gecko, Agama, Skink)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Herptiles) Common Species - Burrowing, Fast Mobility (i.e. racerunner, etc.)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**

100MW PV - Impact Assessment of Unmitigated Impact from disturbance causing lowered survivorship/reproductive success; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Mammals) Nationally Uplisted Species - Large Mobile Mammal, Nocturnal (Corsac Fox, Steppe Polecat)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Large Mobile Mammal, Nocturnal (Red Fox)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Rare / Not Numerous Species - Burrowing, Nocturnal (Libyan Jird)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Bats) Nationally Uplisted Species - Myotis sp.	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Bats) Rarer Species - Eptesicus sp.	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Bats) Common Species - Pipistrellus pipistrellus	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Endangered Species - Raptors - Egyptian Vulture	Very High	Minor	**Moderate to Major**	Negligible	**Minor**

100MW PV - Impact Assessment of Unmitigated Impact from disturbance causing lowered survivorship/reproductive success; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Avifauna) Nationally Uplisted Species - Raptors - Griffon Vulture	High	Minor	**Minor to moderate**	Negligible	**Minor**
(Avifauna) Common Species - Residents - i.e. Crested Lark, etc.	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**

Nurobod BESS

For Nurobod BESS site, lowered survivorship is rated as a minor magnitude for the majority of receptors (except shyer species rated as Moderate, including Great Bustard).

The general mitigation as described will be sufficient, as it will to a negligible magnitude, with a negligible to minor residual significance.

Table 10-129 Impact assessment of the potentially affected receptors at the Nurobod BESS by reduced survivorship and reproductive success due to disturbance and their residual significance after the implementation of proposed mitigation measures

Nurobod BESS - Impact Assessment of Unmitigated Impact from disturbance causing lowered survivorship/reproductive success; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Herptiles) Vulnerable Species - Burrowing, Slow Mobility (i.e. Central Asian Tortoise)	High	Minor	**Minor to moderate**	Negligible	**Minor**
(Herptiles) Near Threatened Species - Burrowing, Medium Mobility (i.e. Tatary Sand Boa)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**

Nurobod BESS - Impact Assessment of Unmitigated Impact from disturbance causing lowered survivorship/reproductive success; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Herptiles) Common Species - Burrowing, Medium Mobility (i.e. Gecko, Agama, Skink)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Herptiles) Common Species - Burrowing, Fast Mobility (i.e. whipsnakes,etc)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Nationally Uplisted Species - Burrowing, Nocturnal (Steppe Polecat)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Large Mobile Mammal, Nocturnal (Red Fox)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Bats) Common Bats (Common Pipistrelle)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Bats) Rarer Bats (Eptesicus sp.)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Bats) IUCN Red List - DD - Bats (Myotis sp.)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Avifauna) Endangered Species - Raptors (Egyptian Vulture)	Very High	Minor	**Moderate to Major**	Negligible	**Minor**

NUROBOD BESS - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM DISTURBANCE CAUSING LOWERED SURVIVORSHIP/REPRODUCTIVE SUCCESS; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	VALUE/ SENSITIVITY	MAGNITUDE	UNMITIGATED SIGNIFICANCE	MITIGATED MAGNITUDE	RESIDUAL SIGNIFICANCE
(Avifauna) Nationally Uplisted Species - Raptors (Griffon Vulture)	Medium	Minor	**Minor**	Minor	**Minor**
(Avifauna) Common Resident Species (Crested Lark, etc)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**

4.9-KM LILO OTL CORRIDOR

Table 10-130 Impact assessment of the potentially affected receptors at the 4.9KM OTL by reduced survivorship and reproductive success due to disturbance and their residual significance after the implementation of proposed mitigation measures

4.9KM OTL - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM DISTURBANCE CAUSING LOWERED SURVIVORSHIP/REPRODUCTIVE SUCCESS; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	VALUE/ SENSITIVITY	MAGNITUDE	UNMITIGATED SIGNIFICANCE	MITIGATED MAGNITUDE	RESIDUAL SIGNIFICANCE
(Herptiles) Vulnerable Species - Slow Mobility (i.e. Central Asian Tortoise)	High	Minor	**Minor to moderate**	Negligible	**Minor**
(Herptiles) Near Threatened Species - Medium Mobility (i.e. Tatary Sand Boa)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Herptiles) Common Species - Medium Mobility (i.e. Gecko, Agama, Skink)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Herptiles) Common Species - Fast Mobility (i.e. racerunner, whip snake)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**

4.9KM OTL - Impact Assessment of Unmitigated Impact from disturbance causing lowered survivorship/reproductive success; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Mammals) Nationally Uplisted Species - Larger Mobile, Nocturnal (Steppe Polecat)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Large Mobile, Nocturnal (Red Fox)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Rarer Species - Large Mobile (Asiatic Wildcat)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Avifauna) Endangered Species - Raptors (Egyptian Vulture)	Very High	Minor	**Moderate to Major**	Negligible	**Minor**
(Avifauna) Nationally Uplisted Species - Raptors (Griffon Vulture)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Avifauna) Common Species - Raptors (Upland Buzzard, Common Kestrel, etc)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Common Species - Migratory (Common Swift, Greater Short-toed Lark)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Common Species - Residents, or Common Visitors (i.e. Crested LArk, Common Starling)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Urban Species - Residents (Rock Pigeon, Common Raven)	Very Low	Minor	**Negligible to minor**	Negligible	**Negligible**

70-KM LILO OTL CORRIDOR

For 70km OTL site, lowered survivorship is rated as a minor magnitude for the majority of receptors (except shyer species rated as Moderate, including Great Bustard).

The general mitigation as described will be sufficient for the majority of ecological receptors, as it will to a negligible magnitude, with a negligible to minor residual significance.

Great Bustard is the sole exception that requires additional consideration: Great Bustard will also be subject to population monitoring throughout construction and restoration phases. This monitoring paired with adaptive management approaches will ensure that any significant impacts are managed appropriately. Therefore, the assigned mitigated magnitude for this receptor has been downgraded to negligible, resulting in a minor residual significance.

Table 10-131 Impact assessment of the potentially affected receptors at the 4.9km OTL by reduced survivorship and reproductive success due to disturbance and their residual significance after the implementation of proposed mitigation measures

70KM OTL - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM DISTURBANCE CAUSING LOWERED SURVIVORSHIP/REPRODUCTIVE SUCCESS; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	**VALUE/ SENSITIVITY**	**MAGNITUDE**	**UNMITIGATED SIGNIFICANCE**	**MITIGATED MAGNITUDE**	**RESIDUAL SIGNIFICANCE**
(Herptile) Vulnerable Species - Slow Mobility (i.e. Central Asian Tortoise)	High	Minor	**Minor to moderate**	Negligible	**Minor**
(Herptile) Vulnerable Species - Medium Mobility (Caspian Monitor)	High	Minor	**Minor to moderate**	Negligible	**Minor**
(Herptile) Near Threatened Species - Medium Mobility (i.e. Tatary Sand Boa)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Herptile) Common Species - Medium Mobility (i.e.Gecko, Agama, Skink)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**

70KM OTL - Impact Assessment of Unmitigated Impact from disturbance causing lowered survivorship/reproductive success; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Herptile) Common Species - Fast Mobility (i.e. Racerunner, whip snake)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Nationally Uplisted Species - Large Mobile (i.e. Corsac Fox)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Mammals) Common Species - Insectivore, Nocturnal (i.e. Long-eared Hedgehog)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Large Mobile, Nocturnal (i.e. Red Fox)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Rarer Species - Insectivore (Brandt's Hedgehog)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Mammals) Rarer Species - Burrowing (Lesser Jerboa, etc)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Mammals) Rarer Species - Nocturnal (i.e. Libyan Jird)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Avifauna) Endangered Species - Raptors (Egyptian Vultre, Steppe Eagle)	Very High	Minor	**Moderate to Major**	Negligible	**Minor**
(Avifauna) Endangered Species - Groundbirds (Great Bustard)	Very High	Moderate	**Major**	Negligible	**Minor**
(Avifauna) Vulnerable Species - Raptors (Greater Spotted Eagle, Eastern Imperial Eagle)	High	Minor	**Minor to moderate**	Negligible	**Minor**

70KM OTL - Impact Assessment of Unmitigated Impact from disturbance causing lowered survivorship/reproductive success; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Avifauna) Near Threatened Species - Raptors (Cinereous Vulture, Pallid Harrier)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Avifauna) Near Threatened Species - Groundbirds(Little Bustard)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Avifauna) Near Threatened Species - Waterbirds - Northern Lapwing	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Avifauna) Nationally Important Species - Waterbirds - Black Stork	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Avifauna) Common Species - Raptors (Rough-legged BUzzard, Common Buzzard, etc)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Common / LC Species - Waterbirds (Migratory) (Little Egret, Etc.)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Common Species (Others) - Lark, Wheatear, etc.	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Urban Speceis - Rock Dove	Very Low	Minor	**Negligible to minor**	Negligible	**Negligible**

400 MW PV Plant and pooling station, access roads

Resident and breeding species will be more likely to be affected than migratory species, although for overwintering populations, even temporary disturbance may have significant impact. The construction schedule/programme should be reviewed by an Ecologist for a site-by-site protocol to be developed which will allow for monitoring of receptors during appropriate seasons to ensure that nests are adequately buffered and construction disturbance magnitude can be minimized as much as possible.

Table 10-132 Impact assessment of the potentially affected receptors at the 70km OTL by reduced survivorship and reproductive success due to disturbance and their residual significance after the implementation of proposed mitigation measures

400MW PV - Impact Assessment of Unmitigated Impact from disturbance causing lowered survivorship/reproductive success; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Herptiles) Vulnerable Species - Burrowing, Slow Mobility (i.e. Central Asian Tortoise)	High	Minor	**Minor to moderate**	Negligible	**Minor**
(Herptiles) Vulnerable Species - Burrowing, Medium Mobility (i.e. Caspian Monitor)	High	Minor	**Minor to moderate**	Negligible	**Minor**
(Herptiles) Near Threatened Species - Burrowing, Medium Mobility (i.e. Tatary Sand Boa)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Herptiles) Common Species - Burrowing, Medium Mobility (i.e. Gecko, Agama, Skink)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Herptiles) Common Species - Burrowing, Fast Mobility (i.e. whipsnakes,etc)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Nationally Uplisted Species - Large Mobile (Corsac Fox, Steppe Polecat)	Medium	Moderate	**Moderate**	Negligible	**Negligible to minor**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Moderate	**Minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**

400MW PV - Impact Assessment of Unmitigated Impact from disturbance causing lowered survivorship/reproductive success; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Mammals) Common Species - Large Mobile, Nocturnal (Red Fox)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Rarer Species - Insectivore (Brandt's Hedgehog)	Medium	Moderate	**Moderate**	Negligible	**Negligible to minor**
(Bats) Common Bat Species (Lesser Noctule)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Bats) Rarer Bat Species (Eptesicus sp., Tadarida sp.)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Avifauna) Near Threatened Species - Groundbirds (Migratory) (Little Bustard)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Avifauna) Common Species - Raptors (Long-legged Buzzard, Western Marsh Harrier, etc)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Common Species - Waterbirds (Migratory) (Greater Sand Plover)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Common Resident Species (i.e. Lark, Sandgrouse..)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**

11-km LILO OTL corridor

Table 10-133 Impact assessment of the potentially affected receptors at the 11km OTL by reduced survivorship and reproductive success due to disturbance and their residual significance after the implementation of proposed mitigation measures

11KM OTL - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM DISTURBANCE CAUSING LOWERED SURVIVORSHIP/REPRODUCTIVE SUCCESS; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	**VALUE/ SENSITIVITY**	**MAGNITUDE**	**UNMITIGATED SIGNIFICANCE**	**MITIGATED MAGNITUDE**	**RESIDUAL SIGNIFICANCE**
(Herptiles) Vulnerable Species - Slow Mobility (Central Asian Tortoise)	High	Minor	**Minor to moderate**	Negligible	**Minor**
(Mammals) Nationally Uplisted Species - Large Mobile (Steppe Polecat)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Rarer Species - Burrowing (i.e. Zaisan Mole Vole)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Large Mobile, Nocturnal (Red Fox)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Rarer Species - Large Mobile, Nocturnal (Asiatic Wildcat)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Avifauna) Endangered Species - Raptors (Steppe Eagle)	Very High	Minor	**Moderate to Major**	Negligible	**Minor**
(Avifauna) Vulnerable Species - Raptors (Eastern Imperial Eagle)	High	Minor	**Minor to moderate**	Negligible	**Minor**
(Avifauna) Near Threatened Species - Raptors (Hen Harrier)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**

11KM OTL - Impact Assessment of Unmitigated Impact from disturbance causing lowered survivorship/reproductive success; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Avifauna) Common Species - Raptors (i.e. Common Kestrel, Long-legged Buzzard)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Common Species - Waterbirds (Migratory) (i.e. Green Sandpiper, Little Ringed Plover)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Common Species - Residents & Visitors (Rook, Jackdaw, etc.)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Urban Species (Rock Pigeon)	Very Low	Minor	**Negligible to minor**	Negligible	**Negligible**

19-km LILO OTL corridor

Table 10-134 Impact assessment of the potentially affected receptors at the 19km OTL by reduced survivorship and reproductive success due to disturbance and their residual significance after the implementation of proposed mitigation measures

19KM OTL - Impact Assessment of Unmitigated Impact from disturbance causing lowered survivorship/reproductive success; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Herptiles) Vulnerable Species - Slow Mobility (Central Asian Tortoise)	High	Minor	**Minor to moderate**	Negligible	**Minor**
(Mammals) Nationally Uplisted Species - Large Mobile Mammals (Steppe Polecat)	Medium	Moderate	**Moderate**	Minor	**Minor**

19KM OTL - Impact Assessment of Unmitigated Impact from disturbance causing lowered survivorship/reproductive success; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Rarer Species - Burrowing (i.e. Zaizan Mole Vole)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Larger Mobile Mammals, Nocturnal (Red Fox)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Rarer Species - Larger Mobile Mammals, Nocturnal (Asiatic Wildcat)	Medium	Moderate	**Moderate**	Minor	**Minor**
(Avifauna) Endangered Species - Raptors (Steppe Eagle)	Very High	Minor	**Moderate to Major**	Negligible	**Minor**
(Avifauna) Vulnerable Species - Raptors (Eastern Imperial Eagle)	High	Minor	**Minor to moderate**	Negligible	**Minor**
(Avifauna) Near Threatened Species - Raptors (Hen Harrier)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Avifauna) Common Species - Raptors (i.e. Common Kestrel, Long-legged Buzzard)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Common Species - Waterbirds (Migratory) (i.e. Green Sandpiper, Little Ringed Plover)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Common Species - Residents & Visitors (Rook, Jackdaw, etc.)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Urban Species (Rock Pigeon)	Very Low	Minor	**Negligible to minor**	Negligible	**Negligible**

10.11.2.2 Impact – Increased Competition due to Displacement

Shyer species may be displaced away from the project area as a result of construction disturbance, having indirect secondary impacts on adjacent territories via increased competition for resources compromising population stability, causing ecosystem imbalances.

Mitigation against this impact is not logistically feasible in most cases. Possible monitoring and management of population dynamics of displaced species in adjacent habitats throughout the project may be warranted in specific cases. The magnitude of this impact on receptors is best assessed on a site based approach, **detailed in the following sub-sections.**

100 MW PV Plant and Access Road Sites

The majority of receptors will not have significant impacts thus no specific mitigation is needed for the displacement impact (so unmitigated and residual remain equivalent). However:

Central Asian Tortoise has a moderate magnitude and thus moderate to major significance. However, the pre-construction/pre-clearing relocations have already taken into account release sites with suitable habitat and adequate carrying capacity; therefore the residual significance is minor.

Egyptian Vulture could possibly have moderate to major significant impacts from increased competition for resources. The population monitoring for sensitive raptors will enable adaptive management of any undue impacts arising from displacement and competition that can be clearly attributed solely to the project.

Table 10-135 Impact assessment of the potentially affected receptors at the 100 MW facility by increased competition due to displacement and their residual significance after the implementation of proposed mitigation measures

100MW PV - Impact Assessment of Unmitigated Impact from dispersal of fauna away from the site, resulting in increasing competition with adjacent populations; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Herptiles) Vulnerable Species - Burrowing, Slow Mobility (i.e. Central Asian Tortoise)	High	Moderate	**Moderate to Major**	Minor	**Minor to moderate**
(Herptiles) Near Threatened Species - Burrowing, Medium Mobility (i.e. Tatary Sand Boa, Central Asian Cobra)	Medium	Moderate	**Moderate**	Moderate	**Moderate**
(Herptiles) Common Species - Burrowing, Medium Mobility (i.e. Gecko, Agama, Skink)	Low	Minor	**Negligible to minor**	Minor	**Negligible to minor**
(Herptiles) Common Species - Burrowing, Fast Mobility (i.e. racerunner, etc.)	Low	Moderate	**Minor**	Moderate	**Minor**
(Mammals) Nationally Uplisted Species - Large Mobile Mammal, Nocturnal (Corsac Fox, Steppe Polecat)	Medium	Moderate	**Moderate**	Moderate	**Moderate**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Moderate	**Minor**	Moderate	**Minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Minor	**Negligible to minor**	Minor	**Negligible to minor**

100MW PV - Impact Assessment of Unmitigated Impact from dispersal of fauna away from the site, resulting in increasing competition with adjacent populations; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Mammals) Common Species - Large Mobile Mammal, Nocturnal (Red Fox)	Low	Moderate	**Minor**	Moderate	**Minor**
(Mammals) Rarer Species - Burrowing, Nocturnal (Libyan Jird)	Medium	Minor	**Minor**	Minor	**Minor**
(Bats) Nationally Uplisted Species - Myotis sp.	Medium	Moderate	**Moderate**	Moderate	**Moderate**
(Bats) Rarer Species - Eptesicus sp.	Medium	Moderate	**Moderate**	Moderate	**Moderate**
(Bats) Common Species - Pipistrellus pipistrellus	Low	Moderate	**Minor**	Moderate	**Minor**
(Avifauna) Endangered Species - Raptors - Egyptian Vulture	Very High	Moderate	**Major**	Negligible	**Minor**
(Avifauna) Nationally Uplisted Species - Raptors - Griffon Vulture	Medium	Moderate	**Moderate**	Moderate	**Moderate**
(Avifauna) Common Species - Residents - i.e. Crested Lark, etc.	Low	Minor	**Negligible to minor**	Minor	**Negligible to minor**

Nurobod BESS and underground cables

The majority of receptors will not have significant impacts thus no specific mitigation is needed for the displacement impact (so unmitigated and residual remain equivalent). However:

Central Asian Tortoise has a moderate magnitude and thus moderate to major significance. However, the pre-construction/pre-clearing relocations have already taken into account release sites with suitable habitat and adequate carrying capacity; therefore the residual significance is minor.

Egyptian Vulture could possibly have moderate to major significant impacts from increased competition for resources. The population monitoring for sensitive raptors will enable adaptive management of any undue impacts arising from displacement and competition that can be clearly attributed solely to the project.

Table 10-136 Impact assessment of the potentially affected receptors at the Nurobod BESS facility by increased competition due to displacement and their residual significance after the implementation of proposed mitigation measures

NUROBOD BESS - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM DISPERSAL OF FAUNA AWAY FROM THE SITE, RESULTING IN INCREASING COMPETITION WITH ADJACENT POPULATIONS; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	**VALUE/ SENSITIVITY**	**MAGNITUDE**	**UNMITIGATED SIGNIFICANCE**	**MITIGATED MAGNITUDE**	**RESIDUAL SIGNIFICANCE**
(Herptiles) Vulnerable Species - Burrowing, Slow Mobility (i.e. Central Asian Tortoise)	High	Moderate	**Moderate to Major**	Minor	**Minor to moderate**
(Herptiles) Near Threatened Species - Burrowing, Medium Mobility (i.e. Tatary Sand Boa)	Medium	Moderate	**Moderate**	Moderate	**Moderate**

NUROBOD BESS - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM DISPERSAL OF FAUNA AWAY FROM THE SITE, RESULTING IN INCREASING COMPETITION WITH ADJACENT POPULATIONS; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	**VALUE/ SENSITIVITY**	**MAGNITUDE**	**UNMITIGATED SIGNIFICANCE**	**MITIGATED MAGNITUDE**	**RESIDUAL SIGNIFICANCE**
(Herptiles) Common Species - Burrowing, Medium Mobility (i.e. Gecko, Agama, Skink)	Low	Minor	**Negligible to minor**	Minor	**Negligible to minor**
(Herptiles) Common Species - Burrowing, Fast Mobility (i.e. whipsnakes,etc)	Low	Moderate	**Minor**	Moderate	**Minor**
(Mammals) Nationally Uplisted Species - Burrowing, Nocturnal (Steppe Polecat)	Medium	Moderate	**Moderate**	Moderate	**Moderate**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Moderate	**Minor**	Moderate	**Minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Minor	**Negligible to minor**	Minor	**Negligible to minor**
(Mammals) Common Species - Large Mobile Mammal, Nocturnal (Red Fox)	Low	Moderate	**Minor**	Moderate	**Minor**
(Bats) Common Bats (Common Pipistrelle)	Low	Moderate	**Minor**	Moderate	**Minor**
(Bats) Rarer Bats (Eptesicus sp.)	Medium	Moderate	**Moderate**	Moderate	**Moderate**

NUROBOD BESS - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM DISPERSAL OF FAUNA AWAY FROM THE SITE, RESULTING IN INCREASING COMPETITION WITH ADJACENT POPULATIONS; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	**VALUE/ SENSITIVITY**	**MAGNITUDE**	**UNMITIGATED SIGNIFICANCE**	**MITIGATED MAGNITUDE**	**RESIDUAL SIGNIFICANCE**
(Bats) IUCN Red List - DD - Bats (Myotis sp.)	Medium	Moderate	**Moderate**	Moderate	**Moderate**
(Avifauna) Endangered Species - Raptors (Egyptian Vulture)	Very High	Moderate	**Major**	Negligible	**Minor**
(Avifauna) Nationally Uplisted Species - Raptors (Griffon Vulture)	Medium	Moderate	**Moderate**	Moderate	**Moderate**
(Avifauna) Common Resident Species (Crested Lark, etc)	Low	Minor	**Negligible to minor**	Minor	**Negligible to minor**

4.9-KM LILO OTL CORRIDOR

The majority of receptors will not have significant impacts thus no specific mitigation is needed for the displacement impact (so unmitigated and residual remain equivalent). However:

Central Asian Tortoise has a moderate magnitude and thus moderate to major significance. However, the pre-construction/pre-clearing relocations have already taken into account release sites with suitable habitat and adequate carrying capacity; therefore the residual significance is minor.

Egyptian Vulture could possibly have moderate to major significant impacts from increased competition for resources. The population monitoring for sensitive raptors will enable adaptive management of any undue impacts arising from displacement and competition that can be clearly attributed solely to the project.

Table 10-137 Impact assessment of the potentially affected receptors at the 4.9km OTL by increased competition due to displacement and their residual significance after the implementation of proposed mitigation measures

4.9KM OTL - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM DISPERSAL OF FAUNA AWAY FROM THE SITE, RESULTING IN INCREASING COMPETITION WITH ADJACENT POPULATIONS; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	**VALUE/ SENSITIVITY**	**MAGNITUDE**	**UNMITIGATED SIGNIFICANCE**	**MITIGATED MAGNITUDE**	**RESIDUAL SIGNIFICANCE**
(Herptiles) Vulnerable Species - Slow Mobility (i.e. Central Asian Tortoise)	High	Moderate	**Moderate to Major**	Minor	**Minor to moderate**
(Herptiles) Near Threatened Species - Medium Mobility (i.e. Tatary Sand Boa)	Medium	Moderate	**Moderate**	Moderate	**Moderate**
(Herptiles) Common Species - Medium Mobility (i.e. Gecko, Agama, Skink)	Low	Minor	**Negligible to minor**	Minor	**Negligible to minor**
(Herptiles) Common Species - Fast Mobility (i.e. racerunner, whip snake)	Low	Moderate	**Minor**	Moderate	**Minor**
(Mammals) Nationally Uplisted Species - Larger Mobile, Nocturnal (Steppe Polecat)	Medium	Moderate	**Moderate**	Moderate	**Moderate**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Moderate	**Minor**	Moderate	**Minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Minor	**Negligible to minor**	Minor	**Negligible to minor**

4.9KM OTL - Impact Assessment of Unmitigated Impact from dispersal of fauna away from the site, resulting in increasing competition with adjacent populations; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Mammals) Common Species - Large Mobile, Nocturnal (Red Fox)	Low	Moderate	**Minor**	Moderate	**Minor**
(Mammals) Rarer Species - Large Mobile (Asiatic Wildcat)	Medium	Moderate	**Moderate**	Moderate	**Moderate**
(Avifauna) Endangered Species - Raptors (Egyptian Vulture)	Very High	Moderate	**Major**	Negligible	**Minor**
(Avifauna) Nationally Uplisted Species - Raptors (Griffon Vulture)	Medium	Moderate	**Moderate**	Moderate	**Moderate**
(Avifauna) Common Species - Raptors (Upland Buzzard, Common Kestrel, etc)	Low	Moderate	**Minor**	Moderate	**Minor**
(Avifauna) Common Species - Migratory (Common Swift, Greater Short-toed Lark)	Low	Minor	**Negligible to minor**	Minor	**Negligible to minor**
(Avifauna) Common Species - Residents, or Common Visitors (i.e. Crested LArk, Common Starling)	Low	Minor	**Negligible to minor**	Minor	**Negligible to minor**

4.9KM OTL - Impact Assessment of Unmitigated Impact from dispersal of fauna away from the site, resulting in increasing competition with adjacent populations; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Avifauna) Urban Species - Residents (Rock Pigeon, Common Raven)	Very Low	Minor	**Negligible to minor**	Minor	**Negligible to minor**

70-km LILO OTL corridor

The majority of receptors will not have significant impacts thus no specific mitigation is needed for the displacement impact (so unmitigated and residual remain equivalent). However:

Central Asian Tortoise has a moderate magnitude and thus moderate to major significance. However, the pre-construction/pre-clearing relocations have already taken into account release sites with suitable habitat and adequate carrying capacity; therefore the residual significance is minor.

Egyptian Vulture as well as Greater Spotted Eagle and Eastern Imperial Eagle could possibly have moderate to major significant impacts from increased competition for resources. The population monitoring for sensitive raptors will enable adaptive management of any undue impacts arising from displacement and competition that can be clearly attributed solely to the project.

Similarly, Great Bustard could have moderate to major significant impacts from increased competition for resources. The population monitoring for Great Bustard will similarly enable adaptive management of any undue impacts arising from displacement and competition that can be clearly attributed solely to the project.

Table 10-138 Impact assessment of the potentially affected receptors at the 70km OTL by increased competition due to displacement and their residual significance after the implementation of proposed mitigation measures

70KM OTL - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM DISPERSAL OF FAUNA AWAY FROM THE SITE, RESULTING IN INCREASING COMPETITION WITH ADJACENT POPULATIONS; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	**VALUE/ SENSITIVITY**	**MAGNITUDE**	**UNMITIGATED SIGNIFICANCE**	**MITIGATED MAGNITUDE**	**RESIDUAL SIGNIFICANCE**
(Herptile) Vulnerable Species - Slow Mobility (i.e. Central Asian Tortoise)	High	Moderate	**Moderate to Major**	Minor	**Minor to moderate**
(Herptile) Vulnerable Species - Medium Mobility (Caspian Monitor)	High	Minor	**Minor to moderate**	Minor	**Minor to moderate**
(Herptile) Near Threatened Species - Medium Mobility (i.e. Tatary Sand Boa)	Medium	Moderate	**Moderate**	Moderate	**Moderate**
(Herptile) Common Species - Medium Mobility (i.e.Gecko, Agama, Skink)	Low	Minor	**Negligible to minor**	Minor	**Negligible to minor**
(Herptile) Common Species - Fast Mobility (i.e. Racerunner, whip snake)	Low	Moderate	**Minor**	Moderate	**Minor**

70KM OTL - Impact Assessment of Unmitigated Impact from dispersal of fauna away from the site, resulting in increasing competition with adjacent populations; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Mammals) Nationally Uplisted Species - Large Mobile (i.e. Corsac Fox)	Medium	Moderate	**Moderate**	Moderate	**Moderate**
(Mammals) Common Species - Insectivore, Nocturnal (i.e. Long-eared Hedgehog)	Low	Moderate	**Minor**	Moderate	**Minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Minor	**Negligible to minor**	Minor	**Negligible to minor**
(Mammals) Common Species - Large Mobile, Nocturnal (i.e. Red Fox)	Low	Moderate	**Minor**	Moderate	**Minor**
(Mammals) Rarer Species - Insectivore (Brandt's Hedgehog)	Medium	Moderate	**Moderate**	Moderate	**Moderate**
(Mammals) Rarer Species - Burrowing (Lesser Jerboa, etc)	Medium	Minor	**Minor**	Minor	**Minor**
(Mammals) Rarer Species - Nocturnal (i.e. Libyan Jird)	Medium	Minor	**Minor**	Minor	**Minor**

70KM OTL - Impact Assessment of Unmitigated Impact from dispersal of fauna away from the site, resulting in increasing competition with adjacent populations; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Avifauna) Endangered Species - Raptors (Egyptian Vulture, Steppe Eagle)	Very High	Moderate	**Major**	Negligible	**Minor**
(Avifauna) Endangered Species - Groundbirds (Great Bustard)	Very High	Moderate	**Major**	Negligible	**Minor**
(Avifauna) Vulnerable Species - Raptors (Greater Spotted Eagle, Eastern Imperial Eagle)	High	Moderate	**Moderate to Major**	Minor	**Minor to moderate**
(Avifauna) Near Threatened Species - Raptors (Cinereous Vulture, Pallid Harrier)	Medium	Moderate	**Moderate**	Moderate	**Moderate**
(Avifauna) Near Threatened Species - Groundbirds(Little Bustard)	Medium	Moderate	**Moderate**	Moderate	**Moderate**
(Avifauna) Near Threatened Species - Waterbirds - Northern Lapwing	Medium	Moderate	**Moderate**	Moderate	**Moderate**

70KM OTL - Impact Assessment of Unmitigated Impact from dispersal of fauna away from the site, resulting in increasing competition with adjacent populations; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Avifauna) Nationally Important Species - Waterbirds - Black Stork	Medium	Moderate	**Moderate**	Moderate	**Moderate**
(Avifauna) Common Species - Raptors (Rough-legged Buzzard, Common Buzzard, etc)	Low	Moderate	**Minor**	Moderate	**Minor**
(Avifauna) Common / LC Species - Waterbirds (Migratory) (Little Egret, Etc.)	Low	Moderate	**Minor**	Moderate	**Minor**
(Avifauna) Common Species (Others) - Lark, Wheatear, etc.	Low	Minor	**Negligible to minor**	Minor	**Negligible to minor**
(Avifauna) Urban Species - Rock Dove	Very Low	Minor	**Negligible to minor**	Minor	**Negligible to minor**

400 MW PV Plant and pooling station, access roads

The majority of receptors will not have significant impacts thus no specific mitigation is needed for the displacement impact (so unmitigated and residual remain equivalent). However:

Central Asian Tortoise has a moderate magnitude and thus moderate to major significance. However, the pre-construction/pre-clearing relocations have already taken into account release sites with suitable habitat and adequate carrying capacity; therefore the residual significance is minor.

Table 10-139 Impact assessment of the potentially affected receptors at the 400 MW facility by increased competition due to displacement and their residual significance after the implementation of proposed mitigation measures

400MW PV - Impact Assessment of Unmitigated Impact from dispersal of fauna away from the site, resulting in increasing competition with adjacent populations; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Herptiles) Vulnerable Species - Burrowing, Slow Mobility (i.e. Central Asian Tortoise)	High	Moderate	**Moderate to Major**	Minor	**Minor to moderate**
(Herptiles) Vulnerable Species - Burrowing, Medium Mobility (i.e. Caspian Monitor)	High	Minor	**Minor to moderate**	Minor	**Minor to moderate**
(Herptiles) Near Threatened Species - Burrowing, Medium Mobility (i.e. Tatary Sand Boa)	Medium	Moderate	**Moderate**	Moderate	**Moderate**
(Herptiles) Common Species - Burrowing, Medium Mobility (i.e. Gecko, Agama, Skink)	Low	Minor	**Negligible to minor**	Minor	**Negligible to minor**
(Herptiles) Common Species - Burrowing, Fast Mobility (i.e. whipsnakes,etc)	Low	Moderate	**Minor**	Moderate	**Minor**

400MW PV - Impact Assessment of Unmitigated Impact from dispersal of fauna away from the site, resulting in increasing competition with adjacent populations; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Mammals) Nationally Uplisted Species - Large Mobile (Corsac Fox, Steppe Polecat)	Medium	Moderate	**Moderate**	Moderate	**Moderate**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Moderate	**Minor**	Moderate	**Minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Minor	**Negligible to minor**	Minor	**Negligible to minor**
(Mammals) Common Species - Large Mobile, Nocturnal (Red Fox)	Low	Moderate	**Minor**	Moderate	**Minor**
(Mammals) Rarer Species - Insectivore (Brandt's Hedgehog)	Medium	Moderate	**Moderate**	Moderate	**Moderate**
(Bats) Common Bat Species (Lesser Noctule)	Low	Moderate	**Minor**	Moderate	**Minor**
(Bats) Rarer Bat Species (Eptesicus sp., Tadarida sp.)	Medium	Moderate	**Moderate**	Moderate	**Moderate**
(Avifauna) Near Threatened Species - Groundbirds (Migratory) (Little Bustard)	Medium	Moderate	**Moderate**	Moderate	**Moderate**

400MW PV - Impact Assessment of Unmitigated Impact from dispersal of fauna away from the site, resulting in increasing competition with adjacent populations; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Avifauna) Common Species - Raptors (Long-legged Buzzard, Western Marsh Harrier, etc)	Low	Moderate	**Minor**	Moderate	**Minor**
(Avifauna) Common Species - Waterbirds (Migratory) (Greater Sand Plover)	Low	Moderate	**Minor**	Moderate	**Minor**
(Avifauna) Common Resident Species (i.e. Lark, Sandgrouse..)	Low	Minor	**Negligible to minor**	Minor	**Negligible to minor**

11-km LILO OTL corridor

The majority of receptors will not have significant impacts thus no specific mitigation is needed for the displacement impact (so unmitigated and residual remain equivalent). However:

Central Asian Tortoise has a moderate magnitude and thus moderate to major significance. However, the pre-construction/pre-clearing relocations have already taken into account release sites with suitable habitat and adequate carrying capacity; therefore the residual significance is minor.

Egyptian Vulture as well as the Eastern Imperial Eagle could possibly have moderate to major significant impacts from increased competition for resources. The population monitoring for sensitive raptors will enable adaptive management of any undue impacts arising from displacement and competition that can be clearly attributed solely to the project.

Table 10-140 Impact assessment of the potentially affected receptors at the 11km OTL by increased competition due to displacement and their residual significance after the implementation of proposed mitigation measures

11KM OTL- Impact Assessment of Unmitigated Impact from dispersal of fauna away from the site, resulting in increasing competition with adjacent populations; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Herptiles) Vulnerable Species - Slow Mobility (Central Asian Tortoise)	High	Moderate	**Moderate to Major**	Minor	**Minor to moderate**
(Mammals) Nationally Uplisted Species - Large Mobile (Steppe Polecat)	Medium	Moderate	**Moderate**	Moderate	**Moderate**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Moderate	**Minor**	Moderate	**Minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Minor	**Negligible to minor**	Minor	**Negligible to minor**
(Mammals) Rarer Species - Burrowing (i.e. Zaisan Mole Vole)	Medium	Minor	**Minor**	Minor	**Minor**
(Mammals) Common Species - Large Mobile, Nocturnal (Red Fox)	Low	Moderate	**Minor**	Moderate	**Minor**

11KM OTL- Impact Assessment of Unmitigated Impact from dispersal of fauna away from the site, resulting in increasing competition with adjacent populations; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Mammals) Rarer Species - Large Mobile, Nocturnal (Asiatic Wildcat)	Medium	Moderate	**Moderate**	Moderate	**Moderate**
(Avifauna) Endangered Species - Raptors (Steppe Eagle)	Very High	Moderate	**Major**	Negligible	**Minor**
(Avifauna) Vulnerable Species - Raptors (Eastern Imperial Eagle)	High	Moderate	**Moderate to Major**	Minor	**Minor to moderate**
(Avifauna) Near Threatened Species - Raptors (Hen Harrier)	Medium	Moderate	**Moderate**	Moderate	**Moderate**
(Avifauna) Common Species - Raptors (i.e. Common Kestrel, Long-legged Buzzard)	Low	Moderate	**Minor**	Moderate	**Minor**
(Avifauna) Common Species - Waterbirds (Migratory) (i.e. Green Sandpiper, Little Ringed Plover)	Low	Moderate	**Minor**	Moderate	**Minor**

11KM OTL- Impact Assessment of Unmitigated Impact from dispersal of fauna away from the site, resulting in increasing competition with adjacent populations; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Avifauna) Common Species - Residents & Visitors (Rook, Jackdaw, etc.)	Low	Minor	**Negligible to minor**	Minor	**Negligible to minor**
(Avifauna) Urban Species (Rock Pigeon)	Very Low	Minor	**Negligible to minor**	Minor	**Negligible to minor**

19-km LILO OTL corridor

The majority of receptors will not have significant impacts thus no specific mitigation is needed for the displacement impact (so unmitigated and residual remain equivalent). However:

Central Asian Tortoise has a moderate magnitude and thus moderate to major significance. However, the pre-construction/pre-clearing relocations have already taken into account release sites with suitable habitat and adequate carrying capacity; therefore the residual significance is minor.

Egyptian Vulture as well as the Eastern Imperial Eagle could possibly have moderate to major significant impacts from increased competition for resources. The population monitoring for sensitive raptors will enable adaptive management of any undue impacts arising from displacement and competition that can be clearly attributed solely to the project.

Table 10-141 Impact assessment of the potentially affected receptors at the 19km OTL by increased competition due to displacement and their residual significance after the implementation of proposed mitigation measures

19KM OTL - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM DISPERSAL OF FAUNA AWAY FROM THE SITE, RESULTING IN INCREASING COMPETITION WITH ADJACENT POPULATIONS; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	VALUE/ SENSITIVITY	MAGNITUDE	UNMITIGATED SIGNIFICANCE	MITIGATED MAGNITUDE	RESIDUAL SIGNIFICANCE
(Herptiles) Vulnerable Species - Slow Mobility (Central Asian Tortoise)	High	Moderate	**Moderate to Major**	Minor	**Minor to moderate**
(Mammals) Nationally Uplisted Species - Large Mobile Mammals (Steppe Polecat)	Medium	Moderate	**Moderate**	Moderate	**Moderate**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Moderate	**Minor**	Moderate	**Minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Minor	**Negligible to minor**	Minor	**Negligible to minor**
(Mammals) Rarer Species - Burrowing (i.e. Zaizan Mole Vole)	Medium	Minor	**Minor**	Minor	**Minor**
(Mammals) Common Species - Larger Mobile Mammals, Nocturnal (Red Fox)	Low	Moderate	**Minor**	Moderate	**Minor**

19KM OTL - Impact Assessment of Unmitigated Impact from dispersal of fauna away from the site, resulting in increasing competition with adjacent populations; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Mammals) Rarer Species - Larger Mobile Mammals, Nocturnal (Asiatic Wildcat)	Medium	Moderate	**Moderate**	Moderate	**Moderate**
(Avifauna) Endangered Species - Raptors (Steppe Eagle)	Very High	Moderate	**Major**	Negligible	**Minor**
(Avifauna) Vulnerable Species - Raptors (Eastern Imperial Eagle)	High	Moderate	**Moderate to Major**	Minor	**Minor to moderate**
(Avifauna) Near Threatened Species - Raptors (Hen Harrier)	Medium	Moderate	**Moderate**	Moderate	**Moderate**
(Avifauna) Common Species - Raptors (i.e. Common Kestrel, Long-legged Buzzard)	Low	Moderate	**Minor**	Moderate	**Minor**
(Avifauna) Common Species - Waterbirds (Migratory) (i.e. Green Sandpiper, Little Ringed Plover)	Low	Moderate	**Minor**	Moderate	**Minor**

19KM OTL - Impact Assessment of Unmitigated Impact from dispersal of fauna away from the site, resulting in increasing competition with adjacent populations; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Avifauna) Common Species - Residents & Visitors (Rook, Jackdaw, etc.)	Low	Minor	**Negligible to minor**	Minor	**Negligible to minor**
(Avifauna) Urban Species (Rock Pigeon)	Very Low	Minor	**Negligible to minor**	Minor	**Negligible to minor**

10.11.2.3 Impact – Proliferation of Generalist or Pest Species

The dispersal of shyer species away from disturbed areas can lead to an increase in generalist species such as Red Fox which are well adapted to anthropogenic habitats.

Further, poor management of solid waste can result in the proliferation of pest species, such as feral dog, cat, rats, and other urban-adapted species. This can cause further competition and displacement of native fauna.

However, the following mitigation measures will be implemented to minimize the magnitude of these potential impacts:

- Preparation of a Waste Management Plan as one of the supplementary plans to the CESMP;
- Strict waste management supervision and controls under the HSE Team;
- Zero tolerance for littering on site;
- Training will be provided to staff such as tool box meetings which include waste management
- Daily inspections and clean-up of litter by EPC/sub-contractor(s) responsible.

- No provision of food waste for feral cats and dogs

100 MW PV Plant and Access Road Sites

Table 10-142 Impact assessment of the potentially affected receptors at the 100 MW facility by proliferation of generalist/pest and their residual significance after the implementation of proposed mitigation measures

100MW PV - Impact Assessment of Unmitigated Impact from proliferation of pest or general species which outcompete or over-consume native species; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Flora) Common Grassland and Shrub Species	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Flora) Herbaceous Species	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Flora) Invasive and Pioneer Species	Very Low	Minor	**Negligible to minor**	Negligible	**Negligible**
(Flora) Least Concern (LC) - Riparian and Moisture-Loving Species	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Flora) Weedy and Ruderal Species	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Flora) Cultivated Species	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Flora) Cereal Crops	Very Low	Minor	**Negligible to minor**	Negligible	**Negligible**

100MW PV - Impact Assessment of Unmitigated Impact from proliferation of pest or general species which outcompete or over-consume native species; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Herptiles) Vulnerable Species - Burrowing, Slow Mobility (i.e. Central Asian Tortoise)	High	Minor	**Minor to moderate**	Negligible	**Minor**
(Herptiles) Near Threatened Species - Burrowing, Medium Mobility (i.e. Tatary Sand Boa, Central Asian Cobra)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Herptiles) Common Species - Burrowing, Medium Mobility (i.e. Gecko, Agama, Skink)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Herptiles) Common Species - Burrowing, Fast Mobility (i.e. racerunner, etc.)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Nationally Uplisted Species - Large Mobile Mammal, Nocturnal (Corsac Fox, Steppe Polecat)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**

100MW PV - Impact Assessment of Unmitigated Impact from proliferation of pest or general species which outcompete or over-consume native species; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Large Mobile Mammal, Nocturnal (Red Fox)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Rarer Species - Burrowing, Nocturnal (Libyan Jird)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Bats) Nationally Uplisted Species - Myotis sp.	Medium	Negligible	**Negligible to minor**	No change	**Neutral**
(Bats) Rarer Species - Eptesicus sp.	Medium	Negligible	**Negligible to minor**	No change	**Neutral**
(Bats) Common Species - Pipistrellus pipistrellus	Low	Negligible	**Negligible to minor**	No change	**Neutral**
(Avifauna) Endangered Species - Raptors - Egyptian Vulture	Very High	Negligible	**Minor**	No change	**Neutral**

100MW PV - Impact Assessment of Unmitigated Impact from proliferation of pest or general species which outcompete or over-consume native species; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Avifauna) Nationally Uplisted Species - Raptors - Griffon Vulture	Medium	Negligible	**Negligible to minor**	No change	**Neutral**
(Avifauna) Common Species - Residents - i.e. Crested Lark, etc.	Low	Negligible	**Negligible to minor**	No change	**Neutral**

Nurobod BESS and underground cables

Table 10-143 Impact assessment of the potentially affected receptors at the Nurobod BESS facility by proliferation of generalist/pest and their residual significance after the implementation of proposed mitigation measures

Nurobod BESS - Impact Assessment of Unmitigated Impact from proliferation of pest or general species which outcompete or over-consume native species; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Flora) Native Species - Grassland Species	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Flora) Least Concern (LC) Species	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Flora) Alien Species - Weedy Species	Very Low	Minor	**Negligible to minor**	Negligible	**Negligible**
(Flora) Native Fruit Trees	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**

NUROBOD BESS - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM PROLIFERATION OF PEST OR GENERAL SPECIES WHICH OUTCOMPETE OR OVER-CONSUME NATIVE SPECIES; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	**VALUE/ SENSITIVITY**	**MAGNITUDE**	**UNMITIGATED SIGNIFICANCE**	**MITIGATED MAGNITUDE**	**RESIDUAL SIGNIFICANCE**
(Flora) Native Agricultural Crops	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Herptiles) Vulnerable Species - Burrowing, Slow Mobility (i.e. Central Asian Tortoise)	High	Minor	**Minor to moderate**	Negligible	**Minor**
(Herptiles) Near Threatened Species - Burrowing, Medium Mobility (i.e. Tatary Sand Boa)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Herptiles) Common Species - Burrowing, Medium Mobility (i.e. Gecko, Agama, Skink)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Herptiles) Common Species - Burrowing, Fast Mobility (i.e. whipsnakes,etc)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Nationally Uplisted Species - Burrowing, Nocturnal (Steppe Polecat)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**

NUROBOD BESS - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM PROLIFERATION OF PEST OR GENERAL SPECIES WHICH OUTCOMPETE OR OVER-CONSUME NATIVE SPECIES; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	**VALUE/ SENSITIVITY**	**MAGNITUDE**	**UNMITIGATED SIGNIFICANCE**	**MITIGATED MAGNITUDE**	**RESIDUAL SIGNIFICANCE**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Large Mobile Mammal, Nocturnal (Red Fox)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Bats) Common Bats (Common Pipistrelle)	Low	Negligible	**Negligible to minor**	No change	**Neutral**
(Bats) Rarer Bats (Eptesicus sp.)	Medium	Negligible	**Negligible to minor**	No change	**Neutral**
(Bats) IUCN Red List - DD - Bats (Myotis sp.)	Medium	Negligible	**Negligible to minor**	No change	**Neutral**
(Avifauna) Endangered Species - Raptors (Egyptian Vulture)	Very High	Negligible	**Minor**	No change	**Neutral**
(Avifauna) Nationally Uplisted Species - Raptors (Griffon Vulture)	Medium	Negligible	**Negligible to minor**	No change	**Neutral**

NUROBOD BESS - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM PROLIFERATION OF PEST OR GENERAL SPECIES WHICH OUTCOMPETE OR OVER-CONSUME NATIVE SPECIES; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	**VALUE/ SENSITIVITY**	**MAGNITUDE**	**UNMITIGATED SIGNIFICANCE**	**MITIGATED MAGNITUDE**	**RESIDUAL SIGNIFICANCE**
(Avifauna) Common Resident Species (Crested Lark, etc)	Low	Negligible	**Negligible to minor**	No change	**Neutral**

4.9-KM LILO OTL CORRIDOR

Table 10-144 Impact assessment of the potentially affected receptors at the 4.9km OTL by proliferation of generalist/pest and their residual significance after the implementation of proposed mitigation measures

4.9KM OTL - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM PROLIFERATION OF PEST OR GENERAL SPECIES WHICH OUTCOMPETE OR OVER-CONSUME NATIVE SPECIES; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	**VALUE/ SENSITIVITY**	**MAGNITUDE**	**UNMITIGATED SIGNIFICANCE**	**MITIGATED MAGNITUDE**	**RESIDUAL SIGNIFICANCE**
(Flora) Native Species	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Flora) Least Concern (LC)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Flora) Alien Species	Very Low	Minor	**Negligible to minor**	Negligible	**Negligible**
(Herptiles) Vulnerable Species - Slow Mobility (i.e. Central Asian Tortoise)	High	Minor	**Minor to moderate**	Negligible	**Minor**

4.9KM OTL - Impact Assessment of Unmitigated Impact from proliferation of pest or general species which outcompete or over-consume native species; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Herptiles) Near Threatened Species - Medium Mobility (i.e. Tatary Sand Boa)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Herptiles) Common Species - Medium Mobility (i.e. Gecko, Agama, Skink)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Herptiles) Common Species - Fast Mobility (i.e. racerunner, whip snake)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Nationally Uplisted Species - Larger Mobile, Nocturnal (Steppe Polecat)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**

4.9KM OTL - Impact Assessment of Unmitigated Impact from proliferation of pest or general species which outcompete or over-consume native species; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Mammals) Common Species - Large Mobile, Nocturnal (Red Fox)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Rarer Species - Large Mobile (Asiatic Wildcat)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Avifauna) Endangered Species - Raptors (Egyptian Vulture)	Very High	Negligible	**Minor**	No change	**Neutral**
(Avifauna) Nationally Uplisted Species - Raptors (Griffon Vulture)	Medium	Negligible	**Negligible to minor**	No change	**Neutral**
(Avifauna) Common Species - Raptors (Upland Buzzard, Common Kestrel, etc)	Low	Negligible	**Negligible to minor**	No change	**Neutral**
(Avifauna) Common Species - Migratory (Common Swift, Greater Short-toed Lark)	Low	Negligible	**Negligible to minor**	No change	**Neutral**
(Avifauna) Common Species - Residents, or Common Visitors (i.e. Crested LArk, Common Starling)	Low	Negligible	**Negligible to minor**	No change	**Neutral**

4.9KM OTL - Impact Assessment of Unmitigated Impact from proliferation of pest or general species which outcompete or over-consume native species; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Avifauna) Urban Species - Residents (Rock Pigeon, Common Raven)	Very Low	Negligible	**Negligible**	No change	**Neutral**

70-km LILO OTL corridor

Table 10-145 Impact assessment of the potentially affected receptors at the 70km OTL by proliferation of generalist/pest and their residual significance after the implementation of proposed mitigation measures

70KM OTL - Impact Assessment of Unmitigated Impact from proliferation of pest or general species which outcompete or over-consume native species; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Flora) Endangered (EN) Species (Exotic Non Native)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Flora) Native Species	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Flora) Least Concern (LC)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Flora) Alien Species	Very Low	Minor	**Negligible to minor**	Negligible	**Negligible**
(Flora) Native Fruit Trees	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**

70KM OTL - Impact Assessment of Unmitigated Impact from proliferation of pest or general species which outcompete or over-consume native species; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Flora) Native Agricultural Crops	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Herptile) Vulnerable Species - Slow Mobility (i.e. Central Asian Tortoise)	High	Minor	**Minor to moderate**	Negligible	**Minor**
(Herptile) Vulnerable Species - Medium Mobility (Caspian Monitor)	High	Minor	**Minor to moderate**	Negligible	**Minor**
(Herptile) Near Threatened Species - Medium Mobility (i.e. Tatary Sand Boa)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Herptile) Common Species - Medium Mobility (i.e.Gecko, Agama, Skink)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Herptile) Common Species - Fast Mobility (i.e. Racerunner, whip snake)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Nationally Uplisted Species - Large Mobile (i.e. Corsac Fox)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Insectivore, Nocturnal (i.e. Long-eared Hedgehog)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**

70KM OTL - Impact Assessment of Unmitigated Impact from proliferation of pest or general species which outcompete or over-consume native species; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Large Mobile, Nocturnal (i.e. Red Fox)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Rarer Species - Insectivore (Brandt's Hedgehog)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Mammals) Rarer Species - Burrowing (Lesser Jerboa, etc)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Mammals) Rarer Species - Nocturnal (i.e. Libyan Jird)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Avifauna) Endangered Species - Raptors (Egyptian Vulture, Steppe Eagle)	Very High	Negligible	**Minor**	No change	**Neutral**
(Avifauna) Endangered Species - Groundbirds (Great Bustard)	Very High	Negligible	**Minor**	No change	**Neutral**
(Avifauna) Vulnerable Species - Raptors (Greater Spotted Eagle, Eastern Imperial Eagle)	High	Negligible	**Minor**	No change	**Neutral**

70KM OTL - Impact Assessment of Unmitigated Impact from proliferation of pest or general species which outcompete or over-consume native species; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Avifauna) Near Threatened Species - Raptors (Cinereous Vulture, Pallid Harrier)	Medium	Negligible	**Negligible to minor**	No change	**Neutral**
(Avifauna) Near Threatened Species - Groundbirds(Little Bustard)	Medium	Negligible	**Negligible to minor**	No change	**Neutral**
(Avifauna) Near Threatened Species - Waterbirds - Northern Lapwing	Medium	Negligible	**Negligible to minor**	No change	**Neutral**
(Avifauna) Nationally Important Species - Waterbirds - Black Stork	Medium	Negligible	**Negligible to minor**	No change	**Neutral**
(Avifauna) Common Species - Raptors (Rough-legged Buzzard, Common Buzzard, etc)	Low	Negligible	**Negligible to minor**	No change	**Neutral**
(Avifauna) Common / LC Species - Waterbirds (Migratory) (Little Egret, Etc.)	Low	Negligible	**Negligible to minor**	No change	**Neutral**
(Avifauna) Common Species (Others) - Lark, Wheatear, etc.	Low	Negligible	**Negligible to minor**	No change	**Neutral**
(Avifauna) Urban Species - Rock Dove	Very Low	No change	**Neutral**	No change	**Neutral**

Table 10-146 Impact assessment of the potentially affected receptors at the 400 MW facility by proliferation of generalist/pest and their residual significance after the implementation of proposed mitigation measures

400MW PV - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM PROLIFERATION OF PEST OR GENERAL SPECIES WHICH OUTCOMPETE OR OVER-CONSUME NATIVE SPECIES; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	VALUE/ SENSITIVITY	MAGNITUDE	UNMITIGATED SIGNIFICANCE	MITIGATED MAGNITUDE	RESIDUAL SIGNIFICANCE
(Flora) Native Grassland and Shrub Species	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Flora) Native Moisture-Loving Species	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Flora) Invasive and Alien Species	Very Low	Minor	**Negligible to minor**	Negligible	**Negligible**
(Flora) Native Fruit Trees	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Flora) Native Agricultural Crops	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Herptiles) Vulnerable Species - Burrowing, Slow Mobility (i.e. Central Asian Tortoise)	High	Minor	**Minor to moderate**	Negligible	**Minor**
(Herptiles) Vulnerable Species - Burrowing, Medium Mobility (i.e. Caspian Monitor)	High	Minor	**Minor to moderate**	Negligible	**Minor**
(Herptiles) Near Threatened Species - Burrowing, Medium Mobility (i.e. Tatary Sand Boa)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Herptiles) Common Species - Burrowing, Medium Mobility (i.e. Gecko, Agama, Skink)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**

400MW PV - Impact Assessment of Unmitigated Impact from proliferation of pest or general species which outcompete or over-consume native species; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Herptiles) Common Species - Burrowing, Fast Mobility (i.e. whipsnakes,etc)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Nationally Uplisted Species - Large Mobile (Corsac Fox, Steppe Polecat)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Large Mobile, Nocturnal (Red Fox)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Rarer Species - Insectivore (Brandt's Hedgehog)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Bats) Common Bat Species (Lesser Noctule)	Low	Negligible	**Negligible to minor**	No change	**Neutral**
(Bats) Rarer Bat Species (Eptesicus sp., Tadarida sp.)	Medium	Negligible	**Negligible to minor**	No change	**Neutral**
(Avifauna) Near Threatened Species - Groundbirds (Migratory) (Little Bustard)	Medium	Negligible	**Negligible to minor**	Minor	**Minor**

400MW PV - Impact Assessment of Unmitigated Impact from proliferation of pest or general species which outcompete or over-consume native species; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Avifauna) Common Species - Raptors (Long-legged Buzzard, Western Marsh Harrier, etc)	Low	Negligible	**Negligible to minor**	No change	**Neutral**
(Avifauna) Common Species - Waterbirds (Migratory) (Greater Sand Plover)	Low	Negligible	**Negligible to minor**	No change	**Neutral**
(Avifauna) Common Resident Species (i.e. Lark, Sandgrouse..)	Low	Negligible	**Negligible to minor**	No change	**Neutral**

11-km LILO OTL corridor

Table 10-147 Impact assessment of the potentially affected receptors at the 11km OTL by proliferation of generalist/pest and their residual significance after the implementation of proposed mitigation measures

11KM OTL - Impact Assessment of Unmitigated Impact from proliferation of pest or general species which outcompete or over-consume native species; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Flora) Endangered (EN) Species - Exotic/Nonnative	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Flora) Native Species	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Flora) Least Concern (LC)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**

11KM OTL - Impact Assessment of Unmitigated Impact from proliferation of pest or general species which outcompete or over-consume native species; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Flora) Alien Species	Very Low	Minor	**Negligible to minor**	Negligible	**Negligible**
(Flora) Native Fruit Trees	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Flora) Native Agricultural Crops	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Herptiles) Vulnerable Species - Slow Mobility (Central Asian Tortoise)	High	Minor	**Minor to moderate**	Negligible	**Minor**
(Mammals) Nationally Uplisted Species - Large Mobile (Steppe Polecat)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Rarer Species - Burrowing (i.e. Zaisan Mole Vole)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Large Mobile, Nocturnal (Red Fox)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**

11KM OTL - Impact Assessment of Unmitigated Impact from proliferation of pest or general species which outcompete or over-consume native species; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Mammals) Rarer Species - Large Mobile, Nocturnal (Asiatic Wildcat)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Avifauna) Endangered Species - Raptors (Steppe Eagle)	Very High	Negligible	**Minor**	No change	**Neutral**
(Avifauna) Vulnerable Species - Raptors (Eastern Imperial Eagle)	High	Negligible	**Minor**	No change	**Neutral**
(Avifauna) Near Threatened Species - Raptors (Hen Harrier)	Medium	Negligible	**Negligible to minor**	No change	**Neutral**
(Avifauna) Common Species - Raptors (i.e. Common Kestrel, Long-legged Buzzard)	Low	Negligible	**Negligible to minor**	No change	**Neutral**
(Avifauna) Common Species - Waterbirds (Migratory) (i.e. Green Sandpiper, Little Ringed Plover)	Low	Negligible	**Negligible to minor**	No change	**Neutral**
(Avifauna) Common Species - Residents & Visitors (Rook, Jackdaw, etc.)	Low	Negligible	**Negligible to minor**	No change	**Neutral**

11KM OTL - Impact Assessment of Unmitigated Impact from proliferation of pest or general species which outcompete or over-consume native species; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Avifauna) Urban Species (Rock Pigeon)	Very Low	No change	**Neutral**	No change	**Neutral**

19-km LILO OTL corridor

Table 10-148 Impact assessment of the potentially affected receptors at the 19KM OTL by proliferation of generalist/pest and their residual significance after the implementation of proposed mitigation measures

19KM OTL - Impact Assessment of Unmitigated Impact from proliferation of pest or general species which outcompete or over-consume native species; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Flora) Native Species	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Flora) Least Concern (LC)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Flora) Alien Species	Very Low	Minor	**Negligible to minor**	Negligible	**Negligible**
(Flora) Native Fruit Trees	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Herptiles) Vulnerable Species - Slow Mobility (Central Asian Tortoise)	High	Minor	**Minor to moderate**	Negligible	**Minor**

19KM OTL - Impact Assessment of Unmitigated Impact from proliferation of pest or general species which outcompete or over-consume native species; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Mammals) Nationally Uplisted Species - Large Mobile Mammals (Steppe Polecat)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Rarer Species - Burrowing (i.e. Zaizan Mole Vole)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Larger Mobile Mammals, Nocturnal (Red Fox)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Rarer Species - Larger Mobile Mammals, Nocturnal (Asiatic Wildcat)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Avifauna) Endangered Species - Raptors (Steppe Eagle)	Very High	Negligible	**Minor**	No change	**Neutral**
(Avifauna) Vulnerable Species - Raptors (Eastern Imperial Eagle)	High	Negligible	**Minor**	No change	**Neutral**
(Avifauna) Near Threatened Species - Raptors (Hen Harrier)	Medium	Negligible	**Negligible to minor**	No change	**Neutral**
(Avifauna) Common Species - Raptors (i.e. Common Kestrel, Long-legged Buzzard)	Low	Negligible	**Negligible to minor**	No change	**Neutral**

19KM OTL - Impact Assessment of Unmitigated Impact from proliferation of pest or general species which outcompete or over-consume native species; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Avifauna) Common Species - Waterbirds (Migratory) (i.e. Green Sandpiper, Little Ringed Plover)	Low	Negligible	**Negligible to minor**	No change	**Neutral**
(Avifauna) Common Species - Residents & Visitors (Rook, Jackdaw, etc.)	Low	Negligible	**Negligible to minor**	No change	**Neutral**
(Avifauna) Urban Species (Rock Pigeon)	Very Low	No change	**Neutral**	No change	**Neutral**

10.11.3 Operation Impacts

With appropriate design and operation, there should not be any significant impacts on biodiversity elements during the operational phase from air quality, noise/vibration, light pollution, erosion, or hydrological alterations.

However, care must be taken when designing and implementing the maintenance programme for the PV array to ensure that contamination from routine maintenance and cleaning does not enter the river ecosystem or run-off freely into the soils.

Other potential impacts arising during operation of the facilities are outlined in the subsequent sub-sections.

10.11.3.1 Impact – Habitat Fragmentation

Development and operation of large-scale and linear alignment projects will fragment the landscape's existing habitats, reducing overall ecosystem connectivity and function. This in turn reduces the ability for vegetation recruitment and wildlife movement between habitat patches. Species with large home range requirements and migratory species in particular may be affected by fragmented habitat. Long-term

fragmentation caused by physical barriers may also lead to a reduction in genetic exchange which is a concern for selected species with rapid generation turnover.

Specifically for the BESS and SS plots, the relatively smaller areas that will be taken up by the facilities, especially in context of the wider landscape, which is mostly open expanses of a mosaic of grasslands and agricultural land.

The larger PV sites may possibly have a moderate magnitude of fragmentation impact on wider-ranging species as the sites will fenced, potentially splitting up contiguous home ranges. However, based on sensitivity, calculated significance is generally negligible to minor, and thus does not require any additional specific mitigation measures.

The OTLs will not be fenced and therefore operation phase does not pose a fragmentation impact on the majority of species, both terrestrial and aerial. However, Ground Bustard, are species that tend to avoid anthropogenic tall structures and there could be a slight fragmentation impact where OTL are being erected in Great Bustard habitat that does not already have OTLs. Only for this case additional mitigation may be warranted, which would be considered as part of the Great Bustard monitoring Programme and adaptive management process.

100 MW PV Plant and Access Road Sites

Table 10-149 Impact assessment of the potentially affected receptors at the 100 MW facility by habitat fragmentation and their residual significance after the implementation of proposed mitigation measures

100MW PV - Impact Assessment of Unmitigated Impact from habitat fragmentation; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Herptiles) Vulnerable Species - Burrowing, Slow Mobility (i.e. Central Asian Tortoise)	High	Minor	**Minor to moderate**	Minor	**Minor to moderate**

100MW PV - Impact Assessment of Unmitigated Impact from habitat fragmentation; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Herptiles) Near Threatened Species - Burrowing, Medium Mobility (i.e. Tatary Sand Boa, Central Asian Cobra)	Medium	Negligible	**Negligible to minor**	Negligible	**Negligible to minor**
(Herptiles) Common Species - Burrowing, Medium Mobility (i.e. Gecko, Agama, Skink)	Low	Negligible	**Negligible to minor**	Negligible	**Negligible to minor**
(Herptiles) Common Species - Burrowing, Fast Mobility (i.e. racerunner, etc.)	Low	Negligible	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Nationally Uplisted Species - Large Mobile Mammal, Nocturnal (Corsac Fox, Steppe Polecat)	Medium	Moderate	**Moderate**	Moderate	**Moderate**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Minor	**Negligible to minor**	Minor	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Negligible	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Large Mobile Mammal, Nocturnal (Red Fox)	Low	Moderate	**Minor**	Moderate	**Minor**

100MW PV - Impact Assessment of Unmitigated Impact from habitat fragmentation; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Mammals) Rare / Not Numerous Species - Burrowing, Nocturnal (Libyan Jird)	Medium	Negligible	**Negligible to minor**	Negligible	**Negligible to minor**
(Bats) Nationally Uplisted Species - Myotis sp.	Medium	No change	**Neutral**	No change	**Neutral**
(Bats) Rarer Species - Eptesicus sp.	Medium	No change	**Neutral**	No change	**Neutral**
(Bats) Common Species - Pipistrellus pipistrellus	Low	No change	**Neutral**	No change	**Neutral**
(Avifauna) Endangered Species - Raptors - Egyptian Vulture	Very High	No change	**Neutral**	No change	**Neutral**
(Avifauna) Nationally Uplisted Species - Raptors - Griffon Vulture	High	No change	**Neutral**	No change	**Neutral**
(Avifauna) Common Species - Residents - i.e. Crested Lark, etc.	Low	No change	**Neutral**	No change	**Neutral**

Nurobod BESS and underground cables

Table 10-150 Impact assessment of the potentially affected receptors at the Nurobod BESS facility by habitat fragmentation and their residual significance after the implementation of proposed mitigation measures

NUROBOD BESS - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM HABITAT FRAGMENTATION; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	VALUE/ SENSITIVITY	MAGNITUDE	UNMITIGATED SIGNIFICANCE	MITIGATED MAGNITUDE	RESIDUAL SIGNIFICANCE
(Herptiles) Vulnerable Species - Burrowing, Slow Mobility (i.e. Central Asian Tortoise)	High	Minor	**Minor to moderate**	Minor	**Minor to moderate**
(Herptiles) Near Threatened Species - Burrowing, Medium Mobility (i.e. Tatary Sand Boa)	Medium	Negligible	**Negligible to minor**	Negligible	**Negligible to minor**
(Herptiles) Common Species - Burrowing, Medium Mobility (i.e. Gecko, Agama, Skink)	Low	Negligible	**Negligible to minor**	Negligible	**Negligible to minor**
(Herptiles) Common Species - Burrowing, Fast Mobility (i.e. whipsnakes,etc)	Low	Negligible	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Nationally Uplisted Species - Burrowing, Nocturnal (Steppe Polecat)	Medium	Moderate	**Moderate**	Moderate	**Moderate**

Nurobod BESS - Impact Assessment of Unmitigated Impact from habitat fragmentation; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Minor	**Negligible to minor**	Minor	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Negligible	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Large Mobile Mammal, Nocturnal (Red Fox)	Low	Moderate	**Minor**	Moderate	**Minor**
(Bats) Common Bats (Common Pipistrelle)	Low	No change	**Neutral**	No change	**Neutral**
(Bats) Rarer Bats (Eptesicus sp.)	Medium	No change	**Neutral**	No change	**Neutral**
(Bats) IUCN Red List - DD - Bats (Myotis sp.)	Medium	No change	**Neutral**	No change	**Neutral**
(Avifauna) Endangered Species - Raptors (Egyptian Vulture)	Very High	No change	**Neutral**	No change	**Neutral**
(Avifauna) Nationally Uplisted Species - Raptors (Griffon Vulture)	Medium	No change	**Neutral**	No change	**Neutral**
(Avifauna) Common Resident Species (Crested Lark, etc)	Low	No change	**Neutral**	No change	**Neutral**

4.9-KM LILO OTL CORRIDOR

Table 10-151 Impact assessment of the potentially affected receptors at the 11km OTL by habitat fragmentation and their residual significance after the implementation of proposed mitigation measures

4.9KM OTL - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM HABITAT FRAGMENTATION; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	VALUE/ SENSITIVITY	MAGNITUDE	UNMITIGATED SIGNIFICANCE	MITIGATED MAGNITUDE	RESIDUAL SIGNIFICANCE
(Herptiles) Vulnerable Species - Slow Mobility (i.e. Central Asian Tortoise)	High	No change	**Neutral**	No change	**Neutral**
(Herptiles) Near Threatened Species - Medium Mobility (i.e. Tatary Sand Boa)	Medium	No change	**Neutral**	No change	**Neutral**
(Herptiles) Common Species - Medium Mobility (i.e. Gecko, Agama, Skink)	Low	No change	**Neutral**	No change	**Neutral**
(Herptiles) Common Species - Fast Mobility (i.e. racerunner, whip snake)	Low	No change	**Neutral**	No change	**Neutral**
(Mammals) Nationally Uplisted Species - Larger Mobile, Nocturnal (Steppe Polecat)	Medium	No change	**Neutral**	No change	**Neutral**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	No change	**Neutral**	No change	**Neutral**

4.9KM OTL - Impact Assessment of Unmitigated Impact from habitat fragmentation; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	No change	**Neutral**	No change	**Neutral**
(Mammals) Common Species - Large Mobile, Nocturnal (Red Fox)	Low	No change	**Neutral**	No change	**Neutral**
(Mammals) Rarer Species - Large Mobile (Asiatic Wildcat)	Medium	No change	**Neutral**	No change	**Neutral**
(Avifauna) Endangered Species - Raptors (Egyptian Vulture)	Very High	No change	**Neutral**	No change	**Neutral**
(Avifauna) Nationally Uplisted Species - Raptors (Griffon Vulture)	Medium	No change	**Neutral**	No change	**Neutral**
(Avifauna) Common Species - Raptors (Upland Buzzard, Common Kestrel, etc)	Low	No change	**Neutral**	No change	**Neutral**
(Avifauna) Common Species - Migratory (Common Swift, Greater Short-toed Lark)	Low	No change	**Neutral**	No change	**Neutral**
(Avifauna) Common Species - Residents, or Common Visitors (i.e. Crested LArk, Common Starling)	Low	No change	**Neutral**	No change	**Neutral**
(Avifauna) Urban Species - Residents (Rock Pigeon, Common Raven)	Very Low	No change	**Neutral**	No change	**Neutral**

The majority of receptors will not have significant impacts thus no specific mitigation is needed for the fragmentation impact (so unmitigated and residual remain equivalent). However:

Ground Bustard, are species that tend to avoid anthropogenic tall structures and there could be a slight fragmentation impact where OTL are being erected in Great Bustard habitat that does not already have OTLs. Only for this case additional mitigation may be warranted, which would be considered as part of the Great Bustard monitoring Programme and adaptive management process.

Table 10-152 Impact assessment of the potentially affected receptors at the 70km OTL by habitat fragmentation and their residual significance after the implementation of proposed mitigation measures

70KM OTL - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM HABITAT FRAGMENTATION; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	VALUE/ SENSITIVITY	MAGNITUDE	UNMITIGATED SIGNIFICANCE	MITIGATED MAGNITUDE	RESIDUAL SIGNIFICANCE
(Herptile) Vulnerable Species - Slow Mobility (i.e. Central Asian Tortoise)	High	No change	**Neutral**	No change	**Neutral**
(Herptile) Vulnerable Species - Medium Mobility (Caspian Monitor)	High	No change	**Neutral**	No change	**Neutral**
(Herptile) Near Threatened Species - Medium Mobility (i.e. Tatary Sand Boa)	Medium	No change	**Neutral**	No change	**Neutral**
(Herptile) Common Species - Medium Mobility (i.e.Gecko, Agama, Skink)	Low	No change	**Neutral**	No change	**Neutral**
(Herptile) Common Species - Fast Mobility (i.e. Racerunner, whip snake)	Low	No change	**Neutral**	No change	**Neutral**

70KM OTL - Impact Assessment of Unmitigated Impact from habitat fragmentation; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Mammals) Nationally Uplisted Species - Large Mobile (i.e. Corsac Fox)	Medium	No change	**Neutral**	No change	**Neutral**
(Mammals) Common Species - Insectivore, Nocturnal (i.e. Long-eared Hedgehog)	Low	No change	**Neutral**	No change	**Neutral**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	No change	**Neutral**	No change	**Neutral**
(Mammals) Common Species - Large Mobile, Nocturnal (i.e. Red Fox)	Low	No change	**Neutral**	No change	**Neutral**
(Mammals) Rarer Species - Insectivore (Brandt's Hedgehog)	Medium	No change	**Neutral**	No change	**Neutral**
(Mammals) Rarer Species - Burrowing (Lesser Jerboa, etc)	Medium	No change	**Neutral**	No change	**Neutral**
(Mammals) Rarer Species - Nocturnal (i.e. Libyan Jird)	Medium	No change	**Neutral**	No change	**Neutral**
(Avifauna) Endangered Species - Raptors (Egyptian Vulture, Steppe Eagle)	Very High	No change	**Neutral**	No change	**Neutral**
(Avifauna) Endangered Species - Groundbirds (Great Bustard)	Very High	Minor	**Moderate to Major**	Negligible	**Minor**
(Avifauna) Vulnerable Species - Raptors (Greater Spotted Eagle, Eastern Imperial Eagle)	High	No change	**Neutral**	No change	**Neutral**

70KM OTL - Impact Assessment of Unmitigated Impact from habitat fragmentation; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Avifauna) Near Threatened Species - Raptors (Cinereous Vulture, Pallid Harrier)	Medium	No change	**Neutral**	No change	**Neutral**
(Avifauna) Near Threatened Species - Groundbirds(Little Bustard)	Medium	Minor	**Minor**	Minor	**Minor**
(Avifauna) Near Threatened Species - Waterbirds - Northern Lapwing	Medium	No change	**Neutral**	No change	**Neutral**
(Avifauna) Nationally Important Species - Waterbirds - Black Stork	Medium	No change	**Neutral**	No change	**Neutral**
(Avifauna) Common Species - Raptors (Rough-legged Buzzard, Common Buzzard, etc)	Low	No change	**Neutral**	No change	**Neutral**
(Avifauna) Common / LC Species - Waterbirds (Migratory) (Little Egret, Etc.)	Low	No change	**Neutral**	No change	**Neutral**
(Avifauna) Common Species (Others) - Lark, Wheatear, etc.	Low	No change	**Neutral**	No change	**Neutral**
(Avifauna) Urban Species - Rock Dove	Very Low	No change	**Neutral**	No change	**Neutral**

400 MW PV Plant and pooling station, access roads

Fencing of the PV site, due to its large area, may cause localized Habitat fragmentation, though to a lesser degree than long linear barriers (i.e. roads/rail lines or dams).

Fencing specifications should take into account the needs of high value species such as Central Asian Tortoise and polecat to allow for localized species movement across the fence boundaries, so that the value of habitat restoration in proximity to the PV site can be maximized.

Table 10-153 Impact assessment of the potentially affected receptors at the 400 MW facility by habitat fragmentation and their residual significance after the implementation of proposed mitigation measures

400MW PV - Impact Assessment of Unmitigated Impact from habitat fragmentation; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Herptiles) Vulnerable Species - Burrowing, Slow Mobility (i.e. Central Asian Tortoise)	High	Minor	**Minor to moderate**	Minor	**Minor to moderate**
(Herptiles) Vulnerable Species - Burrowing, Medium Mobility (i.e. Caspian Monitor)	High	Negligible	**Minor**	Negligible	**Minor**
(Herptiles) Near Threatened Species - Burrowing, Medium Mobility (i.e. Tatary Sand Boa)	Medium	Negligible	**Negligible to minor**	Negligible	**Negligible to minor**
(Herptiles) Common Species - Burrowing, Medium Mobility (i.e. Gecko, Agama, Skink)	Low	Negligible	**Negligible to minor**	Negligible	**Negligible to minor**

400MW PV - Impact Assessment of Unmitigated Impact from habitat fragmentation; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Herptiles) Common Species - Burrowing, Fast Mobility (i.e. whipsnakes,etc)	Low	Negligible	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Nationally Uplisted Species - Large Mobile (Corsac Fox, Steppe Polecat)	Medium	Moderate	**Moderate**	Moderate	**Moderate**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	Minor	**Negligible to minor**	Minor	**Negligible to minor**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	Negligible	**Negligible to minor**	Negligible	**Negligible to minor**
(Mammals) Common Species - Large Mobile, Nocturnal (Red Fox)	Low	Moderate	**Minor**	Moderate	**Minor**
(Mammals) Rarer Species - Insectivore (Brandt's Hedgehog)	Medium	Minor	**Minor**	Minor	**Minor**
(Bats) Common Bat Species (Lesser Noctule)	Low	No change	**Neutral**	No change	**Neutral**
(Bats) Rarer Bat Species (Eptesicus sp., Tadarida sp.)	Medium	No change	**Neutral**	No change	**Neutral**

400MW PV - Impact Assessment of Unmitigated Impact from habitat fragmentation; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Avifauna) Near Threatened Species - Groundbirds (Migratory) (Little Bustard)	Medium	No change	**Neutral**	No change	**Neutral**
(Avifauna) Common Species - Raptors (Long-legged Buzzard, Western Marsh Harrier, etc)	Low	No change	**Neutral**	No change	**Neutral**
(Avifauna) Common Species - Waterbirds (Migratory) (Greater Sand Plover)	Low	No change	**Neutral**	No change	**Neutral**
(Avifauna) Common Resident Species (i.e. Lark, Sandgrouse..)	Low	No change	**Neutral**	No change	**Neutral**

11-km LILO OTL corridor

Table 10-154 Impact assessment of the potentially affected receptors at the 11km OTL by habitat fragmentation and their residual significance after the implementation of proposed mitigation measures

11KM OTL - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM HABITAT FRAGMENTATION; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	VALUE/ SENSITIVITY	MAGNITUDE	UNMITIGATED SIGNIFICANCE	MITIGATED MAGNITUDE	RESIDUAL SIGNIFICANCE
(Herptiles) Vulnerable Species - Slow Mobility (Central Asian Tortoise)	High	No change	**Neutral**	No change	**Neutral**
(Mammals) Nationally Uplisted Species - Large Mobile (Steppe Polecat)	Medium	No change	**Neutral**	No change	**Neutral**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	No change	**Neutral**	No change	**Neutral**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	No change	**Neutral**	No change	**Neutral**
(Mammals) Rarer Species - Burrowing (i.e. Zaisan Mole Vole)	Medium	No change	**Neutral**	No change	**Neutral**
(Mammals) Common Species - Large Mobile, Nocturnal (Red Fox)	Low	No change	**Neutral**	No change	**Neutral**
(Mammals) Rarer Species - Large Mobile, Nocturnal (Asiatic Wildcat)	Medium	No change	**Neutral**	No change	**Neutral**
(Avifauna) Endangered Species - Raptors (Steppe Eagle)	Very High	No change	**Neutral**	No change	**Neutral**

11KM OTL - Impact Assessment of Unmitigated Impact from habitat fragmentation; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Avifauna) Vulnerable Species - Raptors (Eastern Imperial Eagle)	High	No change	**Neutral**	No change	**Neutral**
(Avifauna) Near Threatened Species - Raptors (Hen Harrier)	Medium	No change	**Neutral**	No change	**Neutral**
(Avifauna) Common Species - Raptors (i.e. Common Kestrel, Long-legged Buzzard)	Low	No change	**Neutral**	No change	**Neutral**
(Avifauna) Common Species - Waterbirds (Migratory) (i.e. Green Sandpiper, Little Ringed Plover)	Low	No change	**Neutral**	No change	**Neutral**
(Avifauna) Common Species - Residents & Visitors (Rook, Jackdaw, etc.)	Low	No change	**Neutral**	No change	**Neutral**
(Avifauna) Urban Species (Rock Pigeon)	Very Low	No change	**Neutral**	No change	**Neutral**

19-km LILO OTL corridor

Table 10-155 Impact assessment of the potentially affected receptors at the 19km OTL by habitat fragmentation and their residual significance after the implementation of proposed mitigation measures

19KM OTL - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM HABITAT FRAGMENTATION; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	**VALUE/ SENSITIVITY**	**MAGNITUDE**	**UNMITIGATED SIGNIFICANCE**	**MITIGATED MAGNITUDE**	**RESIDUAL SIGNIFICANCE**
(Herptiles) Vulnerable Species - Slow Mobility (Central Asian Tortoise)	High	No change	**Neutral**	No change	**Neutral**
(Mammals) Nationally Uplisted Species - Large Mobile Mammals (Steppe Polecat)	Medium	No change	**Neutral**	No change	**Neutral**
(Mammals) Common Species - Insectivore, Nocturnal (Long-eared Hedgehog)	Low	No change	**Neutral**	No change	**Neutral**
(Mammals) Common Species - Burrowing (i.e. Yellow Ground Squirrel)	Low	No change	**Neutral**	No change	**Neutral**
(Mammals) Rarer Species - Burrowing (i.e. Zaizan Mole Vole)	Medium	No change	**Neutral**	No change	**Neutral**
(Mammals) Common Species - Larger Mobile Mammals, Nocturnal (Red Fox)	Low	No change	**Neutral**	No change	**Neutral**
(Mammals) Rarer Species - Larger Mobile Mammals, Nocturnal (Asiatic Wildcat)	Medium	No change	**Neutral**	No change	**Neutral**
(Avifauna) Endangered Species - Raptors (Steppe Eagle)	Very High	No change	**Neutral**	No change	**Neutral**

19KM OTL - Impact Assessment of Unmitigated Impact from habitat fragmentation; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Avifauna) Vulnerable Species - Raptors (Eastern Imperial Eagle)	High	No change	**Neutral**	No change	**Neutral**
(Avifauna) Near Threatened Species - Raptors (Hen Harrier)	Medium	No change	**Neutral**	No change	**Neutral**
(Avifauna) Common Species - Raptors (i.e. Common Kestrel, Long-legged Buzzard)	Low	No change	**Neutral**	No change	**Neutral**
(Avifauna) Common Species - Waterbirds (Migratory) (i.e. Green Sandpiper, Little Ringed Plover)	Low	No change	**Neutral**	No change	**Neutral**
(Avifauna) Common Species - Residents & Visitors (Rook, Jackdaw, etc.)	Low	No change	**Neutral**	No change	**Neutral**
(Avifauna) Urban Species (Rock Pigeon)	Very Low	No change	**Neutral**	No change	**Neutral**

10.11.3.2 Lake-effect (Birds & Bats)

It has been documented that birds, particularly waterbirds, have been recorded near PV plant installations in arid habitats where they otherwise would typically not be recorded. Hence, it has been theorized that there is a 'lake-effect' occurring, where the array of dark PV panels from an aerial view resembles a large inland lake, thus attracting migrant waterbirds to descend for stopovers. Some experts opinion that collision fatalities

of birds are occurring due to mistaken descent into the panels themselves, while others claim this is unlikely but that there is a real impact due to unnecessary energy expenditure as well as the inability of some waterbirds to regain flight without using a water surface for take-off.

It is currently under debate if the so-called 'lake effect' causes collision impacts on birds, with many experts split on the matter. There is a lack of research on the causes and correlations of bird mortality at PV solar farms, although there is evidence that fatality does occur.

Similarly, bats may be subjected to lake-effect impacts. Bats have been studied and shown to mistake smooth anthropogenic surfaces for water, displaying drinking behaviour when tested with glass, wood and plastic smooth panels. However, they did not collide with the objects; further, the PV panels are situated at an angle and thus are less likely to cause an echolocation pattern that bats may mistake for the horizontal surface of water. On the other hand, bat mortality has also been recorded under PV panels in solar farms. It is therefore unclear if birds and bats suffer from 'lake-effect' or another phenomena is causing mortality at PV farms. It is unknown what the exact causes of fatality are, what the exact impacts are, and what the significance of those impacts are. A preliminary magnitude of "Minor" has been put forward at this time for waterbirds and bats, as even if Lake-effect is a factual phenomenon, it is unlikely to have a regional wide effect on bird and bat populations.

Regardless, fatality, even if generally minor, is known to occur at PVs; thus given the presence of important bird species, a limited carcass search protocol i.e. monthly for the first year of operation) should be undertaken as part of fatality monitoring during post-construction period.

100 MW PV Plant and Access Road Sites

Table 10-156 Impact assessment of the potentially affected receptors at the 100 MW facility by the "lake effect" and their residual significance after the implementation of proposed mitigation measures

100MW PV - Impact Assessment of Unmitigated Impact from 'Lake Effect'; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Bats) Nationally Uplisted Species - Myotis sp.	Medium	Minor	**Minor**	Negligible	**Negligible to minor**

100MW PV - Impact Assessment of Unmitigated Impact from 'Lake Effect'; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Bats) Rarer Species - Eptesicus sp.	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Bats) Common Species - Pipistrellus pipistrellus	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Endangered Species - Raptors - Egyptian Vulture	Very High	Negligible	**Minor**	No change	**Neutral**
(Avifauna) Nationally Uplisted Species - Raptors - Griffon Vulture	High	Negligible	**Minor**	No change	**Neutral**
(Avifauna) Common Species - Residents - i.e. Crested Lark, etc.	Low	Negligible	**Negligible to minor**	No change	**Neutral**

400 MW PV Plant and pooling station, access roads

Table 10-157 Impact assessment of the potentially affected receptors at the 400 MW facility by the "lake effect" and their residual significance after the implementation of proposed mitigation measures

400MW PV - Impact Assessment of Unmitigated Impact from 'Lake Effect'; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Bats) Common Bat Species (Lesser Noctule)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Bats) Rarer Bat Species (Eptesicus sp., Tadarida sp.)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Avifauna) Near Threatened Species - Groundbirds (Migratory) (Little Bustard)	Medium	Negligible	**Negligible to minor**	No change	**Neutral**
(Avifauna) Common Species - Raptors (Long-legged Buzzard, Western Marsh Harrier, etc)	Low	Negligible	**Negligible to minor**	No change	**Neutral**
(Avifauna) Common Species - Waterbirds (Migratory) (Greater Sand Plover)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Common Resident Species (i.e. Lark, Sandgrouse..)	Low	Negligible	**Negligible to minor**	No change	**Neutral**

10.11.3.3 Impact – OTL Collision

Thin, dark wires used in overhead transmission lines as well as guylines for weather masts are visually difficult to detect. Bird mortality by collisions with these wires are documented for a variety of species.

In the case of power lines, the bird collides with one of the wires, generally the earth wire, which is less visible. Particularly at risk are birds migrating between 20-50m altitude, birds flying at night, birds flying in flocks, and / or large and heavy birds of limited manoeuvrability.

Based on morphology, behaviour, and records from literature, the following categorizes the collision risk of the identified species of concern that may occur within the project site.

Table 10-158 Level of OTL Collision Risk

Grouping Value	Species of Concern (Identified/Suspected)	Risky Flight Indicators	Collision Risk (I=un likely; II=possible; III=highly probable)	Species Flight Altitude Ranges
Endangered Birds - Raptors	Steppe Eagle	Migratory Large-bodied	II	Up to 2000 m (during migration)
	Egyptian Vulture	Large-bodied	II	1000-3000 m
	Saker Falcon	Migratory Small-bodied	II	500-2000 m
Threatened Birds - Raptors	Eastern Imperial Eagle	Migratory Large-bodied	II	1000-3000 m
	Greater-spotted Eagle	Migratory Large-bodied	II	1000-3000 m
Threatened Birds - Groundbirds	Great Bustard	Poor Manoeuvrability Low Visual Detectability Low Altitude	III	0-500 m
Nationally Threatened Birds - Raptors	Osprey	Migratory	II	0-500 m
	Bearded Vulture	Non-Migratory	I	1000-4000 m
	Griffon Vulture	Migratory	II	500-1500 m

Grouping Value	Species of Concern (identified/suspected)	Risky Flight Indicators	Collision Risk (I=un likely; II=possible; III=highly probable)	Species Flight Altitude Ranges
	Golden Eagle	Migratory	II	500-3000 m
	Booted Eagle	Migratory	II	500-1500 m
	Peregrine Falcon	Migratory	II	300-1000 m
	Barbary Falcon	Migratory	II	300-1000 m
	Cinereous Vulture	Migratory	II	1000-3000 m
Nationally Threatened - Groundbirds	Little Bustard	Poor Manoeuvrability Low Visual Detectability Low Altitude	III	0-500 m
	Glossy Ibis	Small-bodied Migratory	II	0-1000 m
Nationally Threatened - Passerines	Turtle Dove	Small-bodied	I	0-300 m
Nationally Threatened Birds - Waterbirds	Little Egret	Migratory	III	0-300 m
	Black Stork	Migratory	III	100-2000 m
Non-threatened Raptors	Pallid Harrier	Migratory	II	500-2000 m
	Long-legged Buzzard	Migratory	II	500-1500 m
	Lesser Kestrel	Migratory	II	0-1000 m
Non-threatened Waterbirds	Pygmy Cormorant Common Teal Asian White Stork	Poor Manoeuvrability Large-bodied Low Visual Detectability	III	0 – 500 m
Non-threatened Groundbirds	Zarafshan Ring-necked / Green Pheasant	Poor Manoeuvrability Low Altitude	III	0-300 m

The optimal design mitigation to completely remove collision risk is to bury the lines. However, this is not always possible and comes with other associated impacts.

The following mitigation measures will be applied to reduce collision risks:

- Utilizing Existing Infrastructure Corridors: Using existing infrastructure corridors such as road and railway Rights of Way (RoW), existing powerline transmission corridors, and other disturbed areas that naturally deter bird activity. This strategy leverages existing investments, minimizing additional costs and environmental impacts.
- Applying Visual Markers: Use bird flight diverters (either FireFly brand or a similar brand with a long-term guarantee against failure) to increase line visibility by thickening the appearance of the line by a minimum of 20 cm over a length of 10-20 cm. Markers will be moveable, of contrasting colors (e.g., black and white), and placed 5-10 m apart. These diverters will be placed along OTL sections within critical avian habitats until such a point that a diverter experiment from another ACWA project may provide evidence to demonstrate that either a different type of line marker should be installed or that neither type of marker or diverter is sufficiently effective to warrant installation (e.g., effectiveness <10%).
- Ensuring Marker Durability and Maintenance: Markers must be robust to endure environmental exposure. Maintenance plans for the Overhead Transmission Line (OTL) will include regular inspections and replacements of marker devices as needed. This ensures long-term effectiveness without significant recurring costs.
- Implementing a Fatality Monitoring Plan: A Fatality Monitoring Plan will include carcass searches and mortality rate calculations for the OTL to assess the effectiveness of the mitigation measures and make necessary adjustments. This plan allows for adaptive management, ensuring that resources are allocated efficiently based on actual impact data.

4.9-KM LILO OTL CORRIDOR

Table 10-159 Impact assessment of the potentially affected receptors at the 4.9km OTL by OTL collision and their residual significance after the implementation of proposed mitigation measures

4.9KM OTL - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM COLLISION WITH OTL; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	**VALUE/ SENSITIVITY**	**MAGNITUDE**	**UNMITIGATED SIGNIFICANCE**	**MITIGATED MAGNITUDE**	**RESIDUAL SIGNIFICANCE**
(Avifauna) Endangered Species - Raptors (Egyptian Vulture)	Very High	Minor	**Moderate to Major**	Negligible	**Minor**

4.9KM OTL - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM COLLISION WITH OTL; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	VALUE/ SENSITIVITY	MAGNITUDE	UNMITIGATED SIGNIFICANCE	MITIGATED MAGNITUDE	RESIDUAL SIGNIFICANCE
(Avifauna) Nationally Uplisted Species - Raptors (Griffon Vulture)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Avifauna) Common Species - Raptors (Upland Buzzard, Common Kestrel, etc)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Common Species - Migratory (Common Swift, Greater Short-toed Lark)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Common Species - Residents, or Common Visitors (i.e. Crested LArk, Common Starling)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Urban Species - Residents (Rock Pigeon, Common Raven)	Very Low	Negligible	**Negligible**	No change	**Neutral**

70-KM LILO OTL CORRIDOR

Great Bustard population monitoring will further support the suite of mitigation measures already being put in place during design and operation of the OTL, as OTL collision is a leading issue for large bustard species including Great Bustard.

Table 10-160 Impact assessment of the potentially affected receptors at the 70km OTL by OTL collision and their residual significance after the implementation of proposed mitigation measures

70KM OTL - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM COLLISION WITH OTL; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	VALUE/ SENSITIVITY	MAGNITUDE	UNMITIGATED SIGNIFICANCE	MITIGATED MAGNITUDE	RESIDUAL SIGNIFICANCE
(Avifauna) Endangered Species - Raptors (Egyptian Vulture, Steppe Eagle)	Very High	Minor	**Moderate to Major**	Negligible	**Minor**
(Avifauna) Endangered Species - Groundbirds (Great Bustard)	Very High	Major	**Major**	Negligible	**Minor**
(Avifauna) Vulnerable Species - Raptors (Greater Spotted Eagle, Eastern Imperial Eagle)	High	Minor	**Minor to moderate**	Negligible	**Minor**
(Avifauna) Near Threatened Species - Raptors (Cinereous Vulture, Pallid Harrier)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Avifauna) Near Threatened Species - Groundbirds(Little Bustard)	Medium	Major	**Moderate to Major**	Moderate	**Moderate**
(Avifauna) Near Threatened Species - Waterbirds - Northern Lapwing	Medium	Moderate	**Moderate**	Minor	**Minor**
(Avifauna) Nationally Important Species - Waterbirds - Black Stork	Medium	Moderate	**Moderate**	Minor	**Minor**
(Avifauna) Common Species - Raptors (Rough-legged Buzzard, Common Buzzard, etc)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**

70KM OTL - Impact Assessment of Unmitigated Impact from collision with OTL; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Avifauna) Common / LC Species - Waterbirds (Migratory) (Little Egret, Etc.)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Avifauna) Common Species (Others) - Lark, Wheatear, etc.	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Avifauna) Urban Species - Rock Dove	Very Low	Negligible	**Negligible**	No change	**Neutral**

11-km LILO OTL corridor

Table 10-161 Impact assessment of the potentially affected receptors at the 11km OTL by OTL collision and their residual significance after the implementation of proposed mitigation measures

11KM OTL - Impact Assessment of Unmitigated Impact from collision with OTL; followed by mitigated residual significance					
Receptor / Group	Value/ Sensitivity	Magnitude	Unmitigated Significance	Mitigated Magnitude	Residual Significance
(Avifauna) Endangered Species - Raptors (Steppe Eagle)	Very High	Minor	**Moderate to Major**	Negligible	**Minor**
(Avifauna) Vulnerable Species - Raptors (Eastern Imperial Eagle)	High	Minor	**Minor to moderate**	Negligible	**Minor**

11KM OTL - Impact Assessment of Unmitigated Impact from collision with OTL; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Avifauna) Near Threatened Species - Raptors (Hen Harrier)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Avifauna) Common Species - Raptors (i.e. Common Kestrel, Long-legged Buzzard)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Common Species - Waterbirds (Migratory) (i.e. Green Sandpiper, Little Ringed Plover)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Avifauna) Common Species - Residents & Visitors (Rook, Jackdaw, etc.)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Urban Species (Rock Pigeon)	Very Low	Negligible	**Negligible**	No change	**Neutral**

19-km LILO OTL corridor

Table 10-162 Impact assessment of the potentially affected receptors at the 19km OTL by OTL collision and their residual significance after the implementation of proposed mitigation measures

19KM OTL - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM COLLISION WITH OTL; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	VALUE/ SENSITIVITY	MAGNITUDE	UNMITIGATED SIGNIFICANCE	MITIGATED MAGNITUDE	RESIDUAL SIGNIFICANCE
(Avifauna) Endangered Species - Raptors (Steppe Eagle)	Very High	Minor	**Moderate to Major**	Negligible	**Minor**
(Avifauna) Vulnerable Species - Raptors (Eastern Imperial Eagle)	High	Minor	**Minor to moderate**	Negligible	**Minor**
(Avifauna) Near Threatened Species - Raptors (Hen Harrier)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Avifauna) Common Species - Raptors (i.e. Common Kestrel, Long-legged Buzzard)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Common Species - Waterbirds (Migratory) (i.e. Green Sandpiper, Little Ringed Plover)	Low	Moderate	**Minor**	Minor	**Negligible to minor**
(Avifauna) Common Species - Residents & Visitors (Rook, Jackdaw, etc.)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Urban Species (Rock Pigeon)	Very Low	Negligible	**Negligible**	No change	**Neutral**

10.11.3.4 Impact – OTL Electrocution

Power transmission lines present potential electrocution risk to birds. In particular, larger-bodied birds which tend to prefer perching at high altitudes such as raptors, including eagles and vultures, have the highest risk for electrocution, as larger wingspans create the opportunity for span the

distance between energized and ground components of power lines. Further compounding the impact is the fact that many of these species are K-selected with low reproductive rates, so additive mortality is of significance. For many endangered species worldwide, electrocution by powerlines is considered to be the number one conservation threat contributing to population decline.

Based on size, behaviour, and records from literature, the following categorizes the electrocution risk of the identified species of concern that may occur within the project site.

Table 10-163 Level of OTL Electrocution Risk

GROUPING VALUE	SPECIES OF CONCERN (IDENTIFIED/SUSPECTED)	RISKY FLIGHT INDICATORS	ELECTROCUTION RISK (I=UN LIKELY; II=POSSIBLE; III=HIGHLY PROBABLE)
Endangered Birds - Raptors	Steppe Eagle	Migratory Large-bodied	III
	Egyptian Vulture	Large-bodied	III
	Saker Falcon	Migratory Small-bodied	II
Threatened Birds - Raptors	Eastern Imperial Eagle	Migratory Large-bodied	III
	Greater-spotted Eagle	Migratory Large-bodied	III
Threatened Birds - Groundbirds	Great Bustard	Poor Manoeuvrability Low Visual Detectability Low Altitude	III
Nationally Threatened Birds - Raptors	Osprey	Migratory	III
	Bearded Vulture	Non-Migratory	III
	Griffon Vulture	Migratory	III
	Golden Eagle	Migratory	III
	Booted Eagle	Migratory	III
	Peregrine Falcon	Migratory	II

Grouping Value	Species of Concern (identified/suspected)	Risky Flight Indicators	Electrocution Risk (I=un likely; II=possible; III=highly probable)
	Barbary Falcon	Migratory	II
	Cinereous Vulture	Migratory	III
Nationally Threatened - Groundbirds	Little Bustard	Poor Manoeuvrability Low Visual Detectability Low Altitude	II
	Glossy Ibis	Small-bodied Migratory	II
Nationally Threatened - Passerines	Turtle Dove	Small-bodied	I
Nationally Threatened Birds - Waterbirds	Little Egret	Migratory	II
	Black Stork	Migratory	II
Non-threatened Raptors	Pallid Harrier	Migratory	II
	Long-legged Buzzard	Migratory	II
	Lesser Kestrel	Migratory	II
Non-threatened Waterbirds	Pygmy Cormorant Common Teal Asian White Stork	Poor Manoeuvrability Large-bodied Low Visual Detectability	II
Non-threatened Groundbirds	Zarafshan Ring-necked / Green Pheasant	Poor Manoeuvrability Low Altitude	I

The optimal design mitigation to completely remove electrocution risk is to bury the lines. However, this is not always possible and comes with other associated impacts.

Therefore, for above-ground designs, the following integrated measures will be applied:

- Ensure a safe design of the cross arm and related equipment (separate energized conductors and grounded hardware distances by more than largest species wingspan)

- Use suspended insulators and avoid pin and dead-end/strain insulators
- Ensure safe distance (minimum 2m) between suspended conductor/jumper wire and lower branch in the cross arm.
- In the configurations with high electrocution risk (derivations, tap, transformer and switch poles and its connected grounded wires and jumpers) all grounded elements will be insulated, and grounded wires and jumpers will be sheathed wires.
- Design will be as per recommendations provided in Reference Note: Quick Guidance for Preventing Electrocution Impacts on Birds, Initiated by International Association for Falconry and Conservation of Birds of Prey.
- Provide safe perching and nesting opportunities via the erection of perching poles and/or nesting platforms or boxes; they will be the highest elements of the structure to attract birds away from perching on potentially dangerous components.
- A Fatality Monitoring Plan will be in place to include carcass searches and mortality rate calculations for the OTL.

4.9-KM LILO OTL CORRIDOR

Steppe Eagle population monitoring will further support the suite of mitigation measures already being put in place during design and operation of the OTL, as OTL electrocution is a leading issue for large perching raptors.

Table 10-164 Impact assessment of the potentially affected receptors at the 4.9km OTL by OTL electrocution and their residual significance after the implementation of proposed mitigation measures

4.9KM OTL - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM ELECTROCUTION BY OTL; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	VALUE/ SENSITIVITY	MAGNITUDE	UNMITIGATED SIGNIFICANCE	MITIGATED MAGNITUDE	RESIDUAL SIGNIFICANCE
(Avifauna) Endangered Species - Raptors (Egyptian Vulture)	Very High	Major	**Major**	Negligible	**Minor**
(Avifauna) Nationally Uplisted Species - Raptors (Griffon Vulture)	Medium	Major	**Moderate to Major**	Moderate	**Moderate**

4.9KM OTL - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM ELECTROCUTION BY OTL; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	VALUE/ SENSITIVITY	MAGNITUDE	UNMITIGATED SIGNIFICANCE	MITIGATED MAGNITUDE	RESIDUAL SIGNIFICANCE
(Avifauna) Common Species - Raptors (Upland Buzzard, Common Kestrel, etc)	Low	Major	**Minor to moderate**	Moderate	**Minor**
(Avifauna) Common Species - Migratory (Common Swift, Greater Short-toed Lark)	Low	Negligible	**Negligible to minor**	No change	**Neutral**
(Avifauna) Common Species - Residents, or Common Visitors (i.e. Crested Lark, Common Starling)	Low	Negligible	**Negligible to minor**	No change	**Neutral**
(Avifauna) Urban Species - Residents (Rock Pigeon, Common Raven)	Very Low	Negligible	**Negligible**	No change	**Neutral**

70-KM LILO OTL CORRIDOR

Steppe Eagle and Greater Spotted Eagle, and Eastern Imperial Eagle population monitoring will further support the suite of mitigation measures already being put in place during design and operation of the OTL, as OTL electrocution is a leading issue for large perching raptors.

Table 10-165 Impact assessment of the potentially affected receptors at the 70km OTL by OTL electrocution and their residual significance after the implementation of proposed mitigation measures

70KM OTL - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM ELECTROCUTION BY OTL; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	VALUE/ SENSITIVITY	MAGNITUDE	UNMITIGATED SIGNIFICANCE	MITIGATED MAGNITUDE	RESIDUAL SIGNIFICANCE
(Avifauna) Endangered Species - Raptors (Egyptian Vultre, Steppe Eagle)	Very High	Major	**Major**	Negligible	**Minor**
(Avifauna) Endangered Species - Groundbirds (Great Bustard)	Very High	Minor	**Moderate to Major**	Negligible	**Minor**
(Avifauna) Vulnerable Species - Raptors (Greater Spotted Eagle, Eastern Imperial Eagle)	High	Major	**Major**	Minor	**Minor to moderate**
(Avifauna) Near Threatened Species - Raptors (Cinereous Vulture, Pallid Harrier)	Medium	Major	**Moderate to Major**	Moderate	**Moderate**
(Avifauna) Near Threatened Species - Groundbirds(Little Bustard)	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Avifauna) Near Threatened Species - Waterbirds - Northern Lapwing	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Avifauna) Nationally Important Species - Waterbirds - Black Stork	Medium	Minor	**Minor**	Negligible	**Negligible to minor**
(Avifauna) Common Species - Raptors (Rough-legged Buzzard, Common Buzzard, etc)	Low	Major	**Minor to moderate**	Moderate	**Minor**

70KM OTL - Impact Assessment of Unmitigated Impact from electrocution by OTL; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Avifauna) Common / LC Species - Waterbirds (Migratory) (Little Egret, Etc.)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Common Species (Others) - Lark, Wheatear, etc.	Low	Negligible	**Negligible to minor**	No change	**Neutral**
(Avifauna) Urban Species - Rock Dove	Very Low	Negligible	**Negligible**	No change	**Neutral**

11-km LILO OTL corridor

Steppe Eagle and Eastern Imperial Eagle population monitoring will further support the suite of mitigation measures already being put in place during design and operation of the OTL, as OTL electrocution is a leading issue for large perching raptors.

Table 10-166 Impact assessment of the potentially affected receptors at the 11km OTL by OTL electrocution and their residual significance after the implementation of proposed mitigation measures

11KM OTL - Impact Assessment of Unmitigated Impact from electrocution by OTL; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Avifauna) Endangered Species - Raptors (Steppe Eagle)	Very High	Major	**Major**	Negligible	**Minor**

11KM OTL - Impact Assessment of Unmitigated Impact from electrocution by OTL; followed by mitigated residual significance					
Receptor / Group	**Value/ Sensitivity**	**Magnitude**	**Unmitigated Significance**	**Mitigated Magnitude**	**Residual Significance**
(Avifauna) Vulnerable Species - Raptors (Eastern Imperial Eagle)	High	Major	**Major**	Minor	**Minor to moderate**
(Avifauna) Near Threatened Species - Raptors (Hen Harrier)	Medium	Major	**Moderate to Major**	Moderate	**Moderate**
(Avifauna) Common Species - Raptors (i.e. Common Kestrel, Long-legged Buzzard)	Low	Major	**Minor to moderate**	Moderate	**Minor**
(Avifauna) Common Species - Waterbirds (Migratory) (i.e. Green Sandpiper, Little Ringed Plover)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Common Species - Residents & Visitors (Rook, Jackdaw, etc.)	Low	Negligible	**Negligible to minor**	No change	**Neutral**
(Avifauna) Urban Species (Rock Pigeon)	Very Low	Negligible	**Negligible**	No change	**Neutral**

19-km LILO OTL corridor

Steppe Eagle and Eastern Imperial Eagle population monitoring will further support the suite of mitigation measures already being put in place during design and operation of the OTL, as OTL electrocution is a leading issue for large perching raptors.

Table 10-167 Impact assessment of the potentially affected receptors at the 19km OTL by OTL electrocution and their residual significance after the implementation of proposed mitigation measures

19KM OTL - IMPACT ASSESSMENT OF UNMITIGATED IMPACT FROM ELECTROCUTION BY OTL; FOLLOWED BY MITIGATED RESIDUAL SIGNIFICANCE					
RECEPTOR / GROUP	**VALUE/ SENSITIVITY**	**MAGNITUDE**	**UNMITIGATED SIGNIFICANCE**	**MITIGATED MAGNITUDE**	**RESIDUAL SIGNIFICANCE**
(Avifauna) Endangered Species - Raptors (Steppe Eagle)	Very High	Major	**Major**	Negligible	**Minor**
(Avifauna) Vulnerable Species - Raptors (Eastern Imperial Eagle)	High	Major	**Major**	Minor	**Minor to moderate**
(Avifauna) Near Threatened Species - Raptors (Hen Harrier)	Medium	Major	**Moderate to Major**	Moderate	**Moderate**
(Avifauna) Common Species - Raptors (i.e. Common Kestrel, Long-legged Buzzard)	Low	Major	**Minor to moderate**	Moderate	**Minor**
(Avifauna) Common Species - Waterbirds (Migratory) (i.e. Green Sandpiper, Little Ringed Plover)	Low	Minor	**Negligible to minor**	Negligible	**Negligible to minor**
(Avifauna) Common Species - Residents & Visitors (Rook, Jackdaw, etc.)	Low	Negligible	**Negligible to minor**	No change	**Neutral**
(Avifauna) Urban Species (Rock Pigeon)	Very Low	Negligible	**Negligible**	No change	**Neutral**

10.12Decommissioning

A Decommissioning Plan will be prepared at least 18 months prior to planned decommissioning and submitted to the Regulator for review and approval. No decommissioning works can be commenced without a permit from the Regulator. The Plan will detail the site and surrounding environment and receptors and will likely require new baseline studies to assess the condition of the site, adjacent areas and the overall area of influence including designated sites. Based on the details outlined in this Report, the measures will likely relate to the following:

- Removal of all Project related components and wastes and appropriate disposal method that adopts the waste hierarchy and maximises re-use and recycling of materials;
- Restoration of terrestrial ecology habitats within the Project footprint including access roads e.g. re-seeding and re-vegetation using local indigenous species; and
- Remediation and/or scarification of any compacted soils.

10.13Specific Requirements for DFIs

Although many DFIs follow the IFC P.S. 6, some also include additional guidance and standards (i.e., ADB's Environmental Safeguards). The following provides a summary of the DFI requirements that are *additional* to the ESIA's process of setting baseline conditions, identifying sensitive receptors, predicting impact, and proposing mitigation to reduce residual significance to acceptable levels.

10.13.1.1 Critical Habitat

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

If CH is identified, this triggers the project to provide proof that a number of requirements are met, including a net impact of Net Gain for the affected species/habitats. IN some cases species that do not trigger CH but meet other requirements are deemed as "Significant Biodiversity Features" (SBVs). SBVs which are IUCN CR or EN listed must have No Net Reduction. Further, IFC P.S. 6 requires the designation of habitats into Natural and Modified habitat typologies, for which Natural Habitat requires a No Net Loss residual impact.

10.13.1.2 Biodiversity Plans & Programmes

IFC P.S. 6 as well as other DFI standards and requirements refer to a number of specific biodiversity documents, mostly known by the following terminologies:

BIODIVERSITY ACTION PLAN

- Biodiversity Action Plan. This is a document that must be prepared in two circumstances: (1) Critical Habitat is triggered for any one element (2) CH is not triggered but the sensitivities of the site are considered enough to warrant the development of the BAP.
- The purpose of the Biodiversity Action Plan is to comprehensively narrate the full assessment process and provide the action plan for ensuring NNL / NG targets will be met in a transparent manner. Thus, the BAP report and/or associated tables are typically organized by receptor.
- The BAP is often disclosed as part of the publicly available project documentation.
- The BAP will first and foremost include the summary of the CHA process and findings as well as a narrative providing a brief but comprehensive understanding of the project's key biodiversity impacts and mitigation measures. Further, any CH triggering elements will be addressed with an overview of the baseline status, potential impacts, committed mitigation, and strategy to achieve Net Gain (including loss calculations, compensation and offset plans, and subsequent pathway to Net Gain). Implementation details such as timelines and monitoring requirements and evaluation indicators are also provided.
- A BAP should also include, for each SBV:
  - Baseline status
  - Acceptable Take Threshold (if applicable)
  - Predicted Impacts
  - Mitigation Measures

- Residual Significance
- Compensation / Offsets (when NNL is not achieved via mitigation)

BIODIVERSITY MANAGEMENT PLAN

- Regardless of the presence of absence of CH, SBVs; biodiversity-related commitments within the ESIA relating to mitigation, management and monitoring must be captured within the project's CESMP / OESMP / overall ESMS.
- A stand-alone BMP is not required if the project's CESMP/OESMP/overall ESMS and topic-specific management plans are well developed and adequately cross-referenced. Topic-specific plans include implementation plans to guide implementing parties on the requirements and methods to be undertaken; examples include Habitat Restoration Plan, Breeding Bird Protection Plan, Relocation Plan, etc.
- IFC P.S. 6 does not require a BMP in all cases, but suggests that a BMP will be useful in cases where there is significant biodiversity sensitivities and related requirements. Many DFIs request a BMP when there are multiple sensitivities as a way to consolidate all biodiversity management actions and requirements in a collated document.
- The purpose of the Biodiversity Management Plan is to provide a biodiversity-focused management plan to be used as a tool by implementing parties. Thus, the BMP is typically organized by project phase, in order to simplify the allocation of responsibilities to the relevant implementing party (which could be the developer, designer, contractor, operator, etc).
- The BMP, like many implementation and management plans, is often not required to be disclosed as part of the publicly available project documentation.
- The BMP will first and foremost include the summary of the ESIA process and findings in a narrative form, providing a brief but comprehensive overview of the project's ecological receptors, key biodiversity impacts and mitigation and monitoring commitments. This should include details relevant to the implementation method, timeframe, and how it should be recorded, reported, tracked, and evaluated.
- If there are a number of topic-specific plans related to Biodiversity or biodiversity-related commitments in other plans, these will be elucidated in the BMP to explain how any plans, sub-plans, control plans, management plans, and implementation plans should be cross-referenced. For example the BMP may provide an overview and information on the biodiversity requirements within the CESMP, a Habitat Restoration Plan, and/or a Relocation Plan developed for the project.
- Each and every management/control measure and monitoring commitment must be presented in a tabular format organized by phase, which includes:

- References to any relevant documentation (i.e. a topic-specific plan),
- Timing in the form of the implementation schedule, seasonality, and frequency,
- Identification of the party responsible to ensure implementation and the specific personnel requirements for carrying out implementation;
- Outcome reporting, which tracks all documentation that is meant to be an outcome of each management/control and/or monitoring measure.

- A BMP provides a clear assemblage of all biodiversity related management and monitoring actions and assigned responsibilities and roles. It does not need to include information relating to CH, SBVs, NNL or NG as it is immaterial to the implementation of the measures which have been determined based on the former assessments and requirements.

BIODIVERSITY MONITORING & EVALUATION PROGRAM

- The Biodiversity Monitoring & Evaluation Program is not stated to be required in all projects by IFC P.S. 6 and similarly to the BMP, could potentially be foregone if the project has explicit biodiversity management, monitoring, and evaluation criteria outlined clearly in other relevant ESMS documents (CESMP, OESMP, ESMP, etc).
- However, in most cases, it may be beneficial to prepare a stand-alone BMEP, or combine the BMEP with the project's BAP and/or BMP if relevant.
- The core purpose of the BMEP is to firstly demonstrate compliance with the biodiversity commitments and secondly to demonstrate effectiveness of the mitigation in achieving desired outcomes (namely, NNL or NG respectively).
- A BMEP encapsulates the "Plan – Do – Check – Act" cycle and is a fundamental component of successful adaptive mitigation.
- On a receptor-specific basis, the BMEP provides a framework within which to monitor that each biodiversity mitigation measure is being implemented correctly and that the outcomes of the mitigation are inline with requirements.
- The BMEP may or may not be disclosed as part of the publicly available project documentation.
- The BMEP will first and foremost include a brief summary of the project's process to date, including:
  - Summary of CHA process and findings (CH / SBVs)
  - Summary of ESIA process and findings (baseline / impacts / mitigation including NNL and NG requirements)
- The BMEP will then describe the adaptive management process that will be in place for monitoring implementation compliance and evaluating effectiveness. In some cases, a specific Biodiversity Committee may need to be formed that will oversee the various project

phases from a technical advisory point of view. The committee would include implementing parties, project proponent, relevant lenders representatives or advisors, and technical biodiversity advisors. Each project phase may need slightly different composition of representatives in the committee. The purpose of the committee will be to meet on a regular basis as well as convening in any emergency situations. These meetings will review documentation of monitoring to date and identify if any adaptive changes need to be made to re-calibrate the biodiversity mitigation measures towards NNL / NG respectively.

- The BMEP is often tabulated, on a receptor/grouping basis (similar to BAP). However similar to BMP, the information provided is broken down in such a way as to clarify the requirements.
- For each SBV/CH element, the BMEP table will include:
  - baseline status,
  - acceptable level of take if relevant (thresholds for NNL),
  - applicable project phase, required measures,
  - reference documents,
  - implementation schedule/frequency/timing,
  - responsible party and personnel,
  - outcome reporting, as well as
  - means of verification,
  - parameters and KPIs, and
  - trigger actions that are implemented in the event that thresholds are crossed / targets are not met. (Often the trigger action will be convening of the Biodiversity Committee to review the situation and determine the adaptive changes needed, whether upscaling mitigation or implementing stricter controls, etc.)

10.13.1.3 Recommendations for Project

Based on the nature of this project, and the findings of the CHA and ESIA process, it is anticipated that a stand-alone BAP is not required.

However, as there will be biodiversity-related commitments that will be outlined in a number of documents (CESMP, OESMP, ESMS; Habitat Restoration Plan; Biodiversity Chance-Find Procedure; etc) a BMP may be beneficial in order to provide a consolidated document relating to biodiversity management requirements and implementation planning. Further, this could be combined with the BMEP requirements (referred to

henceforth as Biodiversity Management and Monitoring Plan, BMMP). Thus, a single biodiversity stand-alone document can encapsulate the BMP and BMEP requirements of the DFI standards.

The BMMP will include the NNL tables, framework for implementation plans needed, and explanation of the adaptive management cycle that will be in place, along with specific KPIs (as per what BMEP requirements are).

10.14General Mitigation Requirements

10.14.1 Loss of habitat

AVOIDANCE, MITIGATION AND OFFSET MEASURES
• All construction activities will be restricted to demarcated construction zones within the project sites and designated access roads. • Mandatory buffers for perennial rivers will be observed for all construction activities along OTL corridors. • Micro-siting of construction zones within the project sites and any access roads will avoid wooded vegetation (i.e., trees) to the extent feasible. • Micro-siting of construction zones within the project sites and any access roads will avoid riparian habitats to the extent feasible. • The use of herbicides and pesticides for maintenance of construction zones and temporary facilities will be strictly prohibited. • Public access to the project sites will be restricted using procedural and engineering controls including site fencing, to prevent the introduction of invasive species, hunting and unauthorized wood harvesting from tree stands within the project area. • Rehabilitation of all construction zones with the project sites will include the re-establishment of vegetative cover in residual areas within the project sites (i.e., those located outside of permanent clearance zones for the operation and maintenance of project facilities). • The loss of Natural Habitat for the PV site(s) is of a sufficient scale that given the preliminary layout of the PV site, it is unlikely that rehabilitation of unused habitats on the PV site(s) alone will enable No Net Loss. Subsequent analyses to quantify on-site restoration (within residual areas) for NNL will be completed. However, the Project Developer commits to finding alternatives which may include off-site areas for offsets to Natural Habitat, which will be

AVOIDANCE, MITIGATION AND OFFSET MEASURES
included in the next version of this ESIA (with quantification of loss and gain to demonstrate achievability of No Net Loss). • Any compensatory replanting within designated sites to offset the loss of resident trees within the project site will be carried out in line with relevant regulatory requirements prescribed by the Ministry of Ecology, Environmental Protection and Climate Change (MEEPCC).

10.14.2 Direct mortality of fauna

AVOIDANCE, MITIGATION AND OFFSETTING MEASURES
• All construction activities will be restricted to demarcated construction zones within the project sites and designated access roads. • Mandatory buffers for perennial rivers will be observed for all construction activities along OTL corridors. • Micro-siting of construction zones within the project sites and any access roads will avoid wooded vegetation (i.e., trees) to the extent feasible. • Micro-siting of construction zones within the project sites and any access roads will avoid riparian habitats to the extent feasible. • Poaching of any mammalian species utilizing habitats in and around the project sites will be strictly prohibited. • Unwarranted attacks and killing of mammalian, reptilian and avian species utilizing habitats in and around the project sites will be strictly prohibited. • Speed limits will be established within the project sites to minimize the risk of road kills, particularly within construction zones located close to natural habitats adjoining the sites. • Biodiversity inspections will be carried out for the identification of any live fauna entrapped within on-site excavations and trenches for evacuation. • Biodiversity inspections will be carried out to record wildlife mortalities including road kills. • Haphazard dumping of solid and liquid waste into waterbodies in and around the project sites will be strictly prohibited. The discharge of liquid construction waste (e.g., sewage, concrete washout, used/waste oils) into water bodies will be proscribed.

10.14.3 Transient displacement of sensitive fauna and disruption of ecological processes

AVOIDANCE, MITIGATION AND OFFSETTING MEASURES
• Construction works will be restricted to the daytime, to the extent possible, in order to (i) minimize disturbance and displacement of faunal mammalian, reptilian and avian species utilizing habitats nearby the project sites, and (ii) prevent accidental animal kills. • Measures for abating noise emissions will be implemented for the duration of construction activities. Such measures will include (but not be limited to) siting noise-generating hotspots away from off-site human and ecological receptors to the extent feasible, switching off idle machinery with acoustic impacts, use of sound proofing installation and acoustic enclosure for noise-generating equipment, and the establishment and/or utilization of acoustic barriers. • Measures for abating light spills will be implemented for the duration of construction activities. Such measures will include (but not be limited to) minimizing the height of lighting poles, orienting floodlights towards the interior of the project sites, use of flood light shields and Light-Emitting Diode (LED) lamps to the extent feasible. • An adequate number of waste bins will be placed at strategic locations within the project site for collection of non-hazardous construction waste to minimize littering. • Dedicated bins will be placed around any on-site kitchen, office and resting facilities to enable the collection and temporary storage of putrescible waste. On-site bins and skips dedicated to this waste stream will be covered and regularly emptied/ replaced to prevent pest infestation. • Haphazard dumping of solid and liquid waste into waterbodies in and around the project sites will be strictly prohibited. The discharge of liquid construction waste (e.g., sewage, concrete washout, used/waste oils) into water bodies will be proscribed. • Excavation and stockpiling will be sited as far as possible from unprotected drainage channels, irrigation canals, natural streams and rivers. • Silt traps fences or curtains will be installed where earthworks must be carried out in close proximity to unprotected drainage channels, irrigation canals, natural streams and rivers. • Any earthworks within drainage channels, infiltration ponds and natural streams will be avoided, or otherwise curtailed to the extent feasible during periods of heavy rainfall. • Designated facilities with an impermeable base (flooring), roofing, and facilities for temperature control, lighting protection, fire detection and suppression will be established for the storage of hazardous materials and waste. These facilities will be sheltered to prevent exposure of chemical/waste stock to direct sunlight, precipitation, humidity, and wind.

AVOIDANCE, MITIGATION AND OFFSETTING MEASURES

10.14.4 Introduction of Invasive and Alien Species (IAS)

AVOIDANCE, MITIGATION AND OFFSETTING MEASURES
• Excavated soil will be stockpiled and preserved within dedicated sites to enable its reuse in backfilling excavations and landscaping as part of site rehabilitation post the completion of construction works. • Any imports of soil and aggregates will be sourced from borrow pits and quarry sites located closest to the project sites, to the extent feasible and in coordination with relevant Local Government Authorities (LGAs). • Visual inspections will be carried out for imported stocks of tree seeds, manure and compost during site rehabilitation, to identify any invasive plant specimens with potential for on-site regeneration and propagation. Suitable weed control measures will be implemented for any related finds. • Washing of equipment and machinery (including vehicles) will only be permitted in designated areas, with impermeable surfaces and isolated drainage systems. • A checklist of common alien and invasive floral species within the project-affected districts and region will be developed in advance of construction work. • The clearance of invasive and alien floral species within the project sites will follow a weed control hierarchy. Control measures such as the use of herbicides and fire will be prohibited.