Environmental and Social Impact Assessment

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Uzbekistan: Samarkand 1 Solar PV and BESS Project

Appendixes – Part 5

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5 Flora Assessment

5.1 100 MW PV plant

In total, 70 plant species were recorded within 100 MW PV plant area, none of them are nationally or globally red-listed, 13 species are alien and 2 are agricultural crops (wheat - Triticum aestivum and barley - Hordeum vulgare). Annuals are 37 species, 7 are biennials, 24 – perennials and 1 subshrub. All recorded species are typical and more or less common for piedmont plains and foothills of Uzbekistan. Predominance of therophytes (annuals and biennials) is a feature of secondary ephemeral-grass and ephemeral-forb-grass communities on fallow lands in Uzbekistan. The number of plant species recorded per sample plot varies from 24 to 67.

5.2 500/220KV Nurabad substation

In total, 25 plant species were recorded within neighbouring areas of Nurabad substation and 500 MW BESS, none of them are nationally or globally red-listed, 3 species are alien. Annuals are 14 species, 2 are biennials, and 9 – perennials. All recorded species are typical and more or less common for piedmont plains and foothills of Uzbekistan occupied with rainfed crops and fallow lands

5.3 500 MW BESS

In total, 25 plant species were recorded within neighbouring areas of Nurabad substation and 500 MW BESS, none of them are nationally or globally red-listed, 3 species are alien. Annuals are 14 species, 2 are biennials, and 9 – perennials. All recorded species are typical and more or less common for piedmont plains and foothills of Uzbekistan occupied with rainfed crops and fallow lands.

5.4 400 MW PV plant

In total, 14 plant species were recorded within neighbouring areas of 400 and 500 MW PV plants, none of them are nationally or globally red-listed, or alien. Annuals are 8 species, and 6 are perennials. All recorded species are typical and more or less common for piedmont plains and foothills of Uzbekistan. The number of plant species recorded per sample plot varies from 9 to 14.

5.5 500 MW PV plant

In total, 14 plant species were recorded within neighbouring areas of 400 and 500 MW PV plants, none of them are nationally or globally red-listed, or alien. Annuals are 8 species, and 6 are perennials. All recorded species are typical and more or less common for piedmont plains and foothills of Uzbekistan. The number of plant species recorded per sample plot varies from 9 to 14.

5.6 Karakul BESS

In total, 19 plant species were recorded, none of them are nationally or globally red-listed, or alien (Table 46). 9 species are annuals, 6 – perennials, 2 – subshrubs, and 2 – shrubs. All recorded species are typical and more or less common for south-western part of Kyzylkum Desert. The territory of planned BESS currently is used mainly for sand mining and garbage dump, the level of anthropogenic disturbance is high.

5.7 Khalka substation and 360 km OHTLTable 46

Khalka substation

In total, 41 plant species were recorded, none of them are nationally or globally red-listed, 8 species are alien, 1 species is an agricultural crop, 1 species of planted trees is introduced. Annuals, biennials – 15, perennials – 27, trees – 1 (Table 3).

360 km OHTL

In total, 247 plant species of 52 families (197 native, 39 alien and 11 agricultural crops or introduced fruit or ornamental trees) were recorded during the field surveys along 360 km OTHL. One threatened restricted-range endemic species included in the Red Data Book of Uzbekistan (*Phlomis nubilans*, UzbRDB category 3) was found on the north stony slope of the Nuratau Range. Along the OTHL line, this rare species occurs only between

40.14441° N 67.69072° E and 40.14761° N 67.69127° E (about 700 m). 78 specimens of *Phlomis nubilans* were count in 100x10 m transect in the upper part of the slope. Solitary specimens of two not red-listed endemic species, *Dianthus helenae* (endemic to the Nuratau Mountains, endemic of Uzbekistan) and *Nanophyton saxatile* (endemic to northwestern spurs of Pamir-Alay mountain system, including Nuratau and Zirabulak-Ziadin mountains, and Malguzar Range, endemic of Uzbekistan) also were recorded on this territory together with *Phlomis nubilans.* Species assessed in the IUCN Red List as CR, EN or VU were not recorded among wild growing plants. Among ornamental trees, planted in woodland belts, one introduced species, *Gleditsia caspica*, is included in the IUCN Red List as Endangered (EN A2ac+4ac), and one native species *Prunus bucharica (Amygdalus bucharica*) is included in the IUCN Red List as Vulnerable (VU). Another native species, planted in the woodland belts, is nationally red-listed *Platanus orientalis* (category 3). Generally, the flora of the project area is composed with plant species more or less widely spread and typical for river valleys, deserts, foothills and anthropogenic landscapes of Uzbekistan. The number of plant species recorded per sample plot varies from 20-22 to 86.

5.8 70 km OHTL

In total, 76 plant species were recorded along 70 km OTHL, none of them are nationally or globally red-listed, 15 species are alien weeds and 4 are agricultural crops (wheat - Triticum aestivum, cotton - *Gossypium hirsutum*, peanut - *(Arachis hypogaea,* alfalfa – *Medicago sativa*), 4 species are cultivated fruit or ornamental trees ans shrubs (apple – *Malus domestica*, grapevine – *Vitis vinifera*, etc.). Annuals are 31 species, 7 are biennials, 34 – perennials and 1 subshrub. All recorded species are typical and more or less common for piedmont plains and foothills of Uzbekistan. The number of plant species recorded per sample plot varies from 6 to 45, where natural and secondary communities on xeric natural and modified habitats have rather poor and uniform species composition, and secondary communities on mesic modified habitats have a more diverse and reach species composition, which is associated with the presence of numerous native and alien weeds. ()

5.9 4.9 km OHTL

In total, 25 plant species were recorded within neighbouring areas of Nurabad substation and 500 MW BESS, none of them are nationally or globally red-listed, 3 species are alien. Annuals are 14 species, 2 are biennials, and 9 – perennials. All recorded species are typical and more or less common for piedmont plains and foothills of Uzbekistan occupied with rainfed crops and fallow lands

6 Findings and Results

1) 100 MW PV plant. In total, 5 sample plots were described (SP 34–38), including one plot for Ettitepa Archeologic Heritage site. Check-lists of plants recorded for each plot are represented below in Table 36, the data of their location, coordinates, landscape, canopy cover and number of recorded plant species are represented in Annex D, photographs are represented in Annex A. The number of plant species recorded per sample plot varies from 24 to 67. In total, 70 plant species were recorded within 100 MW PV plant area, none of them are nationally or globally red-listed, 13 species are alien and 2 are agricultural crops (Annex C).
2) 500/220KV Nurabad substation. One sample plot was described (SP 33). In total, 24 plant species were recorded. Check-list is represented in Table 35, the data of SP 33 location, coordinates, landscape, canopy cover, etc. are represented in Annex D, photographs are represented in Annex A.
3) 500 MW BESS. One sample plot was described (SP 32). In total, 19 plant species were recorded. Check-list is represented in Table 35, the data on SP 33 location, coordinates, landscape, canopy cover, etc. are represented in Annex D, photographs are represented in Annex A.
4) 400 MW PV plant. 3 sample plots were described (SP 39–41). Check-lists of plants recorded for each plot are represented below in Table 41, Table 42, Table 43, the data of their location, coordinates, landscape, canopy cover and number of recorded plant species are represented in Annex D, photographs are represented in Annex A.
5) 500 MW PV plant. 2 sample plots were described (SP 42–43). Check-lists of plants recorded for each plot are represented below in Table 44 and Table 45, the data of their location, coordinates, landscape,

canopy cover and number of recorded plant species are represented in Annex D, photographs are represented in Annex A. In total, 14 plant species were recorded within neighbouring areas of 400 and 500 MW PV plants, none of them are nationally or globally red-listed, or alien (Annex C). The number of plant species recorded per sample plot varies from 9 to 14.

6) Karakul BESS. One sample plot was described (SP 44). In total, 19 plant species were recorded. Check-list is represented in Table 46, the data on SP 01 location, coordinates, landscape, canopy cover, etc. are represented in Annex D, photographs are represented in Annex A.
7) Khalka substation and 360 km OHTL.
   Khalka substation. One sample plot was described (SP 01). In total, 41 plant species were recorded. Check-list is represented in Table 3, the data on SP 01 location, coordinates, landscape, canopy cover, etc. are represented in Annex D, photographs are represented in Annex A.
   360 km OHTL. In total, 30 sample plots were described along the 360 km OHTL (SP 02–31). Check-lists of plants recorded for each plot are represented below in pointsTable 13-33, the data of their location, coordinates, landscape, canopy cover and number of recorded plant species are represented in Annex D, photographs are represented in Annex A. The number of plant species recorded per sample plot varies from 20-22 to 86. In total, 247 plant species of 52 families (198 native, including 1 nationally red-listed endemic, 2 not red-listed endemics, 38 alien and 11 introduced) were recorded (Annex C).
8) 70 km OHTL
   70 km OHTL. In total, 11 sample plots were described along the 70 km OHTL (SP 45–55). Check-lists of plants recorded for each plot are represented below in points 45–55, the data of their location, coordinates, landscape, canopy cover and number of recorded plant species are represented in Annex D, photographs are represented in Annex A.

7 Impact Assessment

1) 100 MW PV plant

The analysis of satellite imagery and results of the field survey showed that the habitats within the 100 MW plant site are modified. There are rainfed arable lands and fallow lands with secondary vegetation typical for such disturbed areas in clayey piedmont plains of Uzbekistan. Threatened or endemic species, trees and shrubs are absent. The loss of vegetation during construction of the solar power plant can have some negative impacts on flora and vegetation, affect habitat conditions of wildlife, and potentially reducing biodiversity in the area. The negative impact also may be related to the deflation and dust storms after the destroying of vegetation on these areas. Taking into account the current state of these modified habitats and secondary vegetation, the negative impact can be assessed as insignificant.

2) 500/220KV Nurabad substation and 500 MW BESS

The analysis of satellite imagery and results of the field survey showed that the habitats within the 500 MW BESS and Nurabad substation site are modified. It is a fallow land with poor, sparse and uniform vegetation typical for such disturbed areas and intensively grazed rangelands in clayey piedmont plains of Uzbekistan. Threatened or endemic species, trees and shrubs are absent. The loss of vegetation during construction of the substation and BESS can have some negative impacts on flora and vegetation, affect habitat conditions of wildlife, and potentially reducing biodiversity in the area. The negative impact also may be related to the deflation and dust storms after the destroying of vegetation on these areas. Taking into account the current state of these modified habitats and poor secondary vegetation, the negative impact can be assessed as insignificant.

3) 400 MW PV plant and 500 MW PV plant

The analysis of satellite imagery and results of the field survey showed that the habitats within the 400 and 500 MW PV plant site are both natural and modified, occupied with poor, sparse and uniform vegetation typical for such disturbed areas and intensively grazed rangelands in clayey piedmont plains of Uzbekistan. Threatened or endemic species, trees and shrubs are absent. The loss of vegetation during construction of the solar power

plants can have some negative impacts on flora and vegetation, affect habitat conditions of wildlife, and potentially reducing biodiversity in the area. The installation of solar panels can lead to changes in local microclimate and affect some plant species that are sensitive to changes in insolation, temperature, humidity, and wind conditions. The negative impact also may be related to the deflation and dust storms after the destroying of vegetation on large areas. Taking into account the current state of these habitats and poor vegetation, the negative impact can be assessed as insignificant.

4) Karakul BESS

The habitats within the Karakul BESS site are both natural and modified. The natural habitat of the sandy desert has already been destroyed on about half of the territory, and strongly degraded on the another half. Threatened or endemic species are absent. The main negative impact may be related to the deflation and dust storms after the destroying of vegetation on this area. Taking into account the current state of these habitats and strongly degraded vegetation, the negative impact can be assessed as insignificant. But special measures should be taken for fixation of sands and combat deflation (phytomelioration, fences, mechanical dune stabilization, etc.) in the project site of Karakul BESS and its surroundings.

5) Khalka substation and 360 km OHTL

Khalka substation

The habitats within the Khalka substation site are modified. There are irrigated arable lands used under cotton, woodland belts, boundary-strips, roadsides, banks of canals and drainage channels with mesophytic and hydrophytic plants typical for such agricultural landscapes (including native and alien weeds). Endemics or nationally or globally red-listed plant species are absent. The loss of this anthropogenic vegetation as a result of construction and operation of the substation will not damage the native flora and vegetation. But the construction of the substation will lead to the loss of 32 hectares of the most valuable and highly productive agricultural lands with the best and most fertile soils of Uzbekistan. With this in mind, it is not recommended to build a substation on this valuable land intensively used in agriculture. It is more rational to use some wasteland for the construction of a substation.

360 km OHTL

The analysis of satellite imagery and results of the field survey showed that the habitats along the OTHL are both natural and modified, and the diversity of flora and vegetation is rather significant. Some natural habitats are sensitive and/or threatened, as riparian habitats of valleys of the Syrdarya and Zeravshan rivers and xerophytic shrublands on the north slope of the Nuratau Range. Endemic and threatened plants were found on the north slope of the Nuratau Range. But in general, OTHL crosses mainly modified habitats of agricultural lands. The loss of vegetation during construction of OTHL towers can have some negative impacts on flora and vegetation on small areas. Within the modified habitats, the negative impact can be assessed as insignificant. As for natural habitats, the location of OHTL towers should be identified in such a way as to minimize potential negative impacts on flora and vegetation, especially endemic, threatened and sensitive species on the north slope of the Nuratau Range and riparian habitats of the Syrdarya and Zeravshan valleys

6) 70 km OHTL

The analysis of satellite imagery and results of the field survey showed that the habitats along the 70 km OTHL are both natural and modified. Natural habitats cover rather small areas along the OTHL line, they are occupied with poor, sparse and uniform vegetation typical for intensively grazed rangelands in clayey piedmont plains and foothills of Uzbekistan. The 70 km OTHL crosses mainly modified habitats of non-irrigated and irrigated agricultural lands, gardens and vineyards. For these modified habitats, mainly weedy plants were recorded (including aliens). The loss of vegetation during construction of OTHL towers can have some negative impacts on flora and vegetation on small areas, but in general, the negative impact can be assessed as insignificant. Threatened or endemic species are absent.

8 Conclusion

The habitats within the **100 MW PV plant** site are modified. There are rainfed arable lands and fallow lands with secondary vegetation typical for such disturbed areas in clayey piedmont plains of Uzbekistan. In total, 70 plant species were recorded, none of them are nationally or globally red-listed, 13 species are alien and 2 are agricultural crops, trees and shrubs are absent. The loss of vegetation during construction of the solar power plant can have some negative impacts on flora and vegetation, affect habitat conditions of wildlife, and potentially reducing biodiversity in the area. The negative impact also may be related to the deflation and dust storms after the destroying of vegetation on these areas. Taking into account the current state of these modified habitats and secondary vegetation, the negative impact can be assessed as insignificant.

The habitats within the **500 MW BESS and Nurabad substation** site are modified. It is a fallow land with poor, sparse and uniform vegetation typical for such disturbed areas and intensively grazed rangelands in clayey piedmont plains of Uzbekistan. In total, 25 plant species were recorded, none of them are nationally or globally red-listed, 3 species are alien, trees and shrubs are absent. The loss of vegetation during construction of the substation and BESS can have some negative impacts on flora and vegetation, affect habitat conditions of wildlife, and potentially reducing biodiversity in the area. The negative impact also may be related to the deflation and dust storms after the destroying of vegetation on these areas. Taking into account the current state of these modified habitats and poor secondary vegetation, the negative impact can be assessed as insignificant.

The habitats within the **400 and 500 MW PV plant** site are both natural and modified, occupied with poor, sparse and uniform vegetation typical for such disturbed areas and intensively grazed rangelands in clayey piedmont plains of Uzbekistan. In total, 14 plant species were recorded, none of them are nationally or globally red-listed, or alien, trees and shrubs are absent. The loss of vegetation during construction of the solar power plants can have some negative impacts on flora and vegetation, affect habitat conditions of wildlife, and potentially reducing biodiversity in the area. The installation of solar panels can lead to changes in local microclimate and affect some plant species that are sensitive to changes in insolation, temperature, humidity, and wind conditions. The negative impact also may be related to the deflation and dust storms after the destroying of vegetation on large areas. Taking into account the current state of these habitats and poor vegetation, the negative impact can be assessed as insignificant.

The habitats along the **OHTL 350 km** are both natural and modified, and the diversity of flora and vegetation is rather significant. In total, 8 habitat types were identified (4 types of modified and 4 types of natural habitats). Some natural habitats are sensitive and/or threatened, as riparian habitats of valleys of the Syrdarya and Zeravshan rivers and xerophytic shrublands on the north slope of the Nuratau Range. Endemic and threatened plants were found on the north slope of the Nuratau Range. But in general, OHTL crosses mainly modified habitats of agricultural lands. In total, 247 plant species of 52 families (197 native, 39 alien and 11 agricultural crops or introduced fruit or ornamental trees) were recorded during the field surveys along 360 km OTHL. One threatened restricted-range endemic species included in the Red Data Book of Uzbekistan (*Phlomis nubilans*, UzbRDB category 3) and 2 non redlisted endemics (*Dianthus helenae* and *Nanophyton saxatile)* were found on the north stony slope of the Nuratau Range in the natural habitat of xerophytic shrublands. Among ornamental trees, planted in woodland belts, one introduced species, *Gleditsia caspica*, is included in the IUCN Red List as Endangered, and one native species *Prunus bucharica (Amygdalus bucharica*) is included in the IUCN Red List as Vulnerable. One native species planted in the woodland belts, *Platanus orientalis,* is nationally red-listed (category 3). Generally, the flora of the OTHL area is composed with plant species more or less widely spread and typical for river valleys, foothills and anthropogenic landscapes of Uzbekistan. The habitats within the Khalka substation site are modified. There are irrigated arable lands used under cotton, woodland belts, boundary-strips, roadsides, banks of canals and drainage channels with mesophytic and hydrophytic plants typical for such agricultural landscapes (including native and alien weeds). 41 plant species were recorded, none of them are nationally or globally red-listed, 8 species are alien, 1 species is an agricultural crop, 1 species of planted trees is introduced. The loss of this anthropogenic vegetation as a result of construction and operation of the substation will not damage the native flora and vegetation. But the construction of the substation will lead to the loss of 32 hectares of the most valuable and highly productive agricultural lands with the best and most fertile soils of Uzbekistan. In this connection, it more rational to use some wasteland for the construction of a substation.

The habitats along the **70 km OTHL** are both natural and modified, and the diversity of flora and vegetation is rather low. In total, 6 habitat types were identified (4 types of modified and 2 types of natural habitats). Endemic and/or threatened plants were not found. In general, the 70 km OTHL crosses mainly modified habitats of of non-irrigated and irrigated agricultural lands, gardens and vineyards. In total, 76 plant species of 28 families (53 native,

15 alien and 8 agricultural crops or introduced fruit or ornamental trees) were recorded during the field surveys along 70 km OTHL. Among ornamental trees, planted in woodland belts, one introduced species, *Gleditsia caspica*, is included in the IUCN Red List as Endangered. Generally, the flora of the 70 km OTHL area is composed with plant species more or less widely spread and typical for dry foothills and anthropogenic landscapes of Uzbekistan.

The habitats within the **Karakul BESS** site are both natural and modified. The natural habitat of the sandy desert has already been destroyed on about half of the territory, and strongly degraded on the another half. In total, 19 plant species were recorded, none of them are nationally or globally red-listed, or alien. The main negative impact may be related to the deflation and dust storms after the destroying of vegetation on this area. Taking into account the current state of these habitats and strongly degraded vegetation, the negative impact can be assessed as insignificant.

The habitats within the **4.9 km OHTL** site are modified. It is a fallow land with poor, sparse and uniform vegetation typical for such disturbed areas and intensively grazed rangelands in clayey piedmont plains of Uzbekistan. In total, 25 plant species were recorded, none of them are nationally or globally red-listed, 3 species are alien, trees and shrubs are absent. Taking into account the current state of these modified habitats and poor secondary vegetation, the negative impact can be assessed as insignificant.

Following habitat types were identified within the Project area: 6 types of natural habitats (Dry grasslands, Wet grasslands, Wetlands, Xerophytic shrublands, Riparian scrub and Sandy desert); 4 types of modified habitats (Arable lands, Fruit gardens and vineyards, Fallow lands and Woodland belts, boundary-strips, roadsides, canals and drainage channels). The flora of the Project area counts 266 species of 53 families, among them, 39 are alien and 12 are agricultural crops or introduced fruit or ornamental trees. 2 species (one of them is planted tree) are listed in the Red Data Book of Uzbekistan as vulnerable and decreasing (status 3). 2 species are not red-listed endemics. 2 species of planted trees (1 native and 1 introduced) are included in the IUCN Red List.

Resuming above mentioned habitat and flora assessment results, following measures can be recommended to prevent and minimize these negative impacts, and restore habitats and biodiversity of the Project area:

- The location of OHTL towers should be identified in such a way as to minimize potential negative impacts on flora and habitats, especially endemic, threatened and sensitive species on the north slope of the Nuratau Range and riparian habitats of the Syrdarya and Zeravshan valleys.

- Habitat restoration measures and regular monitoring should be carried out in surroundings of solar power plants, BESS and substations. Native plant species should be reintroduced, weeds and alien plants should be controlled.

- It is not recommended to build a Khakla substation on the valuable land intensively used in agriculture; it is more rational to use some wasteland for this purpose.

- Special measures should be taken for fixation of sands and combat deflation (phytomelioration, fences, mechanical dune stabilization, etc.) in the project site of Karakul BESS and its surroundings.

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Annex A: Photo materials on habitats

Figure 23: SS Khalka, sample plot 01 (41.01202° N, 69.09104° E), irrigated arable lands used under cotton (Gossypium hirsutum). Modified habitat

Figure 24: Center of SS Khalka, sample plot 01 (41.01202° N, 69.09104° E), a boundary-strip along the cotton field and a woodland belt of mulberry trees (Morus alba). Modified habitat

Figure 25: SS Khalka, sample plot 01 (41.01202° N, 69.09104° E), an irrigation canal between the cotton fields with reeds (Phragmites australis). Modified habitat

Figure 26: Sample plot 02 (40.98328° N, 69.07634° E), 360 km OTHL, Quyi Chirchiq District of Tashkent Region, 3 km to the south of SS Khalka. Woodland belt, roadsides with ruderal vegetation and canal with reeds. Modified habitat

Figure 27: Sample plot 03 (40.84008° N, 68.86496° E), 360 km OTHL, Quyi Chirchiq District of Tashkent Region, between villages Dustobod and Qis-ona, irrigated arable lands used under wheat (Triticum aestivum). Modified habitat

Figure 28: Sample plot 03 (40.84008° N, 68.86496° E), 360 km OTHL, Quyi Chirchiq District of Tashkent Region, between villages Dustobod and Qiz-Ona, reeds and salt tree-forb-grass community along a canal between wheat, cotton and peanut fields

Figure 29: Sample plot 04 (40.81907° N, 68.82596° E), 360 km OTHL, Quyi Chirchiq District of Tashkent Region, wetland on the right bank of the river Syrdarya near the village Qiz-Ona, and riparian tamarisk scrub on the left bank

Figure 30: Sample plot 04 (40.81907° N, 68.82596° E), 360 km OTHL, Quyi Chirchiq District of Tashkent Region, wetland on the right bank of the river Syrdarya near the village Qiz-Ona, sand mining and riparian tamarisk scrub on the left bank

Figure 31: Sample plot 05 (40.81739° N, 68.82465° E), 360 km OTHL, Syrdarya District of Syrdarya Region, a group of poplar trees (Populus pruinosa) among sparse riparian tamarisk scrub on the left bank of Syrdarya River

Figure 32: Sample plot 05 (40.81739° N, 68.82465° E), 360 km OTHL, Syrdarya District of Syrdarya Region, left bank of the river Syrdarya, sand mining

Figure 33: Sample plot 06 (40.80202° N, 68.79952° E), 360 km OTHL, Syrdarya District of Syrdarya Region, along the road P-26, between villages Hikmatli and Syrdarya, reeds and ruderal vegetation on the banks of the canal, between rice fields

Figure 34: Sample plot 07 (40.78989° N, 68.75629° E), 360 km OTHL, Syrdarya District of Syrdarya Region, between villages Hikmatli and Qumovul, wetland with salt tree-Zygophyllum-camel thorn-grass community along drainage channel, between irrigated arable lands

Figure 35: Sample plot 07 (40.78989° N, 68.75629° E), 360 km OTHL, Syrdarya District of Syrdarya Region, between villages Hikmatli and Qumovul, wetland with salt tree-Zygophyllum-camel thorn-grass community along a drainage channel

Figure 36: Sample plot 08 (40.78442° N, 68.68° E), 360 km OTHL, Syrdarya District of Syrdarya Region, woodland belt and irrigated alfa-alfa crops between the railway and highway M34

Figure 37: Sample plot 09 (40.5548° N, 68.61285° E), 360 km OTHL, Mirzaabad District of Syrdarya Region, drainage channel with camel thorn-reed-liquorice community, between irrigated wheat and cotton fields and highway

Figure 38: Sample plot 10 (40.52026° N, 68.45822° E), 360 km OTHL, Mirzaabad District of Syrdarya Region, 3.6 km to the east of the village Sardoba, tamarisk-saltwort-camel thorn community and reeds along drainage channel

Figure 39: Sample plot 11 (40.447° N, 68.24592° E), 360 km OTHL, border of Dzhizak and Syrdarya Regions, 1 km to the west of the village Gulzor, tamarisk-saltwort-camel thorn community and reeds between the drainage channel and highway M39

Figure 40: Sample plot 12 (40.33315° N, 67.92044° E), 360 km OTHL, Pakhtakor District of Dzhizak Region, between towns Pakthakor and Zafarabad, woodland belt and community of camel thorn, tamarisk and reeds along the road and canal

Figure 41: Sample plot 12 (40.33315° N, 67.92044° E), 360 km OTHL, Pakhtakor District of Dzhizak Region, between towns Pakthakor and Zafarabad, woodland belt and community of camel thorn and tamarisk along the road and on boundary strip at the edge of irrigated field

Figure 42: Sample plot 13 (40.16754° N, 67.694° E), 360 km OTHL, Sharaf Rashidov District of Dzhizak Region, northern piedmonts of Nuratau Range, caper-ephemeroid-sagebrush community. Natural habitat.

Figure 43: Sample plot 14 (40.1459° N, 67.69066° E), 360 km OTHL, Sharaf Rashidov District of Dzhizak Region, northern slope of Nuratau Range, sparse spiny almond shrublands with nationally red-listed endemic Phlomis nubilans in the herbage. Natural habitat.

Figure 44: Sample plot 15 (40.14371° N, 67.69029° E), 360 km OTHL, Sharaf Rashidov District of Dzhizak Region, crest of Nuratau Range, non-irrigated fallow land with secondary forb-grass community. Modified habitat.

Figure 45: Sample plot 16 (40.07431° N, 67.59559° E), 360 km OTHL, Gallaral District of Dzhizak Region, surroundings of the village Chayanly, intensively grazed wet grassland in the valley of temporary stream on the southern slope of Nuratau Range

Figure 46: Surroundings of sample plot 16 (40.07431° N, 67.59559° E), 360 km OTHL, Gallaral District of Dzhizak Region, surroundings of the village Chayanly, southern slope of Nuratau Range, area trampled by livestock (shepherds summer camp) on the terrace of temporary stream

Figure 47: Sample plot 17 (40.06872° N, 67.56588° E), 360 km OTHL, Gallaral District of Dzhizak Region, between town Gallaaral and village Karakchi, woodland belt and non-irrigated safflower field (Carthamus tinctorius) on the southern slope of Nuratau Range, modified habitat

Figure 48: Sample plot 18 (40.02118° N, 67.53507° E), 360 km OTHL, Gallaral District of Dzhizak Region, 3 km to the west of town Gallaaral, woodland belt along the railway, modified habitat

Figure 49: Sample plot 18 (40.02118° N, 67.53507° E), 360 km OTHL, Gallaral District of Dzhizak Region, 3 km to the west of town Gallaaral, cattle camp in the pasture between woodland belt and the railway

Figure 50: Sample plot 19 (39.98759° N, 67.5331° E), 360 km OTHL, Gallaral District of Dzhizak Region, intermountain Nurata valley, between town Gallaaral and village Moltop, rainfed wheat fields, modified habitat

Figure 51: Surroundings of sample plot 19 (39.98759° N, 67.5331° E), 360 km OTHL, Gallaral District of Dzhizak Region, intermountain Nurata valley, between town Gallaaral and village Moltop, young apple garden among rainfed fields, modified habitat

Figure 52: Sample plot 20 (39.9269° N, 67.50502° E), 360 km OTHL, border of Dzhizak and Samarkand Regions, eastern piedmonts of Khobduntau Range, woodland belt along the road to the village Ingichka, modified habitat

Figure 53: Sample plot 21 (39.82803° N, 67.26876° E), 360 km OTHL, Bulungur District of Samarkand Region, southern piedmonts of Khobduntau Range, 3 km to the north of the village Gatcha, rainfed barley fields and fallow lands, modified habitat

Figure 54: Sample plot 22 (39.83778° N, 67.21814° E), 360 km OTHL, Bulungur District of Samarkand Region, southern piedmonts of Khobduntau Range, 2.5 km to the north of the village Bat-Bat, fallow land with camel thorn-caper-ephemeroid vegetation, apple garden in the background, modified habitat

Figure 55: Sample plot 23 (39.85665° N, 67.15567° E), 360 km OTHL, Dzhambay District of Samarkand Region, southern piedmonts of Khobduntau Range, 3.5 km to the northeast of the village Qongirot, dry ravine with ruderal vegetation among apple gardens and fallow lands

Figure 56: Sample plot 23 (39.85665° N, 67.15567° E), 360 km OTHL, Dzhambay District of Samarkand Region, southern piedmonts of Khobduntau Range, garbage in the dry ravine among apple gardens and fallow lands

Figure 57: Sample plot 24 (39.87971° N, 66.98251° E), 360 km OTHL, Dzhambay District of Samarkand Region, small irrigated cotton, alfalfa and corn fields, vineyards and market gardens, between the village Dauchar and canal Payaryk. Modified habitat

Figure 58: Sample plot 25 (39.83927° N, 66.9548° E), 360 km OTHL, Payaryk District of Samarkand Region, irrigated cotton fields and woodland belts near the village Bakalchak. Modified habitat

Figure 59: Sample plot 26 (39.82998° N, 66.88828° E), 360 km OTHL, Payaryk District of Samarkand Region, surroundings of the village Chumishli, weedy vegetation on the floodplain terrace on the right bank of the river Akdarya (right branch of the river Zeravshan) among irrigated lands. Modified habitat

Figure 60: Sample plot 27 (39.77631° N, 66.7911° E), 360 km OTHL, Akdarya District of Samarkand Region, 1.5 km to the southwest of the village Khadzhi, native riparian vegetation on the floodplain on the right bank of the river Karadarya (left branch of the river Zeravshan). Natural habitat

Figure 61: Sample plot 27 (39.77631° N, 66.7911° E), 360 km OTHL, Akdarya District of Samarkand Region, the river Karadarya (left branch of the river Zeravshan)

Figure 62: Sample plot 27 (39.77631° N, 66.7911° E), 360 km OTHL, Akdarya District of Samarkand Region, on illegal garbage dump among riparian scrub in the floodplain of the river Karadarya

Figure 63: Sample plot 28 (39.75687° N, 66.74248° E), 360 km OTHL, Pastdargom District of Samarkand Region, a canyon of canal Dargom

Figure 64: Sample plot 28 (39.75687° N, 66.74248° E), 360 km OTHL, Pastdargom District of Samarkand Region, a vineyard on the terrace on the right bank of canal Dargom

Figure 65: Sample plot 29 (39.77313° N, 66.69923° E), 360 km OTHL, Pastdargom District of Samarkand Region, grass-camel thorn vegetation on clayey slopes of ravine between canals Dargom and Durmansay

Figure 66: Surroundings of sample plot 29 (39.77313° N, 66.69939° E), 360 km OTHL, Pastdargom District of Samarkand Region, to the north of the village Baldyr, ponds in the ravine between canals Dargom and Durmansay

Figure 67: Sample plot 30 (39.62176° N, 66.582° E), 360 km OTHL, Pastdargom District of Samarkand Region, irrigated arable lands between villages Khancharvak and Kayrogoch

Figure 68: Sample plot 31 (39.59459° N, 66.71014° E), 360 km OTHL, Pastdargom District of Samarkand Region, 5 km to the north of the village Sazagan, apple garden and camel thorn-grass community on the boundary-strip

Figure 69: Sample plot 32 (39.57447° N, 66.7379° E), 500 MW BESS, Nurabad District of Samarkand Region, 2.5 km to the north of the village Sazagan, fallow land

Figure 70: Sample plot 33 (39.57559° N, 66.74406° E), Nurabad substation, Nurabad District of Samarkand Region, 2.5 km to the north of the village Sazagan, fallow land

Figure 71: Area to the south of Nurabad substation, Nurabad District of Samarkand Region. Dead apple seedlings and drip irrigation pipes, an unsuccessful attempt to create an orchard on the fallow land

Figure 72: Sample plot 34 (39.55423° N, 66.69496° E), Sazagan-2 PV site, Nurabad District of Samarkand Region, 2 km to the northwest of the village Sazagan, rainfed crops

Figure 73: Sample plot 35 (39.5462° N, 66.69512° E), Sazagan-1 PV site, Nurabad District of Samarkand Region, 1.5 km to the west of the village Sazagan, fallow land

Figure 74: Sample plot 36 (39.55146° N, 66.68727° E), Nurabad District of Samarkand Region, Ettitepa Archeologic Heritage site, dry grassland

Figure 75: Sample plot 36 (39.55146° N, 66.68727° E), Nurabad District of Samarkand Region, Ettitepa Archeologic Heritage site, archaeological excavations

Figure 76: Sample plot 37 (39.54724° N, 66.68084° E), Sazagan-1 PV site, Nurabad District of Samarkand Region, 2.8 km to the west of the village Sazagan, rainfed crops

Figure 77: Sample plot 38 (39.54687° N, 66.67097° E), Sazagan-1 PV site, Nurabad District of Samarkand Region, 4 km to the west of the village Sazagan, fallow land with secondary forb-grass vegetation

Figure 78: Sample plot 39 (39.45894° N, 65.9849° E), northeastern part of 400 MW PV site, Nurabad District of Samarkand Region, 2.3 km to the northwest of the village Koshkuduk, fallow land with very sparse camel thorn-ephemeroid vegetation

Figure 79: Sample plot 40 (39.44893° N, 65.96658° E), western part of 400 MW PV site, Nurabad District of Samarkand Region, 3.5 km to the west of the village Koshkuduk, natural habitat of clayey piedmont plain with camel thorn-ephemeroid vegetation

Figure 80: Sample plot 41 (39.44314° N, 65.97621° E), central part of 400 MW PV site, Nurabad District of Samarkand Region, 2.3 km to the west of the village Koshkuduk, fallow land with very sparse camel thorn-ephemeroid vegetation

Figure 81: Sample plot 42 (39.41943° N, 65.94493° E), northern part of 500 MW PV site, Nurabad District of Samarkand Region, 5.8 km to the soutwest of the village Koshkuduk, clayey piedmont plain with native camel thorn-ephemeroid vegetation

Figure 82: Sample plot 43 (39.43202° N, 65.94462° E), central part of 500 MW PV site, Nurabad District of Samarkand Region, 5 km to the west of the village Koshkuduk, clayey piedmont plain with native camel thorn-ephemeroid vegetation

Figure 83: Western part of 500 MW PV site, Nurabad District of Samarkand Region, clayey piedmont plain with native camel thorn-ephemeroid vegetation, a flock of sheep in the pasture and village in the background

Figure 84: Sample plot 44 (39.51688° N, 63.87222° E), Karakul BESS site, Karakul District of Bukhara Region, natural habitat of sandy desert with white saxaul (Haloxylon persicum) on shallow wavy fixed sands, and modified habitat (construction site)

Figure 85: Sample plot 44 (39.51688° N, 63.87222° E), Karakul BESS site, Karakul District of Bukhara Region, modified habitat (garbage dump) at the edge of village

Figure 86 Sample plot 45 (39.56555° N, 66.71898° E), 70 km OTHL, Nurobod District of Samarkand Region, dry temporary stream, ephemeroid-forb-camel thorn community