Annexe

Annexe 1 : Biodiversity Management Plan El Khobna

Draft – Biodiversity Management Plan Report for Khobna – 198 MW solar PV site, Mezzouna Sidi Bouzid – Tunisia

Category A Project

Environmental Assessment & Management

September 2025

REPORT:	**Draft – Biodiversity Management Plan Report for Khobna – 198 MW solar PV site, Mezzouna Sidi Bouzid – Tunisia** **Category A Project**
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ACRONYMS & ABREVIATIONS

AAO	Association Les Amies des Oiseaux
BMP	Biodiversity Management Plan
CEPF	Critical Ecosystem Partnership Fund
CHA	Critical Habitat Assessment
CRDA	Regional Agricultural Development Commission
DGF	Directorate General of Forestry
E&S	Environmental and Social
EAM	Environmental Assessment and Management
EBRD	European Bank for Reconstruction and Development
EIB	European Investment Bank
EHS	Environment, Health and Safety
EN	Endangered
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESPIU	Environmental and Social Project Implementation Unit
EU	European Union
IBA	Important Bird Areas
IBAT	International Biodiversity Assessment Tool
IFC	International Finance Corporation
IUCN	International Union for the Conservation of Nature
LC	Least Concern
ME	Ministry for the Environment
MIME	Ministry of Industry, Mines and Energy
NP	National Parks
OHTL	Overhead Transmission Line
PPA	Power Purchase Agreement
PR	Performance Requirement
QHSE	Quality, Health, Safety and Environment
SEP	Stakeholder Engagement Plan
STEG	Tunisian Company of Electricity and Gas
VU	Vulnerable

1 Introduction

1.1 Project Context

As part of its energy transition strategy, Tunisia has set itself the target of achieving a share of renewable energies in the electricity mix of 35% by 2030 and 50% by 2035. This will result in the installation of a total functional renewable capacity of 4,850 MW by 2030 and 8,350 MW by 2035 using photovoltaic and wind. Qair (hereafter referred to as "the Developer"), was awarded in December 2024, a 198 Mega Watt Peak (MWp) Photo Voltaic (PV) Solar power plant in the governorate of Sidi Bouzid referred to as "the Project" or 'Khobna Solar PV Plant'. Qair was selected after an international competitive call of tenders launched by the Government of Tunisia under the reference AO-01-2022, represented by the Ministry of Industry, Energy and Mining (MIME). On 24 March 2025, Qair signed a concession agreement with the Ministry of Industry, Mines and Energy and a 25-year Power Purchase Agreement (PPA) with the Tunisian Company of Electricity and Gas (STEG).

This document is the Biodiversity Management Plan (BMP) for the 198 MWp Solar Photovoltaic (PV) plant and 225 kV overhead transmission line 45 km long. It has been prepared in accordance with the IFC Performance Standards (2012), Environmental and Social Policy (ESP - 2024) of the European Bank for Reconstruction and Development (EBRD) and the Environmental and Social Standard of the European Investment Bank (EIB).

1.2 Purpose of Biodiversity Management Plan

This document constitutes the Biodiversity Management Plan (BMP) and will be updated following the results of additional field ecological surveys, which are required to:

- inform measures to avoid, reduce or compensate biodiversity impacts,
- demonstrate how biodiversity impacts have been avoided in the first instance and mitigated, as well as providing a clear strategy for no net loss/net gain where appropriate,
- confirm the absence of potential Critical Habitat species, and
- identify any additional technical mitigation measures related to the solar PV plant, the final OHTL alignment, and the configuration of cables and pylons.

The BMP contains the management tool that provides the assurance that measures to manage risks to biodiversity are implemented and maintained throughout the project lifecycle. It provides details on how the BMP will be implemented by the Developer (Qair) and EPC Contractors during construction and operational phase.

The objective of this draft BMP includes the following:

- identify the mitigation and monitoring measures for biodiversity in compliance with:
  - IFC – Performance standard 6 (PS6): Biodiversity Conservation and Sustainable Management of Living Natural Resources
  - EBRD – Environmental and Social Requirement 6 (ES6) :, Biodiversity Conservation and Sustainable Management of Living Natural Resources
  - EIB – Standard 4: Biodiversity and ecosystems.
- adopt the mitigation hierarchy to anticipate and avoid, or where avoidance is not possible, reduce, mitigate, and restore impacts to biodiversity.
- develop and strictly implement policies, plans and procedures to integrate biodiversity management within the framework of the project's environmental and social management plans/procedures for the lifecycle of the project.
- establish a monitoring program to assess the effects of residual impacts on biodiversity.

- report the results of the periodic audits and provide for corrective actions, if necessary, in order to reach the plan objectives.

2 Project description

Tunisia is divided 24 Governorates which are subdivided into 264 delegations, further subdivided into sectors. The Khobna Solar Plant site is located within Sidi Bouzid Governorate in the delegation of Mazzouna, and within Khobna Sector. The nearest community to the solar PV plant is Khobna 7 km North-West which has a population of approximately 3,000.
The Project comprises the installation of a 45 km Overhead Transmission line (OHTL) with 7 summits (departure/ arrival and corner pylons) between the Khobna solar PV plant and Meknassi sub-station.

Administrative and google earth maps of Khobna solar PV plant and the OHTL are presented below:

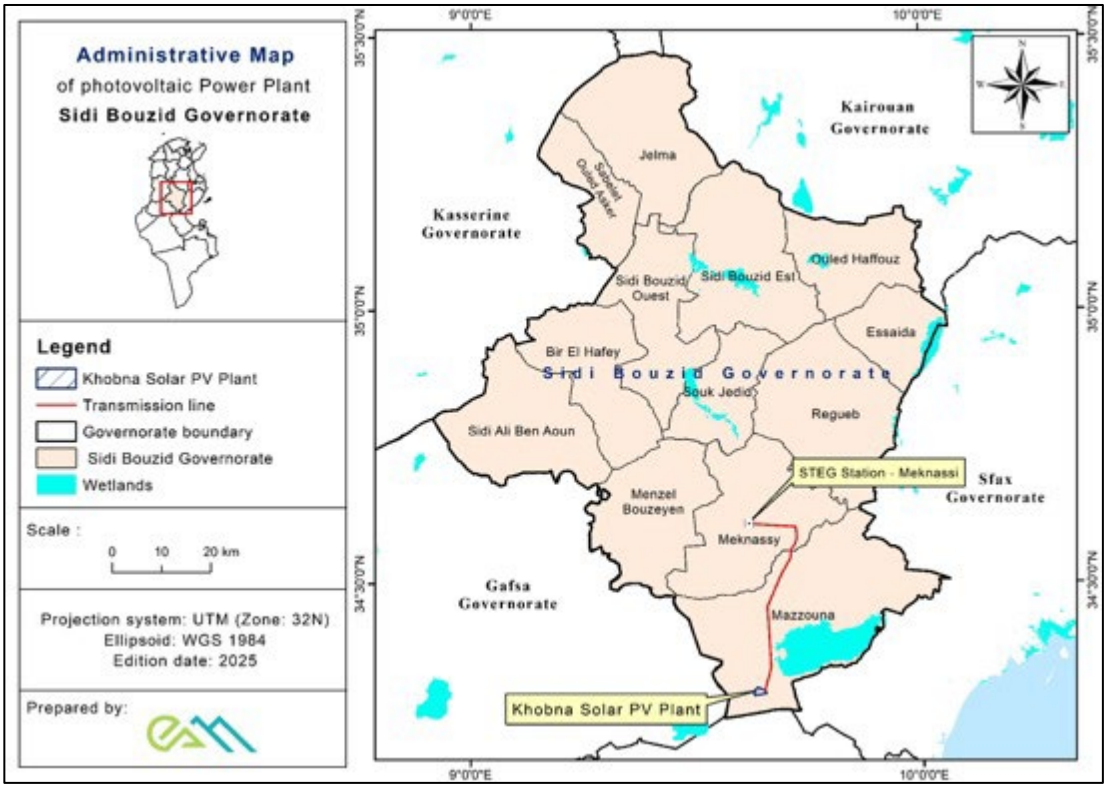

Figure 2.1 - Administrative Map of the Project

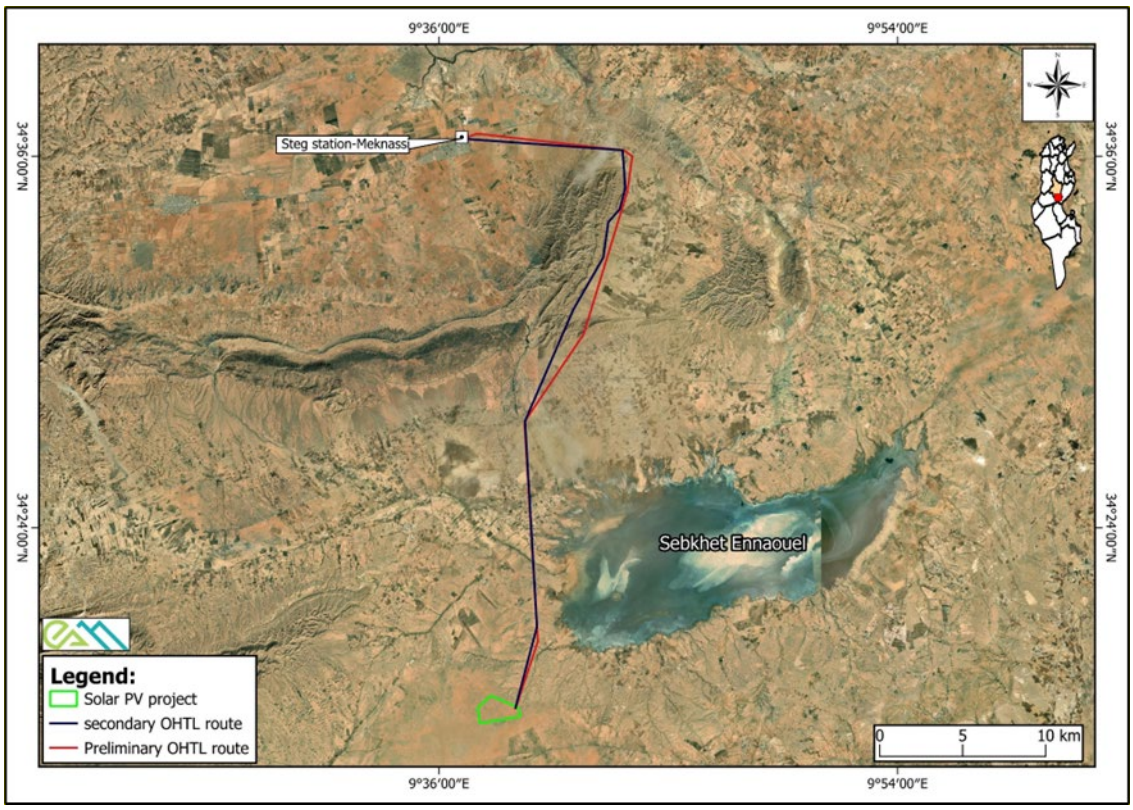

Figure 1.2 - Geographical location of the PV site and the OHTL

3 National legislation and EBRD REquirements

The Developer is committed to ensuring that the Project complies with applicable national legislation and IFC standards, EBRD requirements and EIB standards, a summary of which are outlined in this section. Additional information is provided in the ESIA.

3.1 National Legislation

The legal framework established in Tunisia covers most aspects of environmental protection, pollution control and improvement of the living environment.

In addition to these conventions, a legal arsenal has been put in place to preserve and protect biodiversity, with the most important texts cited below: The local regulatory and legislative framework for biodiversity management includes the following main texts:

- ***Law No. 88-20 on the Forestry Code of 13 April 1988*** revising the Forestry Code, as amended and supplemented by Law no. 2005-13 of January 26, 2005. The Forestry Code covers all the special rules applying to forests, alfalfa beds, rangelands, forest land, national parks and nature reserves, and wild fauna and flora, with the aim of ensuring their protection, conservation and rational use, as well as guaranteeing users the legal exercise of their rights.
- ***Order of the Minister of Agriculture and Hydraulic Resources of 19 July 2006, establishing the list of rare and endangered wild fauna and flora.*** The present Order fixes the list of rare and endangered wild fauna and flora.
- ***Law No. 92-72 of 3 August 1992 on the revision of plant protection legislation***
  This law lays down the general provisions relating to plant protection and the organization of the pesticides sector for agricultural use. The law comprises 24 articles divided into 4 titles, namely General provisions and definitions (I); Quarantine, including provisions relating to the establishment of the list of quarantine pests against which control is compulsory and the list of plants whose entry into Tunisian territory is prohibited, provisions relating to the powers of phytosanitary inspectors, prevention and control measures within the territory (declarations, access and controls, possible compensation), phytosanitary control measures at points of entry (II) Control of the trade, distribution and use of pesticide products, which must be approved and whose manufacture, import, formulation, packaging, sale and distribution must be authorized in advance (III); Penal and final provisions (IV).
- ***The Minister of Agriculture and Hydraulic Resources of 29 June 2006 laying down the conditions for granting authorizations for temporary occupancy in the State forest estate***
  It prohibits the temporary authorization of any work that will have a negative impact and risk on the environment and natural resources in forest areas, national parks, nature parks and wildlife protection zones.

3.2 National Biodiversity Strategy and Action Plan

Biodiversity in Tunisia is related to 69 sets of natural ecosystems and 12 sets of agro-systems. A total of 7212 species including 3749 terrestrial plant and animal species and 3463 marine and aquatic plant and animal species have been recorded.

The National Biodiversity Strategy and Action Plan 2018-2030 was drawn up in 2017 by the Ministry of Local Affairs and the Environment.

The document is structured into five chapters that deal successively with (1) Biodiversity; (2) the background to the strategy; (3) the strategy; (4) the action plan for implementing the strategy; and (5) financing the 2018-2030 action plan.

The report:

- ✓ defines biodiversity, the benefits inherent in ecosystem services and the pressures on biodiversity in Tunisia;
- ✓ recalls the history and results of previous steps taken in this context;
- ✓ proposes the strategy to be adopted, its vision and priorities in 5 main actions aimed at (a) strengthening capacity and implementation of the strategy and its action plan; (b) integrating biodiversity values into all policies; (c) developing traditional knowledge and know-how; (d) reducing pressures and threats to biodiversity and promoting its sustainable use; and (e) protecting and restoring biodiversity, improving ecosystem resilience and enhancing ecosystem services, taking into account the Aichi strategic goals and objectives.
- ✓ sets out the action plan for implementing the strategy;
- ✓ proposes and describes five federated actions in relation to the main priorities defined;
- ✓ draws up a financing plan for the 2018-2023 action plan.

The Biodiversity Management Plan for the OHTL considers the National Biodiversity Strategy and Action Plan 2018-2030 and responds to at least eight of its strategic actions and objectives directly related to biodiversity and ecosystem conservation:

1. Strategic objective 1.2: Set up a system for monitoring and evaluating the implementation of the National Biodiversity Strategy and Action Plan 2018-2030.
2. Strategic objective 2.1: Raise awareness, educate and communicate on the values of biodiversity.
3. Strategic objective 2.2: Integrate biodiversity into socio-economic development planning at various levels.
4. Strategic goal 3.1: Improve and integrate knowledge of changes in the state of biodiversity.
5. Strategic objective 4.1: Reduce the causes of biodiversity loss.
6. Strategic goal 4.2: Mitigate/prevent environmental threats to ecosystems.
7. Strategic goal 5.1: Protect and restore biodiversity.
8. Strategic goal 5.2: Improve ecosystem resilience and maintain/enhance ecosystem services.

3.3 International conventions ratified by Tunisia

Tunisia has ratified more than 60 international conventions and agreements concerning environmental protection. It has developed information systems as part of the implementation of the three RIO conventions to facilitate reporting to various organizations, including: (i) the information system developed as part of the implementation of the Convention on Biological Diversity; and (ii) the information system on the Clean Development Mechanism.

Table 3.1 - *The main texts regulating these international ratifications*

International Conventions	Ratification text
Stockholm Convention on Persistent Organic Pollutants (POPs)	Decree No. 2004-918 of April 13, 2004
Cartagena Protocol on Biosafety.	Law n°2002-58 of June 25, 2002
Kyoto Protocol and Law 93-46 of May 3, 1993, ratifying the United Nations Framework Convention on Climate Change.	Law 2002-55 of June 19, 2002
Agreement Relating to the Establishment and Operation of the Observatory of the Sahara and Sahel	Law n°2000- 12 of February 7, 2000
Bern Convention on the Conservation of European Wildlife and Natural Habitats.	Law n° 95-75 of 07/08/95
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal.	Law 95-63 of July 10, 1995
United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought.	Law 95-52 of June 19, 1995
United Nations Convention on Biological Diversity.	Law 93-45 of May 3, 1993
United Nations Framework Convention on Climate Change.	Law 93-46 of May 3, 1993
Convention on the Conservation of Migratory Species of Wild Animals.	Law 86-63 of July 16, 1986
Convention on Wetlands of International Importance.	Law No. 80-9 of March 3, 1980
Protocol relating to the cooperation of North African States in the fight against desertification.	Law 71-1 of January 25, 1979
African Convention for the Conservation of Nature and Natural Resources.	Law 76-91 of November 4, 1976
Convention for the Protection of the World Cultural and Natural Heritage.	Law 74-89 of December 11, 1974
Convention on International Trade in Endangered Species of Wild Fauna and Flora	Law 74-12 of March 11, 1974

3.4 IFC Requirements

The IFC of the World Bank provides a range of guidance documents related to the assessment and management of E&S issues in project development. Not only does IFC guidance provide a generally accepted basis for good practice, but it also provides the technical cornerstone for the Equator Principles which set out the E&S requirements of banks for project finance. The IFC requirements have become the de facto international E&S performance benchmark for project financing.

The IFC policy on E&S Sustainability puts into practice IFC's overall commitments to E&S sustainability. The policy seeks to: (i) enhance the predictability, transparency, and

accountability of IFC's actions and decision making; (ii) help clients manage their environmental and social risks and impacts and improve their performance; and (iii) enhance positive development outcomes on the ground. In addition, the Policy identifies IFC's commitments, its roles and responsibilities and other as applicable.

The IFC Performance Standards (PS) on Social and Environmental Sustainability set out a framework for managing and improving project performance from planning and assessment, through construction and operations to closure. The Performance Standards requirements are summarized in the table below.

IFC PS	Key Points
PS1: Assessment and Management of Environmental and Social Risks and Impacts	PS1 underscores the importance of managing social and environmental performance throughout the life of a project by using a dynamic social and environmental management system. Specific objectives of this Performance Standard are: ▪ To identify and assess social and environment impacts, both adverse and beneficial, in the project's area of influence; ▪ To avoid, or where avoidance is not possible, minimize, mitigate, or compensate for adverse impacts on workers, affected communities, and the environment; ▪ To ensure that affected communities are appropriately engaged on issues that could potentially affect them; and ▪ To promote improved social and environment performance of companies through the effective use of management systems.
PS2: Labor and Working Conditions	The requirements set out in this PS have been in part guided by a number of international conventions negotiated through the International Labor Organization (ILO) and the United Nations (UN). Specific objectives of this Performance Standard are: ▪ To establish, maintain and improve the worker-management relationship; ▪ To promote the fair treatment, non-discrimination and equal opportunity of workers and compliance with national labor and employment laws; ▪ To protect the workforce by addressing child labor and forced labor; and ▪ To promote safe and healthy working conditions, and to protect and promote the health of workers.
PS 3: Resource Efficiency and Pollution Prevention	This Performance Standard outlines a project approach to pollution prevention and abatement in line with international available technologies and practices. It promotes the private sector's ability to integrate such technologies and practices as far as their use is technically and financially feasible and cost-effective in the context of a project that relies on commercially available skills and resources. Specific objectives of this Performance Standard are: ▪ To avoid or minimize adverse impacts on human health and the environment by avoiding or minimizing pollution from project activities; and ▪ To promote the reduction of emissions that contribute to climate change.
PS 4: Community Health, Safety and Security	This PS recognizes that project activities, equipment, and infrastructure often bring benefits to communities including employment, services, and opportunities for economic development. However, projects can also increase risks arising from accidents, releases of hazardous materials, exposure to diseases, and the use of security personnel. While acknowledging the public authorities' role in promoting the health, safety and security of the public, this PS

	addresses the project sponsor's responsibility in respect of community health, safety and security.
PS 5: Land Acquisition and Involuntary Resettlement	Involuntary resettlement refers both to physical and economic displacement as a result of project-related land acquisition. Where involuntary resettlement is unavoidable, appropriate measures to mitigate adverse impacts on displaced persons and host communities should be carefully planned and implemented.
PS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	This Performance Standard reflects the objectives of the Convention on Biological Diversity to conserve biological diversity and promote the use of renewable natural resources in a sustainable manner. This Performance Standard addresses how project sponsors can avoid or mitigate threats to biodiversity arising from their operations as well as sustainably manage renewable natural resources. Specific objectives of this Performance Standard are: ▪ To protect and conserve biodiversity; and ▪ To promote the sustainable management and use of natural resources through the adoption of practices that integrate conservation needs and development priorities.
PS 7: Indigenous Peoples	Indigenous peoples may be particularly vulnerable to the adverse impacts associated with project development, including risk of impoverishment and loss of identity, culture, and natural resource-based livelihoods. PS7 seeks to ensure that business activities minimize negative impacts, foster respect for human rights, dignity and culture of indigenous populations, and promote development benefits in culturally appropriate ways. PS 7 (Indigenous Peoples) is not considered to be applicable to this Project.
PS 8: Cultural Heritage	Consistent with the Convention Concerning the Protection of the World Cultural and Natural Heritage, this Performance Standard aims to protect irreplaceable cultural heritage and to guide project sponsors on protecting cultural heritage in the course of their business operations.

3.5 EBRD Requirements

The applicability to the Project of EBRD's Environmental and Social Requirements is summarised below:

EBRD Performance Requirement	Applicability to the Project
EBRD ESR1 – Assessment and management of environmental and social risks and impacts	Applicable – this ESR always applies to an EBRD financed Project.
EBRD ESR2 – Labour and working conditions	Applicable – the Project will involve the use of a workforce consisting of direct employees and non-employee workers engaged through contractors and potentially other intermediaries. The Project will involve a supply chain where there is a risk of labour violations from occurring.
EBRD ESR3 – Resource efficiency and pollution prevention and control	Applicable – the Project will generate greenhouse emissions, use resources (such as gravel and water), has the potential to result in pollution, and must also respond and be resilient to climate impacts.
EBRD ESR4 – Health, safety and security	Applicable – the Project will generate health and safety risks to local communities and the workforce, including workers who are non-employees and those involved in the supply chain. The Project will also use security personnel to ensure the safety of sites from equipment theft and unauthorised entry.

EBRD Performance Requirement	Applicability to the Project
EBRD ESR5 – Land acquisition, restrictions on land use and involuntary resettlement	Applicable – the Project will involve land acquisition and restrictions on access to land-based assets from the physical presence of the transmission line pylons and the substation, and land use restrictions below the electrical wires.
EBRD ESR6 – Biodiversity conservation and sustainable management of living natural resources	Applicable – the Project may require the clearance of vegetation and soil to provide space for the transmission line pylons and substation, and there is a risk that flora and fauna will be affected. Most significantly, avifauna are likely to be impacted by habitat removal and the installation and operation of overhead electrical cables. Appropriate well tested mitigation measures will need to be developed and implemented.
EBRD ESR8 – Cultural heritage	Applicable – the Project involves ground-breaking, intrusive work during the construction stage that has the potential to damage physical cultural heritage resources that may be present below ground. A Chance find procedure will be applied although ESR8 may still apply as the proximity of cultural heritage receptors to the route of the transmission line is not yet known and will be clarified during later stages of the ESIA process.
EBRD ESR10 – Information disclosure and stakeholder engagement	Applicable – this ESR always applies to an EBRD financed Project.

3.6 EIB Requirements

The European Investment Bank's (EIB) Standard 4: Biodiversity and Ecosystems (along with associated guidance note) requires project promoters to assess, manage, and monitor the impacts and risks to biodiversity and ecosystems in order to protect biodiversity, maintain ecosystem functions, and prevent significant harm. The standard is underpinned and aligned with relevant EU legislation especially the 'do no significant harm" principle and promoting a holistic, human rights-based approach. Key requirements of the Standard include assessing impacts, identifying and protecting high-value biodiversity, managing risks from invasive species, and applying the mitigation hierarchy (avoidance, minimization, restoration, and compensation) to achieve no net loss or a net positive impact on biodiversity.

4 EXISTING ENVIRONMENT

Ornithological surveys were undertaken between April and August 2025. Avifauna on the project site were monitored using transect methods, while surveys along the OHTL route were conducted from fixed vantage points (point observations). The survey campaigns took place on 8–11 April, 17–18 May, 12–15 June, 12–13 July, 18–19 August, 1–2 and 21–22 September 2025. The April–July campaigns were undertaken along the initial OHTL route, whereas the August and September campaigns were conducted along the revised route. Further surveys will be undertaken in Autumn 2025 and Winter 2025/2026.

A biodiversity survey focusing on flora and terrestrial fauna was also conducted on 17–18 May 2025 within the project site and along the initial OHTL route. Although the alignment has since been slightly modified, this adjustment is not considered material and does not affect the overall biodiversity baseline assessment results.

This section presents the key findings on flora, fauna, and avifauna based on field surveys conducted as described below.

4.1 Habitats and Flora

PV Solaire Plant

From an ecosystem perspective, the site lies in an arid steppe characterized by flat grazing land with skeletal sandy-loam soils, occasionally stony or sandy with small dunes stabilized by Jujube (*Ziziphus lotus*). The landscape is homogeneous with sparse, low-diversity vegetation, dominated by Baguel (*Haloxylon salicornicum*), with scattered Astragalus (*Astragalus armatus*), Syrian Rue (*Peganum harmala*), and *Atractylis carduus*. In stony-sandy areas, Remth (*Haloxylon scoparium*) occurs, while nebkas and barchans fixed by Jujube provide shelter for small fauna, as shown by numerous burrows.
The taxonomic list of plant species identified at the site is presented in Table 1, following the nomenclature of *Le Floc'h et al., 2010*. It should be noted that the conservation status of all these species is Not Evaluated (NE). However, they may be considered as Least Concern (LC), since none are listed in national references (REGNES and the Red List of Threatened Flora in Tunisia (ME, 2025), nor in regional or international lists (IUCN, 2025). Moreover, these taxa are common and widely distributed, particularly in the arid regions of the country.

Table 4.1 - *Taxonomic list of plant species recorded at the site*

Family	Species	French name	Status	
			IUCN (2025)	National
Amaranthaceae	***Haloxylon salicornicum***	Baguel	NE	NE
	Haloxylon scoparium	Remth	NE	NE
Fabaceae	***Astragalus armatus***	Astragale vulnérant	NE	NE
Zygophyllaceae	***Peganum harmala***	Rue sauvage	NE	NE

Family	Species	French name	Status	
			IUCN (2025)	National
Amaranthaceae	***Haloxylon salicornicum***	Baguel	NE	NE
	Haloxylon scoparium	Remth	NE	NE
Fabaceae	***Astragalus armatus***	Astragale vulnérant	NE	NE
Asteraceae	***Atractylis carduus***	Atractyle à Chardon	NE	NE
Rhamnaceae	***Ziziphus lotus***	Jujubier	NE	NE

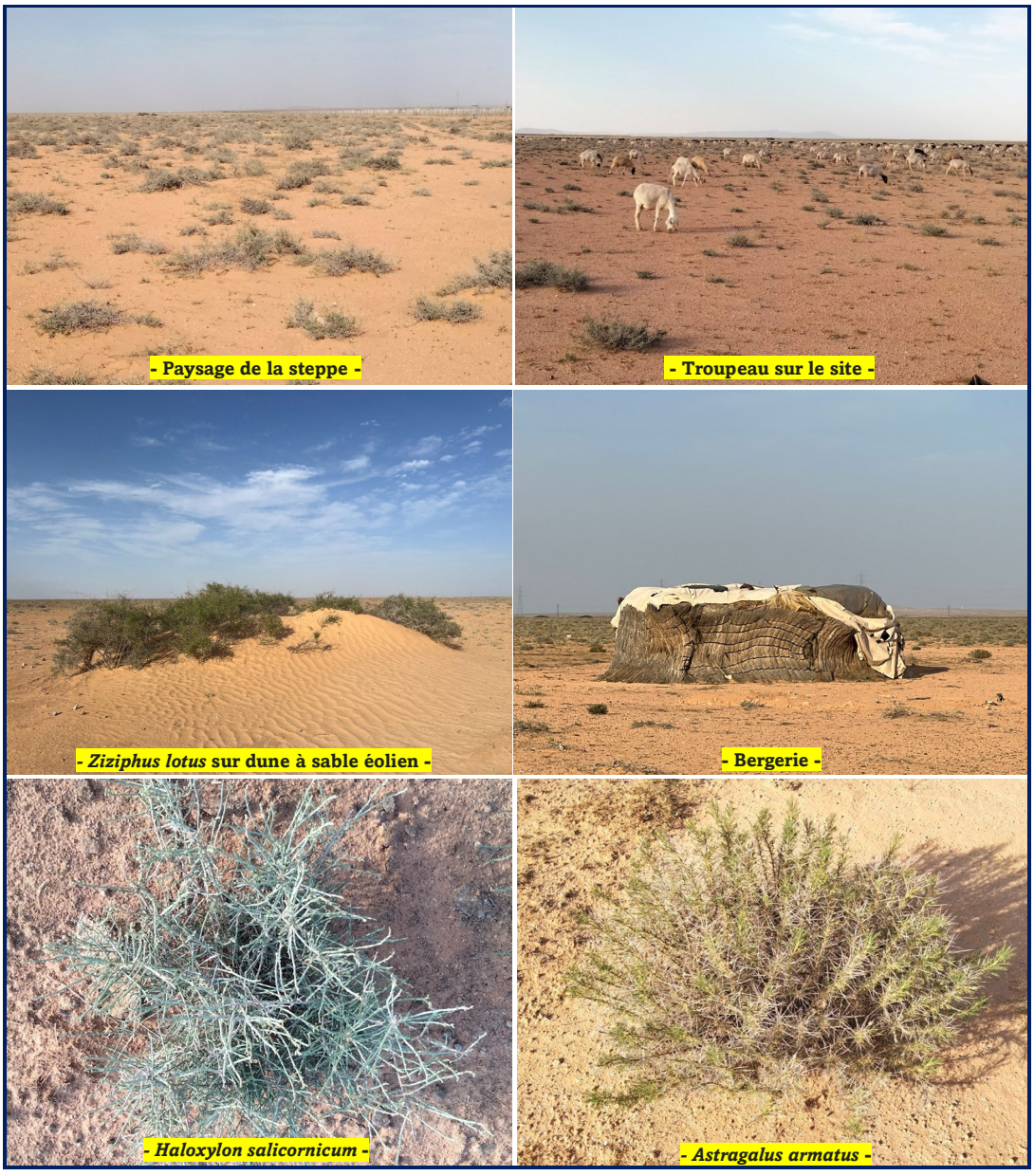

Figure 4.1 - Landscapes and main plant species of the site

Along the OHTL

The transmission line associated with the planned photovoltaic station is approximately 45 km long, extending from the eastern boundary of the site to Meknassi. Surveys of natural habitats along the transmission line corridor were carried out at eight stations, located near and around the eight avifauna

observation points (Vantage points). The biodiversity surveys were conducted prior to the modification of the OHTL route and therefore followed the previous alignment. However, as the adjustment was slight, the ecological conditions and habitat types along the revised route remain similar to those initially surveyed.

Table 4.2 - *Location of survey stations (Points 1 to 8) along the HT transmission line route*

Survey stations	Geographic coordinates	
	Latitude	Longitude
ST 1	34°20'19.51 "N	9°39'52.84 "E
ST 2	34°22'59.09 "N	9°39'41.01 "E
ST 3	34°25'12.74 "N	9°39'32.02 "E
ST 4	34°27'34.67 "N	9°39'28.99 "E
ST 5	34°30'16.83 "N	9°41'41.40 "E
ST 6	34°33'18.54 "N	9°42'48.80 "E
ST 7	34°36'13.29 "N	9°43'11.72 "E
ST 8	34°36'33.89 "N	9°39'38.97 "E

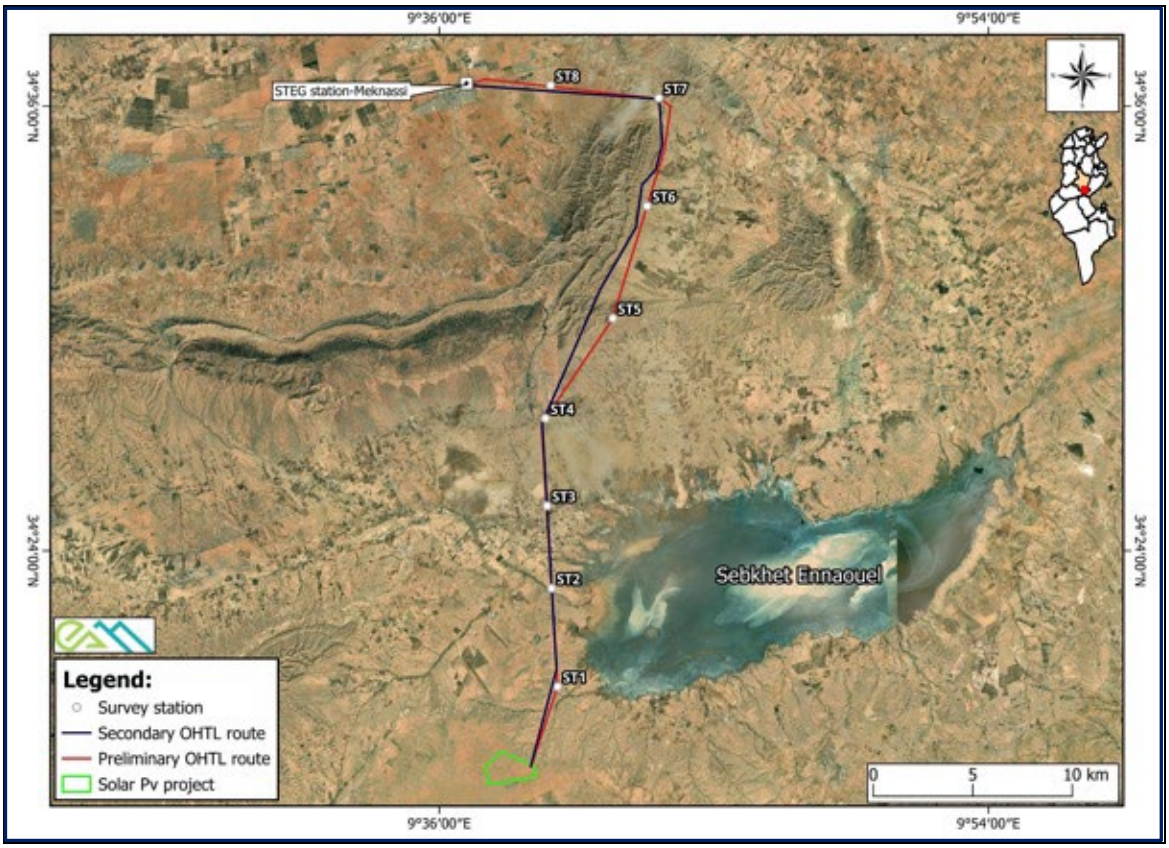

Figure 2.2 - Location of survey stations (Points 1 to 8) along the OHTL route

The surveys identified a range of habitat types across the eight stations. Station 1 corresponds to xerophilous steppe on hills with sparse shrub cover. Station 2 is a halophytic steppe on sandy soils near a wadi flowing into Sebkher Ennaoual, combining halophytic species with scattered individuals of *Vachellia tortilis* (LC globally; VU nationally) and wadi-associated vegetation. Station 3 represents sebkha habitat dominated by halophytes, where *Vachellia tortilis* also occurs sporadically. Station 4 contains a relict stand of *Vachellia tortilis* interspersed with farmland and sandy soils. Stations 5, 6, and 7 are located along the margins of Bouhedma National Park: Station 5

supports steppe vegetation on stony soils, with *Searsia tripartita* (LC globally; VU nationally) present in ravines; Station 6 combines xerophilous steppe with wadi-associated plant communities; and Station 7 consists of rugged stony terrain with steppe vegetation where perennial grasses including *Stipa tenacissima* (VU globally; LC nationally) were recorded. Station 8 lies between olive groves and a wadi, supporting vegetation linked to sandy, moist soils.

Table 4.3 - *List of plant species identified along the OHTL line*

Family	Latin name	French name	Status	
			IUCN (2025)	National
Aizoaceae	***Mesembryanthemum nodiflorum***	Ficoïde nodale	NE	NE
Amaranthaceae	***Anabasis articulata***	Baguel	NE	NE
	Atriplex halimus	Arroche	NE	NE
	Caroxylon vermiculatum	Salicorne vermiculée	NE	NE
	Halocnemum strobilaceum	Salicorne strobilée	NE	NE
	Haloxylon salicornicum	Saligne blanche	NE	NE
	Haloxylon scoparium	Remth	NE	NE
	Suaeda vermiculata	Soude vermiculée	NE	NE
Anacardiaceae	***Searsia tripartita***	Sumac tripartite	LC	VU
Apiaceae	***Pituranthos chloranthus***	Déesse de l'accouchement	NE	NE
Apocynaceae	***Pergularia tomentosa***	Pergulaire	NE	NE
Asparagaceae	***Asparagus horridus***	Asperge d'horride	NE	NE
Asteraceae	***Artemisia campestris***	Armoise champêtre	NE	NE
	Artemisia herba-alba	Armoise blanche	NE	NE
	Cynara cardunculus	Cardon sauvage	NE	NE
	Rhanterium suaveolens	Rhanterium odorant	NE	NE
Boraginaceae	***Echiochilon fruticosum***	Absinthe du désert	NE	NE
Brassicaceae	***Diplotaxis harra***	Diploptaxe	NE	NE
	Moricandia arvensis	Chou des champs	NE	NE

Caprifoliaceae	***Scabiosa atropurpurea***	Scabieuse pourpre	NE	NE
Caryophyllaceae	***Gymnocarpos decander***	Gymnocarpe	NE	NE
Cistaceae	***Helianthemum lippii***	Fleur de Jade	NE	NE
Euphorbiaceae	***Euphorbia retusa***	Euphorbe obtus	NE	NE
Fabaceae	***Astragalus armatus***	Astragale vulnérant	NE	NE
	Retama raetam	Rétame	NE	NE
	Vachellia (Acacia) tortilis	L'Acacia gommier	**LC**	**VU**
Frankeniaceae	***Frankenia thymifolia***	Frankénie	NE	NE
Lamiaceae	***Ballota hirsuta***	Marrube hérissé	NE	NE
	Lavandula multifide	Lavande multifide	NE	NE
Nitrariaceae	***Nitraria retusa***	Nitraire	NE	NE
	Peganum harmala	Rue sauvage	NE	NE
Plumbaginaceae	***Limoniastrum monopetalum***	Grande Statice	NE	NE
	Limonium lobatum	Statice lobée	NE	NE
	Limonium tuberculatum	Statice à tubercules	NE	NE
Poaceae	***Cenchrus ciliaris***	Cenchrus cilié	NE	NE
	Lygeum spartum	Sparte	NE	NE
	Stipa tenacissima	Alfa	**VU**	**LC**
Polygonaceae	***Polygonum equisetiforme***	Renouée à balais	NE	NE
Rhamnaceae	***Ziziphus lotus***	Jujubier	NE	NE
Solanaceae	***Lycium shawii***	Lyciet	**LC**	NE
Tamaricaceae	***Reaumuria vermiculata***	Lotier faux pied d'oiseau	NE	NE
	Tamarix africana	Tamaris africain	**LC**	NE
Thymelaeaceae	***Thymelaea hirsuta***	Passerine	NE	NE

NE = Not Evaluated, LC = Least Concern, VU = Vulnerable, Species indicated as NE because they are not listed in national (REGNES, ME 2025), regional, or international (IUCN 2025) references. They are common and widely distributed in arid regions. They may therefore be considered as Least Concern (LC).

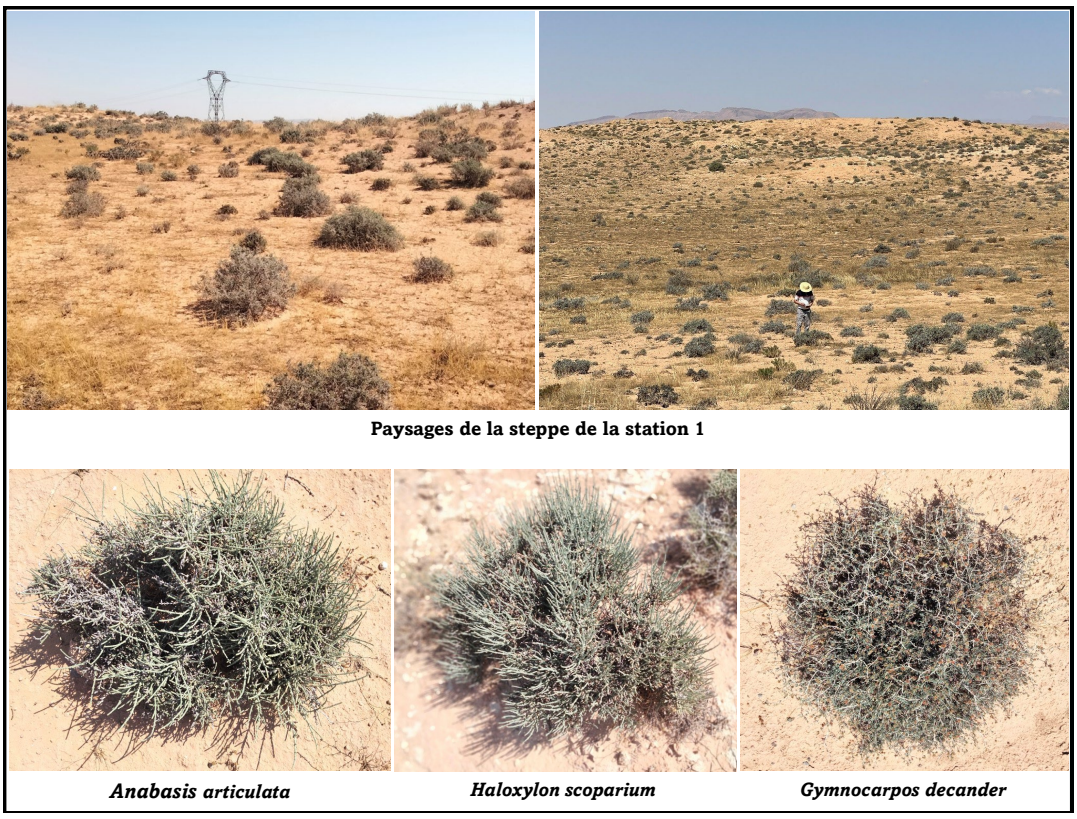

Figure 4.3 - Landscapes and characteristic plant species of Station 1

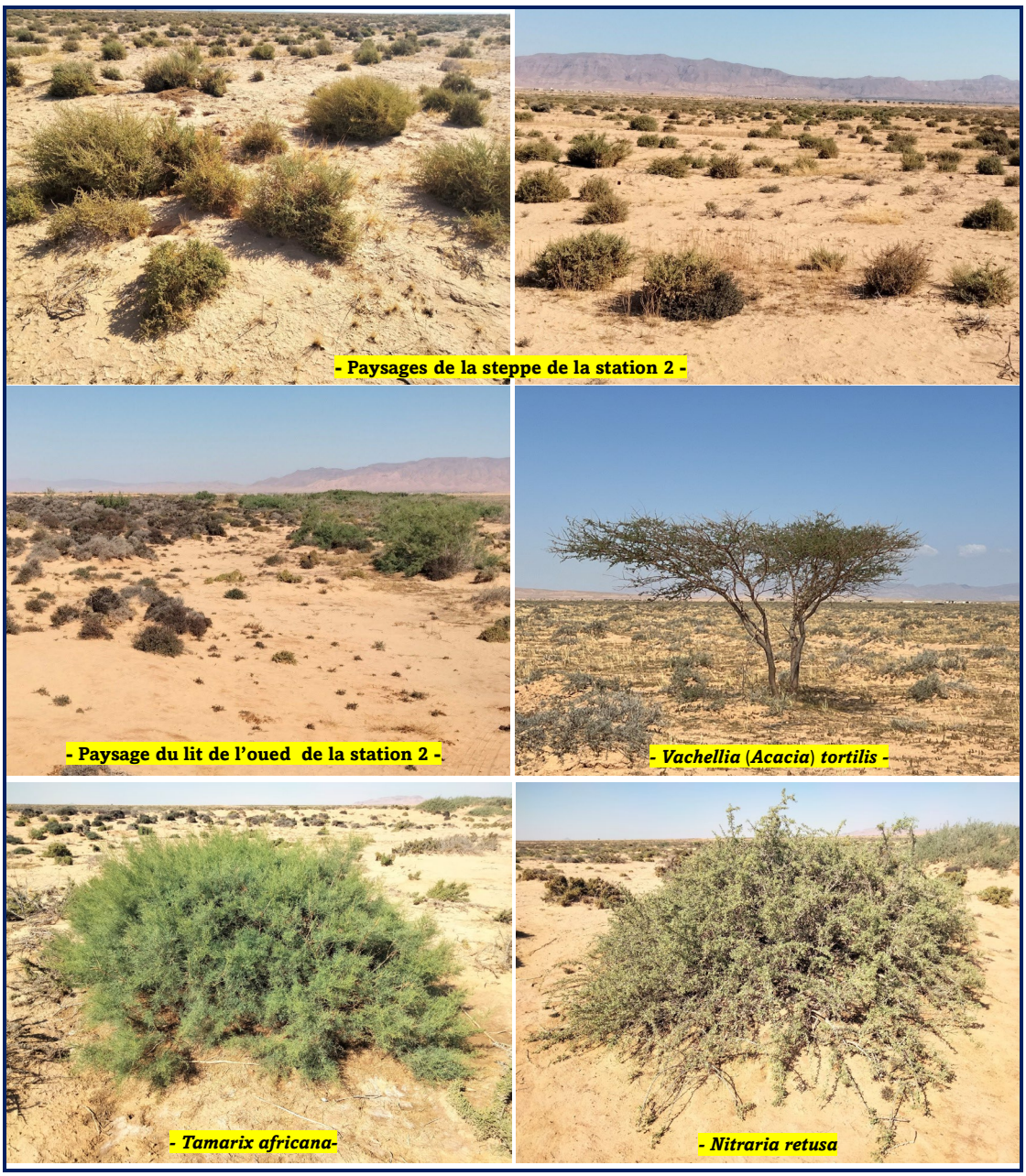

Figure 4.4 - Landscapes and characteristic plant species of Station 2

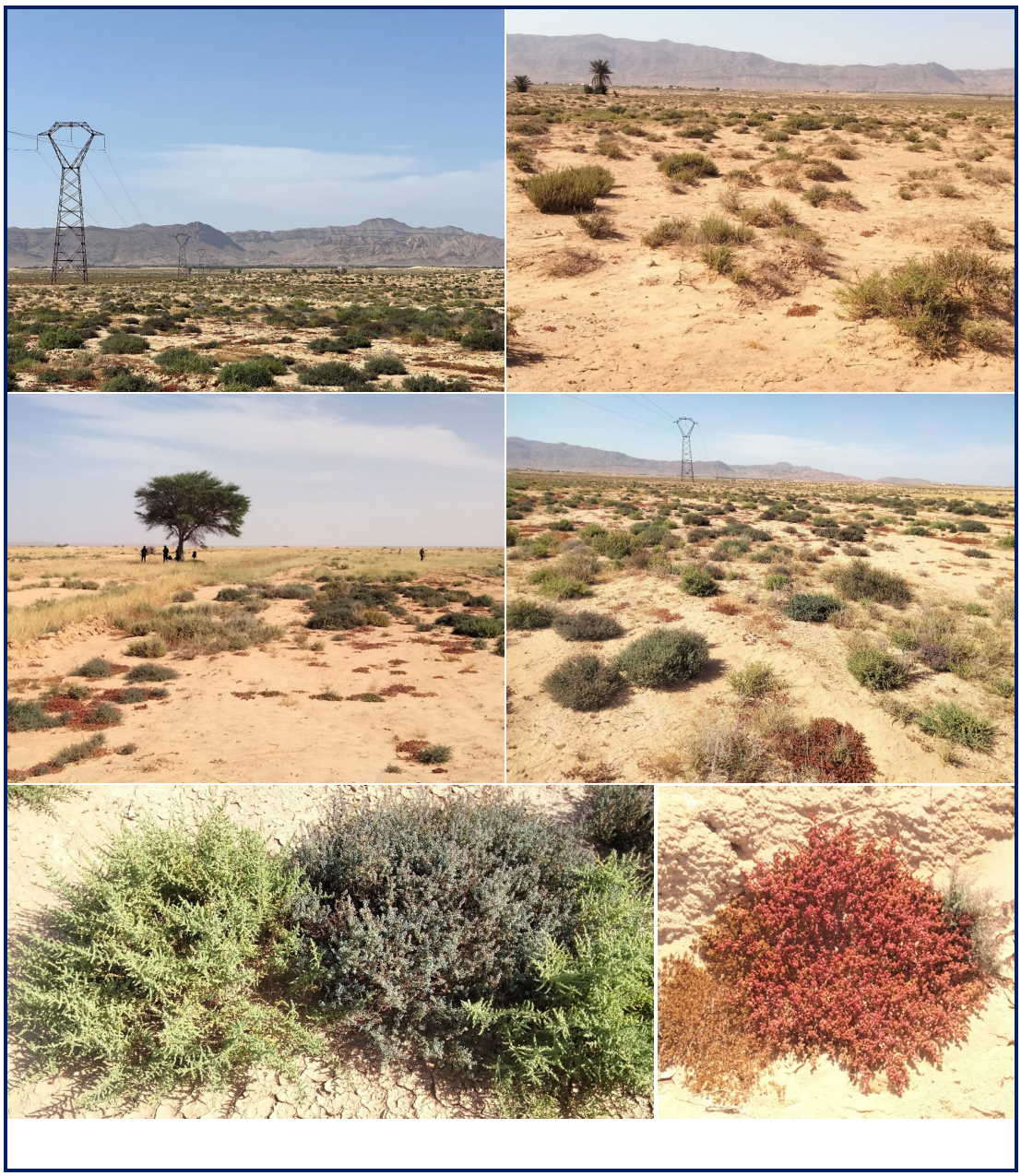

Figure 4.5 - Landscapes and Halophytes of the Sebkha (Station 3)

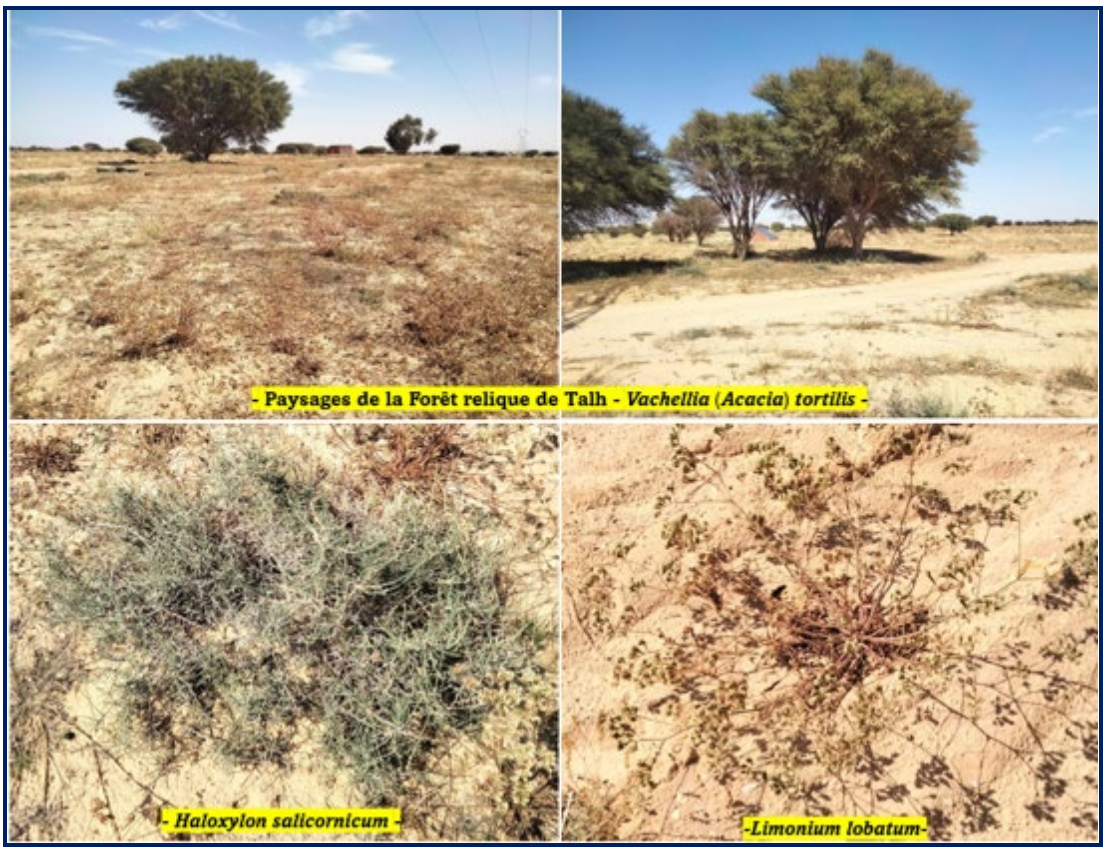

Figure 4.6 - Landscape and Main plants at station 4

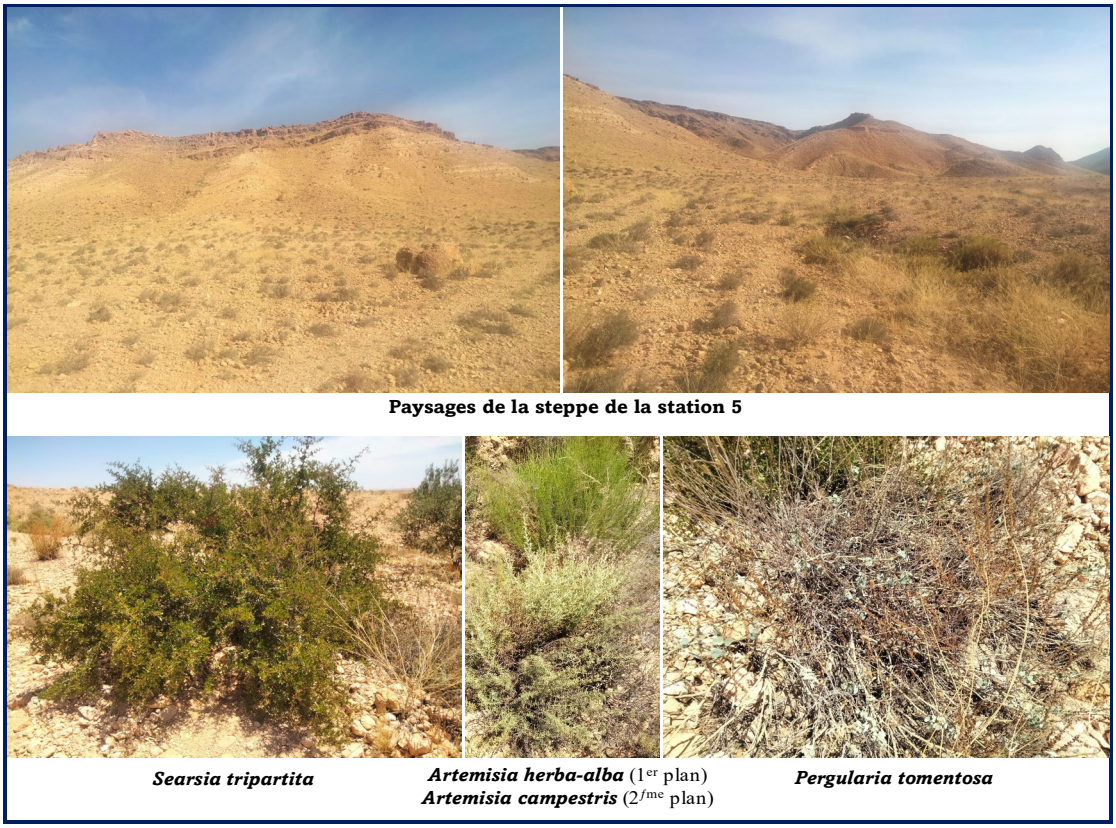

Figure 4.7 - Landscape and Main plants at station 5

Figure 4.8 - Landscape of station 7

Figure 4.9 - Landscape of Station 8

Conclusion

- The PV site and HT line corridor are dominated by arid steppe and halophytic ecosystems**,** with sparse, low-diversity vegetation typical of pre-desert environments.
- *Haloxylon salicornicum*, *Haloxylon scoparium*, *Anabasis articulata*, and *Astragalus armatus* are the most widespread species across the surveyed stations.
- The majority of the Species are indicated as NE, they are not listed in national (REGNES, ME 2025) or international (IUCN 2025) references. They are common and widely distributed in arid regions. They may therefore be considered as Least Concern (LC).
- Three species of conservation concern were recorded:
  - *Vachellia Acacia tortilis* (LC globally; VU nationally), observed at Station 2 and 4
  - *Stipa tenacissima* (VU globally; LC nationally, observed at station 7
  - *Searsia tripartita* (LC globally; VU nationally), observed at station 5 and 7

In line with EBRD ESR6 definitions, only *Stipa tenacissima* (a Needle Grass) qualifies as a **Priority Biodiversity Feature (PBF)** due to their Vulnerable status at a global level. However, they were observed only as scattered individuals at low densities and do not form dominant or habitat-defining assemblages.

4.2 Fauna

Faunal surveys were conducted both within the boundaries of the PV solar plant site and along the route of the associated transmission line. In line with the approach used for the flora survey, observations were made at the same eight survey stations established

near the avifauna vantage points.

PV solar plant

a. Invertebrates

The small invertebrates observed on the site are:

- A gastropod mollusc: *Sphincterochila candidissima*.
- Two species of Tenebrionid Coleoptera insects: *Prionotheca coronata* and *Pimelia interstitialis*.
- Two species of Buthidae scorpions: *Androctonus australis* and *Buthacus arenicola*.

b. Vertebrates

i. Reptiles

Two lizard species were recorded on site: *Stenodactylus mauritanicus* and *Chalcides boulengeri*. Workers at the adjacent PV station also reported the presence of *Cerastes cerastes* and *Naja haje*. A broader list of reptiles potentially occurring in the area was compiled from published literature, using the nomenclature of Nouira et al. (2002). All species are listed as Least Concern (LC) by the IUCN Red List of Mediterranean Reptiles (2006).

Table 4.4 - *List of reptiles observed/potentially present within the PV solar project*

Order	Family	Genus & species French & Latin names	Status
Saurians	Varanidae	Le Varan ***Varanus griseus***	LC
	Gekkonidae	Le Gecko ***Stenodactylus mauritanicus*** (Ob.)	LC
	Agamidae	L'agame ***Trapelus mutabilis***	LC
	Lacertidae	L'Acanthodactyle ***Acanthodactylus boskianus***	LC
		La Mésaline ***Mesalina olivieri***	LC
	Scincidae	Le Seps ***Chalcides boulengeri*** (Ob.)	LC
Ophidians	Lamprophiidae	Le Psammophide ***Psammophis schokari***	LC
		La Couleuvre ***Malpolon moilensis***	LC
	Viperidae	La vipère à cornes ***Cerastes cerastes***	LC
	Elapidae	Le Cobra ***Naja haje***	LC

LC: Least concern, Ob: Observed, Status: UICN, 2006. Conservation status and geographical distribution of reptiles and amphibians of the Mediterranean basin.

ii. Mammals

Traces of the movement of Gerboises on the quicksand of the nebkas and several burrows of rodents and red foxes have been spotted at the foot of the plant clumps, particularly those of the Jujubiers in the sandy areas.

The list of mammals likely to be found in this habitat is based on the literature (CHETOUI, in press ; EL-FARHATI et al., 2019). All these species have LC status according to the Red List of Mediterranean Mammals (2008).

Table 4.5 - *List of mammals potentially present within the PV solar project*

Order	Family	French name Genus & species	Status
Lagomorphs	**Leporidae**	Le Lièvre du Cap ***Lepus capensis***	LC
Rodents	**Muridae**	La Gerbille champêtre ***Gerbillus campestris***	LC
		La Gerbille de Simon ***Gerbillus simoni***	LC
		Le Mérion de Shaw ***Meriones shawi***	LC
		Le Rat des sables ***Psammomys obesus***	LC
	Dipodidae	La grande Gerboise ***Jaculus orientalis***	LC
Insectivores	**Erinaceidae**	Le Hérisson d'Algérie ***Atelerix algirus***	LC
Carnivores	**Canidae**	Le Renard roux ***Vulpes vulpes***	LC
		Le Loup doré ***Canis anthus***	LC

LC: Least concern

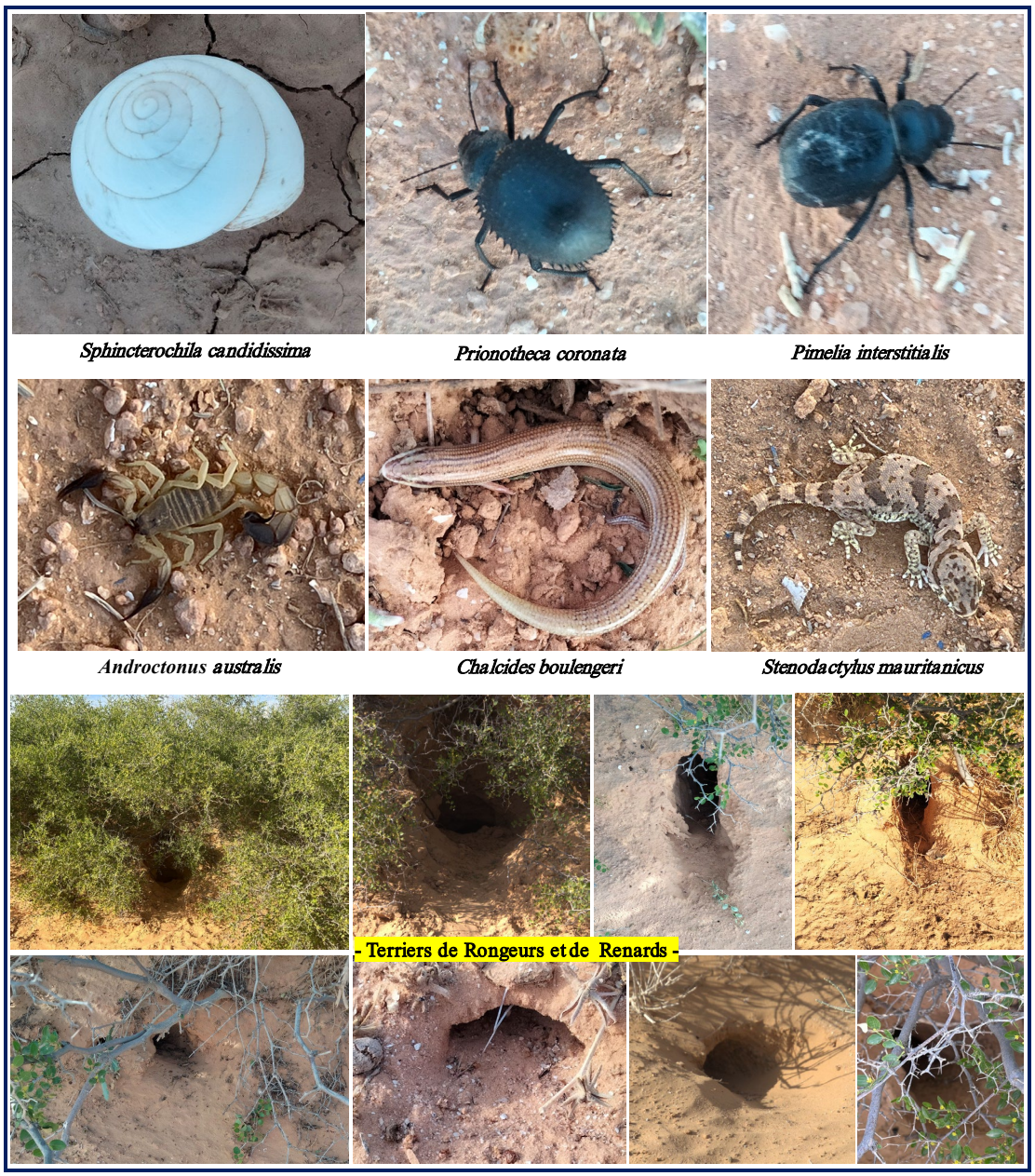

Figure 4.10 - Animals (vertebrates and invertebrates) and burrows found on the site

Along the OHTL

a. Invertebrates

Invertebrates recorded or likely to occur along the OHTL include three gastropod molluscs: *Sphincterochila candidissima*, *Eobania vermiculata*, and *Xeroplana doumeti* (the latter restricted to rocky habitats at Station 7), several insects such as *Eugaster guyony*, *Julodis sp.*, *Geomantis larvoides*, and *Sphinx caterpillars*, as well as five scorpion species. Among the latter, the poisonous *Androctonus australis* was confirmed, alongside *Buthus tunetanus*, *Androctonus bicolor*, *Buthacus arenicola*, and *Scorpio punicus*.

Table 4.6 - *List of invertebrates observed/potentially present along the OHTL route*

Group	Family	Species
Molluscs	Sphincterochilidae	*Sphincterochila candidissima*
	Helicidae	*Eobania vermiculata*
	Hygromiidae	*Xeroplana doumeti*

Insects	Tettigoniidae	*Eugaster guyony*
	Buprestidae	*Julodis sp.*
	Rivetinidae	*Geomantis larvoides*
	Sphingidae	*Sphinx caterpillars*
Scorpions	Buthidae	*Androctonus australis*
	Buthidae	*Buthus tunetanus*
	Buthidae	*Androctonus bicolor*
	Buthidae	*Buthacus arenicola*
	Scorpionidae	*Scorpio punicus*

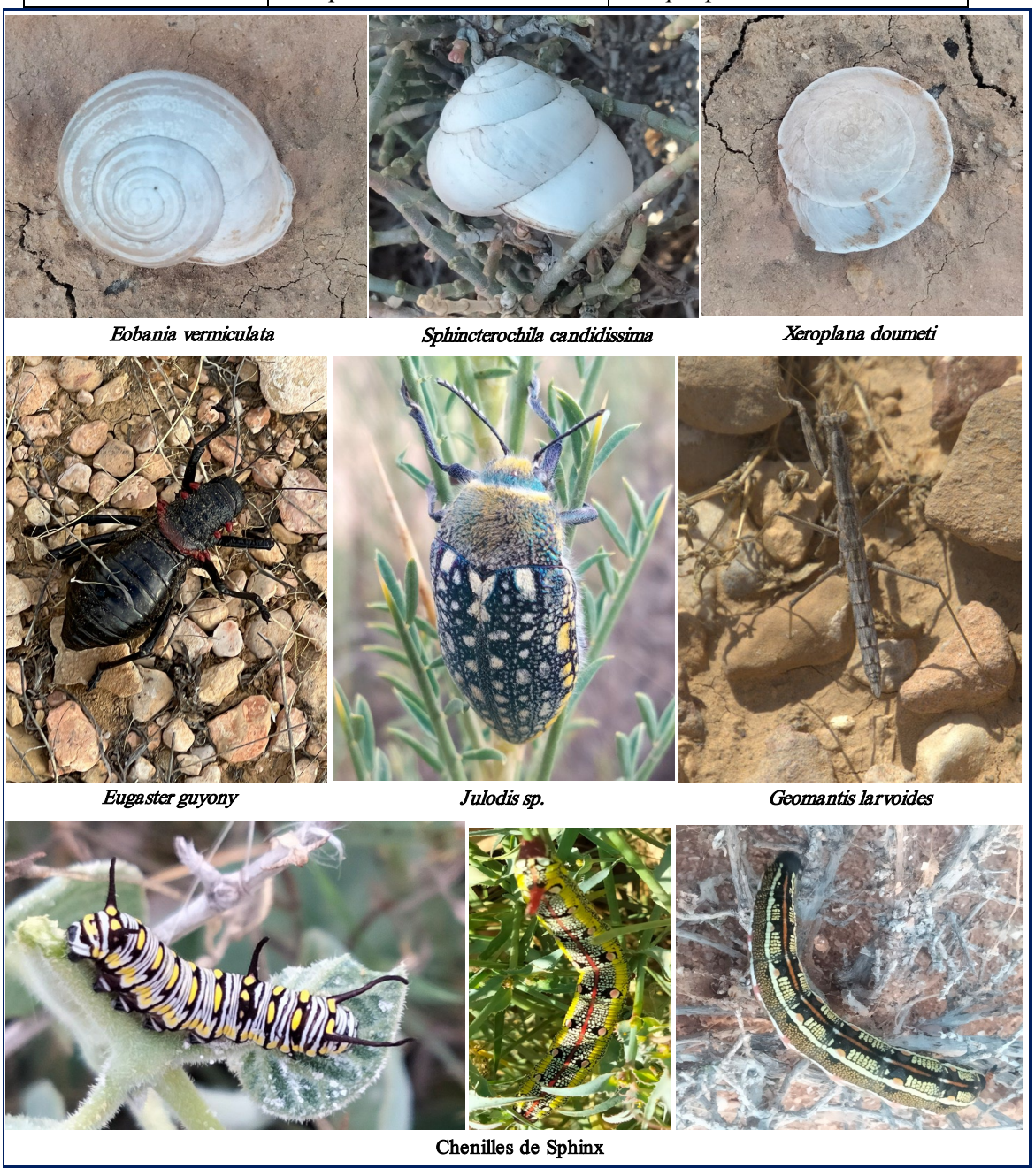

Figure 4.11 - Invertebrate species observed along the OHTL route

b. Vertebrates

i. **Amphibians**

No amphibians have been found along the LEHT route, but four species have been reported (Ben Hassine and Nouira, 2012) in the area surveyed.

Table 4.7 - *List of amphibians observed/potentially present along the OHTL route*

Family	Genus & species	IUCN (2025)
Ranidae	***Rana saharica***	LC
Alytidae	***Discoglossus pictus***	LC
Bufonidae	***Sclerophrys mauritanica***	LC
	Bufotes boulengeri	LC

LC: Least concern,

ii. Reptiles

The Bouhedma region, including the National Park, is particularly rich in reptiles due to the overlap of Palaearctic, Saharan, Saharo-Sindian, African, and North African Mediterranean elements, making it a biogeographic transition zone. Field surveys recorded a few lizards, including Varanus griseus at Station 1, while the broader list of species likely to occur is based on published literature and studies on Bouhedma's fauna.

Table 4.8 - *List of reptiles observed/potentially present along the OHTL route*

Ordre	Family	Species	Status
Chéloniens	**Testudinidae**	***Testudo graeca***	LC
Sauriens	**Chamaeleonidae**	***Chamaeleo chamaeleon***	LC
	Varanidae	***Varanus griseus*** (Observed)	LC
	Agamidae	***Trapelus mutabilis*** (Observed)	LC
		Uromastyx acanthinura	LC
	Lacertidae	***Acanthodactylus boskianus*** (Observed)	LC
		Acanthodactylus maculatus	LC
		Mesalina olivieri	LC
		Mesalina guttulata	LC
		Ophisops occidentalis	LC
	Gekkonidae	***Stenodactylus mauritanicus*** (Observed)	LC
		Tropiocolotes tripolitanus	LC
	Phyllodactylidae	***Tarentola fascicularis***	LC
	Scincidae	***Chalcides ocellatus***	LC
		Chalcides boulengeri (Observed)	LC
		Eumeces schneideri	LC
Ophidiens	**Colubridae**	***Hemorrhois hippocrepis***	LC
		Hemorrhois algirus	LC
	Lamprophiidae	***Psammophis schokari***	LC
		Malpolon insignitus	LC
		Malpolon moilensis	LC
	Viperidae	***Cerastes cerastes*** (Observed)	LC
		Echis leucogaster	LC
		Daboia mauritanica	**NT**
	Elapidae	***Naja haje***	LC

LC = Least Concern, NT :Near Threatened, Status: UICN, 2006. Conservation status and geographical distribution of reptiles and amphibians of the Mediterranean basin.

iii. Mammals

The order of mammals best represented in the sector is that of rodents, as evidenced by the large number of burrows dug at the foot of clumps of vegetation (Jujubier, Rétame,

Baguel, Remth, etc.), particularly in the sandy steppes. The list of Mammals in the sector (Table 18) was compiled using data from the literature, particularly the work of Moldrzyk (2003).
All these species have **LC** status according to the IUCN Red List of Mediterranean Mammals (2008).

Table 4.9 - *List of mammals observed/potentially present along the OHTL route*

Ordre	Family	French name/ Species	Status
Lagomorphes	**Leporidae**	Le Lièvre du Cap **Lepus capensis**	LC
Rongeurs	**Muridae**	La Gerbille champêtre **Gerbillus campestris**	LC
		La Gerbille de Lataste **Gerbillus latastei**	LC
		La Gerbille de Simon **Gerbillus simoni**	LC
		Le Mérion de Shaw **Meriones shawi**	LC
		Le Rat des sables **Psammomys obesus**	LC
		Le Rat noir **Rattus rattus**	LC
		La Souris **Mus musculus**	LC
	Ctenodactylidae	Le Goundi **Ctenodactylus gundi**	LC
	Dipodidae	La Grande Gerboise **Jaculus orientalis**	LC
	Hystricidae	Le Porc Epic ***Hystrix crsitata***	LC
Insectivores	**Erinaceidae**	Le Hérisson d'Algérie ***Atelerix algirus***	LC
Macroscelidea	**Macroscelididae**	Le Rat à trompe *Petrosaltator rozeti*	LC
Carnivores	**Viverridae**	La genette d'Europe ***Genetta genetta***	LC
	Canidae	Le Renard roux ***Vulpes vulpes***	LC
		Le Loup doré ***Canis anthus***	LC

LC = Least Concern,

The mammal group also includes bats, with 13 species recorded in Bouhedma National Park across six habitat types (Dalhoumi et al., 2016; Temple & Cuttelod, 2009). Some of these species may occur in the survey area, particularly on the rocky slopes of Bouhedma National Park, but further surveys are needed to confirm their presence at the PV station site and along the OHTL line.

Table 4.10 - *List of bats recorded in Bouhedma National Park*

Family	French name	Species	IUCN (2025)
Rhinolophidae	Grand rhinolophe	***Rhinolophus ferrumequinum***	**LC**
	Petit rhinolophe	***Rhinolophus hipposideros***	**LC**
	Rhinolophe euryale	***Rhinolophus euryale***	**NT**
	Rhinolophe de Mehely	***Rhinolophus mehelyi***	**VU**
Rhinopomatidae	Petit rhinopome	***Rhinopoma cystops***	**LC**
Molossidae	Molosse de Cestoni	***Tadarida teniotis***	**LC**
Miniopteridae	Minioptère de Schreibers	***Miniopterus schreibersii***	**VU**
Vespertilionidae	Sérotine isabelle	***Eptesicus isabellinus***	**LC**
	Pipistrelle de Kuhl	***Pipistrellus kuhlii***	**LC**
	Pipistrelle commune	***Pipistrellus pipistrellus***	**LC**

Family	French name	Species	IUCN (2025)
	Oreillard d'Hemprich	***Otonycteris hemprichii***	**LC**
	Oreillard du Maghreb	***Plecotus gaisleri***	**NE**
	Murin du Maghreb	***Myotis punicus***	**DD**

LC = Least Concern; NT = Near Threatened; VU = Vulnerable; EN = Endangered; CR = Critically Endangered; NE = Not Evaluated; DD = Data Deficient.

Conclusion

- The fauna of the PV site and OHTL corridor is rich and diverse despite the arid environment, confirmed by field observations, traces, and literature review.
- Reptiles are the most diverse group, reflecting adaptation to the range of habitats along the OHTL.
- Mammals are dominated by rodents, evidenced by numerous burrows and direct observations.
- Most vertebrate species recorded or expected are common in central and southern Tunisia and of no conservation concern.
- *Daboia mauritanica* (Near Threatened, IUCN) was not observed but is considered potentially present in rocky mountain habitats (Stations 5 and 7).
- Hazardous species confirmed in the area include the scorpion *Androctonus australis*, the horned viper *Cerastes cerastes*, and the cobra *Naja haje*.
- Bat surveys have not yet been conducted, but 13 species are known from Bouhedma National Park, including several of conservation concern (VU and NT). Targeted surveys are required to confirm their presence at the PV site and along the OHTL.
- **Potential PBF species**: Based on potentially present species only two bat species (IUCN VU: *Rhinolophus mehelyi***,** *Miniopterus schreibersii*) may may qualify as **PBFs** under EBRD ESR6.

4.3 Avifauna

As part of the methodology established for ornithological investigations at the Khobna–Sidi Bouzid PV power station and the associated HV transmission line, survey campaigns were undertaken on a monthly basis. These were conducted on 8–11 April, 17–18 May, 12–15 June, 12–13 July, 18–19 August, 1–2 and 21–22 September 2025. Avifauna within the project site was monitored using transect methods, while surveys along the OHTL route were carried out from fixed vantage points.

At the PV plant

To cover the footprint of the PV solar plant, the site was divided into seven transects (T1–T7), each walked on foot by the ornithologist. Along each transect, stops were made every few meters to scan the surroundings and listen for bird activity, ensuring thorough coverage. During the surveys, all birds seen or heard were systematically recorded together with their behaviours, and all nests encountered were documented. This approach enabled both the estimation of species abundance and density (ind/km) and the compilation of a near-exhaustive list of species using the site, including resident species, breeding migrants, and transient passage birds.

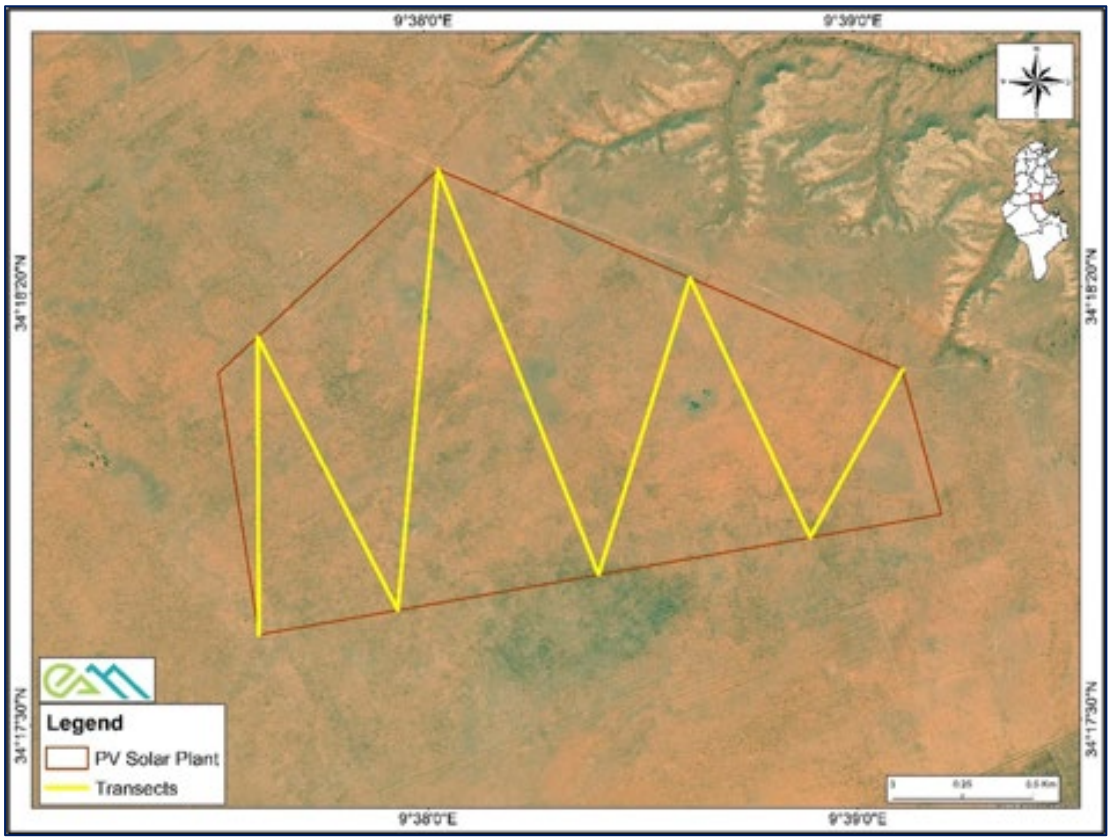

Figure 4.12 - Position of the transect at the PV Solar Project.

Along the OHTL route

To monitor birds along the OHTL route, the survey applied vantage point (VP) methodology. VPs are fixed observation stations strategically positioned to provide a wide field of view over the transmission line and its surroundings. A total of eight VPs were established, spaced approximately 2–2.5 km apart. At each VP, ornithologists remained stationary for a defined period, scanning the sky and landscape with binoculars and telescopes to detect and record all bird movements and activity. During the April and September 2025 campaigns, each VP was monitored for six hours, amounting to a total of 48 observation hours per campaign. For the remaining campaigns, each VP was observed for three hours, resulting in 24 observation hours per campaign. It should be noted that the minor adjustment of the OHTL route did not significantly affect the VP network, with the exception of VP5, which was relocated approximately 2 km to align with the revised route. The new coordinates of VP5 are 34°29'36.09"N, 9°40'27.30"E.

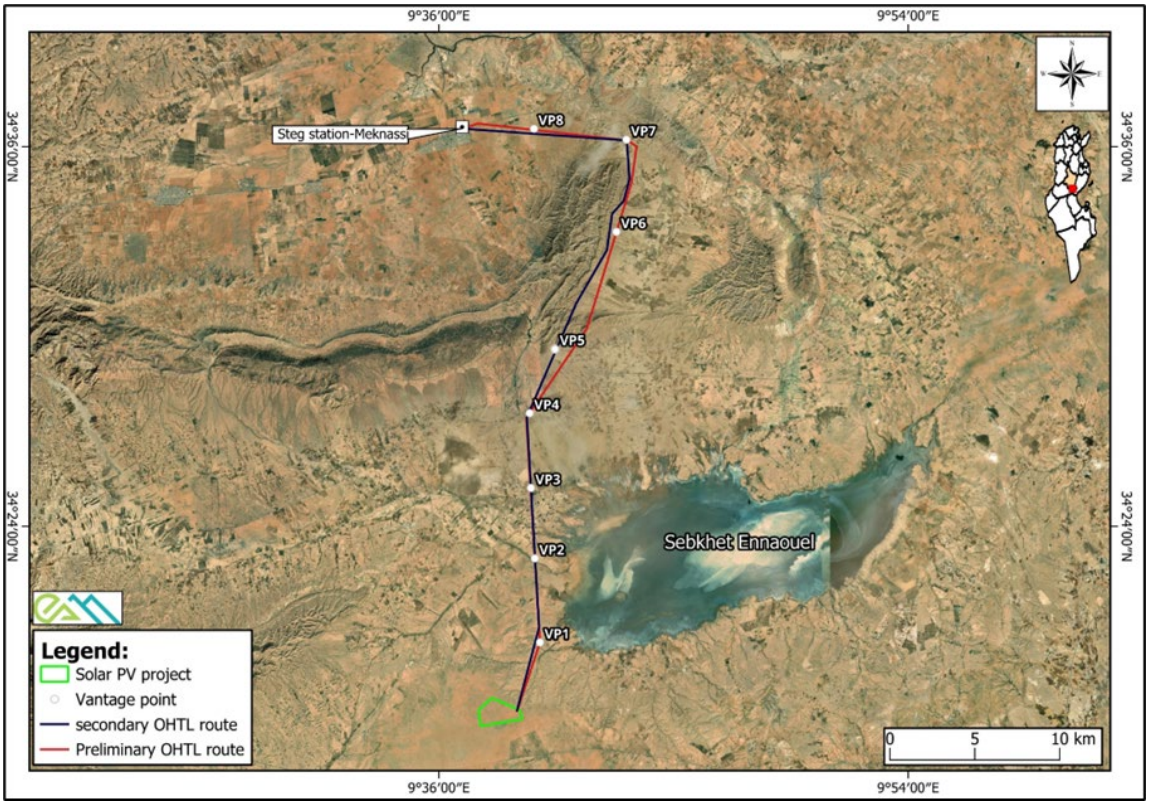

Figure 4.13 - Location of the Vantage Points (Points 1 to 8) along the revised OHTL route

Table 4.11 - *Observation Effort per Campaign (April–September 2025)*

Month	Dates	Hours/VP	Number of VPs	Total Observation Hours
April 2025	8–11	6 hours	8	48 hours
May 2025	17–18	3 hours		24 hours
Juin 2025	12–15	3 hours		24 hours
July 2025	12–13	3 hours		24 hours
August 2025	18–19	3 hours		24 hours
September 2025	1–2	3 hours		48 hours
	21–22	3 hours		

RESULTS OF THE ORNITHOLOGICAL CAMPAIGNS

A total of 83 bird species were identified during the surveys conducted between April and September 2025, both within the PV site and along the OHTL.

These included five species at least partially dependent on water (*Actitis hypoleucos, Anarhynchus alexandrinus, Burhinus oedicnemus, Cursorius cursor, and Gallinula chloropus*), 11 species of birds of prey (*Aquila chrysaetos, Athene noctua, Buteo rufinus, Circaetus gallicus, Circus aeruginosus, Circus macrourus, Circus pygargus, Falco biarmicus, Falco tinnunculus, Milvus migrans,* and *Pernis apivorus*), and a majority of grassland and steppe birds typical of the pre-desert region, such as wheatears, hoopoe larks, larks, coursers, and various warblers.

The following table presents the species recorded over April–September 2025 survey period, together with their global conservation status (IUCN 2025) and national status (Hamdi et al., 2021). PBF species that were confirmed as being present during the survey campaign are highlighted where relevant. Additional PBF species may be present within the AoI (not recorded) and these are presented and discussed in the CHA.

Latin Name	English Name	National (*)	UICN Global
Actitis hypoleucos	Common Sandpiper	IND	LC
Alaemon alaudipes	Greater Hoopoe-Lark	LC	LC
Alaudala rufescens	Lesser Short-toed Lark	LC	LC
Alectoris barbara	Barbary Partridge	LC	LC
Ammomanes cinctura	Bar-tailed Lark	LC	LC
Ammomanes deserti	Desert Lark	LC	LC
Anarhynchus alexandrinus	Kentish Plover	LC	LC
Anthus trivialis	Tree Pipit	IND	LC
Apus apus	Common Swift	LC	LC
Apus pallidus	Pallid Swift	LC	LC
Aquila chrysaetos	Golden Eagle	VU	LC
Argya fulva	Fulvous Babbler	NT	LC
Athene noctua	Little Owl	LC	LC
Bucanetes githagineus	Trumpeter Finch	IND	LC
Burhinus oedicnemus	Eurasian Stone-curlew	LC	LC
Buteo buteo	Common Buzzard	LC	LC
Buteo rufinus	Long-legged Buzzard	LC	NT
Calandrella brachydactyla	Greater Short-toed Lark	LC	LC
Cercotrichas galactotes	Rufous-tailed Scrub Robin	LC	LC
Chloris chloris	European Greenfinch	IND	LC
Circaetus gallicus	Short-toed Snake-Eagle	CR	LC
Circus aeruginosus	Western Marsh Harrier	NT	LC
Circus macrourus	Pallid Harrier	IND	NT
Circus pygargus	Montagu's Harrier	IND	LC
Cisticola juncidis	Zitting Cisticola	LC	LC
Columba livia	Rock Pigeon	LC	LC
Corvus corax	Common Raven	LC	LC
Coturnix coturnix	Common Quail	LC	LC
Curruca communis	Common Whitethroat	LC	LC
Curruca conspicillata	Spectacled Warbler	LC	LC
Curruca hortensis	Western Orphean Warbler	LC	LC
Curruca iberiae	Western Subalpine Warbler	LC	LC
Curruca melanocephala	Sardinian Warbler	LC	LC
Cursorius cursor	Cream-colored Courser	VU	LC
Delichon urbicum	Common House Martin	DD	LC
Emberiza calandra	Corn Bunting	LC	LC
Emberiza sahari	House Bunting	LC	LC
Eremophila bilopha	Temminck's Lark	LC	LC
Falco biarmicus	Lanner Falcon	EN	LC
Falco tinnunculus	Common Kestrel	VU	LC
Ficedula albicollis	Collared Flycatcher	IND	LC
Fringilla coelebs	Eurasian Chaffinch	LC	LC
Fringilla spodiogenys	African Chaffinch	LC	LC
Galerida cristata	Crested Lark	LC	LC
Galerida theklae	Thekla's Lark	LC	LC
Gallinago gallinago	Common Snipe	LC	LC
Gallinula chloropus	Common Moorhen	NT	LC
Hippolais icterina	Icterine Warbler	IND	LC
Hirundo rustica	Barn Swallow	LC	LC
Iduna opaca	Western Olivaceou Warbler	LC	LC
Jynx torquilla	Eurasian Wryneck	LC	LC
Lanius excubitor	Great Grey Shrike	LC	LC
Lanius senator	Woodchat Shrike	LC	NT
Linaria cannabina	Common Linnet	LC	LC
Locustella luscinioides	Savi's Warbler	LC	LC
Melanocorypha calandra	Calandra Lark	VU	LC
Merops apiaster	European Bee-eater	LC	LC
Milvus migrans	Black Kite	LC	LC

Latin Name	English Name	National (*)	UICN Global
Motacilla flava	Western Yellow Wagtail	LC	LC
Muscicapa striata	Spotted Flycatcher	LC	LC
Oenanthe deserti	Desert Wheatear	LC	LC
Oenanthe halophila	Black-throated Wheatear	LC	IND
Oenanthe hispanica	Black-eared Wheatear	LC	LC
Oenanthe leucura	Black Wheatear	LC	LC
Oenanthe moesta	Mourning Wheatear	LC	LC
Oenanthe oenanthe	Northern Wheatear	IND	LC
Passer hispaniolensis	Spanish Sparrow	LC	LC
Pernis apivorus	European Honey Buzzard	IND	LC
Phoenicurus phoenicurus	Common Redstart	LC	LC
Phylloscopus bonelli	Western Bonelli's Warbler	LC	LC
Pterocles orientalis	Black-bellied Sandgrouse	VU	LC
Ptyonoprogne rupestris	Eurasian Crag Martin	IND	LC
Riparia riparia	Sand Martin	LC	LC
Scotocerca inquieta	Streaked Scrub Warbler	LC	LC
Serinus serinus	European Serin	LC	LC
Spilopelia senegalensis	Laughing Dove	LC	LC
Streptopelia decaocto	Eurasian Collared Dove	LC	LC
Streptopelia turtur	European Turtle Dove	VU	VU
Sturnus unicolor	Spotless Starling	LC	LC
Sturnus vulgaris	Common Starling	LC	LC
Turdus merula	Common Blackbird	LC	LC
Upupa epops	Eurasian Hoopoe	LC	LC

LC = Least Concern; NT = Near Threatened; VU = Vulnerable; EN = Endangered; CR = Critically Endangered; NE = Not Evaluated; DD = Data Deficient; IND = Insufficient Data

4.4 Protected natural areas (national Parks, Ramsar sites)

A review of available geospatial and biodiversity data from international sources such as the IUCN Key Biodiversity Areas database (http://www.keybiodiversityareas.org/kba-data), BirdLife International (http://datazone.birdlife.org/site/search), and national institutions (Direction Générale des Forêts and the Ministry of Equipment and Housing), confirms the presence of two conservation interest sites within a 10 km radius of the PV plant.

Sebkhet Ennaoual and Bouhedma National Park have been ratified as Ramsar sites and/or Important Bird Areas (IBAs) and/or Key Biodiversity Areas (KBAs). They meet the selection criteria and thresholds adopted by the international organisations IUCN and Birdlife.

Table 4.12 - *National and international importance of wetland units accepted for the study area*

	Sebkhet Ennaoual	Bouhedma Parc	Solar PV site and OHTL
National Park	0	*	0
Nature reserve	0	0	0
Hunting reserve	*	*	0
Ramsar	*	0	0
ZICO/IBA	*	*	0
KBA	*	*	0

- Bouhedma National Park covers an area of 16,488 hectares, with 8,804 hectares under full protection, 2,400 hectares as a temporary occupation zone, and the remainder as an

intermediate buffer zone. Botanicalsurveys have identified more than 500 plant species, dominated by steppe flora with tree cover similar to the pseudo-savannahs unique to Tunisia. This vegetation, highly adapted to arid conditions, provides excellent refuge for a remarkable variety of birds. The following species are cited with their global IUCN Red List status (2025.1): Bonelli's eagle (LC), Pharaoh Eagle-Owl (LC), Barbary Partridge (LC), Sandgrouse (LC), Common Quail (LC), Eurasian Skylark (LC), North African Ostrich (NE), Crested Lark (LC), European Robin (LC), Eurasian Blackcap (LC), Spanish Sparrows (LC), Little Ringed Plover (LC), Common Bulbul (LC),Common Hoopoe (LC), Little Owl (LC), Trumpeter Finch (LC), Fulvous babbler (LC), etc.

- The Ramsar site Sebkhet Ennaoual meets Criteria 2, 3, 4 and 6 of the Ramsar Convention. In terms of ornithology, its conservation value lies in the fact that it is home to six species limited to the Sindo-Saharan biome: Pharaoh Eagle-owl *Bubo ascalaphus* (breeding), Bar-tailed Lark *Ammomanes cinctura* (Breeding), *Alaemon alaudipes, Turdoides fulvus*, *Scotocerca inquieta* et *Rhodopechys githaginea* (Fishpool & Evans, 2001). In addition, the site is home to 11 bird species restricted to the Mediterranean-North Africa biome, namely the *Alectoris Barbara* (LC), *Caprimulgus ruficollis* (LC), *Eremophila bilopha* (LC), *Phoenicurus moussieri* (LC), *Oenanthe leucura* (LC), *Oenanthe moesta* (LC), *Oenanthe hispanica* (LC), *Sylvia melanocephala* (LC), *Sylvia cantillans* (LC), *Sylvia deserti* (LC Global and NT national), *Sturnus unicolor* (LC). During rainy years, this wetland also hosts wintering populations that can reach up to 1% of the original population, such as the *Phoenicopterus roseus*, *Tadorna tadorna*, etc.
- African Houbara (*Chlamydotis undulata*) is a species cited in the bibliography for both Sebkhet Ennaoual and Bouhedma National Park. It is listed as Vulnerable (VU) globally on the IUCN Red List (2025.1) and as Endangered (EN) nationally in the Tunisian Red Data Book (TRDB). The species has undergone significant population declines in recent decades and, according to the 2023 IUCN assessment, is now considered possibly extinct in northern Tunisia. The TRDB notes that only relict populations remain in the far south of the country, occurring at low densities and with a heterogeneous distribution. Data from GBIF and eBird include 32 historical records of the species in Tunisia, with the most recent sighting in 1993 of two individuals at an Oued between Tozeur and Shabikaha, approximately 75 km west of the project footprint. The species is therefore considered likely to be absent from the Project AoI.
- Sebkhet Sidi Mansour is a Ramsar site; As per IUCN–CEPF (Critical Ecosystem Partnership Fund) report on the Sebkhet of Sidi Mansour[1]:
  - The Sebkhet Sidi Mansour is very poorly studied, and most information remains qualitative and not supported by quantitative ecological data. Reliable inventories of flora, fauna, hydrology, and land use are still lacking. Despite its inclusion in the Ramsar list and recognition as an Important Bird Area (IBA), the site does not currently benefit from structured or effective management plans.

[1] **UICN - Centre de Coopération pour la Méditerranée (2014).** *Analyse de l'information sur le Parc National de l'Ichkeul à Bizerte et la Sebkha Sidi Mansour à Gafsa et renforcement de leur partenariat avec les institutions de recherche et les organisations de la société civile en Tunisie.* Rapport final, projet CEPF « Renforcement des connaissances et des statuts de protection et de gestion des Zones Clés pour la Biodiversité (ZCB) ». Malaga, Espagne: UICN. 92 p.

- The IUCN study further notes that the civil society and institutional involvement is weak, and collaboration mechanisms between CRDA services, research institutions, and local associations remain underdeveloped.

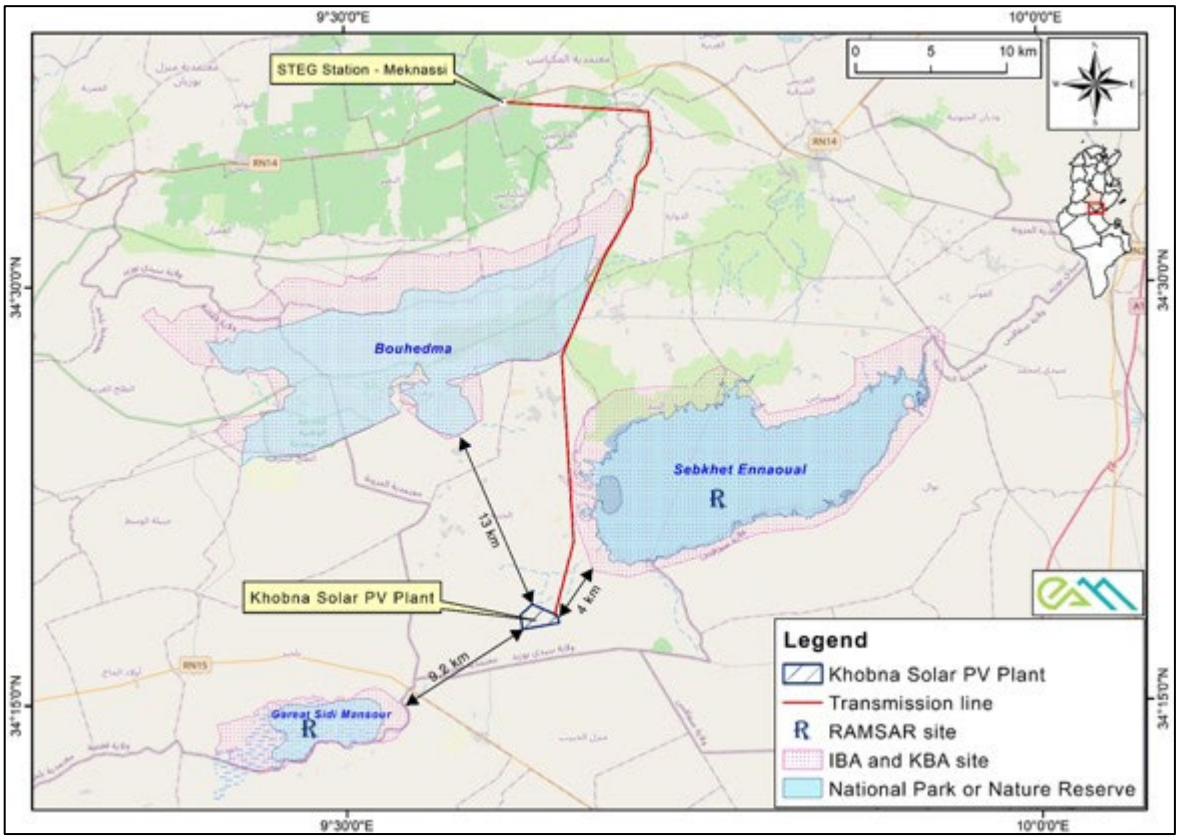

Figure 4.14 - Location of IBA sites and National Park

Ecological analysis of the regional landscape context indicates that regular, daily movement of passerines between the PV plant site and these nearby conservation areas is highly unlikely. This is due to the limited home ranges of most passerine species (typically within a 1 km radius) and their relatively low dispersal capacity. Similarly, waterbirds are strongly tied to aquatic habitats however will move outside of these environments during migration stopovers or wintering. The OHTL is located between two IBAs (Bouhedma Nationla Park and Sebkhet Ennoual) however it is likely that any birds moving between these two sites or arriving from further afield are likely to be flying at heights above the installed OHLT. 'Local movements' between the two sites are also likely, due to the total unsuitability of the terrestrial habitats between the IBAs (e.g. the OHTL AoI) to be above collision height. Significant impacts on waterbirds are therefore not anticipated.

In contrast, birds of prey (raptors) exhibit large home ranges and high mobility, often traveling over 20 km in search of food. These species can move regularly between the project site and surrounding ecosystems, including Bouhedma and Sebkhet Ennaoual. The Project footprint is located outside Sebkhet Ennaoual and Bouhedma National Park protected boundaries. The OHTL is not immediately adjacent to either of the IBAs and any birds moving between these two sites or arriving from further afield are likely to

flying at heights above the installed OHLT. Significant impacts on waterbirds are not anticipated.

Given the distance to the sensitive areas and the lack of ecological connectivity and likely flight heights of IBA species, the Project is not expected to have a significant impact on the conservation objectives of these sites.

5 Roles and responsabilities

Principal roles and responsibilities for the implementation of the BMP are outlined in the table below.

Table 5.1 - *Key Roles and Responsibilities*

Roles	Responsibilities
Lender (IFC, EBRD and EIB)	The lender will be responsible for: ▪ Receiving and reviewing regular reports from the Developer and the EPC contractor during pre-construction, construction, and operation regarding BMP implementation. ▪ Verifying the BMP and related Plans are regularly updated. ▪ Ensuring that the Developer and EPC contractors have sufficient and qualified resources to implement the plans. ▪ auditing the implementation of BMP and related Plans.
Developer (Qair)	As the project proponent, the Developer will assume overall responsibility for implementing the BMP. The Environmental and Social Project Implementation Unit (ESPIU) will ensure that the provisions of this BMP are strictly followed during all phases of the project. The ESPIU should be staffed with competent biodiversity specialists, as applicable to: ▪ Coordinate biodiversity aspects in project procurement, tender documents, and contracts. ▪ Coordinate implementation of biodiversity mitigation and monitoring measures. ▪ Audit the implementation of the BMP and identify corrective measures. ▪ Update the BMP based on audit findings or as needed;
EPC contractor	The EPC contractor will be responsible for complying with all relevant national and international legislation and adhering to all mitigation and monitoring measures specified in this BMP. Prior to the commencement of construction works, the EPC contractor will be required to develop a Construction BMP, including an implementation schedule. During construction, the EPC contractor will assume overall responsibility for the implementation and monitoring of the BMP. They must have sufficient, adequate, and competent resources available to fulfill the BMP requirements. The EPC contractor is responsible for the ongoing management of potential biodiversity impacts of all contract activities, regardless of whether they are undertaken by themselves or by subcontractors. All subcontractors must meet all requirements. The EPC contractor shall appoint, for the entire duration of the works, the following key specialist. ▪ HSE Manager. ▪ Environmental Manager and ▪ Biodiversity advisors
	HSE Manager ▪ Ensure that the BMP is up to date and appropriate and ensuring that it is implemented effectively. ▪ Ensure that action/measures and monitoring activities are carried out timely and adequately according to the BMP requirements. ▪ Propose to Management, if necessary, amendments and/or updates to the BMP and issuing plan revisions. ▪ Program inspections and audit activities to ensure the correct implementation of the BMP. ▪ Address Non-Conformities through the definition of Preventive/ Corrective actions. ▪ Bring major non-Conformities immediately to the attention of the developer's; ▪ Collect, organize, and review monitoring data and monitoring reports and provide summary results of such reports to the Developer's Management, to stakeholders and to the Lenders.

Roles	Responsibilities
	Environmental Manager ▪ Coordinate and supervise all site activities pertaining to the implementation of the BMP. ▪ Keep track of monitoring results and other reporting mechanisms and ensure corrective measures are implemented. ▪ interact with the Contractors and instruct them on the implementation of the measures described in the BMP. ▪ Stop the work in case of significant incidents or violations of the measures described in the BMP. ▪ Prepare "Non-Conformity Report" in case monitoring measures reveal that the relative Key Performance Indicator (KPI) are not met.
	Biodiversity Advisors The contractor's biodiversity advisors shall: ▪ Provide technical biodiversity guidance to the Environmental Manager and contractor's personnel. ▪ Conduct site visits and inspections to confirm implementation of mitigation measures. ▪ Review monitoring reports and prepare BMP implementation reports. ▪ Propose changes and integrations to the mitigation and monitoring activities as required, the proposed changes shall be evaluated and approved by the Developer's Management.
Subcontractors	All Sub-contractors must meet all requirements in relation to the Contractor's discharge of their responsibilities in terms of ongoing management of potential biodiversity impacts of all contract activities.

6 Stakeholder engagement

A letter was sent to the Directorate General of Forests on June 11, 2025, to present the project and its location, and more importantly, to request the most recent documentation concerning migratory bird species frequenting the Ramsar site of Sebkhet Ennoual and Bouhedma National Park, both located near the project area. The objective was to complement field survey data and to assess the potential presence of critical habitats associated with the solar PV site and the transmission line.

Following this correspondence, no official written reply was received. Instead, only a verbal response was provided, indicating that the Association “Les Amis des Oiseaux” (AAO) regularly conducts monitoring activities in these areas. The available bird lists, however, are based on observations carried out during missions conducted at specific times of the year.

Subsequently, EAM contacted Les Amis des Oiseaux, and on July 7, 2025, the association provided a list of bird species recorded at the two sites. It should be noted that these monitoring missions are performed only during certain periods of the year and therefore do not encompass the full range of species that may be observed at Sebkhet Ennoual and Bouhedma National Park. In particular, migratory species are likely underrepresented in the datasets provided.

The database shared by AAO is limited to the dates indicated in the table below.

Table 6.1 - *Monitoring dates*

Area	Dates
Bouhedma National Park	▪ 09/11/1999 ▪ 11/11/2007 ▪ 24/01/2010 ▪ 29/06/2012
Sebkhet Ennoual	▪ 12/11/1999 ▪ 17/01/2003 ▪ 06/01/2008 ▪ 18/01/2009 ▪ 24/01/2010 ▪ 09/01/2011 ▪ 20/01/2012 ▪ 24/01/2013 ▪ 16/01/2014 ▪ 24/01/2015 ▪ 23/01/2017 ▪ 25/01/2019 ▪ 26/01/2025

7 ANALYSIS OF ALTERNATIVES – TRANSMISSION LINE ALIGNMENT

The initial OHTL route connecting the PV plant to the Meknassi substation has been slightly modified following the identification of social and heritage constraints during field investigations and stakeholder consultations. The most significant revision concerns the northern section, which was shifted primarily to minimize crossings of private properties and reduce potential land acquisition conflicts; this adjustment, although

socially motivated, resulted in the route moving closer to the boundary of Bouhedma National Park. The alignment, however, remains entirely outside the park's legally protected and fenced perimeter, as well as its buffer zone.

As per the CHA prepared as per EBRD ESR6, IFC PS6, EIB standard 4, no critical habitat has been identified along the OHTL alignment. The OHTL lies between two IBAs (Bouhedma National Park and Sebkhet Ennoual), but the terrestrial habitats along the alignment are unsuitable for low-level flight, and birds moving between these sites or arriving from further afield are likely to be flying well above collision height. Consequently, significant impacts on waterbirds are not anticipated. In contrast, raptors exhibit larger home ranges and may move between the project area and surrounding IBAs. For these species, targeted mitigation will be implemented, including installation of bird flight diverters along the OHTL and a three-year post-construction bird mortality monitoring program following international good practice guidelines.

In the southern section, the alignment was locally shifted to avoid a recently discovered archaeological site of cultural and scientific value, believed to correspond to an ancient settlement containing visible structural remains such as masonry walls, decorated polychrome frescoes, and mosaic floors. The site has been previously disturbed by illegal mechanical excavations that have damaged parts of the subsurface layers and exposed architectural remains. As a result, the site is considered to require full protection from any physical disturbance or indirect impact. The adjusted OHTL alignment ensures complete avoidance of this archaeological site in accordance with national heritage protection regulations and international lender standards.

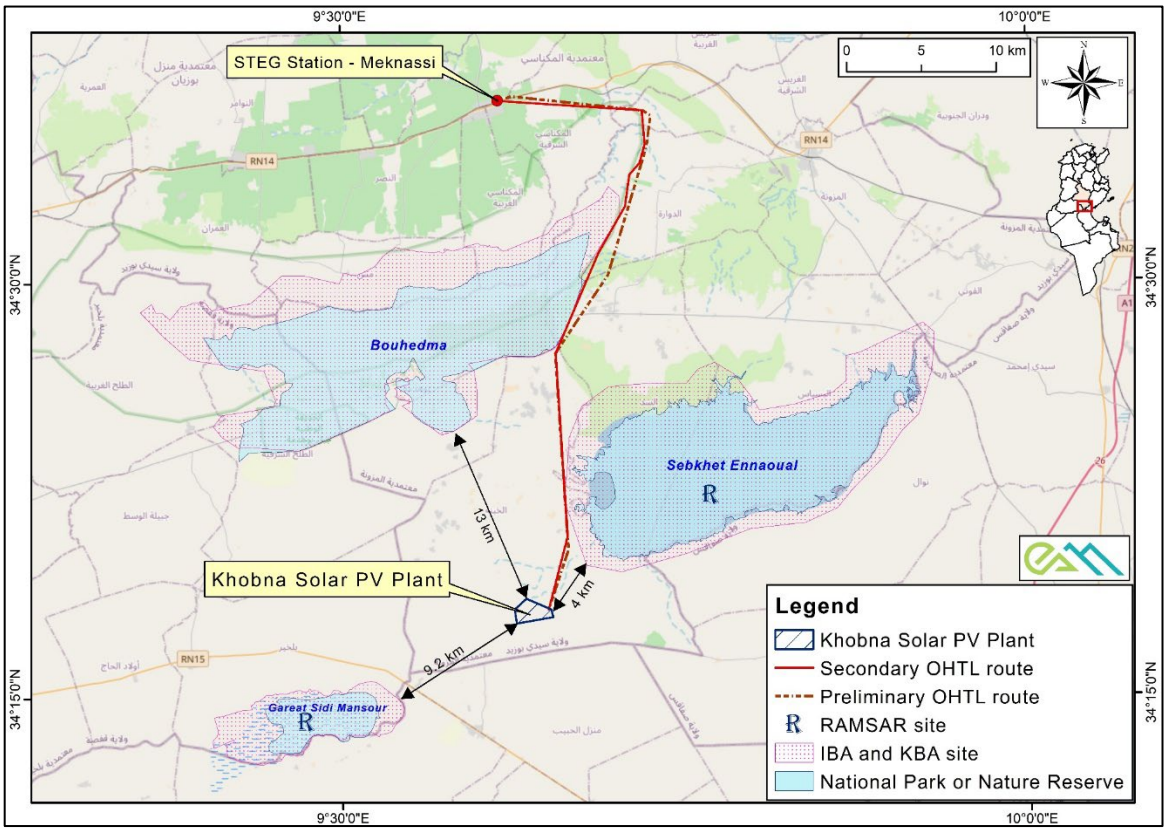

Figure 7.1- OHTL Alignment Alternatives and Location of Adjacent IBAs

8 BIODIVERSITY Impact assessment

Activities undertaken during the construction and operation phases of the Khobna Solar PV Plant and the OHTL have the potential to cause impacts on flora, fauna and avifauna species.

In addition, construction activities can also alter the structure and function of the habitat (habitat values) within the project area, both directly and indirectly.

The risks posed by these activities to the existing biodiversity and habitat values can be determined by considering the likelihood of potential impacts and their consequences, as illustrated in the table below. The construction and operational activities that could impact biodiversity and habitat, along with their associated risk ratings, are summarized in the table below.

Table 7.1 - *Risk Matrix*

Impact Magnitude	Receptor Sensitivity / Value			
	High	Medium	Low	Negligible
High	Major	Major	Moderate	**Negligible**
Medium	Major	Moderate	Minor	**Negligible**
Low	Moderate	Minor	Minor	**Negligible**
Negligible	**Negligible**	**Negligible**	**Negligible**	**Negligible**

An essential step in the ESIA process and also in the BMP is the identification of measures that can be taken to ensure that impacts are mitigated or reduced to acceptable levels. The BMP will first consider the significance of any impacts caused by the Project and then assign mitigation measures using the following hierarchy:

- Avoid or "design out" impacts wherever possible
- Consider alternatives or design modifications to reduce impacts wherever possible
- Apply measures to minimize and manage impacts on the receptor; then, as a last resort
- Identify fair compensation, remedial and compensatory measures to address any potentially significant residual effects.

Some negative impacts can be easily mitigated, while others cannot, or are too difficult and costly to mitigate. The various potential impacts will be described in the ESIA and in the BMP, together with a list of "feasible mitigation measures" that can be implemented. Furthermore, for positive impacts, it is not possible to identify mitigation measures, but rather recommendations aimed at reinforcing the positive impact. In addition, follow-up measures will be identified and developed to ensure that the identified mitigation measures are considered, implemented correctly, and are sufficient for the protection of environmental and social receptors.

The assessment of residual impacts during construction and operational phases is presented respectively in tables below:

Table 7.2 - – *Assessment of residual impacts*

Impact Title	Initial impact significance	Management Plan linked to the mitigation measures	Residual impact	Justification
Assessment of residual impacts during construction phase				
Potential impacts on habitats and species of flora – PV and OHTL	Moderate	• Biodiversity Management Plan	Minor	Induction for all site workers where biodiversity will be discussed and all measures set out in the BMP will be presented. The physical extent of flora disturbed during construction will be minimised and then restored immediately afterwards, resulting in a minor residual impact. The disturbed land will restore habitat to pre-construction status to the extent possible. Some residual loss of modified habitats within the PV site where panels are present. Pre-construction survey of all OHTL pylon locations to identify presence of plant species of conservation concern. OHTL pylon locations will be chosen to avoid PBF and other plant species of national conservation concern as detailed in the BMP. If these locations cannot be avoided, then local translocation will be completed where specimens will be removed from the working area and transplanted to areas of suitable alternative habitat.
Potential impacts on fauna (except birds) – PV and OHTL	Moderate	• Biodiversity Management Plan	Minor	See above – site induction and minimisation of working areas. Area of land supporting fauna will be restored as soon as possible. Working areas will be controlled. Other mitigation measures to include: - Conduct a pre-construction survey to identify presence of fauna species of conservation concern. Survey will also

Impact Title	Initial impact significance	Management Plan linked to the mitigation measures	Residual impact	Justification
				identify presence of venomous snakes which will be removed from the site by qualified and trained herpetologists. This is a Health and Safety measure to prevent harm to site workers but will also avoid impacts to the receptor. - Application of speed limits within the site to avoid / reduce animal / vehicle conflict. (40kph during the day and 20kph at night) - Ban on night-time working / driving within the working area unless strictly necessary. - Ban of hunting / poaching / collection of all ecological receptors and fines to be applied for breaching this measure. - Ban of all fires and or open incineration of waste - Standard safe storage of potential pollutants and materials harmful to the environment and standard pollution control measures (in-line with waste management protocols) - Removal of all carcasses (roads) to reduce attractants to the site. - Good housekeeping to prevent presence of invasive / non-native species including pest species and appropriate control if identified. - Ban on cats and dogs within the PV site and guard dogs are not to be used on site. - Limit other attractants to the site (e.g. creation of water bodies) - Gaps to be installed in site-wide fencing to allow small mammals and reptiles to move in to and out of the site (avoidance of barrier impact and effective habitat loss). - Application of chance find procedure and potential update to mitigation measures based on results of continual monitoring.
Potential impacts on avifauna. – PV Site	Minor	• Biodiversity Management Plan	Negligible / Minor	Site is supporting an assemblage of widespread and commonly occurring species that are not of international or national conservation concern and low impacts are expected. Key measures include but are not limited to: - Conduct a pre-construction survey to identify any nesting birds within the working areas and if of conservation concern (TRDB / IUCN VU+) buffer zones will be applied. - Application of speed limits and limits on working areas - Ban on night-time working / driving within the working area unless strictly necessary. - Ban of hunting / poaching / collection of all ecological receptors and fines to be applied for breaching this measure. - Ban of all fires and or open incineration of waste - Standard safe storage of potential pollutants and materials harmful to the environment and standard pollution control measures (in-line with waste management protocols) - Removal of all carcasses (roads) to reduce attractants to the site. - Limit other attractants to the site (e.g. creation of water bodies).

Impact Title	Initial impact significance	Management Plan linked to the mitigation measures	Residual impact	Justification
				- Application of chance find procedure and potential update to mitigation measures based on results of continual monitoring.
Potential impacts on avifauna. – OHTL	Minor	• Biodiversity Management Plan	Negligible / Minor	- Bird Flight Diverters (BFD) will be installed along the whole OHTL following industry standard designs and spacing. .
Assessment of residual impacts during operation phase				
Potential impacts on habitats and species of flora	Negligible	• None as there are no mitigation measures for the operational stage for this impact.	Negligible	None as there are no mitigation measures for the operational stage for this impact. Continual operational monitoring for invasive / non-native species for at least the first 3 years of operation. Appropriate control where necessary.
Potential impacts on fauna (except birds)	Minor	• Biodiversity Management Plan	Negligible / Minor	Limited operational activities are anticipated. Where essential maintenance is required, working areas will be strictly controlled and speed limits applied. Ban on hunting / collection of fauna. Limit other attractants to the site (e.g. creation of water bodies).
Potential impacts on avifauna - Collision with the OHTL	Major	• Biodiversity Management Plan	Moderate	Implement and undertake a 3-year bird mortality monitoring programme which includes a survey to investigate bird mortality on the OHTL only. Surveys will be completed for at least one whole year (January to December) after which the monitoring protocol will be updated depending on the results. Any changes to the protocol will be agreed with the lenders prior to implementation. Surveys will follow the 2023 PCFM Guidelines (GIIP) and will include carcass persistence trials and searcher efficiency trials. Depending on the results of the PCFM surveys additional offsets will be completed if mortality of bird species of conservation concern is recorded. Offsets could include additional BFD installation on existing OHTL lines or burial of LV and MV distribution lines within the Project AoI. Regular (at least annual for a minimum of 5 years) monitoring of the transmission line for signs of bird nesting on the pylons. In the event of nesting, anti-perching and anti-nesting devices will be installed, if necessary to minimise regular visits by birds to these structures. These devices, if installed, will be replaced where necessary. Safe nesting platforms or other such structures could also be considered if the nesting species are those of conservation concern. The need for and extent of these surveys will be reviewed at the end of the five year monitoring period.

9 Mitigation measures and manAgement controls

This section presents the mitigation measures and management methods that the BMP aims to implement.

The BMP distinguishes measures to be implemented during the construction and operation phase. Relevant BMP actions for the construction phase, as listed in table 8.1 below, will need to be included in the tendering specifications for EPC contractors, and subsequently in the EPC contract.

9.1 Construction Phase

Standard/ Benchmark	Potential Impacts	Management action / Mitigation measures	Monitoring actions	Frequency	Responsibility
PR 6 - Biodiversity conservation and sustainable management of living natural resources (STEG responsibilities)	Potential impacts on habitats and species of flora Potential impacts on fauna (except birds) Potential impacts on avifauna.	- Qair to consult relevant authorities, including Ministry of Agriculture and the Forest Department (DGF), before undertaking any vegetation removal or clearing activities as this is essential to obtain all necessary permits and ensure compliance with environmental regulations.	Qair to review implementation of the PV plant and the pylon of the OHTL and the relevant requirements from the Biodiversity Management Plan that are under the responsibility of the EPC Contractor.	Ongoing during the construction stage.	- EPC Contractor with Qair having an oversight role
PR 6 - Biodiversity conservation and sustainable management of living natural resources (EPC Contractor responsibilities)	Potential impacts on habitats and species of flora Potential impacts on fauna (except birds) Potential impacts on avifauna.	- Engage suitably qualified (bird) ecology expert(s) to undertake training, awareness-raising and monitoring of environmental measures. - During the pre-construction surveys of the working areas any venomous snakes identified will be removed by suitably trained and qualified herpetologists. Any animals caught will be moved to areas of alternative suitable habitat at least 2km from the working areas. - Identify (using signs) and restrict access to areas with sensitive habitats prior to construction, and detail designated construction areas to minimise habitat loss as much as possible (e.g control of working areas). - Limit vehicle movements on dirt/unpaved roads and enforce speed limit of 40 km/hour (daytime) and 20 km/hour (nighttime). - Optimise machine movement in earthworks, land clearance, construction/use of access roads, pylons installation, foundation work, cabling, transit of lorries and machinery, loading/unloading of lorries, etc., to limit impacts on flora and habitats. - Engage suitably qualified biodiversity expert(s) to conduct regular training and environmental awareness programmes for workers (all employees and sub-contractors) on protecting local flora, including identification of rare and protected species and how to minimize harm to these. Programmes will be at works start and once a month depending on workers' numbers. - Prohibit the use of pesticides and fire to clear vegetation. - Regularly conduct planning and monitoring of worksite phases to limit works duration.	Qair to conduct ongoing monitoring during the construction stage in accordance with the Biodiversity Management Plan (the Plan being the responsibility of the EPC Contractor)	Ongoing as defined in the Biodiversity Management Plan	EPC Contractor

Standard/ Benchmark	Potential Impacts	Management action / Mitigation measures	Monitoring actions	Frequency	Responsibility
		- Carefully remove and store topsoil for future site restoration activities. - Install fences around worker accommodation sites and equipment storage areas to limit encroachment on the surrounding area during the works phase. - Prevent introduction of invasive plant species during works by ensuring machinery is cleaned prior to arrival on site. - Undertake a comprehensive biodiversity survey (fauna and flora), prior to construction, to identify species distribution and conservation concerns and ensure habitats and endangered species are adequately protected during the project. - OHTL tower locations will be chosen to avoid PBF and other plant species of national conservation concern as detailed in the BMP. If these locations cannot be avoided, then local translocation will be completed where specimens will be removed from the working area and transplanted to areas of suitable alternative habitat. - Implement seasonal construction restrictions and monitor phases of site activities during sensitive seasons. - Develop deterrent campaigns, pre-earthworks, (using adequate, well tested equipment/methods) to enable snakes, rodents, etc. to flee work area. - Ensure site areas and living quarters are kept clean and good waste management practices are applied, eliminating sources of food attraction. - Inform on-site employees and contractors of protected species/habitats potentially present in the area, to ensure constant monitoring and promote mitigation measures or actions in when encountering wild animals. Prohibit hunting and causes of disturbance or trade in animals and report to Qair any acts of biodiversity disruption or vandalism committed by workforce. Educate workers and other stakeholders about environmental concerns, especially poaching and ban on bushmeat consumption. Fines to be applied to breaches of this measure. - Conduct deterrent activities prior to earthworks, (adequate and well tested equipment/methods) to enable birds likely to be present on the project site to flee. - Installation of gaps under any site wide fencing to allow small mammals and reptiles to move in to and out of the site. If this is not possible select a large mesh size that will allow movement of most receptors. - Locate powerlines >500 m from wetlands, identified bird migration corridors and protected areas.			

Standard/ Benchmark	Potential Impacts	Management action / Mitigation measures	Monitoring actions	Frequency	Responsibility
		- Equip OHTLs with Bird Flight Diverters (BFD), following industry standard designs and spacing (Martin Martin, J., Garrido Lopez, J. R., Clavero Sousa, H. and Barrios, V. (eds.), 2022. Wildlife and Power lines. Guidelines for preventing and mitigating wildlife mortality associated with electricity distribution networks. Gland, Switzerland, IUCN.). BFDs to be installed on all installed OHTL.OWL devices will be installed on the OHTL within 5 km of the Sebkhet Ennoual IBA (see figure 4.14) with the remaining line supporting Hawkeye devices. The OWL version installed will be the one with the LED light and the Hawkeye will also be visible at night. - Installed OHTL is HV so risk of electrocution is minimised however safe design should be implemented along with BFDs. • Construct crossings, insulators and other power lines components so no space for birds to perch and encounter live wires. - A Biodiversity Action Plan (BAP) will be undertaken if CH and species are identified during the upcoming field surveys or if additional ecological receptors are identified during construction (e.g. chance find procedure). - A biodiversity action plan (BAP) is an internationally recognized program addressing threatened species and habitats and is designed to protect and restore biological systems. The original impetus for these plans derives from the 1992 Convention on Biological Diversity (CBD). - The principal elements of a BAP typically include (a) preparing inventories of biological information for selected species or habitats; (b) assessing the conservation status of species within specified ecosystems; (c) consideration of risk/impact/condition; (d) creation of targets for conservation and restoration; and (e) establishing timelines and institutional partnerships for implementing the BAP. A BAP therefore gives an overview of species and habitat in a particular area, identifies threats and sets out steps to be taken to protect and improve the area to preserve and enhance its biodiversity for the future. Importantly, a BAP is a valuable way of targeting conservation at a local level. - Moreover, BAPs should be regularly reviewed and updated as new information arises, project implementation progresses, and conservation context changes over time. - The principal objectives of a BAP include the following: - Review of existing biodiversity baseline information and legislative/policy framework in Tunisia.			

Standard/ Benchmark	Potential Impacts	Management action / Mitigation measures	Monitoring actions	Frequency	Responsibility
		- Develop a new biodiversity baseline based on the 3 sets of surveys undertaken - Identification of priorities and actions for biodiversity conservation based on Critical Habitat Assessment, if applicable. - Identification of a list of opportunities aimed at improving overall biodiversity conservation. - Identification of a specific set of actions, timelines, and responsibilities to avoid, mitigate and compensate potential impacts associated with each facility. - List evaluation requirements to enable the success of the BAP to be assessed.			

9.2 Operational phase

Standard/ Benchmark	Potential Impact identified in the ESIA	Management action / Mitigation measures	Monitoring actions	Frequency	Responsibility
PR 6 - Biodiversity conservation and sustainable management of living natural resources	Potential impacts on fauna (except birds)	Application of control of working areas when undertaking maintenance / cleaning activities. Pre-works checks of vehicle routes to check for breeding birds (February – June) and also to check for presence of venomous snakes. Enforcement of speed limits and pollution control measures. Good housekeeping to ensure clean site areas. Continual monitoring of Project AoI for presence of non-native / invasive species. Monitoring bat mortality during monitoring programme for birds	Qair to conduct ongoing monitoring during the construction stage in accordance with the Biodiversity Management Plan (the Plan being the responsibility of the O&M Contractor) Submit a monitoring protocol	During operation	Qair / O&M Contractor
	Potential impacts on avifauna.	Implement and undertake a 3-year bird mortality monitoring programme which includes a survey to investigate bird mortality on the OHTL. Conduct regular bird mortality monitoring (Post-Construction Fatality Monitoring – PCFM) at the operational	Visual evidence and site inspection	Annual	Qair / O&M Contractor

Standard/ Benchmark	Potential Impact identified in the ESIA	Management action / Mitigation measures	Monitoring actions	Frequency	Responsibility
		phase. Monitoring to include regular (approx. every 15 days) surveys along the OHTL in Spring, Autumn and Winter seasons. Search frequency will be determined based on results of carcass persistence and searcher efficiency trials. Based on the findings of the monitoring, revise and update Biodiversity Management Plan, including additional mitigation measures if needed to ensure the applicable conservations objectives. Any changes to the protocol in Years 2 and 3 (*e.g.* monitoring seasons, frequency of monitoring visits) will be agreed with the lenders prior to implementation. Surveys will follow the 2023 PCFM Guidelines (GIIP) and will include carcass persistence trials and searcher efficiency trials. The results of the PCFM surveys will be used to inform an adaptive management strategy which could include undertaking offsets. Adaptative management and or offsets will be completed if mortality of bird species of conservation concern is recorded (IUCN VU, EN, CR or TRDB EN, CR). If offsets are required a BAP will be completed. Engagement and coordination efforts with STEG and the other developers in the area to reduce pressure on biodiversity in the region. Offsets could include additional BFD installation on existing OHTL lines, burial of LV and MV distribution lines within the Project AoI or installation of anti-electrocution measures on existing LV and MV distribution lines within Project AoI.	Submission of an annual bird mortality report		

Standard/ Benchmark	Potential Impact identified in the ESIA	Management action / Mitigation measures	Monitoring actions	Frequency	Responsibility
		Provision of safe nesting platforms / boxes could also be considered.			
		Regular (at least annual) monitoring of the transmission line for signs of bird nesting on the pylons. In the event of nesting, anti-perching and anti-nesting devices will be installed, if necessary to minimise regular visits by birds to these structures. These devices, if installed, will be replaced where necessary. Safe nesting platforms or other such structures could also be considered if the nesting species are those of conservation concern.	Visual evidence and site inspection		

10 Monitoring

Impact	Monitoring and Evaluation	Details	Biodiversity associated with the measure	Responsible party	Start time	End time	Frequency	Means of verification
Loss of vegetation habitat and species	Vegetation monitoring	A Vegetation Monitoring Program will be developed by the EPC Contractors' Biodiversity Expert and implemented by the STEG and EPC contractor. The programme will monitor the impacts of the project on priority vegetation and habitats.	Terrestrial flora habitats and associated species	Qair / EPC Contractor and Biodiversity Expert with the support of an external consultant	Prior to construction	End of construction	Continuously/ monthly	Monitoring report
Avifauna impacts	Minimize impacts to birds through monitoring	An Avifauna Monitoring Programme will be developed by the O&M Contractors Biodiversity Expert or Avifauna Specialist and implemented by Qair. The programme will monitor avifauna along OHTL. It will assess the effectiveness of mitigation measures by recording actual mortality as a result of collision and or electrocution. Additionally, it will determine the need for adaptive management, including offsets. In Year 1 monitoring will be completed for a full year and will start immediately after line stringing. The monitoring will encompass: - Bird mortality, particularly along the OHTL (effectiveness assessment of bird deflectors) and potential collisions with OHTL. - BFD monitoring / checks to ensure they are still operational. Any defective BFDs will be replaced (by drone) within 4 weeks.	Avifauna species and associated habitat	Qair / O&M Contractor and Biodiversity Expert with the support of an external consultant	Immediately after line stringing	At least three years of operation (to be reviewed afterwards)	Year 1 PCFM – full year, review at end of year 1 and possible change to more seasonal monitoring (e.g. spring and autumn migration). Any changes from full year monitoring to be agreed with the Lenders. BFD monitoring to be completed at least twice per year (pre-spring and pre-autumn migration periods)	Monitoring report
		Three years of spring and autumn passage and winter season bird surveys will be undertaken in the two IBAs in the OHTL AoI. Point count surveys will be completed twice per month to record all activity within the IBAs. The purpose					Three years IBA surveys	

Impact	Monitoring and Evaluation	Details	Biodiversity associated with the measure	Responsible party	Start time	End time	Frequency	Means of verification
		of these surveys is to provide information to relevant stakeholders regarding the use of these sites by birds as well as informing additional conservation measures for these sites.						
		Regular (at least annual) monitoring of the transmission line for signs of bird nesting on the pylons. In the event of nesting, anti-perching and anti-nesting devices will be installed to minimise regular visits by birds to these structures. These devices will be replaced if necessary.					Annual surveys for bird nesting (February to June)	

11 Reporting

The reporting section is in line with the ELMED project's approach to BMP reporting.

a. Biodiversity Non-Conformity Reports

In case monitoring measures reveal that the Indicator and targets are not met, a “Non conformity report” will be prepared by the Environmental Engineer, communicated to the HSE Manager who will decide if support from a Specialized Contractor is needed in order to address the issue within 15 days from the monitoring.

The “Non conformity report” will clearly describe the issue(s) observed and provide all the relevant available information including:

- ID: unique identification code of the monitoring activity;
- topic/ aspect monitored;
- date and location(s) of the monitoring;
- location of the observation (with geographic coordinates if available);
- name and role of the observer(s);
- description of the non-conformity compared to the target;
- photographic documentation (if available);
- suggested corrective actions.

Developer’s HSE Manager will review the report and assess, also with the assistance Specialized Contractor, the need of implementing additional corrective action and/or eventual modifications to the BMP mitigation measures and monitoring activities.

b. Annual Biodiversity Management Plan Reports

Evidence and results of mitigation measures and monitoring activities shall be included in an Annual Biodiversity Report to be prepared by the developer with the support of the Biodiversity Advisor. This report shall include, as a minimum, the following information/data:

<u>Mitigation measures:</u>

- list of the mitigation measures implemented, their aims and description;
- period of the measure application (start date and end date);
- achievement (or not) of the target/acceptance criteria for the indicators.

<u>Monitoring activities:</u>

- location of the monitoring stations (geographical coordinates and elevation);
- timing of the data collection (start date and end date);
- description of the methodology applied and of the equipment used;

- results of the observations conducted;
- any anomalies that could have affected partially or totally the indicators results;
- quality assurance and quality control procedures applied to ensure consistency and reliability of the results.
- the indicator results and their compliance with the target/acceptance criteria;

The mitigation measures report will be prepared by the Developer with the support of the specialized contractor(s) on a yearly basis.

12 Audit and Review

The current BMP is to be monitored through either internal or external audit on a regular basis (preferably yearly) and the audit report submitted to the lenders. The following is a non-exhaustive list of areas that may be checked during the audit process:

- Monitoring of achievement of targets set within the BMP.
- Utilization of funds for the implementation of the BMP.
- Assess whether efforts invested in mitigating threats to biodiversity were successful.
- Adherence to national applicable laws and to internationally signed agreements, protocols and treaties.
- Any sub-contracting undertaken for the implementation of the BMP. In such cases, standard audit procedures on contracts may be performed.
- Gaps in human resources for the proper implementation of the BMP in terms of enforcement activities, availability of scientists, taxonomists, etc.
- Roles of the different entities involved in the implementation of the BMP and their performance.
- Records of non-adherence to applicable rules and regulations and means taken to address non-adherence.
- Assess whether the monitoring and evaluation mechanism helped in effective implementation of the BMP.

Revision of the BMP is the responsibility of Developer's HSE Manager, who is in charge of this Plan. During operational phase, the BMP will be reviewed on an annual basis and any necessary revisions will be made to reflect the changing circumstances, operational needs or monitoring results.

Annexe 2 : Etude de Biodiversité El Khobna

1. *BIOLOGICAL AND ECOLOGICAL RESOURCES*

The characterization of habitats, flora, fauna, and avifauna is derived from field surveys undertaken by EAM's biodiversity specialists. The results of these surveys are provided in Appendix 5 (Biodiversity – Flora and Fauna) and Appendix 6 (Avifauna).

1.1. Habitats and Flora

PV Solaire Plant

From an ecosystem perspective, the site lies in an arid steppe characterized by flat grazing land with skeletal sandy-loam soils, occasionally stony or sandy with small dunes stabilized by Jujube (***Ziziphus lotus***). The landscape is homogeneous with sparse, low-diversity vegetation, dominated by Baguel (***Haloxylon salicornicum***), with scattered Astragalus (***Astragalus armatus***), Syrian Rue (***Peganum harmala***), and ***Atractylis carduus***. In stony-sandy areas, Remth (***Haloxylon scoparium***) occurs, while nebkas and barchans fixed by Jujube provide shelter for small fauna, as shown by numerous burrows.

The taxonomic list of plant species identified at the site is presented in **Table 1**, following the nomenclature of *Le Floc'h et al., 2010*. It should be noted that the conservation status of all these species is Not Evaluated (NE). However, they may be considered as Least Concern (LC), since none are listed in national references (REGNES and the Red List of Threatened Flora in Tunisia (ME, 2025), nor in regional or international lists (IUCN, 2025). Moreover, these taxa are common and widely distributed, particularly in the arid regions of the country.

Table 1:Taxonomic list of plant species recorded at the site (May 2025)

Family	Species	French name	Status	
			IUCN (2025)	National
Amaranthaceae	***Haloxylon salicornicum***	Baguel	NE	NE
	Haloxylon scoparium	Remth	NE	NE
Fabaceae	***Astragalus armatus***	Astragale vulnérant	NE	NE
Zygophyllaceae	***Peganum harmala***	Rue sauvage	NE	NE
Asteraceae	***Atractylis carduus***	Atractyle à Chardon	NE	NE
Rhamnaceae	***Ziziphus lotus***	Jujubier	NE	NE

NE = Not Evaluated

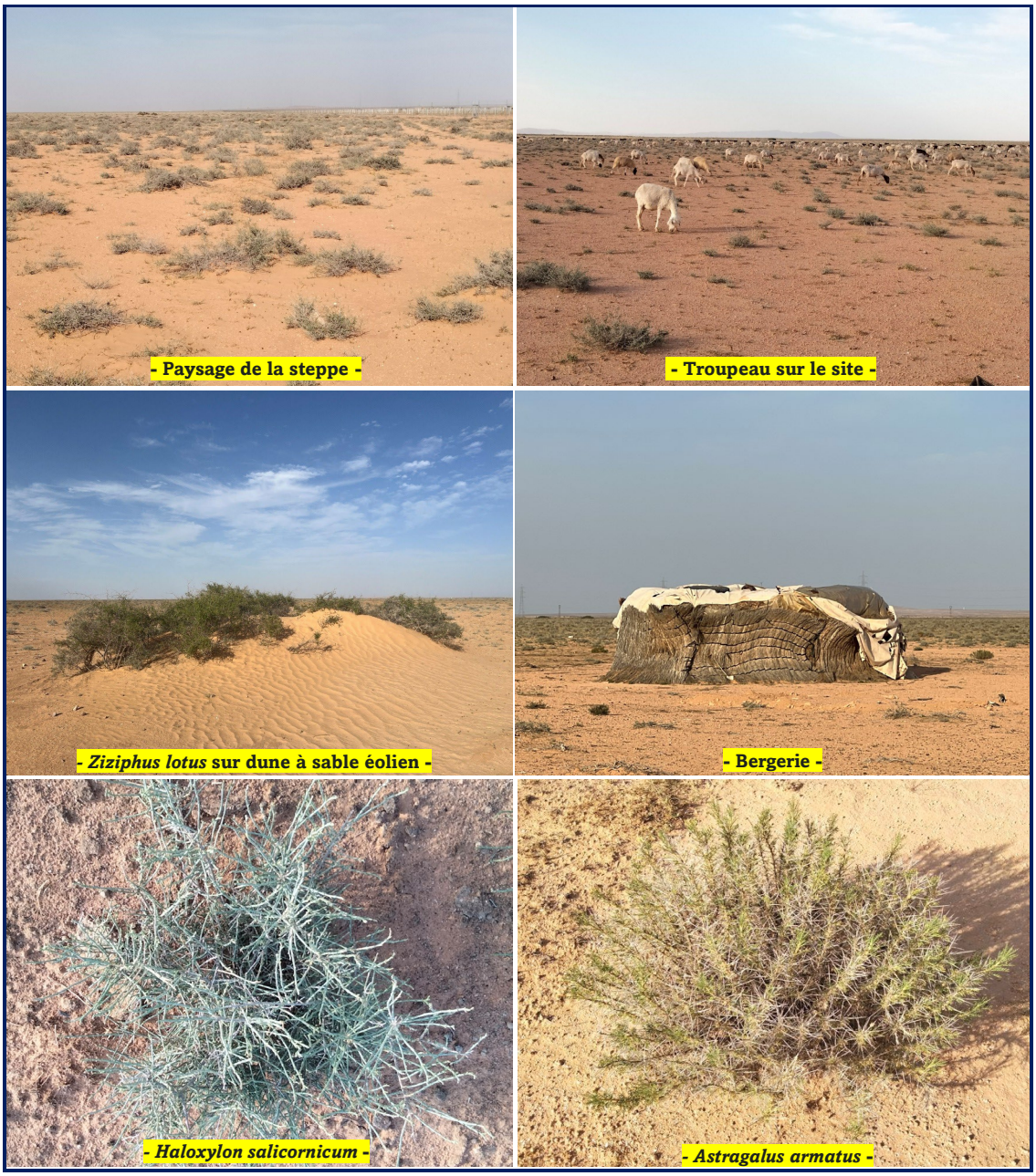

Figure 3: Landscapes and main plant species of the site

Along the OHTL route

The transmission line associated with the planned photovoltaic station is approximately 45 km long, extending from the eastern boundary of the site to Meknassi. Surveys of natural habitats along the transmission line corridor were carried out at eight stations, located near and around the eight avifauna observation points (Vantage points).

Table 2: Geographical coordinates of observation points along the OHTL route

Observation point	Geographical coordinates	
	Latitude	Longitude
VP1	34°20'19.51 "N	9°39'52.84 "E
VP2	34°22'59.09 "N	9°39'41.01 "E
VP3	34°25'12.74 "N	9°39'32.02 "E
VP4	34°27'34.67 "N	9°39'28.99 "E
VP5	34°30'16.83 "N	9°41'41.40 "E
VP6	34°33'18.54 "N	9°42'48.80 "E
VP7	34°36'13.29 "N	9°43'11.72 "E
VP8	34°36'33.89 "N	9°39'38.97 "E

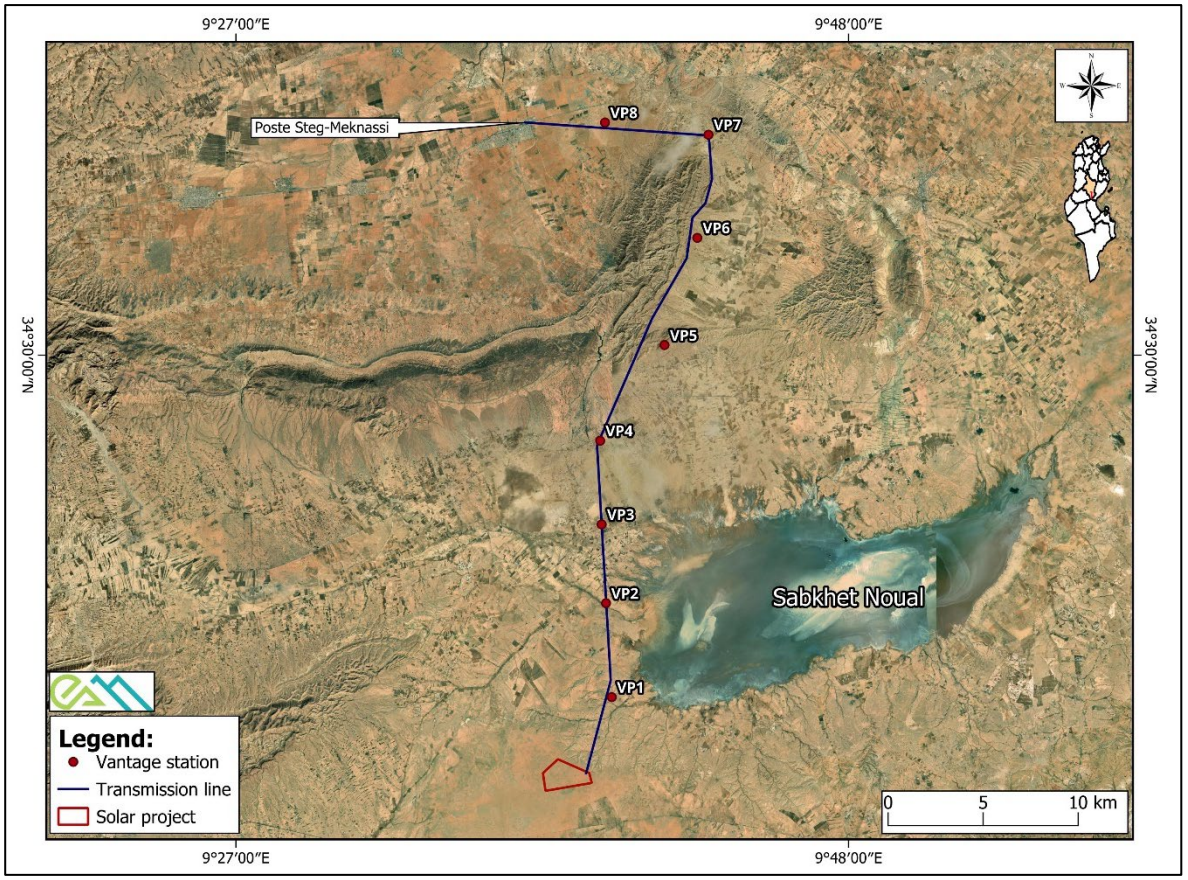

Figure 4: Location of survey stations (Points 1 to 8) along the OHTL route

Given that these points are about 5 km apart and are located at different altitudes, within different bioclimatic zones, biotopes, and ecosystems, the landscapes and floristic composition vary from one environment to another. The following sections present the main characteristics of the surveyed habitats and the typical plant species recorded at each survey station.

a. Survey Station 1

A **xerophilous steppe** on hills characterized by low and sparse steppe vegetation, mainly composed of **Baguel** (*Anabasis articulata*), White Saligne (*Haloxylon salicornicum*), Black Saligne / Remth (*Haloxylon scoparium*), Astragalus (*Astragalus armatus*), Gymnocarpos (*Gymnocarpos decander*), and Arfaj (*Rhanterium suaveolens*).

Table 3: Taxonomic list of plant species at Station 1 (17 and 18 May 2025)

Family	Species	French name	Status	
			IUCN (2025)	National
Amaranthaceae	***Anabasis articulata***	Baguel	NE	NE
	Haloxylon salicornicum	Saligne blanche	NE	NE
	Haloxylon scoparium	Saligne noire Remth	NE	NE
Caryophyllaceae	***Gymnocarpos decander***	Gymnocarpe	NE	NE
Fabaceae	***Astragalus armatus***	Astragale vulnérant	NE	NE
Asteraceae	***Rhanterium suaveolens***	Rhanterium odorant	NE	NE
Cistaceae	***Helianthemum lippii***	Fleur de Jade	NE	NE
Brassicaceae	***Diplotaxis harra***	Diplotaxe	NE	NE
Thymeleaceae	***Thymelaea hirsuta***	Passerine	NE	NE
Zygophyllaceae	***Peganum harmala***	Rue sauvage	NE	NE

NE = Not Evaluated, Species indicated as NE because they are not listed in national (REGNES, ME 2025), regional, or international (IUCN 2025) references. They are common and widely distributed in arid regions. They may therefore be considered as Least Concern (LC).

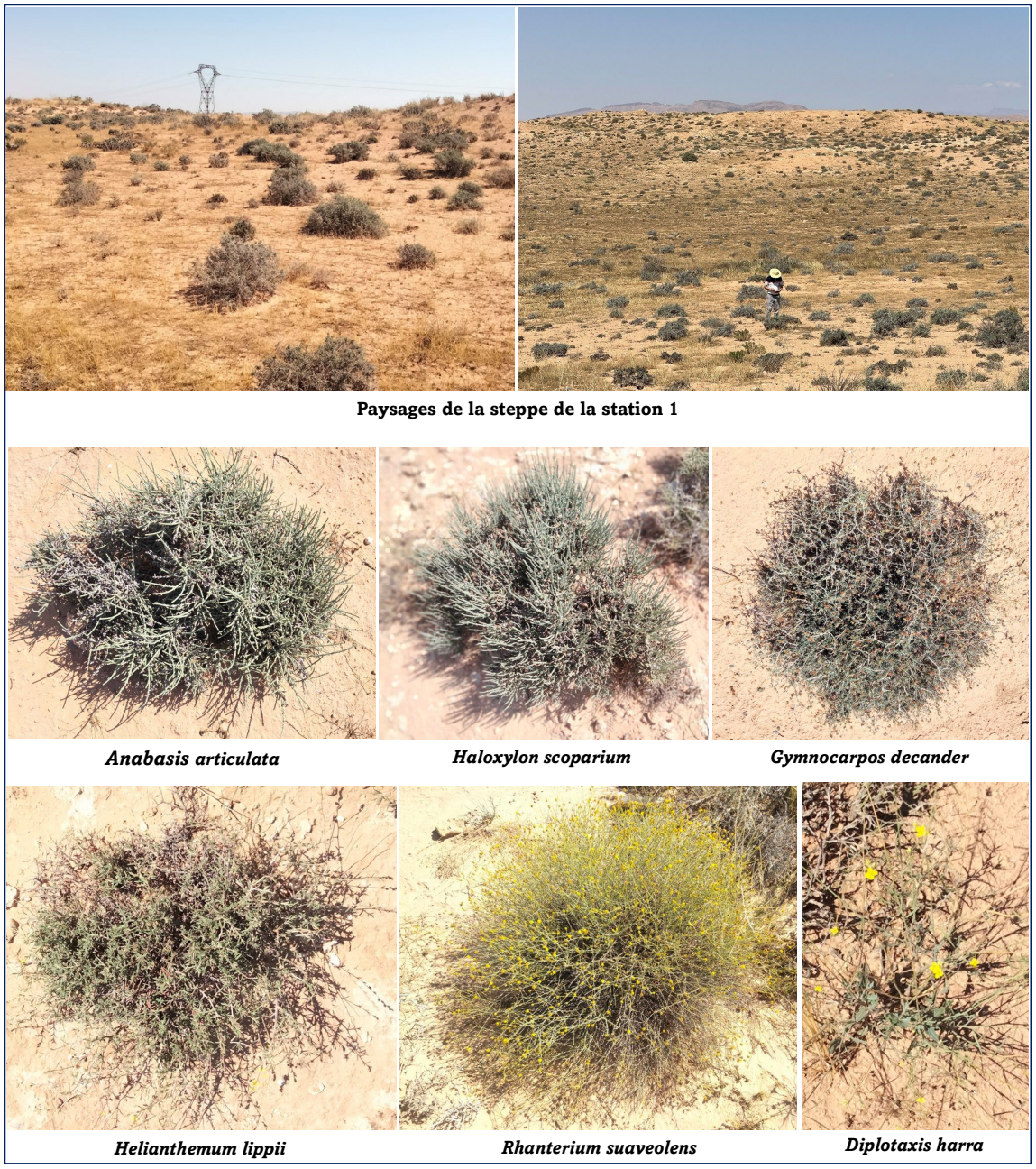

Figure 5: Landscapes and characteristic plant species of Station 1

b. Survey Station 2

A halophytic steppe on sandy soil near a wadi flowing into Sabkhet Naoual. Vegetation is dominated by *Caroxylon vermiculatum* and *Suaeda vermiculata*, with additional species such as *Anabasis articulata*, *Thymelaea hirsuta*, *Frankenia thymifolia*, and *Limonium tuberculatum*. Scattered individuals of *Vachellia tortilis* (Acacia tortilis) are also observed scattered around, while the more humid wadi bed supports *Atriplex halimus*, *Tamarix africana*, *Nitraria retusa*, and *Limoniastrum monopetalum*.

Table 4: Taxonomic list of plant species at station 2

Family	Genus and species	Name French	Status	
			IUCN (2025)	National
Amaranthaceae	***Suaeda vermiculata***	Soude vermiculée	NE	NE
	Caroxylon vermiculatum	Salicorne vermiculée	NE	NE
	Anabasis articulata	Baguel	NE	NE
	Atriplex halimus	Arroche	**LC**	NE
Frankeniaceae	***Frankenia thymifolia***	Frankénie	NE	NE
Nitrariaceae	***Nitraria retusa***	Nitraire	NE	NE
Tamaricaceae	***Tamarix africana***	Tamaris africain	**LC**	NE
Plumbaginaceae	***Limoniastrum monopetalum***	Grande Statice	NE	NE
	Limonium tuberculatum	Statice à tubercules	NE	NE
Thymeleaceae	***Thymelaea hirsuta***	Passerine	NE	NE
Zygophyllaceae	***Peganum harmala***	Rue sauvage	NE	NE
Fabaceae	***Vachellia* (*Acacia*) *tortilis***	L'Acacia gommier	**LC**	VU

NE = Not Evaluated, LC = Least Concern, VU = Vulnerable, Species indicated as NE are not listed in national (REGNES, ME 2025), regional, or international (IUCN 2025) references. They are common and widely distributed in arid regions. They may therefore be considered as Least Concern (LC).

Figure 6: Steppe plant species at station 2

c. Survey Station 3

This habitat is a Sebkha dominated by halophytes, with dense stands of *Halocnemum strobilaceum* and *Suaeda vermiculata*. *Mesembryanthemum nodiflorum* carpets parts of the ground, while *Nitraria retusa* and *Atriplex halimus* are common. Scattered date palms and *Vachellia tortilis* occur sporadically.

Table 5: Taxonomic list of plant species at station 3

Family	Genus and species	French name	Status	
			IUCN (2025)	National
Amaranthaceae	***Halocnemum strobilaceum***	Salicorne strobilée	NE	NE
	Suaeda vermiculata	Soude vermiculée	NE	NE
	Atriplex halimus	Arroche	NE	NE
Aizoaceae	***Mesembryanthemum nodiflorum***	Ficoïde nodale	NE	NE
Nitrariaceae	***Nitraria retusa***	Nitraire	NE	NE

NE = Not Evaluate, Species indicated as NE are not listed in national (REGNES, ME 2025), regional, or international (IUCN 2025) references. They are common and widely distributed in arid regions. They may therefore be considered as Least Concern (LC).

Halocnemum strobilaceum (º droite et º gauche de la photo) et ***Suaeda vermiculata*** (au milieu)

Mesembryanthemum nodiflorum

Figure 7: Landscapes and Halophytes of the Sebkha (Station 3)

d. Survey Station 4

This station lies within a relict stand of *Vachellia tortilis*, interspersed with irrigated farmland. Outside cultivated areas, sandy soils are covered by *Limonium lobatum*, with scattered *Haloxylon salicornicum* and *Lycium shawii* along agricultural field margins.

Table 6: Taxonomic list of plant species at station 4

Family	Genus and species	French name	Status	
			IUCN (2025)	National
Amaranthaceae	***Haloxylon salicornicum***	Saligne blanche	NE	NE
Plumbaginaceae	***Limonium lobatum***	Statice lobée	NE	NE
Solanaceae	***Lycium shawii***	Lyciet	LC	NE
Fabaceae	***Vachellia* (*Acacia*) *tortilis***	L'Acacia gommier	LC	VU

NE = Not Evaluated, LC = Least Concern, VU = Vulnerable, Species indicated as NE are not listed in national (REGNES, ME 2025), regional, or international (IUCN 2025) references. They are common and widely distributed in arid regions. They may therefore be considered as Least Concern (LC).

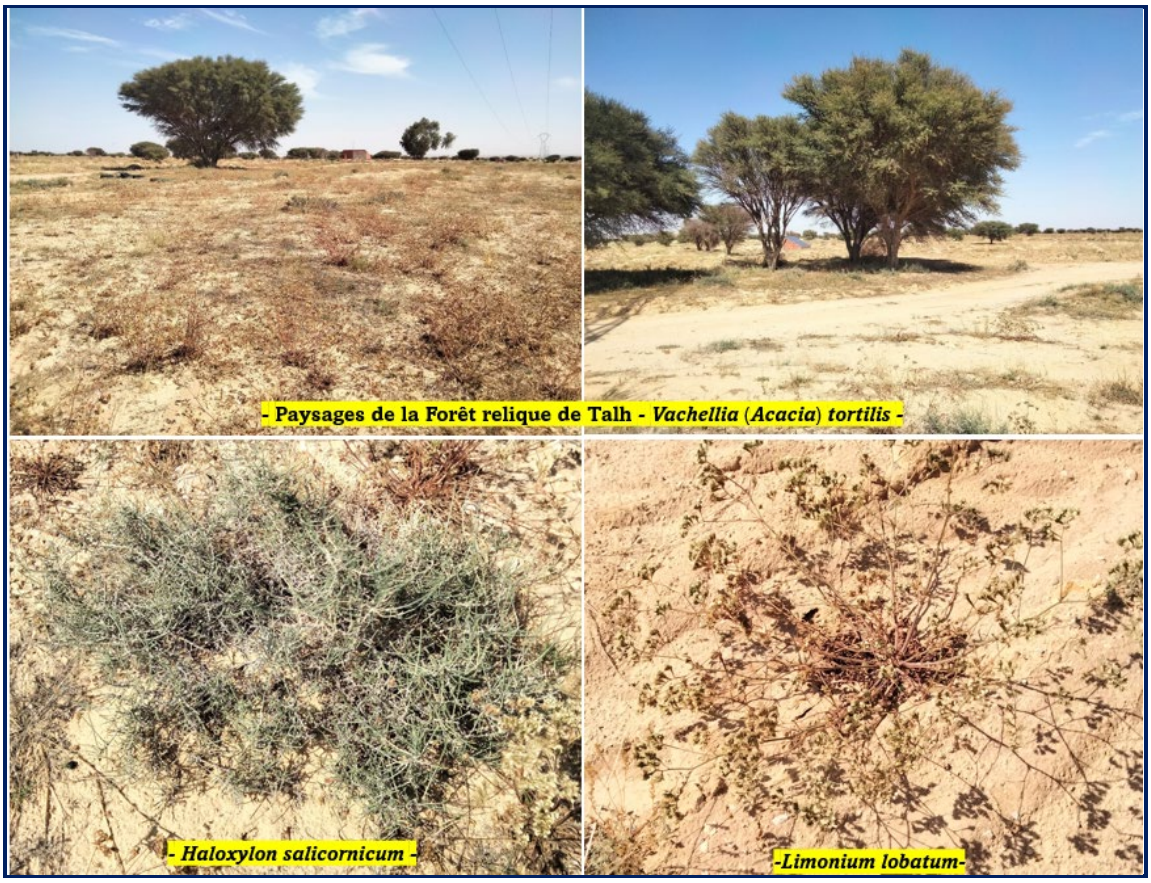

Figure 8: Landscape and Main plants at station 4

e. Survey Station 5

This station, at the foot of the Bouhedma National Park (IBA/KBA) range near farmland and rural dwellings, has stony, dry soils with xerophilous steppe vegetation. Dominant species include *Haloxylon salicornicum*, *Anabasis articulata*, *Astragalus armatus*, and *Gymnocarpos decander*, with associated Artemisia spp., *Pergularia tomentosa*, *Lavandula multifide*, *Ballota hirsuta*, and *Asparagus horridus*. Scattered stands of *Searsia tripartita* occur in adjacent ravines.

Table 7: Taxonomic list of plant species at station 5

Family	Genus and species	French name	Status	
			IUCN (2025)	National
Amaranthaceae	***Haloxylon salicornicum***	Saligne blanche	NE	NE
	Anabasis articulata	Baguel	NE	NE
Caryophyllaceae	***Gymnocarpos decander***	Gymnocarpe	NE	NE
Fabaceae	***Astragalus armatus***	Astragale vulnérant	NE	NE
Asteraceae	***Artemisia herba-alba***	Armoise blanche	NE	NE
	Artemisia campestris	Armoise champêtre	NE	NE
Apocynaceae	***Pergularia tomentosa***	Pergulaire	NE	NE
Lamiaceae	***Lavandula multifide***	Lavande multifide	NE	NE
	Ballota hirsuta	Marrube hérissé	NE	NE
Asparagaceae	***Asparagus horridus***	Asperge d'horride	NE	NE
Anacardiaceae	***Searsia tripartita***	Sumac tripartite	LC	VU

NE = Not Evaluated, LC = Least Concern, VU = Vulnerable, Species indicated as NE are not listed in national (REGNES, ME 2025), regional, or international (IUCN 2025) references. They are common and widely distributed in arid regions. They may therefore be considered as Least Concern (LC).

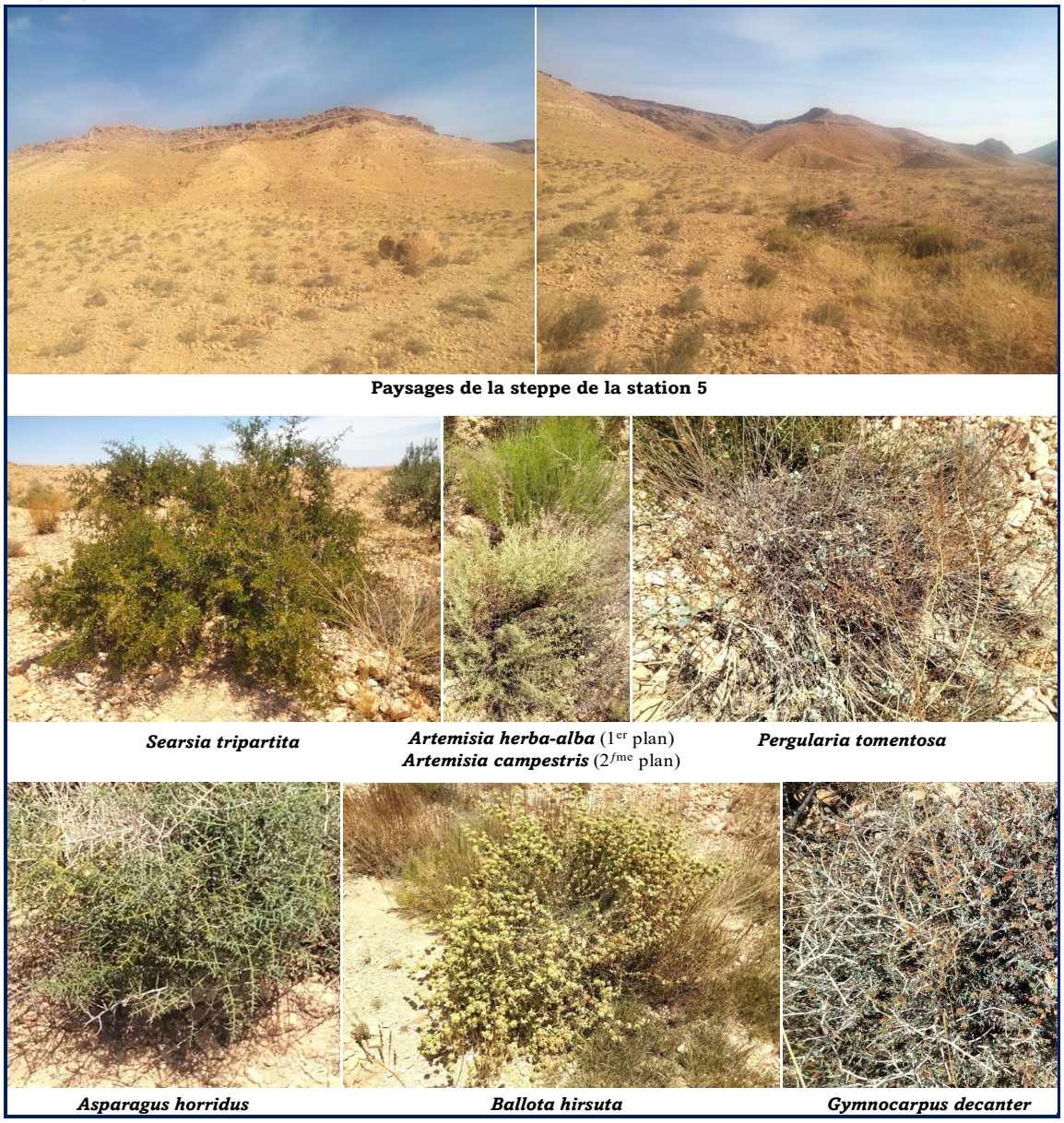

Figure 9: Landscapes and plants species at station 5

f. Survey station 6

This station lies between the north-eastern slope of Bouhedma National Park (IBA/KBA) and an agricultural plain, separated by a wadi bed. The flora is made up of two different plant associations: xerophilous steppe with *Haloxylon scoparium*, *Astragalus armatus*, *Haloxylon salicornicum*, *Gymnocarpos decander*, and *Artemisia herba-alba* and water-associated species in the wadi such as *Cenchrus ciliaris*, *Retama raetam*, *Euphorbia retusa*, *Lavandula multifide*, *Diplotaxis harra*, *Moricandia arvensis*, and *Cynara cardunculus*.

Table 8: Taxonomic list of plant species at station 6

Family	Genus and species	Name French	Status	
			IUCN (2025)	National
Amaranthaceae	***Haloxylon scoparium***	Remth	NE	NE
	Haloxylon salicornicum	Saligne blanche	NE	NE
Caryophyllaceae	***Gymnocarpos decander***	Gymnocarpe	NE	NE
Brassicaceae	***Diplotaxis harra***	Diploptaxe	NE	NE
Fabaceae	***Astragalus armatus***	Astragale vulnérant	NE	NE
	Retama raetam	Rétame	NE	NE
Asteraceae	***Artemisia herba-alba***	Armoise blanche	NE	NE
	Cynara cardunculus	Cardon sauvage	NE	NE
Lamiaceae	***Lavandula multifide***	Lavande multifide	NE	NE
Euphorbiaceae	***Euphorbia retusa***	Euphorbe obtus	NE	NE
Poaceae	***Cenchrus ciliaris***	Cenchrus cilié	NE	NE
Brassicaceae	***Moricandia arvensis***	Chou des champs	NE	NE

NE = Not Evaluated, Species indicated as NE are not listed in national (REGNES, ME 2025), regional, or international (IUCN 2025) references. They are common and widely distributed in arid regions. They may therefore be considered as Least Concern (LC).

Figure 10: Landscape and Plant species of station 6

g. Survey station 7

This station, at the northern edge of Bouhedma National Park, is a rugged stony terrain with xerophilous steppe vegetation. Key species include *Haloxylon salicornicum*, *Astragalus armatus, Gymnocarpos decander, Pituranthos chloranthus, Asparagus horridus, Artemisia herba-alba, Lavandula multifide, Cynara cardunculus*, and, notably, *Stipa tenacissima* and *Lygeum spartum*, recorded here for the first time along the HT line. *Retama raetam* and *Searsia tripartita* occur in ravine escarpments.

Table 9: Taxonomic list of plant species at station 7

Famille	Genre et espèce	Nom Français	Status	
			IUCN (2025)	National
Amaranthaceae	***Haloxylon salicornicum***	Saligne blanche	NE	NE
Caryophyllaceae	***Gymnocarpos decander***	Gymnocarpe	NE	NE
Fabaceae	***Astragalus armatus***	Astragale vulnérant	NE	NE
	Retama raetam	Rétame	NE	NE
Nitrariaceae	***Nitraria retusa***	Nitraire	NE	NE
Brassicaceae	***Diplotaxis harra***	Diploptaxe	NE	NE
Asteraceae	***Artemisia herba-alba***	Armoise blanche	NE	NE
	Cynara cardunculus	Cardon sauvage	NE	NE
Lamiaceae	***Lavandula multifide***	Lavande multifide	NE	NE
Poaceae	***Stipa tenacissima***	Alfa	**VU**	**LC**
	Lygeum spartum	Sparte	NE	NE
Asparagaceae	***Asparagus horridus***	Asperge d'horride	NE	NE
Apiaceae	***Pituranthos chloranthus***	Déesse de l'accouchement	NE	NE
Anacardiaceae	***Searsia tripartita***	**Sumac tripartite**	**LC**	**VU**

NE = Not Evaluated, LC = Least Concern, VU = Vulnerable, Species indicated as NE are not listed in national (REGNES, ME 2025), regional, or international (IUCN 2025) references. They are common and widely distributed in arid regions. They may therefore be considered as Least Concern (LC).

Figure 11: Landscape of station 7

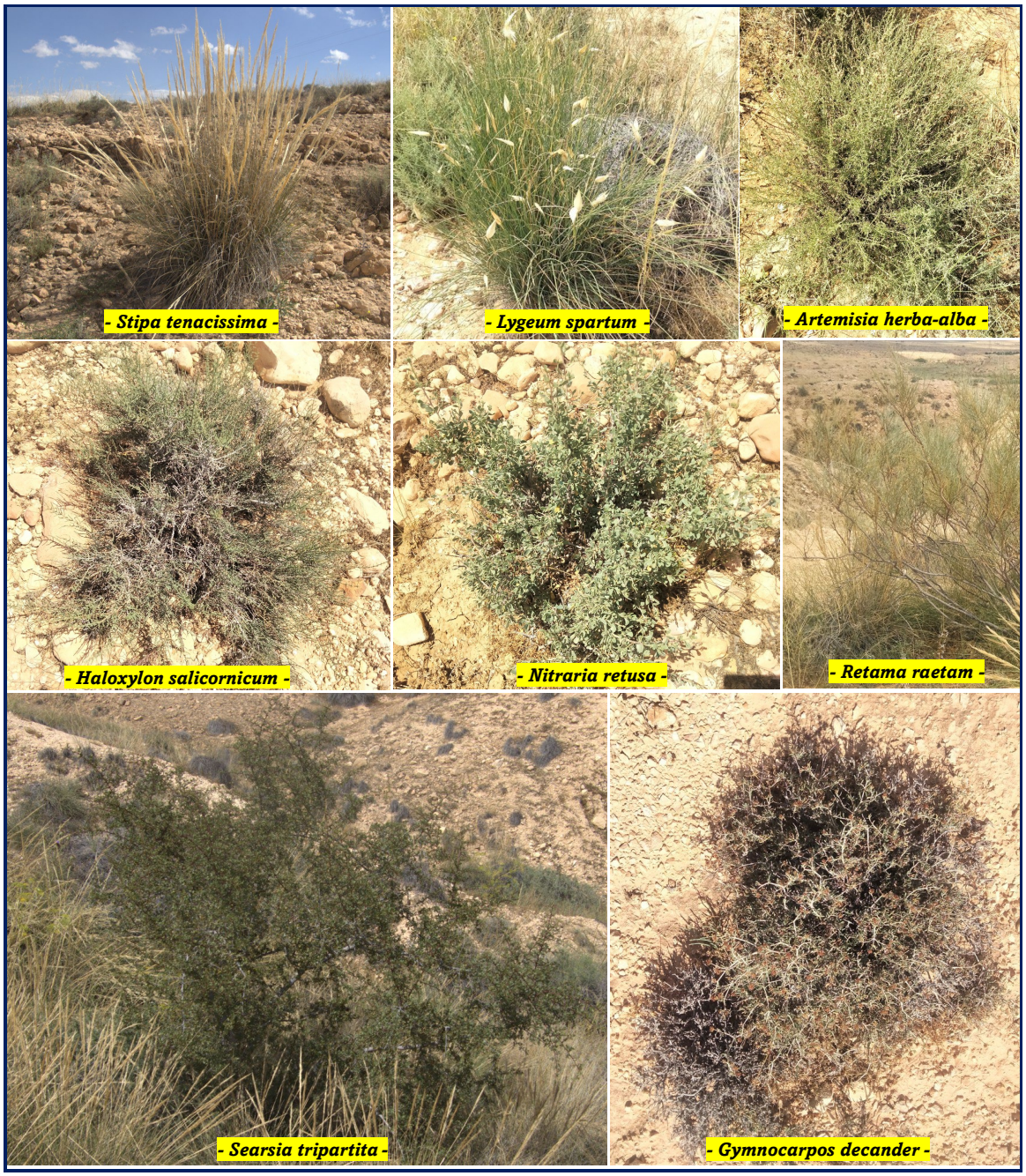

Figure 12: Plant species of Station 7

h. Survey station 8

This station is located between olive groves and a wadi, supports vegetation linked to sandy, moist soils. Wadi banks host *Retama raetam, Ziziphus lotus, Cenchrus ciliaris, Rhanterium suaveolens,* and *Polygonum equisetiforme*, while adjacent areas contain *Artemisia herba-alba, Artemisia campestris, Scabiosa atropurpurea, Echiochilon fruticosum,* and *Thymelaea hirsuta*. The gypso-halophilous *Reaumuria vermiculata* was also recorded on stony ground between Stations 7 and 8.

Family	Genus and species	Name French	Status	
			IUCN (2025)	National
Fabaceae	***Retama raetam***	Rétame	NE	NE
Rhamnaceae	***Ziziphus lotus***	Jujubier	NE	NE
Asteraceae	***Rhanterium suaveolens***	Rhanterium odorant	NE	NE
	Artemisia campestris	Armoise champêtre	NE	NE
	Artemisia herba-alba	Armoise blanche	NE	NE
Thymeleaceae	***Thymelaea hirsuta***	Passerine	NE	NE
Apocynaceae	***Pergularia tomentosa***	Pergulaire	NE	NE
Poaceae	***Cenchrus ciliaris***	Cenchrus cilié	NE	NE
Polygonaceae	***Polygonum equisetiforme***	Renouée à balais	NE	NE
Caprifoliaceae	***Scabiosa atropurpurea***	Scabieuse pourpre	NE	NE
Boraginaceae	***Echiochilon fruticosum***	Absinthe du désert	NE	NE
Tamaricaceae	***Reaumuria vermiculata***	Lotier faux pied d'oiseau	NE	NE

NE = Not Evaluated, Species indicated as NE are not listed in national (REGNES, ME 2025), regional, or international (IUCN 2025) references. They are common and widely distributed in arid regions. They may therefore be considered as Least Concern (LC).

Figure 13: Landscape of Station 8

Figure 14: Plant Species of Station 8

Conclusion

- The PV site and HT line corridor are dominated by **arid steppe and halophytic ecosystems,** with sparse, low-diversity vegetation typical of pre-desert environments.
- *Haloxylon salicornicum*, *Haloxylon scoparium*, *Anabasis articulata*, and *Astragalus armatus* are the most widespread species across the surveyed stations.
- The majority of the Species are indicated as NE, they are not listed in national (REGNES, ME 2025) or international (IUCN 2025) references. They are common and widely distributed in arid regions. They may therefore be considered as Least Concern (LC).
- Three species of conservation concern were recorded:
    - *Vachellia Acacia tortilis* (LC globally; VU nationally), observed at Station 2 and 4
    - *Stipa tenacissima* (VU globally; LC nationally, observed at station 7
    - *Searsia tripartita* (LC globally; VU nationally), observed at station 5 and 7

In line with EBRD ESR6 definitions, these species qualify as **Priority Biodiversity Features (PBFs)** due to their Vulnerable status at national and/or global level. However, they were observed only as scattered individuals at low densities and do not form dominant or habitat-defining assemblages.

1.2. **Fauna**

Faunal surveys were conducted both within the boundaries of the PV solar plant site and along the route of the associated transmission line. In line with the approach used for the flora survey, observations were made at the same eight survey stations established near the avifauna vantage points.

PV solar plant

c. Invertebrates

The small invertebrates observed on the site are :

- A gastropod mollusc: *Sphincterochila candidissima*.
- Two species of Tenebrionid Coleoptera insects: *Prionotheca coronata* and *Pimelia interstitialis*.
- Two species of Buthidae scorpions: *Androctonus australis* and *Buthacus arenicola*.

d. Vertebrates

iii. Reptiles

Two lizard species were recorded on site: *Stenodactylus mauritanicus* and *Chalcides boulengeri*. Workers at the adjacent PV station also reported the presence of *Cerastes cerastes* and *Naja haje*. A broader list of reptiles potentially occurring in the area was compiled from published literature, using the nomenclature of Nouira et al. (2002). All species are listed as Least Concern (LC) by the IUCN Red List of Mediterranean Reptiles (2006).

Order	Family	Genus & species French & Latin names	Status
Saurians	**Varanidae**	Le Varan ***Varanus griseus***	**LC**
	Gekkonidae	Le Gecko ***Stenodactylus mauritanicus*** (Ob.)	**LC**
	Agamidae	L'agame ***Trapelus mutabilis***	**LC**
	Lacertidae	L'Acanthodactyle ***Acanthodactylus boskianus***	**LC**
		La Mésaline ***Mesalina olivieri***	**LC**
	Scincidae	Le Seps ***Chalcides boulengeri*** (Ob.)	**LC**
Ophidians	**Lamprophiidae**	Le Psammophide ***Psammophis schokari***	**LC**
		La Couleuvre ***Malpolon moilensis***	**LC**
	Viperidae	La vipère à cornes ***Cerastes cerastes***	**LC**
	Elapidae	Le Cobra ***Naja haje***	**LC**

LC: Least concern, Ob: Observed, Status: UICN, 2006. Conservation status and geographical distribution of reptiles and amphibians of the Mediterranean basin.

iv. Mammals

Traces of the movement of Gerboises on the quicksand of the nebkas and several burrows of rodents and red foxes have been spotted at the foot of the plant clumps, particularly those of the Jujubiers in the sandy areas.

The list of mammals likely to be found in this habitat is based on the literature (CHETOUI, in press ; EL-FARHATI et al., 2019). All these species have LC status according to the Red List of Mediterranean Mammals (2008).

Order	Family	French name Genus & species	Status
Lagomorphs	**Leporidae**	Le Lièvre du Cap ***Lepus capensis***	LC
Rodents	**Muridae**	La Gerbille champêtre ***Gerbillus campestris***	LC
		La Gerbille de Simon ***Gerbillus simoni***	LC
		Le Mérion de Shaw ***Meriones shawi***	LC
		Le Rat des sables ***Psammomys obesus***	LC
	Dipodidae	La grande Gerboise ***Jaculus orientalis***	LC
Insectivores	**Erinaceidae**	Le Hérisson d'Algérie ***Atelerix algirus***	LC
Carnivores	**Canidae**	Le Renard roux ***Vulpes vulpes***	LC
		Le Loup doré ***Canis anthus***	LC

LC: Least concern

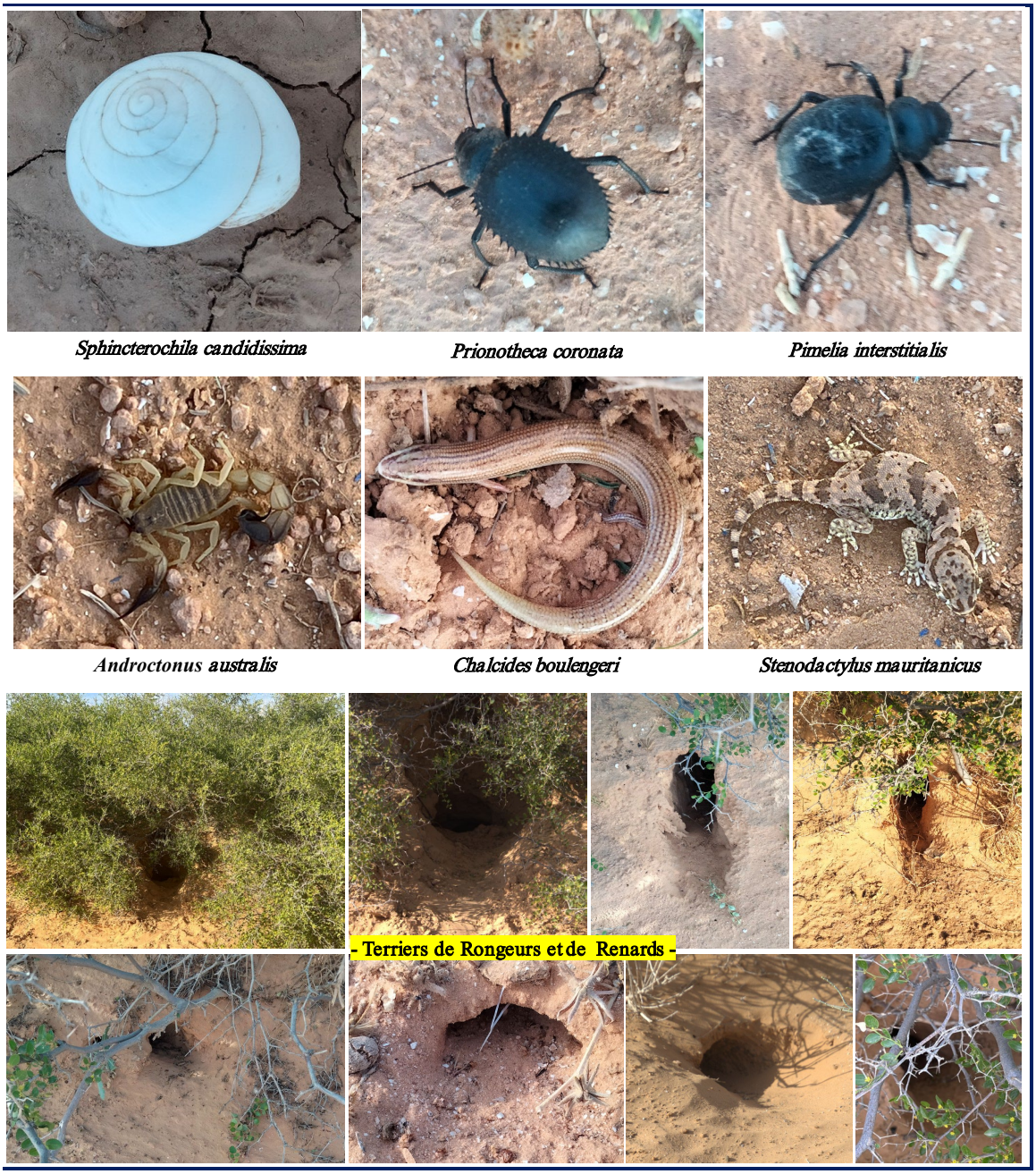

Figure 15: Animals (vertebrates and invertebrates) and burrows found on the site

Along the OHTL route

c. Invertebrates

Invertebrates recorded or likely to occur along the OHTL include three gastropod molluscs: *Sphincterochila candidissima*, *Eobania vermiculata*, and *Xeroplana doumeti* (the latter restricted to rocky habitats at Station 7), several insects such as *Eugaster guyony*, *Julodis sp*., *Geomantis larvoides*, and *Sphinx caterpillars*, as well as five scorpion species. Among the latter, the poisonous *Androctonus australis* was confirmed, alongside *Buthus tunetanus*, *Androctonus bicolor*, *Buthacus arenicola*, and *Scorpio punicus*.

Group	Family	Species
Molluscs	Sphincterochilidae	*Sphincterochila candidissima*
	Helicidae	*Eobania vermiculata*
	Hygromiidae	*Xeroplana doumeti*
Insects	Tettigoniidae	*Eugaster guyony*
	Buprestidae	*Julodis sp.*
	Rivetinidae	*Geomantis larvoides*
	Sphingidae	*Sphinx caterpillars*
Scorpions	Buthidae	*Androctonus australis*
	Buthidae	*Buthus tunetanus*
	Buthidae	*Androctonus bicolor*
	Buthidae	*Buthacus arenicola*
	Scorpionidae	*Scorpio punicus*

Figure 16: Invertebrate species observed along the OHTL route

d. Vertebrates

iv. **Amphibians**

No amphibians have been found along the LEHT route, but four species have been reported (Ben Hassine and Nouira, 2012) in the area surveyed.

Family	Genus & species	IUCN (2025)
Ranidae	***Rana saharica***	LC
Alytidae	***Discoglossus pictus***	LC
Bufonidae	***Sclerophrys mauritanica***	LC
	Bufotes boulengeri	LC

LC: Least concern,

v. Reptiles

The Bouhedma region, including the National Park, is particularly rich in reptiles due to the overlap of Palaearctic, Saharan, Saharo-Sindian, African, and North African Mediterranean elements, making it a biogeographic transition zone. Field surveys recorded a few lizards, including Varanus griseus at Station 1, while the broader list of species likely to occur is based on published literature and studies on Bouhedma's fauna.

Ordre	Family	Species	Status
Chéloniens	**Testudinidae**	***Testudo graeca***	LC
Sauriens	**Chamaeleonidae**	***Chamaeleo chamaeleon***	LC
	Varanidae	***Varanus griseus*** (Observed)	LC
	Agamidae	***Trapelus mutabilis*** (Observed)	LC
		Uromastyx acanthinura	LC
	Lacertidae	***Acanthodactylus boskianus*** (Observed)	LC
		Acanthodactylus maculatus	LC
		Mesalina olivieri	LC
		Mesalina guttulata	LC
		Ophisops occidentalis	LC
	Gekkonidae	***Stenodactylus mauritanicus*** (Observed)	LC
		Tropiocolotes tripolitanus	LC
	Phyllodactylidae	***Tarentola fascicularis***	LC
	Scincidae	***Chalcides ocellatus***	LC
		Chalcides boulengeri (Observed)	LC
		Eumeces schneideri	LC
Ophidiens	**Colubridae**	***Hemorrhois hippocrepis***	LC
		Hemorrhois algirus	LC
	Lamprophiidae	***Psammophis schokari***	LC
		Malpolon insignitus	LC
		Malpolon moilensis	LC
	Viperidae	***Cerastes cerastes*** (Observed)	LC
		Echis leucogaster	LC
		Daboia mauritanica	**NT**
	Elapidae	***Naja haje***	LC

LC = Least Concern, NT : Quasi menacé, Status: IUCN, 2006. Conservation status and geographical distribution of reptiles and amphibians of the Mediterranean basin.

vi. Mammals

The order of mammals best represented in the sector is that of rodents, as evidenced by the large number of burrows dug at the foot of clumps of vegetation (Jujubier, Rétame, Baguel, Remth, etc.), particularly in the sandy steppes. The list of Mammals in the sector (Table 18) was compiled using data from the literature, particularly the work of Moldrzyk (2003) .

All these species have **LC** status according to the IUCN Red List of Mediterranean Mammals (2008).

Ordre	Famille	Nom Français Genre & espèce	Status
Lagomorphes	**Leporidae**	Le Lièvre du Cap **Lepus capensis**	LC
Rongeurs	**Muridae**	La Gerbille champêtre **Gerbillus campestris**	LC
		La Gerbille de Lataste **Gerbillus latastei**	LC
		La Gerbille de Simon **Gerbillus simoni**	LC
		Le Mérion de Shaw **Meriones shawi**	LC
		Le Rat des sables **Psammomys obesus**	LC
		Le Rat noir **Rattus rattus**	LC
		La Souris **Mus musculus**	LC
	Ctenodactylidae	Le Goundi **Ctenodactylus gundi**	LC
	Dipodidae	La Grande Gerboise **Jaculus orientalis**	LC
	Hystricidae	Le Porc Epic ***Hystrix crsitata***	LC
Insectivores	**Erinaceidae**	Le Hérisson d'Algérie ***Atelerix algirus***	LC
Macroscelidea	**Macroscelididae**	Le Rat à trompe *Petrosaltator rozeti*	LC
Carnivores	**Viverridae**	La genette d'Europe ***Genetta genetta***	LC
	Canidae	Le Renard roux ***Vulpes vulpes***	LC
		Le Loup doré ***Canis anthus***	LC

LC = Least Concern,

The mammal group also includes bats, with 13 species recorded in Bouhedma National Park across six habitat types (Dalhoumi et al., 2016; Temple & Cuttelod, 2009). Some of these species may occur in the survey area, particularly on the rocky slopes of Bouhedma National Park, but further surveys are needed to confirm their presence at the PV station site and along the OHTL line.

Famille	Nom commun	Espèce	IUCN (2025)
Rhinolophidae	Grand rhinolophe	***Rhinolophus ferrumequinum***	**LC**
	Petit rhinolophe	***Rhinolophus hipposideros***	**LC**
	Rhinolophe euryale	***Rhinolophus euryale***	**NT**
	Rhinolophe de Mehely	***Rhinolophus mehelyi***	**VU**
Rhinopomatidae	Petit rhinopome	***Rhinopoma cystops***	**LC**
Molossidae	Molosse de Cestoni	***Tadarida teniotis***	**LC**
Miniopteridae	Minioptère de Schreibers	***Miniopterus schreibersii***	**VU**
Vespertilionidae	Sérotine isabelle	***Eptesicus isabellinus***	**LC**
	Pipistrelle de Kuhl	***Pipistrellus kuhlii***	**LC**
	Pipistrelle commune	***Pipistrellus pipistrellus***	**LC**

Famille	Nom commun	Espèce	IUCN (2025)
	Oreillard d'Hemprich	***Otonycteris hemprichii***	**LC**
	Oreillard du Maghreb	***Plecotus gaisleri***	**NE**
	Murin du Maghreb	***Myotis punicus***	**DD**

LC = Least Concern; NT = Near Threatened; VU = Vulnerable; EN = Endangered; CR = Critically Endangered; NE = Not Evaluated; DD = Data Deficient.

Conclusion

- The fauna of the PV site and OHTL corridor is rich and diverse despite the arid environment, confirmed by field observations, traces, and literature review.
- Reptiles are the most diverse group, reflecting adaptation to the range of habitats along the OHTL.
- Mammals are dominated by rodents, evidenced by numerous burrows and direct observations.
- Most vertebrate species recorded or expected are common in central and southern Tunisia and of no conservation concern.
- *Daboia mauritanica* (Near Threatened, IUCN) was not observed but is considered potentially present in rocky mountain habitats (Stations 5 and 7).
- Hazardous species confirmed in the area include the scorpion *Androctonus australis*, the horned viper *Cerastes cerastes*, and the cobra *Naja haje*.
- Bat surveys have not yet been conducted, but 13 species are known from Bouhedma National Park, including several of conservation concern (VU and NT). Targeted surveys are required to confirm their presence at the PV site and along the OHTL.
- **Potential PBF species**: Based on potentially present species, *Daboia mauritanica* (NT) and several bat species (VU and NT) may qualify as **PBFs** under EBRD ESR6.

1.3. Avifauna

As part of the methodology developed to carry out ornithological investigations at the Khobna–Sidi Bouzid PV power station and the associated HV transmission line, three survey campaigns were conducted on 8–11 April 2025, 17–18 May 2025, and 14–15 June 2025. Surveys are being undertaken on a monthly basis, with campaigns scheduled for the upcoming months, including the autumn migration period.

In southern Tunisia, the April and May campaigns coincided with the phenological breeding season for many bird species, while the June campaign marked the end of spring passage for passerines. The present results are based on two complementary techniques commonly applied in ornithological studies: (i) transects with stopping points of approximately 10 minutes each (applied at the PV plant site), and (ii) fixed vantage point observations (applied along the HV transmission line).

The overall objective of the avifauna baseline is to establish an inventory of species present within the study area, along with their relative abundance and conservation status. Particular attention was given to species and ecological conditions of potential concern under **ESR6**, specifically:

- The regular presence of species of conservation interest, including those listed as threatened on the IUCN Red List (global and national levels), or otherwise protected under Tunisian regulations.
- The potential presence of migratory bird populations that may reach or exceed thresholds of 20,000 individuals or 1% of the biogeographical population in the Western Palearctic.
- The possible use of the area as a major migration corridor.
- The presence of Maghreb endemic species
- The occurrence of raptors (diurnal and nocturnal; resident, breeding, or migratory) that play key ecological roles as regulators of prey populations.

- The presence of species of historical or cultural significance to local communities.

a. Methodology

At the PV plant

The ornithologists surveyed the PV plant site along seven transects (T1–T7), recording all birds seen or heard, their behaviours, and all nests encountered. This method enabled the identification of species frequenting the site, estimation of abundance and density (ind/km), and compilation of a near-exhaustive list of sedentary, breeding migrant, and passage species. Special attention was given to emblematic or conservation-sensitive species, including large soaring birds and those listed in international conventions or on the IUCN Red List.

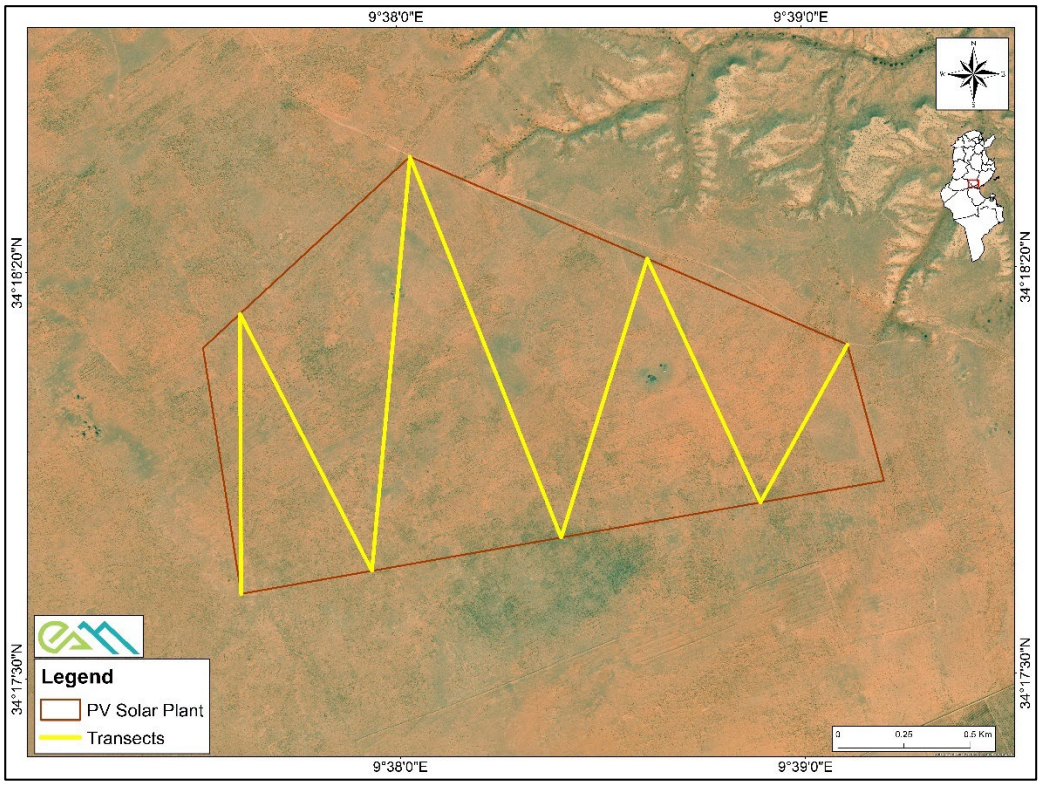

Figure 17: Position of the transect at the PV plant.

Along the OHTL route

To monitor birds along the HV power line corridor associated with the PV plant, the survey used vantage points (VPs). These are fixed observation stations strategically positioned to provide a wide field of view over the line and its surroundings. A total of eight VPs were established, spaced about 2–2.5 km apart. At each VP, ornithologists remained stationary for a set period, scanning the sky and landscape with binoculars and telescopes to detect and record all birds flying through or using the area. During the first campaign in April 2025, each VP was monitored for six hours, amounting to a total of 48 observation hours, while in the May and June 2025 campaigns, each VP was observed for three hours, giving a total of 24 hours of observation per campaign. It should be noted that VP5 was positioned approximately 1 km away from the line due to the mountainous and elevated terrain, which made direct access impossible.

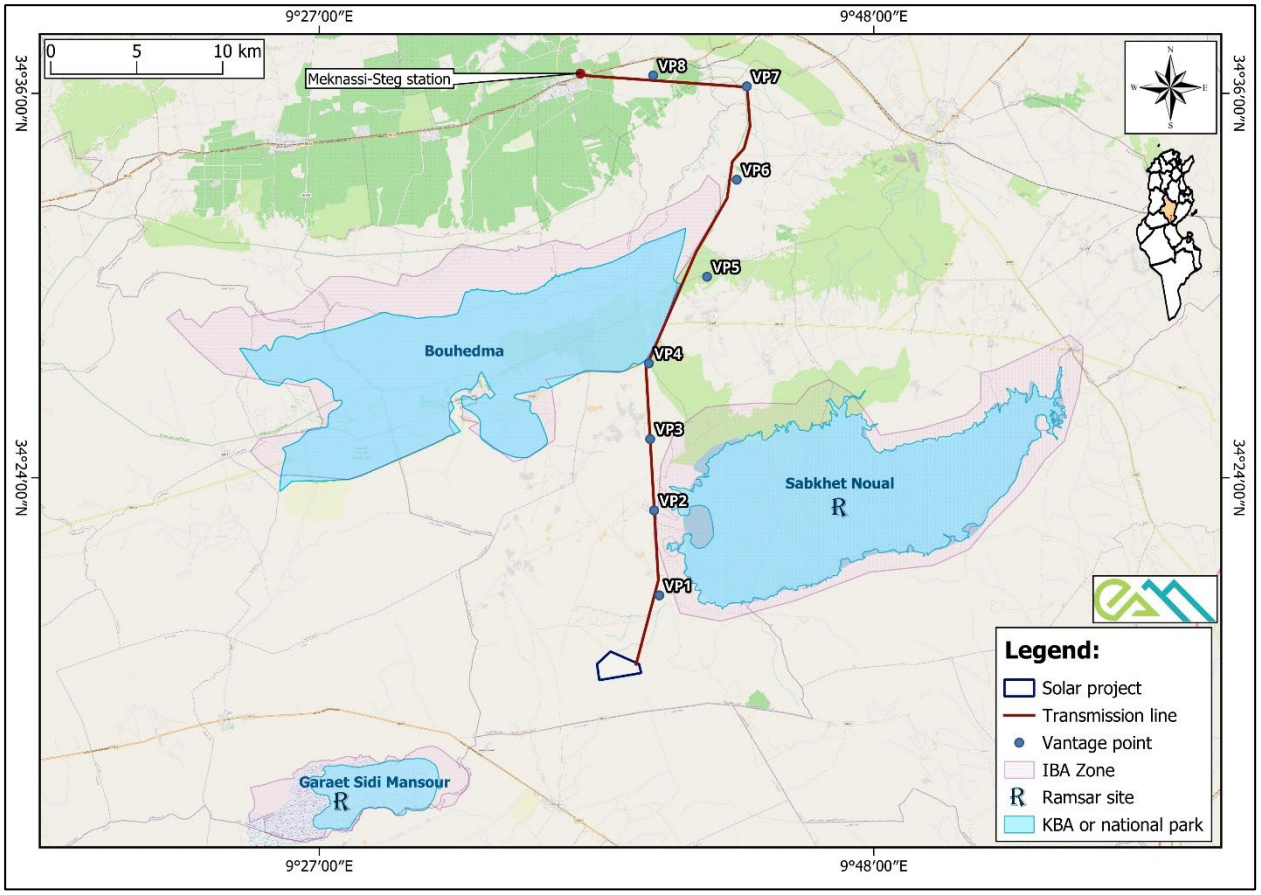

Figure 18: Location of observation points (VP) along the OHTL route

RESULTS OF THE ORNITHOLOGICAL CAMPAIGNS

A total of 71 bird species were identified during the April, May, and June 2025 surveys. These included five species at least partially dependent on water (*Actitis hypoleucos, Anarhynchus alexandrinus, Burhinus oedicnemus, Cursorius cursor, and Gallinula chloropus*), ten species of birds of prey (*Aquila chrysaetos, Athene noctua, Buteo rufinus, Circaetus gallicus, Circus macrourus, Circus pygargus, Falco biarmicus, Falco tinnunculus, Milvus migrans, and Pernis apivorus*), and a majority of grassland birds typical of the pre-desert region, such as wheatears, hoopoe larks, larks, coursers, and certain warblers.

During the May 2025 campaign, the passage of Montagu's Harrier (*Circus pygargus*) and Pallid Harrier (*Circus macrourus*) was recorded, along with a group of approximately thirty European Honey Buzzards (*Pernis apivorus*) passing above or near the first vantage points along the HV line.

Several nests of raptors, namely Long-legged Buzzard (*Buteo rufinus*) and Lanner Falcon (*Falco biarmicus*), as well as corvid nests of Common Raven (*Corvus corax*), were located on pre-existing HV pylons during the breeding season.

In June 2025, vagrant groups of Skylark (*Alauda arvensis*), Calandra Lark (*Melanocorypha calandra*), and Isabelline Skylark (*Alaudala rufescens*) were observed in the meadow areas where the new pylons are planned.

The following table presents the species recorded over the three-month period (April–June 2025), together with their global conservation status (IUCN 2025) and national status (Hamdi et al., 2021).

NOMS LATINS	NOMS ANGLAIS	Nom Français	UICN National (*)	UICN Global
Actitis hypoleucos	Common Sandpiper	Chevalier guignette	IND	LC
Alaemon alaudipes	Greater Hoopoe-Lark	Sirli du désert	LC	LC
Alaudala rufescens	Mediterranean Short-toed Lark	Alouette pispolette	LC	LC
Ammomanes cinctura	Bar-tailed Lark	Ammomane élégante	LC	LC
Ammomanes deserti	Desert Lark	Ammomane isabelline	LC	LC
Anarhynchus alexandrinus	Kentish Plover	Pluvier à collier interrompu	LC	LC
Anthus trivialis	Tree Pipit	Pipit des arbres	IND	LC
Apus apus	Common Swift	Martinet noir	LC	LC
Aquila chrysaetos	Golden Eagle	Aigle royal	VU	LC
Argya fulva	Fulvous Babbler	Cratérope fauve	NT	LC
Athene noctua	Little Owl	Chevêche d'Athéna	LC	LC
Bucanetes githagineus	Trumpeter Finch	Roselin githagine	IND	LC
Burhinus oedicnemus	Eurasian Stone-curlew	Oedicnème criard	LC	LC
Buteo rufinus	Long-legged Buzzard	Buse féroce	LC	NT
Calandrella brachydactyla	Greater Short-toed Lark	Alouette calandrelle	LC	LC
Cercotrichas galactotes	Rufous-tailed Scrub Robin	Agrobate roux	LC	LC
Chloris chloris	European Greenfinch	Verdier d'Europe	IND	LC
Circaetus gallicus	Short-toed Snake Eagle	Circaète Jean-le-Blanc	CR	LC
Circus macrourus	Pallid Harrier	Busard pâle	IND	NT
Circus pygargus	Montagu's Harrier	Busard cendré	IND	LC
Cisticola juncidis	Zitting Cisticola	Cisticole des joncs	LC	LC
Columba livia	Rock Dove	Pigeon biset	LC	LC
Corvus corax	Northern Raven	Grand corbeau	LC	LC
Coturnix coturnix	Common Quail	Caille des blés	LC	LC
Curruca communis	Common Whitethroat	Fauvette grisette	LC	LC
Curruca conspicillata	Spectacled Warbler	Fauvette à lunettes	LC	LC
Curruca hortensis	Western Orphean Warbler	Fauvette orphée	LC	LC
Curruca melanocephala	Sardinian Warbler	Fauvette mélanocéphale	LC	LC
Cursorius cursor	Cream-colored Courser	Courvite isabelle	VU	LC
Delichon urbicum	Western House Martin	Hirondelle de fenêtre	DD	LC

NOMS LATINS	NOMS ANGLAIS	Nom Français	UICN National (*)	UICN Global
Emberiza calandra	Corn Bunting	Bruant proyer	LC	LC
Emberiza sahari	House Bunting	Bruant du Sahara	LC	LC
Eremophila bilopha	Temminck's Lark	Alouette bilophe	LC	LC
Falco biarmicus	Lanner Falcon	Faucon lanier	EN	LC
Falco tinnunculus	Common Kestrel	Faucon crécerelle	VU	LC
Ficedula albicollis	Collared Flycatcher	Gobemouche à collier	IND	LC
Fringilla spodiogenys	African Chaffinch	Pinson des arbres africain	LC	LC
Galerida cristata	Crested Lark	Cochevis huppé	LC	LC
Galerida theklae	Thekla's Lark	Cochevis de Thékla	LC	LC
Gallinula chloropus	Common Moorhen	Gallinule poule-d'eau	NT	LC
Hippolais icterina	Icterine Warbler	Hypolaïs ictérine	IND	LC
Hirundo rustica	Barn Swallow	Hirondelle rustique	LC	LC
Iduna opaca	Western Olivaceous Warbler	Hypolaïs obscure	LC	LC
Jynx torquilla	Eurasian Wryneck	Torcol fourmilier	LC	LC
Lanius excubitor	Great Grey Shrike	Pie-grièche grise	LC	LC
Lanius senator	Woodchat Shrike	Pie-grièche à tête rousse	LC	NT
Linaria cannabina	Common Linnet	Linotte mélodieuse	LC	LC
Melanocorypha calandra	Calandra Lark	Alouette calandre	VU	LC
Merops apiaster	European Bee-eater	Guêpier d'Europe	LC	LC
Milvus migrans	Black Kite	Milan noir	LC	LC
Motacilla flava	Western Yellow Wagtail	Bergeronnette printanière	LC	LC
Muscicapa striata	Spotted Flycatcher	Gobemouche gris	LC	LC
Oenanthe deserti	Desert Wheatear	Traquet du désert	LC	LC
Oenanthe halophila	Maghreb Wheatear	Traquet halophile	LC	IND
Oenanthe hispanica	Western Black-eared Wheatear	Traquet oreillard	LC	LC
Oenanthe leucura	Black Wheatear	Traquet rieur	LC	LC
Oenanthe moesta	Red-rumped Wheatear	Traquet à tête grise	LC	LC
Oenanthe oenanthe	Northern Wheatear	Traquet motteux	IND	LC
Passer hispaniolensis	Spanish Sparrow	Moineau espagnol	LC	LC
Pernis apivorus	European Honey Buzzard	Bondrée apivore	IND	LC

NOMS LATINS	NOMS ANGLAIS	Nom Français	UICN National (*)	UICN Global
Phylloscopus bonelli	Western Bonelli's Warbler	Pouillot de Bonelli	LC	LC
Pterocles orientalis	Black-bellied Sandgrouse	Ganga unibande	VU	LC
Ptyonoprogne rupestris	Eurasian Crag Martin	Hirondelle de rochers	IND	LC
Scotocerca inquieta	Streaked Scrub Warbler	Dromoïque vif-argent	LC	LC
Serinus serinus	European Serin	Serin cini	LC	LC
Spilopelia senegalensis	Laughing Dove	Tourterelle maillée	LC	LC
Streptopelia decaocto	Eurasian Collared Dove	Tourterelle turque	LC	LC
Streptopelia turtur	European Turtle Dove	Tourterelle des bois	VU	VU
Sturnus unicolor	Spotless Starling	Étourneau unicolore	LC	LC
Turdus merula	Common Blackbird	Merle noir	LC	LC
Upupa epops	Eurasian Hoopoe	Huppe fasciée	LC	LC

LC = Least Concern; NT = Near Threatened; VU = Vulnerable; EN = Endangered; CR = Critically Endangered; NE = Not Evaluated; DD = Data Deficient; IND = Insufficient Data

Potential Key Ornithological Issues

Several bird species recorded during the surveys are listed as threatened at the national or global level. These species, presented in the table below, may qualify **as Priority Biodiversity Features (PBFs)** and are of particular importance when evaluating potential risks of electrocution and collision along the HV line.

Species (English – Latin)	Conservation Status		Risks	
	Global (IUCN, 2025)	National (Hamdi et al., 2021)	Electrocution	Collision
Golden Eagle – *Aquila chrysaetos*	LC	VU	II–III	I–II
Fulvous Babbler – *Argya fulva*	LC	NT	I	II
Long-legged Buzzard – *Buteo rufinus*	NT	LC	II–III	I–II
Short-toed Snake Eagle – *Circaetus gallicus*	LC	CR	II–III	I–II
Pallid Harrier – *Circus macrourus*	NT	IND	II–III	I–II
Cream-colored Courser – *Cursorius cursor*	LC	VU	I	II–III
Lanner Falcon – *Falco biarmicus*	LC	EN	II–III	I–II
Common Kestrel – *Falco tinnunculus*	LC	VU	II–III	I–II
Common Moorhen – *Gallinula chloropus*	LC	NT	0	II–III
Woodchat Shrike – *Lanius senator*	NT	LC	I	II
Calandra Lark – *Melanocorypha calandra*	LC	VU	I	II
Black-bellied Sandgrouse – *Pterocles orientalis*	LC	VU	I	II
European Turtle Dove – *Streptopelia turtur*	VU	VU	II	II

0: no casualties reported, I: casualties reported, but no apparent threat to the bird population, II: regionally or locally high casualties; but with no significant impact on the overall species population, III: casualties are a major mortality factor; threatening a species with extinction, regionally or on a larger scale. LC = Least Concern; NT = Near Threatened; VU = Vulnerable; EN = Endangered; CR = Critically Endangered; NE = Not Evaluated; DD = Data Deficient.

Conclusion

- A total of 71 bird species were recorded during the April–June 2025 surveys at the PV plant and along the OHTL.
- Of the recorded species, five are at least partially dependent on water, ten of birds of prey and the majority are grassland birds typical of the pre-desert region, such as wheatears, larks, coursers, and certain warblers.
- Thirteen species of conservation concern were identified, listed as Near Threatened, Vulnerable, Endangered, or Critically Endangered at the national or global level, qualifying as PBFs under EBRD ESR6.

1.4. Protected Areas

A search of digital and cartographic data published by the IUCN (http://www.keybiodiversityareas.org/kba-data), BirdLife International (http://datazone.birdlife.org/site/search) and national authorities (Direction Générale des Forêts and Ministère de l'Équipement et de l'Habitat), revealed the presence of three conservation sites within a radius of 10 km around the PV solar power plant: Bouhedma National Park located approximately 13 km away, Sebkhet Ennaoual Ramsar site approximately 4 km away, and Garaet Sidi Mansour approximately 9.2 km away. Two of the these are in the vicinity of the HV transmission line route: Sebkhet Ennaoual and Bouhedma. Internationally, Sebkhet Ennaoual, Garaet Sidi Mansour, and Bouhedma National Park are recognized as Ramsar sites and/or Important Bird Areas (IBAs) and/or Key Biodiversity Areas (KBAs). At the national level, in addition to its designation as a National Park, Bouhedma, together with Sebkhet Ennaoual, has been designated as a hunting reserve under the Ministerial Order of 1 August 2022 regulating the 2022/2023 hunting season.

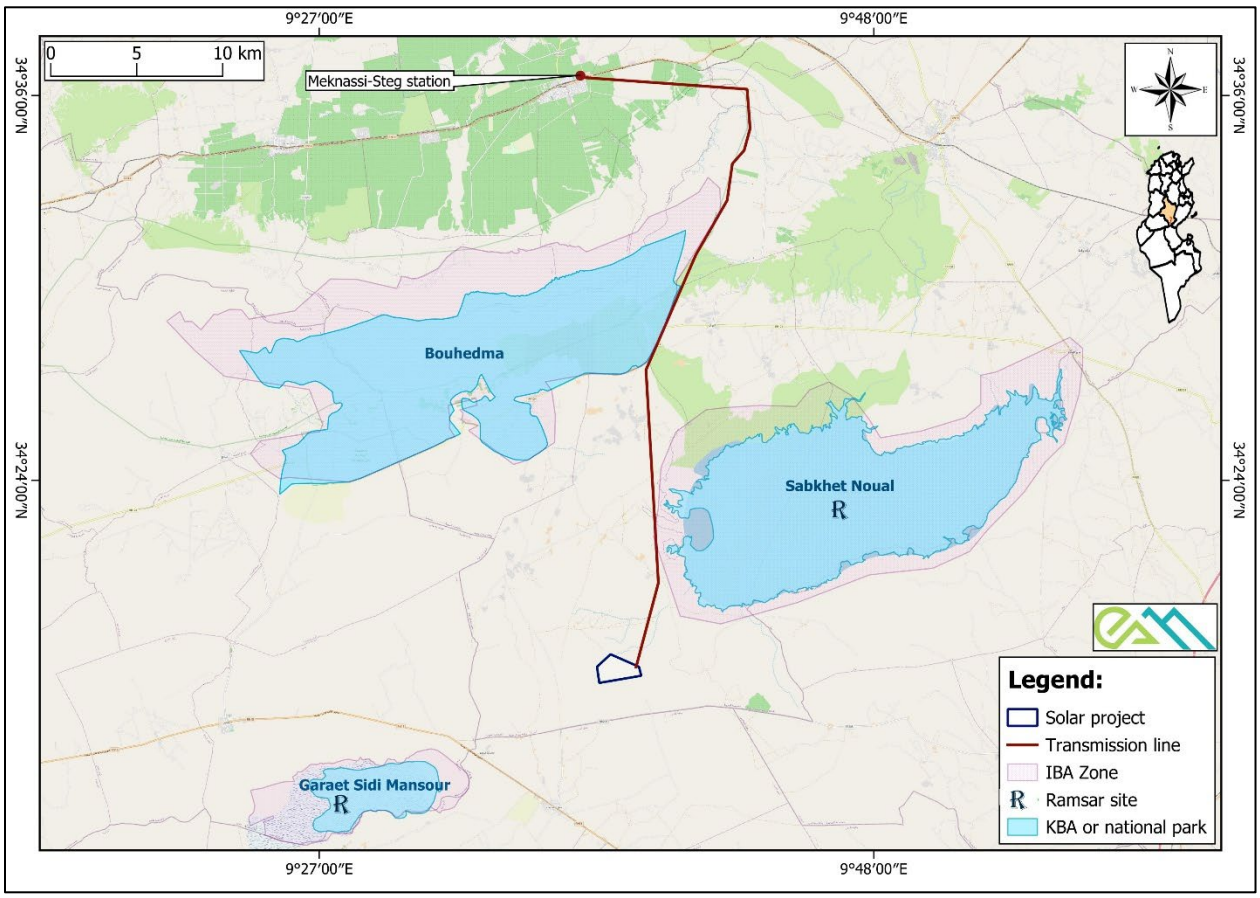

Figure 19: Location of project components and protected areas within a 10 km radius

The following overview summarises the main ornithological values of Sebkhet Ennaoual, Garaet Sidi Mansour, and Bouhedma National Park, together with the IUCN (2025.1) conservation status of the potentially present species.

- Sebkhet Ennaoual (IBA, KBA and Ramsar site) meets Criteria 2, 3, 4, and 6 of the Ramsar Convention. In terms of ornithology, its conservation value lies in the fact that it is home to six species limited to the Sindo-Saharan biome: Pharaoh Eagle-owl Bubo ascalaphus (breeding), Bar-tailed Lark Ammomanes cinctura (Breeding), Alaemon alaudipes, Turdoides fulvus, Scotocerca inquieta et Rhodopechys githaginea (Fishpool & Evans, 2001). In addition, the site is home to 11 bird species restricted to the Mediterranean-North Africa biome, namely the Alectoris Barbara (LC), Caprimulgus ruficollis (LC), Eremophila bilopha (LC), Phoenicurus moussieri (LC), Oenanthe leucura (LC), Oenanthe moesta (LC), Oenanthe hispanica (LC), Sylvia melanocephala (LC), Sylvia cantillans (LC), Sylvia deserti (LC Global and NT national), Sturnus unicolor (LC). During rainy years, this wetland also hosts wintering populations that can reach up to 1% of the original population, such as the Phoenicopterus roseus, Tadorna tadorna
- Garaet Sidi Mansour (IBA, KBA and Ramsar site) included in the Ramsar list of wetlands. In wet years, it regularly attracts migratory waterfowl, with some species exceeding the 1% biogeographic threshold, including threatened taxa such as Marbled Teal (NT), White-headed Duck (EN), and Ferruginous Duck (NT). In exceptionally wet years, the site also serves as a wintering ground for a wide range of Palearctic waterbirds such as Northern Pintail (LC) and Common Crane (LC). Among passerines, the Grey Wagtail (LC) and Common Chiffchaff (LC) are also associated with tamarisk habitats at the site.
- Bouhedma National Park (IBA/KBA and National Park) covers an area of 16,488 hectares, with 8,804 hectares under full protection, 2,400 hectares as a temporary occupation zone, and the remainder as an intermediate buffer zone. Botanicalsurveys have identified more than 500 plant species, dominated by steppe flora with tree cover similar to the pseudo-savannahs unique to Tunisia. This vegetation, highly adapted to arid conditions, provides excellent refuge for a remarkable variety of birds. The following species are cited with their global IUCN Red List status (2025.1): Bonelli's eagle (LC), Pharaoh Eagle-Owl (LC), Barbary Partridge (LC), Sandgrouse (LC), Common Quail (LC), Eurasian Skylark (LC), North African Ostrich (NE), Crested Lark (LC), European Robin (LC), Eurasian Blackcap (LC), Spanish Sparrows (LC), Little Ringed Plover (LC), Common Bulbul (LC),Common Hoopoe (LC), Little Owl (LC), Trumpeter Finch (LC), Fulvous babbler (LC), etc.
- African Houbara (*Chlamydotis undulata*) is a species cited in the bibliography for both Sebkhet Ennaoual and Bouhedma National Park. It is listed as Vulnerable (VU) globally on the IUCN Red List (2025.1) and as Endangered (EN) nationally in the Tunisian Red Data Book (TRDB). The species has undergone significant population declines in recent decades and, according to the 2023 IUCN assessment, is now considered possibly extinct in northern Tunisia, relict populations now confined to the extreme south of Tunisia (Kebili, Medenine, Tataouine). It has not been recorded in the project region (Gabès, Gafsa, Sidi Bouzid) for over three decades, with the last national record dating to 1993 near Tozeur.

1.5. Critical Habitat

The evaluation of Critical Habitat (CH) follows the criteria established under IFC PS 6 (five criteria, GN70–83) and EBRD ESR 6 (six criteria, Section 3.7). Both lenders apply IFC definitions and thresholds as the primary reference:

- **Criterion 1 (PS6-1 / ESR6-ii): Critically Endangered and Endangered species**
  CH is triggered where the area holds ≥0.5% of the global population and ≥5 reproductive units of IUCN-listed CR/EN species, or significant concentrations of VU species whose loss would lead to uplisting. National statuses (e.g. Tunisia's TRDB) are not fully aligned with IUCN but may provide supporting context.
- **Criterion 2 (PS6-2 / ESR6-iii): Endemic or restricted-range species**
  Applies to species with a global range ≤50,000 km². CH is triggered if ≥10% of the global population and ≥10 reproductive units occur in the area.
- **Criterion 3 (PS6-3 / ESR6-iv): Migratory or congregatory species**
  Covers species that cyclically move or gather in large numbers (e.g. colonies, roosting, bottlenecks). CH thresholds are ≥1% of the global population regularly supported, or ≥10% during periods of environmental stress.
- **Criterion 4 (PS6-4 / ESR6-i): Highly threatened or unique ecosystems**
  Triggered if the area represents ≥5% of the global extent of an ecosystem type assessed as CR/EN under IUCN, or if identified as a high-priority conservation area at national/regional level.
- **Criterion 5 (PS6-5 / ESR6-v): Key evolutionary processes**
  Refers to unique structural or spatial landscape features that support genetic diversity, speciation, or other evolutionary processes. Guidance is qualitative, not threshold based.
- **Criterion vi (EBRD ESR6 only): Ecological functions**
  Applies to ecological processes essential for biodiversity persistence (e.g. dispersal corridors, hydrological regimes, keystone species, seasonal refuges).

Determination of Critical Habitat

- **Criterion 1 / ii (Critically Endangered and Endangered species):**
  The Critical Habitat (CH) screening confirmed that no species listed as Critically Endangered (CR) or Endangered (EN) on the IUCN Red List have been recorded within the Project Area of Influence (AoI) or within the species-specific Ecologically Appropriate Area of Analysis (EAAA). As such, thresholds for CH determination under this criterion are not met. Nationally threatened species identified under the Tunisian Red Data Book (TRDB) are not directly considered in this context, since TRDB assessments are not fully aligned with IUCN global methodology.
- **Criterion 2 / iii (Endemic or restricted-range species):**
  No endemic or restricted-range species were detected during surveys, nor is it expected that such species would occur within the relevant EAAA in concentrations that would meet the thresholds for CH determination (≥10% of the global population and ≥10 reproductive units). Therefore, Criterion 2 is not triggered.
- **Criterion 3 / iv (Migratory or congregatory species):**
  Survey data collected during the spring campaigns (April–June 2025) did not reveal the presence of migratory or congregatory species in numbers approaching CH thresholds. The AoI does not provide staging, roosting, or bottleneck habitats that could sustain ≥1% of global populations of migratory species. Wetland sites within the AoI do not regularly support the White-headed Duck (*Oxyura leucocephala*, EN), with thresholds of 53–87 individuals not met,

nor do they support globally significant numbers of other wetland species such as White Stork *(Ciconia ciconia*), Common Crane (*Grus grus*), or Greater Flamingo (*Phoenicopterus roseus*), all of which are classified as Least Concern (LC) globally. Migratory soaring birds have not been recorded roosting or foraging within the AoI, and the landscape does not contain geographical features (e.g., mountain passes, coastal crossings) that would create migratory bottlenecks. Airspace alone does not qualify as CH unless functionally linked to important terrestrial habitats, and in this case no such linkage is present.

Conclusion

At this stage, **CH has not been triggered** for any species of global or national conservation concern likely to occur within the AoI or the species-specific EAAA. Current data do not indicate the presence of species or populations that would meet the thresholds defined under IFC PS6 or EBRD ESR6.

However, the surveys have confirmed the occurrence of several **PBFs**. In addition, some species were not directly recorded within the AoI but are considered potentially present in adjacent IBAs, KBAs, and Ramsar sites, or are known to migrate through the region. These species may therefore interact with the Project, particularly in relation to OHTL. **Species considered to be PBFs are included in Table below.**

Species	Conservation Status		Species presence
	IUCN	National	
Vachellia (Acacia tortilis)	**LC**	**Vu**	**Recorded along OHTL route in May2025**
Stipa tenacissima	**VU**	**LC**	**Recorded along OHTL route in May2025**
Searsia tripartita	**LC**	**VU**	**Recorded along OHTL route in May2025**
Aquila chrysaetos	**LC**	**EN**	**Recorded in April / May 2025 surveys.**
Argya fulva	**LC**	**CR**	**Recorded in April / May 2025 surveys.**
Buteo rufinus	**VU**	**VU**	**Recorded on OHTL surveys in May 2025.**
Circaetus gallicus	**LC**	**VU**	**Recorded on OHTL surveys in April 2025.**
Circus macrourus	**LC**	**NT**	**Recorded on OHTL surveys in April, May, June 2025.**
Cursorius cursor	**NT**	**LC**	**Recorded on OHTL surveys in April, May, June 2025.**
Falco biarmicus	**LC**	**CR**	**Recorded on OHTL surveys in April 2025**
Falco tinnunculus	**NT**	**IND**	**Recorded on OHTL surveys in April 2025**
Gallinula chloropus	**LC**	**VU**	**Recorded on site surveys in June 2025**
Lanius senator	**LC**	**EN**	**Recorded on site surveys in April and June 2025; recorded on OHTL surveys in April and May 2025**
Melanocorypha calandra	**LC**	**VU**	**Recorded on OHTL surveys in April 2025**
Pterocles orientalis	**LC**	**NT**	**Recorded on OHTL surveys in April 2025**
Streptopelia turtur	**NT**	**LC**	**Recorded on OHTL surveys in April 2025**
Aquila chrysaetos	**LC**	**VU**	**Recorded on site surveys in June 2025; recorded on OHTL surveys in May and June 2025**
Argya fulva	**LC**	**VU**	**Recorded on site surveys in April 2025**

Species	Conservation Status		Species presence
	IUCN	National	
Buteo rufinus	**VU**	**VU**	**Recorded on OHTL surveys in April 2025**
Daboia mauritanica	NT	-	Not recorded in AoI April to June but possiliby present. Present in adjacent NP /IBA.
Rhinolophus euryale	NT	-	Not recorded in AoI April to June but possiliby present. Present in adjacent NP / IBA.
Rhinolophus mehelyi	VU	-	Not recorded in AoI April to June but possiliby present. Present in adjacent NP / IBA.
Miniopterus schreibersii	VU	-	Not recorded in AoI April to June but possiliby present. Present in adjacent NP / IBA.
Neophron percnopterus	EN	CR	Not recorded in AoI April to August. Possible migrant over the site.
Falco cherrug	EN	-	Not recorded in AoI April to August. Unlikely migrant over the site.
Oxyura leucocephala	EN	EN	Not recorded on surveys but likely present in adjacent IBA/KBA/Ramsar site and could cross over OHTL AoI.
Aythya ferina	VU	-	Not recorded on surveys Likely present in adjacent IBA/KBA/Ramsar site. Could cross over the OHTL AoI
Calidris ferruginea	VU	-	Not recorded on surveys. Likely present in adjacent IBA/KBA/Ramsar site. Could cross over the OHTL AoI
Calidris falcinellus	VU	-	Not recorded on surveys. Likely present in adjacent IBA/KBA/Ramsar site. Could cross over the OHTL AoI
Pluvialis squatarola	VU	-	Not recorded on surveys. Likely present in adjacent IBA/KBA/Ramsar site. Could cross over the OHTL AoI
Falco vespertinus	VU	-	Not recorded on surveys. Likely present in adjacent IBA/KBA/Ramsar site. Could cross over the OHTL AoI
Chersophilus duponti	VU	-	Not recorded on surveys. Possible presence within the AoI
Chlamydotis undulata	VU	-	Not recorded on surveys. Possible presence within AoI, although likely extinct in northern Tunisia

Qair

Annexe 3: Rapport Archéologique de Oued Ghedada

Qair

Compte rendu du site archéologique de l'Oued Ghedada (Sebkhat Naouel)

Environmental Assessment & Management

Juillet 2025

RAPPORT : **Compte rendu du site archéologique de l'Oued Ghedada (Sebkhat Naouel)**

PRÉPARÉ PAR : Expert en archéologie : Mohamed-Riadh HAMROUNI

CONTRÔLÉ PAR : Directeur du projet : Tahar KHOUAJA

VALIDÉ PAR : Directeur général : Raja KHOUAJA

VÉRIFIÉ PAR : Qair

RÉVISION DU RAPPORT		
DATE	**VERSION**	**RÉFÉRENCE**
4 juillet 2025	00	Version Préliminaire

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INTRODUCTION

Ce compte rendu archéologique a été rédigé à la suite d'une visite du point ST-1, situé sur le tracé de la future ligne haute tension d'environ 45 Km qui part de l'Est du site prévu pour la centrale solaire PV jusqu'au Nord de la ville de Meknassi.

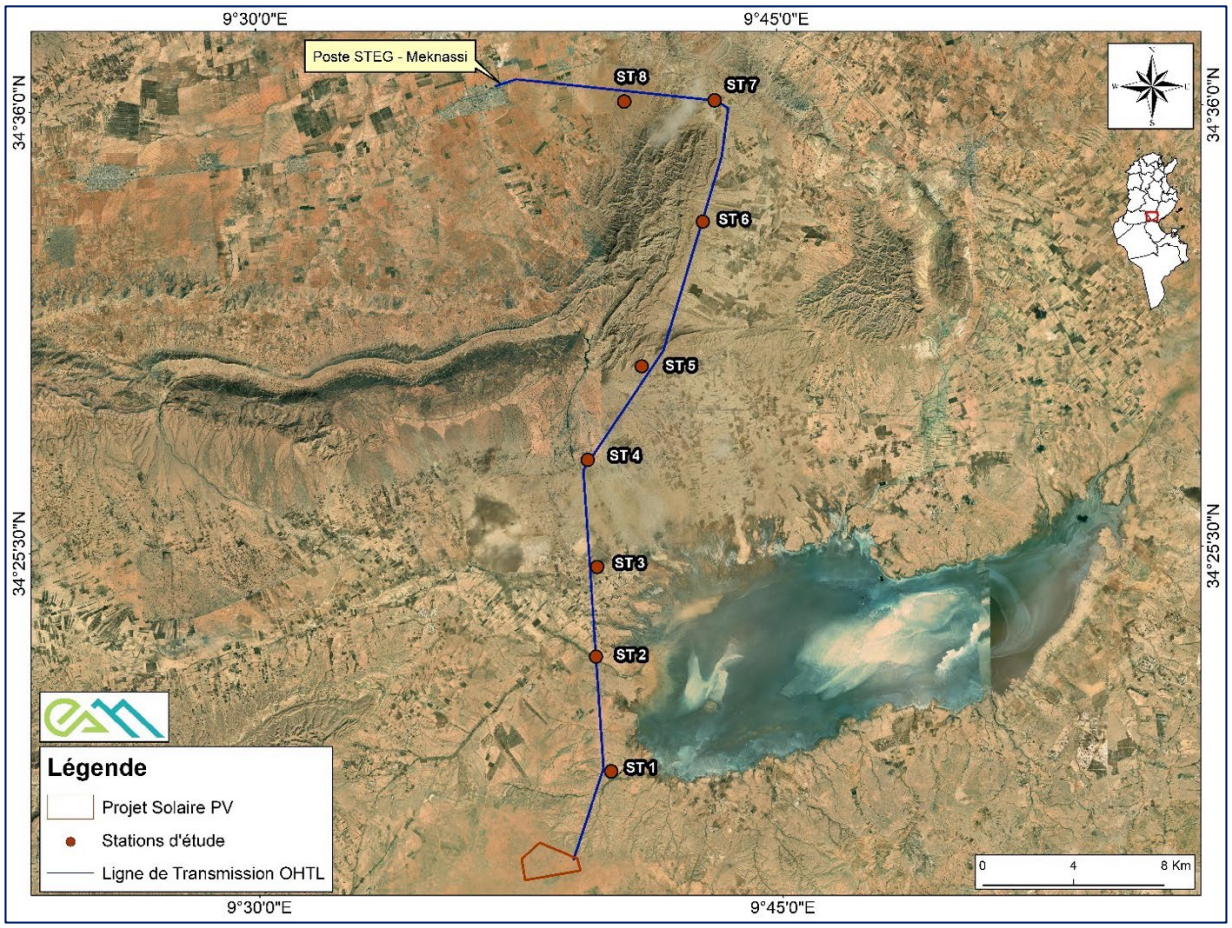

Figure 1 : Localisation des stations d'étude (Points 1 à 8) le long du tracé de la LEHT

RESOURCES

Pour la réalisation de ce compte rendu un archéologue et un expert en environnement ont été mobilisés pour une demi-journée le 13 juin 2025 pour la prospection du point ST-1 au niveau de la ligne de transmission HT. Il s'agit de :

- **M. Mohamed-Riadh Hamrouni, archéologue & maître de conférences**, Université de Kairouan (Tunisie), Faculté des Lettres et des Sciences humaines, *Département d'Archéologie* ; Université de Sousse (Tunisie), Faculté des Lettres et des Sciences humaines, Laboratoire de recherche LR13ES11 : *Occupation du sol, peuplement et modes de vie dans le Maghreb antique et médiéval*.
- **M. Tahar KHOUAJA, Chef du projet et expert international en environnement** avec une expérience professionnelle de +35 ans dans l'évaluation des impacts et des risques environnementaux et sociaux ainsi que la diligence raisonnable en matière d'environnement, de sécurité et de gouvernance. M. KHOUAJA est membre de l'International Association for Impact Assessment (IAIA), Global Network on Impact Assessment.

METHODOLOGIE

Situé à environ 300m au nord de l'Oued Ghedada qui se jette dans Sebkhat Naoual (= Naouel), distance de quelques 1,5 km à l'est, localise le site archéologique visité le 13 juin 2025. (Figure 2 & Figure 3).

Figure 2 : Extrait de la carte topographique de Mehamla (Echelle 1/100 000, n° 68) mentionnant un site antique d'une étendue assez importante (RR = ruines romaines), immédiatement au nord de l'Oued Ghedada

C'est un grand site archéologique antique, victime de fouilles clandestines assez récentes. On y voit, en effet, certaines tranchées creusées, notamment, par des engins mécaniques bouleversant, des fois, les vestiges ***et*** des murs conservant les traces de fresques polychromes ***et*** des sols mosaïqués. (Figure 4)

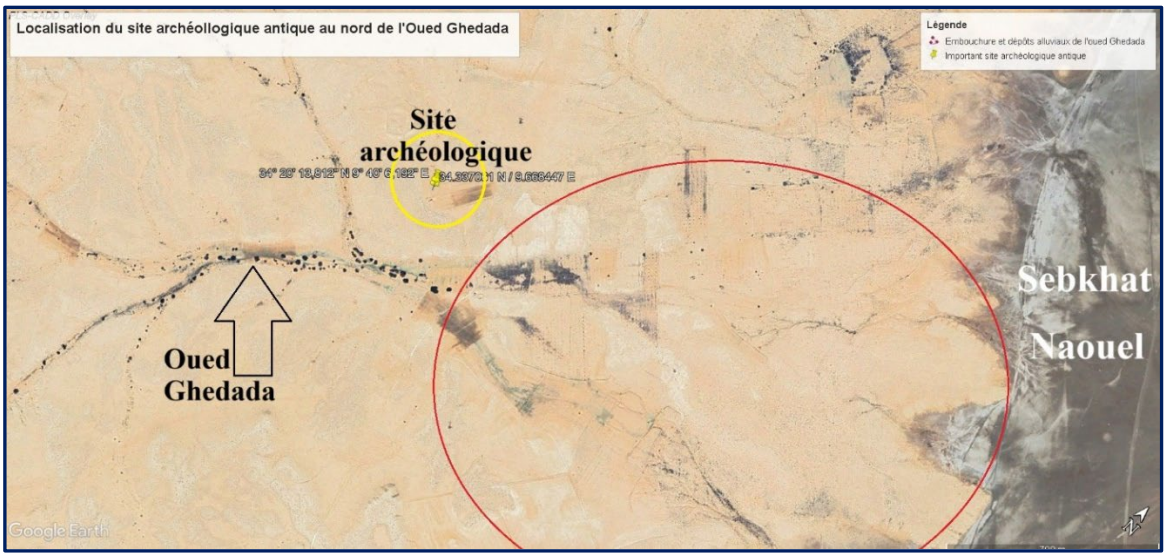

Figure 3 : Image satellitaire indiquant l'emplacement d'un important site archéologique antique au nord de l'Oued Ghedada et ses affluents alimentant Sebkhat Naouel

Figure 4 : Exemple de tranchées endommageant les sols mosaïqués et les murs à fresques du site archéologique de l'Oued Ghedada, en conséquence d'une série de fouilles illégales

Révélant principalement des mosaïques polychromes pavant le sol de plusieurs espaces circonscrits par des murs en moellon, dont certains blocs effondrés sont visibles à plusieurs endroits du site, **les fouilles illégales**, ayant provoqués le dommage d'un

certain nombre de couches archéologiques, les plus récentes et le plus élevées, **ont mis au jours** plusieurs artéfacts ainsi que quelques constructions compartimentées.

Parmi les ruines de ces constructions, nous avons identifié des chambres dont les sols mosaïqués reposent vraisemblablement sur un dispositif de chauffage en hypocauste. Ce dernier est révélé, in situ, en raison de la présence de plusieurs fragments de briques pleines de forme carrée et de pierre de lave volcanique.

(Figure 5, Figure 6 & Figure 7)

Figure 5 : Vestiges d'un ensemble architectural victime d'une fouille clandestine endommageant, d'une part, son sol mosaïqué reposant sur des structures propres à des couloirs d'air chaud dans un hypocauste et, d'autre part, ses murs dont les parois intérieures sont décorées en fresques (1. Fragment et sol d'une mosaïque antique détruite après une fouille clandestine, 2. Fresque polychrome mis au jour à la suite de la même fouille illégale

Assurément, ces données archéologiques confirment la présence d'un grand établissement thermal et sont appuyées par le nombre assez révélateur des bouteilles d'emboitement en terre cuite – également appelées : tubes à voûte –, repérés sur plusieurs endroits du site.

En effet, ces tubes d'emboitement en terre cuite sont utilisés pour le coffrage des voûtes, principalement les voûtes d'arêtes. Emboités et liés au moyen d'un mortier à base de chaux, ces matériaux de constructions – ces bouteilles d'emboitement – typique à l'Afrique du Nord antique, témoignent très souvent de la présence de vestiges des voûtes d'arêtes couvrant durant les époques romaine, vandale et byzantine, en Tunisies, des espaces assez importants à l'instar des *frigidaria* (= les salles d'eau froide) des complexes thermaux. (Figure 6 & Figure 7)

Figure 6 : Sol archéologique comportant des fragments d'une mosaïque avec des tesselles reposant sur un lit de pose à base de chaux (1), des fragments d'une fresque polychrome (2) et des fragments de bouteilles d'emboitement en terre cuite (3)

Aussi, les fresques et les sols mosaïqués, dont les traces sont absolument importantes sur ce site archéologique, apportent un élément de preuve additionnel non seulement en ce qui concerne la présence d'un important complexe thermal, mais aussi sur l'importance de l'ensemble du site archéologique antique de l'Oued Ghedada.

En effet, occupant une superficie dépassant largement les 10 000 m2, ce site archéologique est riche en matériaux de constriction assez diversifiés et onéreux – à

l'instar du marbre – et livre des techniques de construction et de décoration – comme les mosaïques et les fresques – témoignant de l'implication des compétences et des équipements couteux et de l'importance des investissements réalisés pour la construction de plusieurs monuments. Les vestiges de ces derniers sont souvent identifiés grâce à la présence des murs en moellon qui sont, d'une manière générale, en bon état de conservation. (Figure 7, Figure 8 & Figure 9)

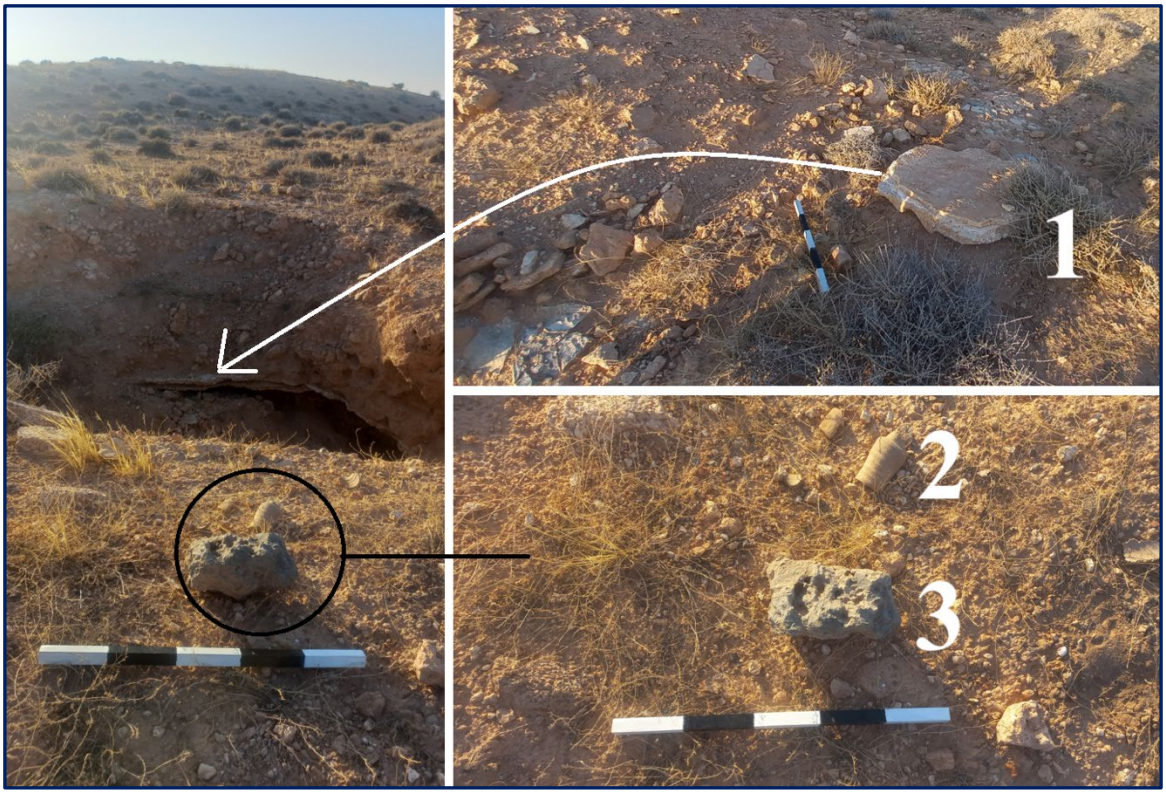

Figure 7 : Pavement en mosaïque monochrome, à tesselles blanches, endommagé suite à une fouille illégale bouleversant un sol archéologique dominé pas des matériaux de construction suggérant la présence d'un complexe thermal antique (1. Fragment d'une mosaïque pavant un sol reposant sur des structures de chauffage en hypocauste, 2. Tube à emboitement en terre cuite, 3. Pierre de lave volcanique utilisée dans la construction de l'hypocauste

Figure 8 : Butte archéologique conservant les vestiges de constructions antiques avec des murs en moellon échappant aux fouilles clandestines

Figure 9 : Exemples de vestiges propres à des voûtes d'arêtes construites sur coffrage perdu en bouteilles d'emboitement en terre cuite, découverts sur d'autres sites tunisiens, permettant d'éclaircir les vestiges des toitures recourant à la même technique de construction repérés sur le site archéologie de l'Oued Ghedada (**A**. Site archéologique de Dougga = *Thugga* : les thermes dits des cyclopes ; **B**. Site archéologique d'El Jem = *Thysdrus* : Eléments de voûtes en arêtes découverts dans les thermes de la Maison dite d'*Africa* ; **C**. Vestiges d'une voûte en arêtes et d'un sol reposant sur hypocauste sur le site archéologique de l'Oued Ghedada)

Somme toute, faisant face à Sebkhat Naoual, les vestiges de ce grand site archéologique sont répartis sur plusieurs buttes dont le sol a gradé les traces de plusieurs constructions dont celle d'un grand complexe thermal.

Outre les ruines des murs dotés de fresques et les sols mosaïqués, on y voit aussi : des grands blocs de pierre en place ou bouleversés par les fouilles clandestines, des murs arasés en moellon noyés dans un mortier à base de chaux et des fragments de poterie architecturale. (Figure 9 & Figure 10).

L'ensemble du site est, par ailleurs, densément recouvert de céramique : la céramique commune et la sigillée africaine, fort abondantes, présentent une grande variété de types ; les pieds et les anses d'amphores et d'amphorettes sont également assez abondants. (Figure 11)

Figure 10 : Exemple de blocs de pierres antiques jonchant le sol des buttes archéologiques de l'Oued Ghedada, victime d'une série de fouilles illégales

Figure 11 : L'une des buttes du site archéologique de l'Oued Ghedada (surplombant Sebkhat Naoual = Naouel) densement parsemée de fragments de céramique antique

CONCLUSION

Bouleversé par des fouilles clandestines, ce site archéologique présente un intérêt majeur et doit être préservé ; il constitue un patrimoine culturel matériel irremplaçable et aucun projet de construction ne devrait empiéter et sur son étendue propre et sur ses limites immédiates.

Ainsi, toute découverte fortuite d'objet et/ou de ruines archéologiques, de toutes sortes, lors des travaux doit obligatoirement faire l'objet d'une déclaration auprès des services compétents de l'Institut National du Patrimoine (INP-Tunis), et le lieu de la découverte doit être nécessairement protégé par rayon de protection de pas moins de 200 m de large, et ce conformément aux articles 26 à 48 du code de protection du patrimoine archéologique, historique et des arts traditionnels.

Annexe 4 : Critical Habitat Assessment

Khobna PV and Associated OHTL, Tunisia Critical Habitat Assessment

Prepared for Environmental Assessment & Management "EAM"

September 2025

Revision 02

TURNSTONE ECOLOGY LIMITED

Project Number:	TT4205
Project Title:	Khobna PV, Tunisia
Document Reference:	R02-Critical Habitats Assessment

Document Issued To:	Environmental Assessment & Management "EAM"
Document Issued By:	Turnstone Ecology Limited

Revision Number	Author(s)	Reviewer(s)	Issuer	Issue Date
REV00 (Draft)	MG (Director)	GB (Principal Consultant)	MG (Director)	17/06/2025
REV01 (Updated survey information)	MG (Director)	GB (Principal Consultant)	MG (Director)	04/09/2025
REV01 (EIB Comments)	MG (Director)	GB (Principal Consultant)	MG (Director)	25/09/2025

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INTRODUCTION

Purpose of Report

This report details the Critical Habitat Assessment (CHA) for the proposed Khobna PV Plant (PV) and associated Overhead Transmission Line (OHTL) in Tunisia.

This CHA has been completed in line with International Finance Corporation (IFC) Performance Standard 6 (PS 6) and European Bank for Reconstruction and Development (EBRD) Performance Requirement 6 (PR / ESR 6) and the corresponding Guidance Notes (GN) to identify if the Project area or parts thereof are considered as Critical Habitat.

This CHA aims to:

- Identify Critical Habitat qualifying species or habitats, Priority Biodiversity Features and Natural Habitat associated with the Project.
- Outline the implications of the CHA for the Project, and
- Highlight future actions for the Project where applicable, as well as outline details that will need to be included in a Biodiversity Management Plan (BMP) or Biodiversity Action Plan (BAP).

The Project Site and Study Area

The PV Project site is in Central Tunisia, approximately 8 km east of the village of Sidi Mansour and will total an area of 303ha. Access to the PV site will be via a 5 km long track to the east of the site, from the C205 road linking the Skhira exit of the A1 motorway to the village of Sidi Mansour (*Figure 1 and 2*).

The PV Project site is made up of open desert habitats and is likely to be supporting an assemblage of terrestrial ecological receptors (flora and fauna) typical for this habitat type within its geographical location and the survey protocol for the PV site and OHTL have been adapted accordingly.

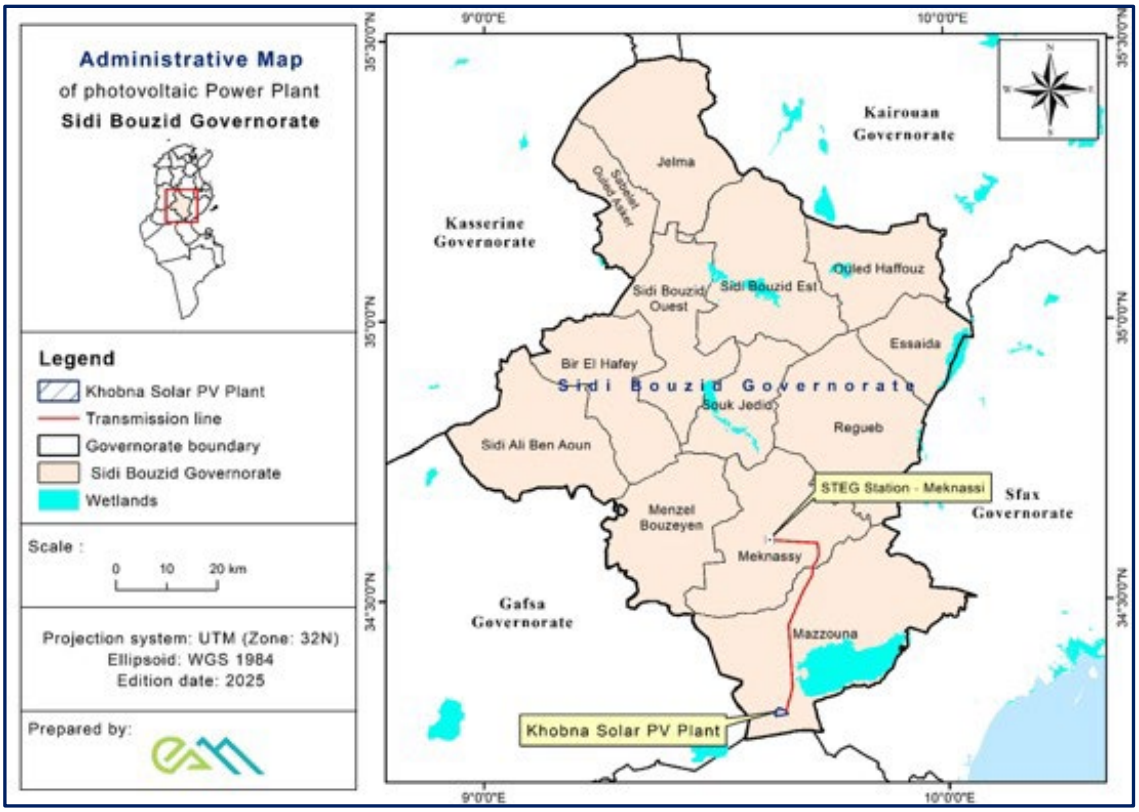


Figure 1 - Location of the PV and OHTL Project

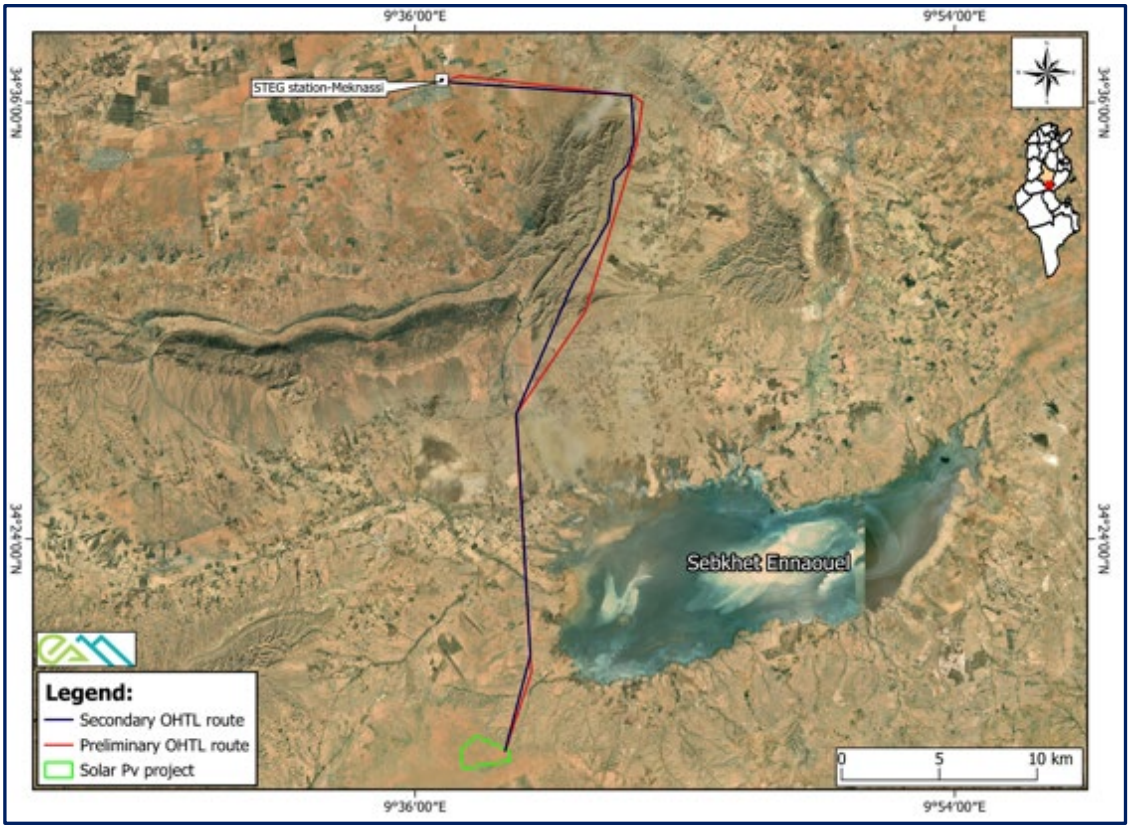


Figure 2 - Location of the PV and OHTL Project

The PV Project site is approximately 4 km from the Sebkhat Ennoual Important Bird Area (IBA) and RAMSAR site. The route of the Project's associated OHTL follows that of an existing OHTL which tracks north and north-east from the Project site for approximately 35 km before turning west, for approximately 10 km, where is terminates at an existing sub-station on the eastern edge of Al-Miknassi.

There are two additional IBAs within the vicinity of the Project AoI and these are: Gareat Sidi Mansour (IBA / RAMSAR) and Bouhedma (National Park and IBA). The location of the PV site, associated OHTL and designated sites are shown on Location of Project Components and Designated Sites / Sites of Importance for Biodiversity.

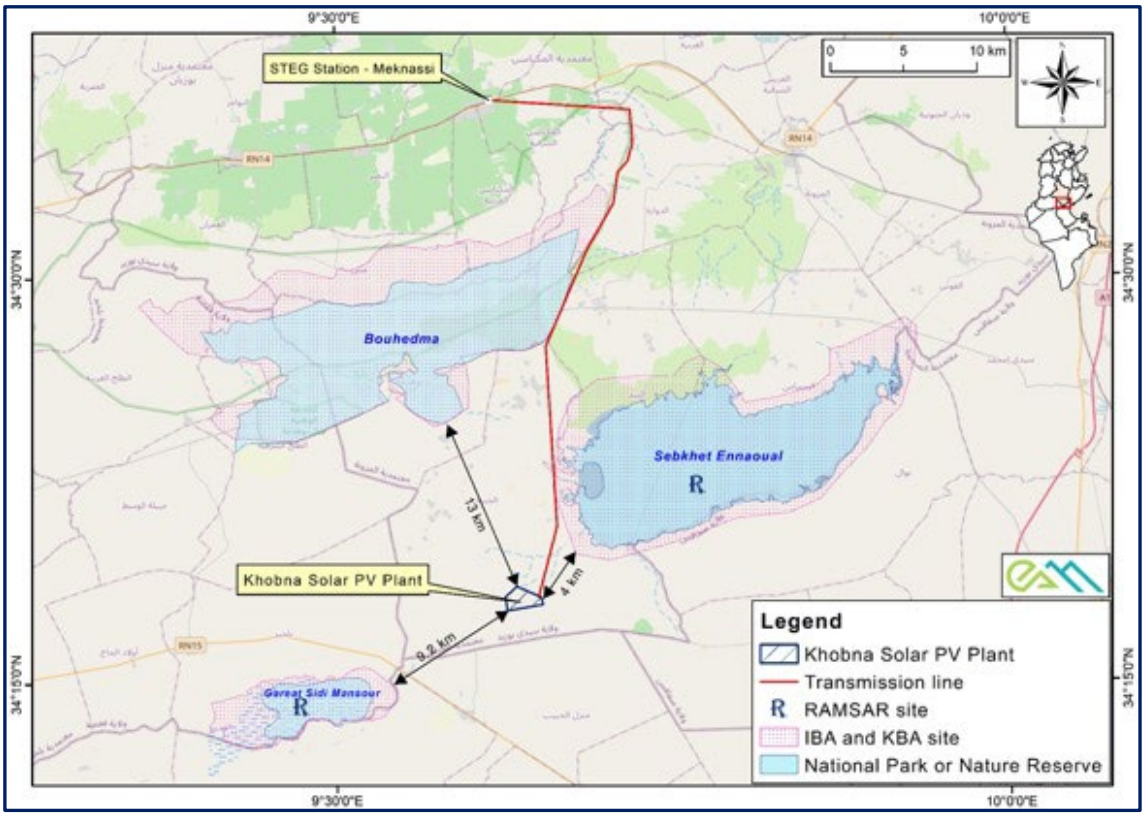


Figure 3 - Location of Project Components and Designated Sites / Sites of Importance for Biodiversity

Constraints

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

present that is suitable, the species is considered to have potential to use the site over the lifetime of the project and is screened in.

ASSESSMENT FRAMEWORK AND METHODOLOGIES

Frameworks

General

Standards for the International Finance Corporation (IFC), European Bank for Reconstruction and Development (EBRD) and the European Investment Bank (EIB) performance standards/requirements are detailed below. Other lenders (e.g. Asian Development Bank (ADB)) use standards which reflect those stipulated by IFC therefore to avoid repetition the institutions needs are covered in this section of the CHA.

International Finance Corporation Performance Standard 6 (PS 6)

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

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

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

- **Modified Habitat**: exercise care to minimize any conversion or degradation of such habitat, depending on scale of project, identify opportunities to enhance habitat and protect and conserve biodiversity as part of operations.
- **Natural Habitat**: developer will not significantly convert or degrade such habitat unless no financial/technical feasible alternatives exist, or overall benefits outweigh cost (including those to biodiversity), and conversion or degradation is suitably mitigated. Mitigation must achieve no net loss of biodiversity where feasible; offset

losses through creation of ecologically comparable area that is managed for biodiversity, compensation of direct users of biodiversity.

- **Critical Habitat**: in areas of CH, the Developer will not implement project activities unless there are no measurable adverse impacts on the ability of the critical habitat to support established populations of species described or on the functions of the critical habitat; no reduction in population of a recognized critically endangered or endangered species and lesser impacts mitigated as per natural habitats. The project must achieve net gains for the biodiversity value for which the Critical Habitat was designated.

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

The EBRD PR 6 (and associated guidance notes, including March 2023) sets objectives to protect and conserve biodiversity using a precautionary approach, utilize the mitigation hierarchy to achieve no net loss/net gains where appropriate, maintain ecosystem services, and promote good practice in the management and use of natural resources.

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

European Investment Bank (EIB) Standard 4

The European Investment Bank's (EIB) Standard 4: Biodiversity and Ecosystems (along with associated guidance note) requires project promoters to assess, manage, and monitor the impacts and risks to biodiversity and ecosystems in order to protect biodiversity, maintain ecosystem functions, and prevent significant harm. The standard is underpinned and aligned with relevant EU legislation especially the ‘do no significant harm" principle and promoting a holistic, human rights-based approach. Key requirements of the Standard include assessing impacts, identifying and protecting high-value biodiversity, managing risks from invasive species, and applying the mitigation hierarchy (avoidance, minimization, restoration, and compensation) to achieve no net loss or a net positive impact on biodiversity.

Assessment Methods

General

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

- Initial Screening – which involves making stakeholder consultation and an initial review of published and grey literature *e.g.* Important Bird Areas (IBAs) in Tunisia, Birdlife Soaring Bird Sensitivity Mapping Tool, IUCN Red List of Threatened Species, Integrated Biodiversity Assessment Tool (IBAT, 2023), IFC PS6 GN6 (IFC, 2012), EBRD PR6, Biodiversity Conservation and Sustainable Management of Living Natural Resources Guidance Note (EBRD, 2022) and World Database of Key Biodiversity Areas, GBIF as well as a range of in-country texts and research papers.
- Establishment of baseline which includes field data collection and verification of available information e.g. Habitat and Flora Survey, Mammals Survey, Bird Survey, Bat Survey, Invertebrate Survey and Reptile Survey.
- Critical habitat determination:

a) Identification of appropriate scale for assessment.
b) Determination of Ecologically Appropriate Area of Analysis.
c) Assessment against Critical Habitat criteria.

Literature Review and Stakeholder Consultation

This assessment is based on existing literature in addition to global and regional datasets, including Integrated Biodiversity Assessment Tool (IBAT, accessed in 2025). All species returned on the IBAT Search that are classified as Critically Endangered (CR), Endangered (EN) or Vulnerable (VU) in the IUCN Red List were screened, as well as all species mapped by IUCN which could be considered range restricted. Species included on Tunisia Red Data Books were, where available, also considered, as were the results from the site surveys completed between April and August 2025.

At the time of writing (September 2025) stakeholder consultation has not been completed.

Scale of Assessment

A Critical Habitat Assessment is usually carried out at a landscape scale, using Ecologically Appropriate Areas of Analysis (EAAA) for determining the presence or absence of Critical Habitat qualifying features under PS6 Criteria 1 – 3 and PR6 Criterion 2 – Priority Species and their Habitats as well as relevant criteria set out in

EIB Standard 4 (2022) and Guidance Note (2018). EAAA are identified at a landscape scale, considering large-scale ecological processes where appropriate, and can therefore be much larger than the project concession or lease area itself. The principles of determination of EAAA only apply to terrestrial areas and cannot be applied to airspace above a site unless it is associated directly with the utilization of a terrestrial habitat.

The CHA methodology described in IFC's Guidance Note 6 heavily draws on the IUCN's Key Biodiversity Area (KBA) Standard, which focuses on geographic areas of land and water that are amenable to site-based conservation. It is for this reason that, for birds, the CHA methodology can be readily applied to terrestrial and water areas, such as stopover points and breeding grounds where concentrations of birds are dependent on the conservation of the habitat at these areas. Considering the airspace in a CHA is more challenging.

Birds utilizing important terrestrial areas will naturally also use the airspace above and around it. Under certain circumstances, this airspace should be considered as part of the habitat and part of the EAAA of a CHA.

Using this approach, a CHA would not be conducted with respect to the airspace where there is no associated important terrestrial area used by birds (or concentrations of them) and no intersection with the project footprint, which will often be the case for long-distance migrants using high altitude airspace between continents or countries. In this scenario, it would be difficult or impossible to delineate the airspace EAAA at this large scale, recalling that "critical habitat boundaries should be equivalent in scale to areas mapped for practical site-based conservation management activities" (PS6 GN59). Without an EAAA, the Critical Habitats thresholds cannot be applied. It is also important to note that the location of a project within a recognized bird migratory corridor (flyway) does not automatically generate high collision risk, not trigger CH determination, because most bird migration activity occurs in a diffuse "broad front" pattern, and recognized bird migration corridors are as ubiquitous as bird migration activity itself, and collectively covers most terrestrial land areas. The migratory/congregatory species criterion described in the CHA sections of IFC PS6 and EBRD PR6 is intended to trigger CH determination only in areas that host continentally significant concentrations of migratory activity. In many cases, these sites have already been designated as IBAs based on the KBA criteria and thresholds[2].

[2] Memorandum Determining Biodiversity Management Requirements Related to Airspace around Wind Energy Facilities (EBRD, June 2023)

That said when taking this into consideration, and being mindful of the precautionary principles, those species which are included on the IUCN Red List (CR, EN and VU only) that could potentially migrate through the Project AoI and traverse the OHTL are included in this assessment where appropriate.

Determination of Ecologically Appropriate Area of Analysis

IFC PS6, EBRD PR6 and EIA Standard 4 requires identification of EAAA to determine the presence of critical habitat for each species with regular occurrence in the Project's Area of Influence (AoI), or ecosystem, covered by the relevant criteria, requirements or standards. The boundaries of an EAAA are determined by taking into account the distribution of species or ecosystems (within and sometimes extending beyond the project's AoI and the ecological patterns, processes, features, and functions that are necessary for maintaining them. This approach ensures that all important biodiversity within the project footprint and linked surrounding habitats are taken into consideration.

Criteria used to define CH under EBRD PR 6 and EIB Standard 4 are closely aligned to the IFC guidance and these require that the study area be defined by comparable parameters to the above. In essence any CH assessment must encompass all direct and indirect impacts within a broad landscape unit which is large enough to include features and functions relevant to the species being considered.

Assessment Against Critical Habitat Criteria

Criteria

The CH determination refers to the evaluation of the area in question with respect to each of the five CH criteria defined in IFC PS 6 GN and the six defined in EBRD PR 6 GN and EIB GN 2018. Each criterion is described in detail in paragraphs GN70–GN83 of IFC PS 6 GN, Section 3.7 of EBRD PR 6 GN and Paragraph 11 of EIB Standard GN, as summarized in ***Erreur ! Source du renvoi introuvable.*** and

below. Definitions and quantitative thresholds for each criterion of the assessment in both guidance notes follow those set out in the IFC guidance as this is considered the most appropriate source by both IFC and EBRD at the time of writing:

Table 1 - Critical Habitat Criteria as defined by IFC PS 6

Critical Habitat Criteria as defined by IFC PS 6	PS 6 Criterion Number

Critically Endangered (CR) and/or Endangered (EN) species	1
Endemic or restricted-range species	2
Migratory or congregatory species	3
Highly threatened and/or unique ecosystems	4
Key evolutionary processes	5

Table 2 - Critical Habitat Criteria as defined by EBRD PR 6

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

Table 3 - Critical Habitat Criteria as defined by EIB Standard 4

Critical Habitat Criteria as defined by EIB Standard 4 (refer to Standard 3 GN, 2018)	Standard 3 Criterion Number
Highly threatened and/or unique ecosystems	1
Populations of Critically Endangered, Endangered or Vulnerable species, as defined by the IUCN Red List of threatened species and in relevant legislation	2
Population range or distribution of endemic or range restricted species, or highly distinctive assemblages of species	3
Habitat required for the survival of migratory species and / or congregatory species	4
Biodiversity and / or ecosystem with significant social, economic, or cultural importance to local communities and indigenous groups	5
Habitat of key scientific value and or associated with key evolutionary processes	6

PS 6 Criterion 1, PR 6 Criterion ii and Standard 4 Criterion 2: Critically Endangered (CR) and/or Endangered (EN) Species

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

- The EAAA contains “globally important concentrations” of an IUCN CR or EN species, defined as at least 0.5% of the global population AND over 5 reproductive units.

- Areas that support globally important or significant concentrations of an IUCN Red-listed Vulnerable (VU) species, or of multiple IUCN VU species, the loss of which would result in the change of the IUCN Red List status to EN or CR and meet the thresholds above.
- As appropriate, areas containing important concentrations of a nationally or regionally listed EN or CR species providing the national/regional red lists are produced in accordance with IUCN standards and guidance, which in the case of the TRDB are not and as such a species with an in-country rating of CR and EN do not correspond to a similar IUCN rating. In-country RDB status is determined through a range of criteria, including IUCN criteria, however in-country conservation status is also weighted. Full Red Data Book Lists and Assessments are not available in Tunisia.
- EIB additional Criterion: a population of species listed in Annex II and IV of the Habitats Directive.

PS 6 Criterion 2, PR 6 Criterion iii and Standard 4 Criterion 3: Endemic and/or Restricted-Range Species and Supporting Habitats

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

According to EIB Criterion 3 an endemic species is one considered to be confined to a defined area. Single-site endemics are species for which populations are confined to a single global location, whereas national endemics are species confined to the country of concern. Restricted-range species are further defined as those being of limited Extent of Occurrence (EOO) meaning that most endemic species are also likely to be restricted-range. For terrestrial vertebrates and plants the EOO is the same as for IFC and EBRD Criterion however additional criteria are defined for marine species (EOO <100,000 km^2) and as well as those for coastal, riverine and other aquatic species.

PS 6 Criterion 3, PR 6 Criterion iv and Standard 4 Criterion 4: Migratory or Congregatory Species and Supporting Habitats

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

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

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

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

- Areas known to sustain, on a cyclical or otherwise regular basis, ≥ 1 percent of the global population of a migratory or congregatory species at any point of the species' lifecycle.
- Areas that predictably support ≥10 percent of the global population of a species during periods of environmental stress.

PS 6 Criterion 4, PR 6 Criterion i and Standard 4 Criterion 1 : Highly Threatened or Unique Ecosystems

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

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

- EIB/EBRD Criteria include Priority Habitats listed in Annex I of the Habitats Directive and habitats considered to be their equivalent in countries outside of the EU. Examples of ecosystems outside the EU and not yet assessed by IUCN, but are

determined to be of high priority for conservation on the basis of regional or national-level systematic conservation planning or informed specialist input.

- Areas representing ≥5 percent of the global extent of an ecosystem type meeting the criteria for IUCN status of CR or EN.
- Other areas, not yet assessed by IUCN, but determined to be of high priority for conservation by regional or national systematic conservation planning.

PS 6 Criterion 5 and PR 6 Criterion v and Standard 4 Criterion 6: Key Evolutionary Processes

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

It should be noted that the IFC PS 6 GN provides qualitative guidance for assessing the projects against these criteria rather than quantitative thresholds, unlike PS 6 Criteria 1-4. Quantitative thresholds are also not provided by EBRD or EIB for this Criterion.

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

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

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

EIB Standard 4 Criterion 5: : Biodiversity and/or ecosystem with significant social, economic, or cultural importance to local communities and indigenous groups.

Areas of semi-natural and natural habitat used by indigenous peoples and local communities to obtain essential or priority benefits will be considered critical from an ecosystem service perspective. Criteria for identifying priority ecosystem services should be developed for each project, with input from social specialists and the relevant users and beneficiaries. Priority ecosystem services are services (including cultural services) on which people depend strongly for their livelihood or wellbeing, with limited access to acceptable alternatives. Impacts must be compatible with sustained and sustainable use of priority ecosystem services and mitigation measures must be identified as necessary to ensure that a) ecosystems retain the capacity to supply the services on which indigenous people or local communities depend or b) to ensure that they are able to obtain essential benefits. In some circumstances communities may accept alternative benefits to those derived from ecosystem services affected by a project, but those alternatives should not be imposed on people without meaningful consultation.

Assessment Against Priority Biodiversity Feature Criteria

Four criteria relating to the determination of PBF are presented within EBRD PR 6. Table 4 shows the criteria for defining PBFs with examples of each feature taken from the EBRD PR 6 guidance note.

Table 4 - Priority Biodiversity Feature (PBF) Criteria as Defined by EBRD PR 6

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

PBF selection criteria and corresponding thresholds are equivalent of the 'High-Value Biodiversity' (HVB) of EIB Standard 4.

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

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

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

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

Criteria and conditions for determining Critical Habitat and Priority Biodiversity Features in line with EBRD Performance Requirement 6 are detailed below in Table 4 (taken from EBRD Guidance Note 6, EBRD 2022).

Table 5 - Criteria and conditions for identifying priority biodiversity features and critical habitats (EBRD March 2023)*

Criterion	Priority Biodiversity Feature	Critical Habitat
1. Priority ecosystems		
Threatened ecosystems a. Habitats listed in Annex 1 of EU Habitats Directive (EU members only) or Resolution 4 of Bern Convention (signatory nations only) b. IUCN Red-List EN or CR ecosystems	(PR6 para. 12-i) a. EAAA is habitat type listed in Annex 1 of EU Habitats Directive or Resolution 4 of Bern Convention b. EAAA** < 5% of the global extent of an ecosystem type with IUCN status of CR or EN	(PR6 para. 14-i) a. EAAA is habitat type listed in Annex 1 of EU Habitats Directive marked as "priority habitat type" b. EAAA ≥5% of global extent of an cosystem type with IUCN status of CR or EN c. EAAA is ecosystem determined to be of high priority for conservation by national systematic conservation planning
2. Priority Species and their Habitats		
Threatened species a. Species and their habitats listed in EU Habitats Directive and Birds Directive (EU members only) or Bern Convention (signatory nations only) b. IUCN Red List EN or CR species c. IUCN Red List VU species d. Nationally or regionally (e.g., Europe) listed EN or CR species	(PR6 para. 12-ii) a. EAAA for species and their habitats listed in Annex II of Habitats Directive, Annex I of Birds Directive, or Resolution 6 of Bern Convention b. EAAA supports < 0.5% of global population OR < 5 reproductive units of a CR or EN species. c. EAAA supports IUCN VU species. d. EAAA for regularly occurring nationally or regionally listed EN or CR species.	(PR6 para. 14-ii) a. EAAA for species and their habitats listed in Annex IV of the Habitats Directive (See EU restrictions) b. EAAA supports ≥ 0.5% of the global population AND ≥ 5 reproductive units of a CR or EN species c. EAAA supports globally significant population of VU species necessary to prevent a change of IUCN Red List status to EN or CR, and satisfies threshold (b) d. EAAA for important concentrations of a nationally or regionally listed EN or CR species
Range-restricted species	(PR6 para 12-ii) a. EAAA for regularly occurring range-restricted species	(PR6 para. 14-iii) a. EAAA regularly holds ≥ 10% of global population AND ≥ 10 reproductive units of the species***
Migratory and congregatory species	(PR6 para 12-ii) a. EAAA identified per Birds Directive or recognized national or international process as important for migratory birds (esp. wetlands)	(PR6 para. 14-iv) a. EAAA sustains, on a cyclical or otherwise regular basis, ≥ 1 percent of the global population at any point of the species' lifecycle b. EAAA predictably supports ≥10 percent of global population during periods of environmental stress

*Quantitative thresholds derived from IUCN Key Biodiversity Area Standard and aligned with International Finance Corporation's (IFC) Guidance Note 6 (rev. 2019)

**EAAA = ecologically appropriate area of analysis, as defined above

***The IUCN Key Biodiversity Areas standard cites the following definition for reproductive unit: "the minimum number and combination of mature individuals necessary to trigger a successful reproductive event at a site. Examples of five reproductive units include five pairs, five reproducing females in one harem, and five reproductive individuals of a plant species."

BASELINE ECOLOGICAL INFORMATION

Methods

The ecological baseline (habitats and flora, terrestrial fauna and avifauna) was established by undertaking site specific surveys within the Project area (PV site and OHTL AoI). The surveys completed for the Project are set out below.

Surveys have been completed on the Project site between April and September 2025, the results of which have been used to inform this CHA. Further surveys are ongoing as set out below and will be used to further inform the CHA as well as the ESIA and other associated documents (*e.g.* BMP).

Background Data Search

An IBAT PS6 report was generated for the Project AoI which includes a default search area of 50 km from the site's boundary. Searches were also made of Birdlife Data Zone https://datazone.birdlife.org), Birdlife Soaring Bird Sensitivity Mapping Tool (https://maps.birdlife.org/MSBtool/), World Database of KBAs (https://www.keybiodiversityareas.org), GBIF (https://www.gbif.org), and Ramsar Sites Information Service (https://rsis.ramsar.org).

Additional data searches using in-country reference materials was completed by the in-country biodiversity team and information is used within this CHA, where relevant. Literature sources are included in in-country survey reports.

Floral and Fauna Surveys

Two days of walkover survey covering the PV and OHTL route were undertaken on the 17 and 18 May 2025 in order to identify dominant habitats and to record all species of flora and fauna (including invertebrates) within the Project AoI. Surveys were focused on identifying all species present, or possibly present, that are included on in-country Red Data Books, where available, or on the IUCN Red List. Flora, habitat and fauna surveys along the OHTL were completed at eight 'survey stations' located near and around the eight avifauna observation points.

The survey was completed by Mr Saïd NOUIRA, Professor of Ecology at the Tunis Faculty of Science and expert in Biodiversity and Mr Tahar KHOUAJA, Project Manager and international environmental expert.

Bats

Bat surveys have not been completed; however a species list of bats that are likely to occur within the Project AoI is included in the CHA which is a list of species that have been previously recorded at the Bouhedma National Park / IBA / KBA.

Avifauna

Bird surveys are being undertaken to quantify the impact of the project on key *Avifauna* species, to subsequently inform final layout, to develop additional mitigation and to form the baseline for any future required supplementary surveys and operational monitoring. Surveys along the OHTL are being undertaken to inform potential impacts caused by construction related disturbance as well as impacts associated with collision and electrocution.

Bird surveys across the project site will be through the year:

- Spring Migration Surveys – February to April (starting in April 2025, finish in March 2026)
- Summer Surveys – May, June and July 2025
- Autumn Migration Surveys – August, September and October 2025
- Winter Surveys – November, December 2025 and January 2026

3.1.4.1 PV Project Site: Transect Surveys

Transect surveys are being completed once per month, for the 12-month survey period. During each visit the transect routes will be walked by the ornithologist and all birds seen / heard will be recorded in full, along with notes on their activity to determine their status on the site (e.g. breeding behaviours). Any nests noted will be recorded in full and if the nesting species is of international or national conservation concern (e.g. raptor, Houbara Bustard) a GPS co-ordinate will also be recorded.

OHTL: Observation Point (OP) Survey

Eight Observation Points have been selected along the 45 km route which will result in survey data being collected on approximately 50% of the proposed OHTL. Each OP will be subject to the following hours of survey:

- Spring Migration – 6 hours per month, total of 48 hours (across all OPs) per month or a combined total of 144 hours over the spring migration season

- Summer – 3 hours per month, total of 24 hours (across all OPs) per month or a combined total of 72 hours over the summer period
- Autumn Migration – 6 hours per month, total of 48 hours (across all OPs) per month or a combined total of 144 hours over the autumn migration season
- Winter – 3 hours per month, total of 24 hours (across all OPs) per month or a combined total of 72 hours over the winter period.

During each survey, transects will be driven between each of the OPs and all notable birds (e.g. those of significant conservation concern) will be recorded in full. All target species seen will be recorded in detail including any behaviour that indicates nesting, which may trigger further detailed surveys. All obvious raptor nests, and status of the nest if possible, and suitable nesting habitat (such as cliffs) within 2 km of the route will be recorded. Surveyors will map the target species, observed nests and habitat types and features that could be used by the target species. Any nests that are identified will be given a unique nest number.

OP locations are shown in the table below as well as on *Figure 3*.

Table 6 - Location of OHTL Observation Points

Observation Point	Coordinates	
	N	E
OHTL OP1	45.55859	82.11857
OHTL OP 2	45.58368	82.11701
OHTL OP 3	45.73583	81.870671
OHTL OP 4	45.839338	81.710826
OHTL OP 5	45.862912	81.523749
OHTL OP 6	45.922546	81.474654
OHTL OP 7	45.979332	81.228122
OHTL OP 8	46.019375	81.084125

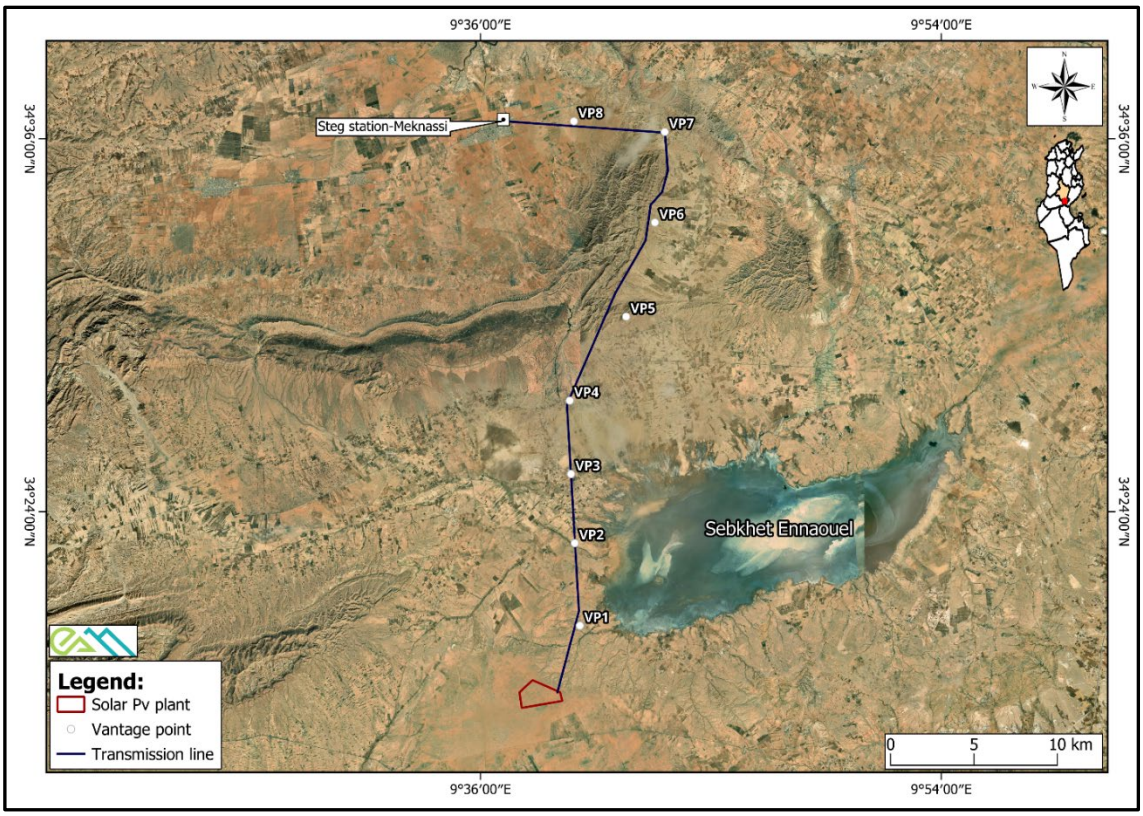


Figure 4 - Locations of the OHTL VPs and Flora and Fauna 'Survey Stations'

Results

Nomenclature

Common Names have been taken from the IUCN Red List Website (www.iucnredlist.com) and where species commons names are not listed, a Google search was completed to find commonly accepted common names.

Background Data Search

3.2.2.1 IBAT Search - Protected Areas

The location of Protected Areas within approximately 50 km of the site boundary were taken from a search of the Integrated Biodiversity Assessment Tool (IBAT) database. The results of the search are as follows:

Protected Areas

- Bouhedma IBA / KBA
- Sebkhat Ennoual IBA / KBA / RAMSAR
- Sebkhat Sidi Mansour IBA / RAMSAR

3.2.2.2 Sites of Biodiversity Importance

- Sebkhet Dreiaa

- Iles Kneiss

3.2.2.3 Sites mentioned in IBAT Search with no additional information

- Chott el Fedjadj
- Complexe des zones humides des Shott El Guetayate et Sebkhet Dhreia et oued Akarit Rekhama et Melah
- Djebel Marchana
- Chott Djerid

Protected Areas

3.2.3.1 Bouhedma National Park IBA/ KBA

This protected area is approximately 14 km north of the PV project area and 1 km west of the proposed OHTL line and is designated for Criterion A3.

BirdLife Data Zone does not provide detailed information on why the site was designated as an IBA, however Criteria 3 is for Bioregion-restricted assemblages, which may relate to Houbara Bustard (*Chlamydotis undulata*).

3.2.3.2 Sebkhat Ennoual RAMSAR / IBA / KBA

This protected area is approximately 4 km east of the PV project site and 1 km east of the proposed OHTL route and is designated as an IBA under Criterion 3 and A4i.

BirdLife Data Zone does not provide detailed information on why the site was designated as an IBA, however Criteria 3 is for Bioregion-restricted assemblages, which relates to historic populations of Houbara Bustard (*Chlamydotis undulata*) within the site and Criterion A4 relates to large congregations, which is presumed to be in relation to the general (wintering) bird assemblage.

This site is also designated as a RAMSAR, and the reason for its designation have been shown in *Table 7* below.

Table 7 - Ramsar Site Citation Information for Sebkhat Ramsar Site

RAMSAR Criteria	Reasoning
Criteria 1	Sebkhet Noual meets the criteria for classification under Criterion 1 because it is a representative example of a sebkhet, a wetland type characteristic of North Africa, in a near-natural state.
Criteria 2	This site supports the following species: • Houbara Bustard (*Chlamydotis undulata*) – IUCN VU • Dorcas Gazelle (*Gazella dorcas*) – IUCN VU • Desert Monitor (*Varanus griseus*) – CITES Appendix I • Eurasian Spoonbill (*Platalea leucorodia*) – CITES Appendix II • Desert Eagle Owl (Bubo ascalaphus) – CITES Appendix II

RAMSAR Criteria	Reasoning
Criteria 3	The site meets the requirements of Criterion 3, as it supports flora and fauna typical of the steppe zones on the northern edge of the Sahara. Of the 13 bird species restricted to the Sindo-Saharan biome found in Tunisia, six are found at Sebkhet Noual: the Desert Eagle Owl, the Bar-tailed Lark (*Ammomanes cincturus*), the Greater Hoopoe Lark (*Alaemon alaudipes*), the Fulvous Babler (*Turdoides fulvus*), Streaked Scrub Warbler (*Scotocerca inquieta*), and Trumpeter Finch (*Rhodopechys githaginea*) (Fishpool & Evans, 2001). In addition, the site is home to 11 of the 16 bird species restricted to the Mediterranean-North Africa biome and found in Tunisia. These are: Barbary Partridge (*Alectoris barbara*), the Red-necked Nightjar (*Capramulgus ruficollis*), Temminck's Lark (*Eremophila bilopha*), the Moussier's Redstart (*Phoenicurus moussieri*), Black Wheatear (*Oenanthe leucura*), Red-rumped Wheatear (*Oenanthe moesta*), Western Black-eared Wheatear (Oenanthe hispanica), the Sardinian Warbler (*Sylvia melanocephala*), Eastern Subalpine Warbler (*Sylvia cantillans*), African Desert Warbler (*Curruca deserti*), and the Spotless Starling (*Sturnus unicolor*) (Fishpool & Evans, 2001). The site therefore makes a significant contribution to maintaining the biological diversity of the Mediterranean-North African and Sindo-Saharan biomes.
Criteria 4	In wet years, the site plays a very important role because it hosts large numbers of wintering waterbirds, a critical stage of their annual cycle. Among the wintering waterbirds are herons, Eurasian Spoonbill (19 individuals in January 1996), Greater Flamingo (*Phoenicopterus roseus*) (up to 4,000 during the wet summer of 1990, when they even made a nesting attempt), Common Shelduck (*Tadorna tadorna*), Ruddy Shelduck (*Tadorna ferruginea*), certain dabbling ducks and waders, and especially the Common Crane (*Grus grus*), which winters regularly (173 in January 1996).
Criteria 5	The site also qualifies under Criterion 6, as the wintering numbers of certain species during wet periods can reach the threshold of 1% of the population: Greater Flamingo between 800 and 2,000 individuals (threshold = 1,000) and Common Shelduck up to 1,500 individuals in January 1973 (threshold = 750);

3.2.3.3 Gareat Sidi Mansour RAMSAR / IBA

This protected area is approximately 4 km east of the PV project site and 1 km east of the proposed OHTL route and is designated as an IBA under Criterion 3 and A4i.

BirdLife Data Zone does not provide detailed information on why the site was designated as an IBA, however Criteria A1 relates to globally threatened species which is presumably White-headed Duck (*Oxyura leucocephala*) (IUCN EN), Criteria A3 is for Bioregion-restricted assemblages and Criteria A4 relates to large congregations, which is presumed to be related to the general waterbird assemblage.

This site is also designated as a RAMSAR, and the reason for its designation have been shown in Table 7 below.

Table 8 - Ramsar Site Citation Information for Gareat Sisi Mansour Ramsar Site

RAMSAR Criteria	Reasoning
Criteria 1	Sidi Mansour offers a very particular, even exceptional, case: a significant part of its surface is a classic freshwater garaet with flood recession cultivation; the

RAMSAR Criteria	Reasoning
	western part, however, resembles a sebkhet; no other places in Tunisia are known to combine the two types of typical wetland in the same place.
Criteria 2	In wet years, the site supports significant numbers of three globally threatened duck species: ▪ White-headed Duck (*Oxyura leucocephala*) listed as IUCN EN certainly nests in Bled es-Segui and most likely in Sidi Mansour, and winters there in any case in appreciable numbers (40-80 individuals) ▪ Marbled Teal (*Marmaronetta angustirostris*) listed as IUCN NT and nests at the site in large numbers and also winters there (50-300 individuals); ▪ Ferruginous Duck (*Aythya nyroca*) listed as IUCN NT but is included on Appendix I of the CMS certainly winters at this site and could possibly breed. The RAMSAR site also supports Dorcas Gazelle (*Gazella dorcas*) an IUCN VU species.
Criteria 3	In wet years, it provides a wintering ground for a wide range of Palearctic migratory waterbirds, such as dabbling ducks (especially the Northern Pintail (*Anas acuta*)) and the Common Crane (*Grus grus*). The site is also important for Palearctic passerines including White Wagtail (*Motacilla alba alba)* and Common Chiffchaff (*Phylloscopus collybita*), both of which over-winter in large numbers in the tamarisks. Even in dry periods the site contributes to maintaining the biological diversity of the region, as it supports a wide range of sedentary plants and birds, typical of steppe areas bordering the desert.
Criteria 4	The RAMSAR site supports many waterbird species at critical stages of their life cycle, including the nesting and wintering seasons. The main interest of the site lies in the presence, during wet periods, of large and varied numbers of waterbirds, in a site on the edge of the desert. Wet conditions are most often found in winter and at this time the site provides a wintering ground for many species of Palearctic ducks. If wet conditions persist into summer, many species nest there.
Criteria 5	It is likely that the site also meets Criterion 5 (presence of more than 20,000 waterbirds), but the data is insufficient to confirm this.
Criteria 6	The site also qualifies under Criterion 6, as the wintering numbers of certain species during wet periods can reach the threshold of 1% of the population: Greater Flamingo between 1,000 and 4,000 wintering individuals (threshold = 1,000) and breeding of this species can also occur. Common Crane between 1,000 and 2,000 wintering individual (1% threshold = 600.) and Pied Avocet (*Recurvirostra avosetta*) between 1,000 and 3,500 wintering individuals (1% threshold = 730). *(NB: The national results of the winter waterbird censuses, organized in Tunisia since the 1960s and coordinated at the international level by Wetlands International, have not been analysed in detail or published to date; to use the 1% criterion, it is therefore necessary to use the data of Isenmann et al (2005) and the unpublished observations of the Association des Amis des Oiseaux – AAO – and M. Smart)*

Sites of Biodiversity Importance

3.2.4.1 Sebkhet Dreiaa

This site of biodiversity importance is approximately 50 km north east of the PV project site and 50 km north-east of the proposed OHTL route and is designated as an IBA under Criterion 4.

BirdLife Data Zone and does not provide detailed information on why the site was designated as an IBA, however Criterion A4 relates to large congregations, which is presumed to be related to the general waterbird assemblage.

3.2.4.2 Iles Kneiss

This site of biodiversity importance is approximately 50 km east of the PV project site and 50 km east of the proposed OHTL route and is designated as an IBA under Criterions 3 and A4.

BirdLife Data Zone and does not provide detailed information on why the site was designated as an IBA, however Criteria A1 relates to globally threatened species and Criterion A4 relates to large congregations, which is presumed to be related to the general waterbird assemblage.

IBAT Search - Protected Species

Data returned in the IBAT search for the presence or potential presence of species of International Conservation Concern (IUCN Vulnerable, Endangered or Critically Endangered) within the Project AoI and 50 km search area is shown in the table below. Of the species listed below only European Turtle Dove have been recorded within the Project AoI (OHTL only).

Scientific Name	Common Name	IUCN	Recorded on Baseline Surveys
Oxyura leucocephala	White-headed Duck	EN	No
Neophron percnopterus	Egyptian Vulture	EN	No
Falco cherrug	Saker Falcon	EN	No
Numenius tenirostris	Slender-billed Curlew	CR	No
Puffinus mauretanicus	Balearic Shearwater	CR	No
Eretmochelys imbricata	Hawksbill Turtle	CR	No
Cheloniamydas mydas	Green Turtle	EN	No

Scientific Name	Common Name	IUCN	Recorded on Baseline Surveys
Anguilla anguilla	European Eel	CR	No
Tropidophoxinellus chaignoni	Tunisian Bleak	EN	No
Thorectes puncticollis	Dung Beetle sp.	EN	No
Aythya ferina	Common Pochard	VU	No
Calidris ferruginea	Curlew Sandpiper	VU	No
Calidris falcinellus	Broad-billed Sandpiper	VU	No
Pluvialis squatarola	Grey Plover	VU	No
Ammotragus lervia	Aoudad	VU	No
Caretta caretta	Loggerhead Turtle	VU	No
Dermochelys coriacea	Leatherback Turtle	VU	No
Gazella dorcas	Dorcas Gazelle	VU	No
Rhinolophus mehelyi	Mehely's Horseshoe Bat	VU	No
Streptopelia turtur	**European Turtle-dove**	**VU**	**Yes**
Larus audouinii	Audouin's Gull	VU	No
Falco vespertinus	Red-footed Falcon	VU	No
Puffinus yelkouan	Yelkouan Shearwater	VU	No
Chersophilus duponti	Dupont's Lark	VU	No
Chlamydotis undulata	African Houbara	VU	No
Stipa tenacissima	Needle Grass	VU	No
Miniopterus schreibersii	Schreiber's Bent-winged Bat	VU	No

The following species were included on the IBAT search as Range-Restricted Species.

Scientific Name	Common Name	IUCN	Recorded on Baseline Surveys
Larus audouinii	Audouin’s Gull	VU	No
Curruca sarda	Marmora’s Warbler	LC	No

Habitats and Flora

The Project site and route of the OHTL are located in the Southern Lowlands (*Figure 4*).

Climatically, the site is in the lower arid bioclimatic zone with temperate winters (*Figure 5*), while the line extends over various bioclimates: it starts in the lower arid bioclimatic zone, passes through the lower arid zone with cool winters to the north of Sabkhet Naoual and around Mezzouna and ends in the upper arid bioclimatic zone with temperate winters along the eastern flank of the Bouhedma range as far as Meknassi.

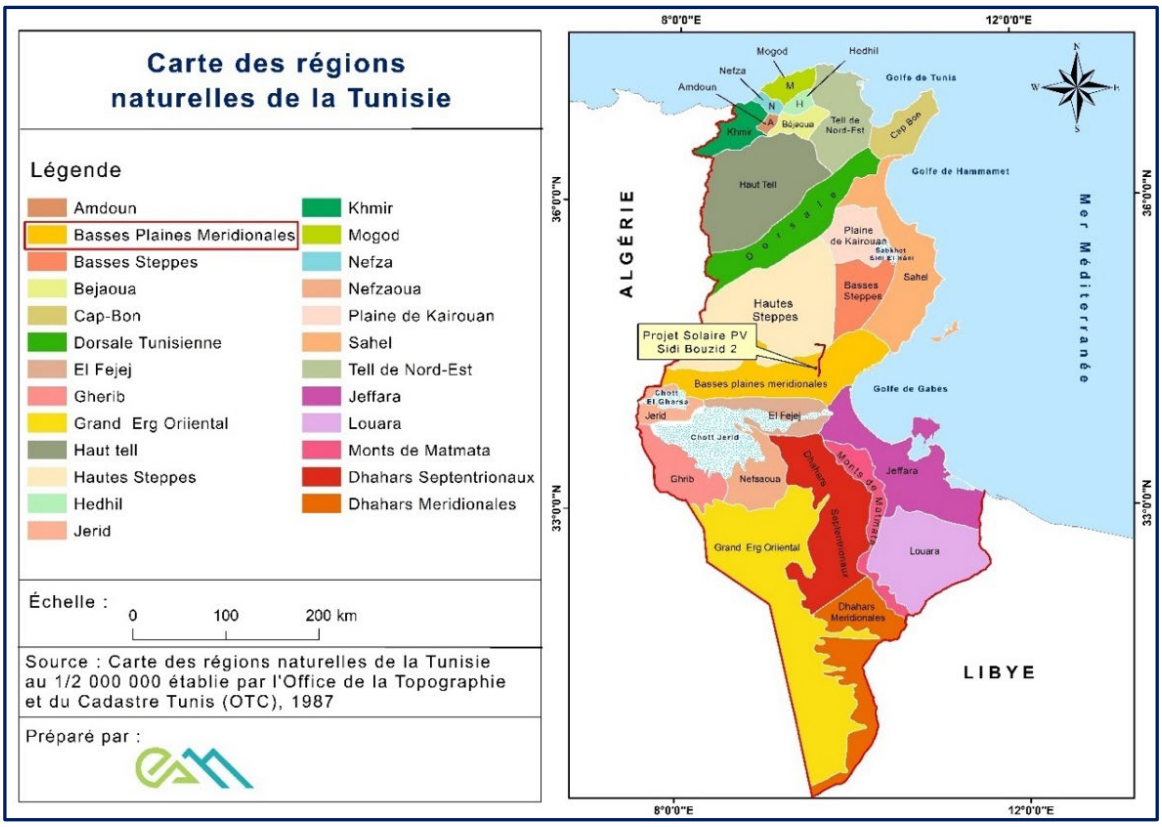


Figure 5 - Location of the site on the map of Tunisia's Natural Regions

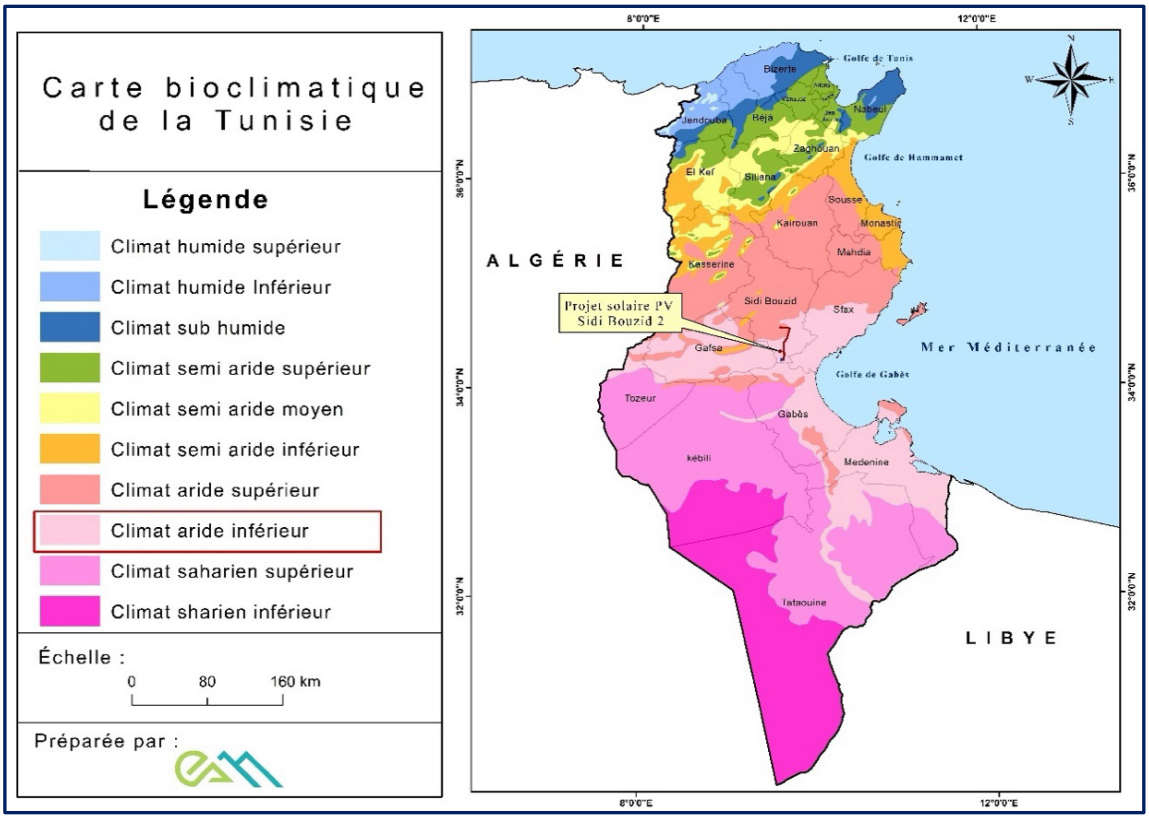


Figure 6 - Location of the site on the bioclimatic map of Tunisia

In ecosystem terms, the site is located in an arid steppe. It is a very flat grazing area with a skeletal sandy-loam soil. It is stony in places, or with fine aeolian sand forming small dunes fixed by *Ziziphus lotus* (a small deciduous tree).

The landscape is generally very homogeneous and the vegetation very sparse with low species diversity. This flora, typical of pre-desert arid zones, is dominated by small low clumps of *Haloxylon salicornicum*. *Astragalus armatus*, *Peganum harmala* and *Atractylis carduus* are also found in this steppe, but are much rarer than the predominant vegetation. Areas of stony, sandy soil contain small tufts of *Haloxylon scoparium*, while the areas of aeolian sand are stabilised and fixed by large, dense tufts of *Ziziphus lotus*, which provide resting places and refuge for many small animals. Several burrows are dug in these dune formations. A list of species recorded on the PV site is shown in *Table 9*. None of the species recorded are of in-country or international conservation concern and the habitats within the Project AoI are not included as Annex I habitats.

Table 9 - Taxonomic list of plant species recorded at the PV site

Scientific Name	Common Name	IUCN Status
Haloxylon salicornicum	Samar Tree	LC
Haloxylon scoparium	White Saxual	LC
Astragalus armatus	A Sub-shrub	LC
Peganum harmala	Wild (African) Rue	LC
Atractylis carduus	Yellow Distaff Thistle	LC
Ziziphus lotus	A Shrub	LC

The surveys along the OHTL were completed at eight 'survey stations', which are approximately 5 km apart. These points are therefore located at different altitudes and in different bioclimates, biotopes and ecosystems. The landscapes and plant composition differ from one environment to another however in general the plant communities were typical for the habitats present, none of which are included as Annex I habitats.

One plant species, *Stipa tenacissima* (a Needle Grass) is included on the IUCN Red List as Vulnerable (LC Nationally) and as such would be considered as a Priority Biodiversity Feature (PBF). This species is not endemic to Tunisia nor is it considered to be range restricted.

Two of the plant species recorded are included on the Tunisia Red Data Book and these are:

- Umbrella Thorn Acacia (*Vachellia tortilis*) which was found at Pont 2 and Point 4. This species is listed as TRDB VU but IUCN LC.
- Tripartite Sumac (*Searsia tripartita*) which was found at Point 5 and Point 7. This species is listed as TRDB VU but IUCN LC.

Neither species is endemic to Tunisia, nor are they considered to be range restricted and neither species is considered a Priority Biodiversity Feature (PBF).

Mammals (excluding bats)

A total of ten species of mammal are likely to be within the PV Project area and these are shown in the table below. None of the species present or possibly present are of international conservation concern. An in-country red data book for mammal species is not available. Species recorded during the site surveys are marked in bold.

Table 10 - Mammal List for the PV Site

Scientific Name	Common Name	IUCN Status	Recorded on Baseline Surveys
Lepus capensis	Cape Hare	LC	No
Gerbillus campestris	North African Gerbil	LC	No
Gerbillus latastei	Lataste's Gerbil	DD	No
Gerbillus simoni	Lesser Short-tailed Gerbil	LC	No
Meriones shawi	Shaw's Jird	LC	No
Psammomys obesus	**Fat Sand Rat**	**LC**	**Yes – colonies / galleries**
Jaculus orientalis	**Greater Egyptian Jerboa**	**LC**	**Yes – field signs**
Atelerix algirus	North African Hedgehog	LC	No
Vulpes vulpes	**Red Fox**	**LC**	**Yes – field signs**
Canis (anthus) lupaster	African Wolf	LC	No

A total of 16 species of mammal are likely to be within the AoI of the proposed OHTL and these are shown in the table below. None of the species present or possibly present are of international conservation concern. An in-country red data book for mammal species is not available. Species recorded during the site surveys are marked in bold.

Table 11 - Mammal List for the OHTL

Scientific Name	Common Name	IUCN Status	Recorded on Baseline Surveys
Lepus capensis	Cape Hare	LC	No
Gerbillus campestris	North African Gerbil	LC	No
Gerbillus latastei	Lataste's Gerbil	DD	No
Gerbillus simoni	Lesser Short-tailed Gerbil	LC	No
Meriones shawi	Shaw's Jird	LC	No
Psammomys obesus	Fat Sand Rat	LC	No
Rattus rattus	House Rat	LC	No
Mus musculus	House Mouse	LC	No
Ctenodactylus gundi	North African Gundi	LC	No
Jaculus orientalis	Greater Egyptian Jerboa	LC	No
Hystrix crsitata	Crested Porcupine	LC	No
Atelerix algirus	North African Hedgehog	LC	No
Petrosaltator rozeti	North African Elephant Shrew	LC	No
Genetta genetta	Common Genet	LC	No
Vulpes vulpes	Red Fox	LC	No
Canis lupaster	African Wolf	LC	No

Bats

Surveys for bats have not been completed however bats are generally not significantly affected by PV Projects and OHTL pose a very minimal collision risk to bats that echolocate. The table of bat species provided below is a list of bat species that have been recorded at the Bouhedma National Park / IBA / Ramsar Site. None of the species included in the table below are of significant international conservation concern (EN+), however three of the species are included on Annex II of the Habitats Directive: Greater Horseshoe Bat, Lesser Horseshoe Bat and Mehley's Horseshoe Bat.

Table 12 - List of Bat Species Potentially Present in the AoI

Scientific Name	Common Name	IUCN Status	Recorded on Baseline Surveys
Rhinolophus ferrumequinum	Greater Horseshoe Bat	LC / NT	N/A
Rhinolophus hipposideros	Lesser Horseshoe Bat	LC	N/A
Rhinolophus euryale	Mediterranean Horseshoe Bat	NT	N/A
Rhinolophus mehelyi	Mehely's Horseshoe Bat	VU	N/A
Rhinopoma cystops	Egyptian Mouse-tailed Bat	LC	N/A
Tadarida teniotis	European Free-tailed Bat	LC	N/A
Miniopterus schreibersii	Schreiber's Bent-winged Bat	VU	N/A
Eptesicus isabellinus	Meridional Serotine	LC	N/A
Pipistrellus kuhlii	Kuhl's Pipistrelle	LC	N/A
Pipistrellus pipistrellus	Common Pipistrelle	LC	N/A
Otonycteris hemprichii	Desert Long-eared Bat	LC	N/A
Plecotus gaisleri	Gaisler's Long-eared Bat	LC	N/A
Myotis punicus	Maghrebian Mouse-eared Bat	DD / VU	N/A

Reptiles and Amphibians

A total of ten species are likely to be within the PV Project area and these are shown in the table below. None of the species possibly present are of international conservation concern nor are they included on Annex II of the Habitats Directive. An in-country red data book for reptile species is not available. Species recorded during the site surveys are marked in bold.

Table 13 - Reptiles Present or Likely Present in the PV Project Area

Scientific Name	Common Name	IUCN Status	Recorded on Baseline Surveys
Varanus griseus	Desert Monitor	LC	No
Stenodactylus mauritanicus	**Northern Elegant Gecko**	**LC**	**Yes**
Trapelus mutabilis	Desert Agama	LC	No
Acanthodactylus boskianus	Bosc's Fringe-toed Lizard	LC	No
Mesalina olivieri	Oliver's Sand Lizard	LC	No

Scientific Name	Common Name	IUCN Status	Recorded on Baseline Surveys
Chalcides boulengeri	**Boulenger's Feylinia**	**LC**	**Yes**
Psammophis schokari	Forskål's Sand Snake	LC	No
Malpolon moilensis	Moila Snake	LC	No
Cerastes cerastes	Desert Horned Viper	LC	No*
Naja haje	Egyptian Cobra	LC	No*

* - Desert Horned Viper and Egyptian Cobra were observed and captured on several occasions by workers at the adjancet PV Plant.

A total of 29 species of reptile and amphibian are likely to be within the AoI of the proposed OHTL, although no amphibians were recorded during the survey. One species, *Daboia mauritanica* is listed as Near-Threatened (NT) by the IUCN. All of the other species are considered to be of Least Concern. Species recorded during the site surveys are marked in bold, none of which are listed on Annex II of the Habitats Directive.

Table 14 - Reptiles and Amphibians Present or Likely Present in the OHTL Project Area

Scientific Name	Common Name	IUCN Status	Recorded on Baseline Surveys
Rana saharica	Sahara Frog	LC	No
Discoglossus pictus	Painted Frog	LC	No
Sclerophrys mauritanica	Moroccan Toad	LC	No
Bufotes boulengeri	African Green Toad	LC	No
Testudo graeca	Common Tortoise	LC	No
Chamaeleo chamaeleon	Mediterranean Chameleon	LC	No
Varanus griseus	**Desert Monitor**	**LC**	**Yes**
Trapelus mutabilis	Desert Agama	**LC**	**Yes**
Uromastyx acanthinura	North African Thorny-tailed Lizard	LC	No
Acanthodactylus boskianus	Bosc's Fringe-toed Lizard	**LC**	**Yes**
Acanthodactylus maculatus	Spotted Fringe-fingered Lizard	LC	No
Mesalina olivieri	Oliver's Sand Lizard	LC	No
Mesalina guttulata	Small-spotted Desert Racer	LC	No
Ophisops occidentalis	Western Snake-eyed Lizard	LC	No
Stenodactylus mauritanicus	**Northern Elegant Gecko**	**LC**	**Yes**
Tropiocolotes tripolitanus	Parker's Pygmy Gecko	LC	No
Tarentola fascicularis	Moorish Gecko	LC	No
Chalcides ocellatus	Ocellated Skink	LC	No
Chalcides boulengeri	**Boulenger's Feylinia**	**LC**	**Yes**
Eumeces schneideri	Orange-tailed Skink	LC	No
Hemorrhoea hippocrepis	Horseshoe Whip-snake	LC	No

Scientific Name	Common Name	IUCN Status	Recorded on Baseline Surveys
Hemorrhoea algirus	Algerian Whip-snake	LC	No
Psammophis schokari	Forskål's Sand Snake	LC	No
Malpolon insignitus	Eastern Montpellier Snake	LC	No
Malpolon moilensis	Moila Snake	LC	No
Cerastes cerastes	Desert Horned Viper	**LC**	**Yes**
Echis leucogaster	White-bellied Carpet Viper	LC	No
Daboia mauritanica	Moorish Viper	NT	No
Naja haje	Egyptian Cobra	LC	No

Invertebrates

Five species of invertebrate were recorded within the PV Project areas, and these are shown on the table below. None of the species present are of international conservation concern. An in-country red data book for invertebrate species is not available.

Table 15 - Invertebrate Species Present in the PV Project Area

Scientific Name	Common Name	IUCN Status	Recorded on Baseline Surveys
Sphincterochila candidissima	**A Snail**	**LC**	**Yes**
Prionotheca coronata	**Urchin Beetle**	**LC**	**Yes**
Pimelia interstitialis	**A Beetle**	**LC**	**Yes**
Androctonus australis	**Yellow Fat-tailed Scorpion**	**LC**	**Yes**
Buthacus arenicola	**A Scorpion**	**LC**	**Yes**

Twelve species of invertebrate were recorded or are likely to be found are likely to be within the AoI of the OHTL area and these are shown in the table below. None of the species present or possibly present are of international conservation concern. An in-country red data book for invertebrate species is not available.

Table 16 - Invertebrate Species Present in the OHTL Project Area

Scientific Name	Common Name	IUCN Status	Recorded on Baseline Surveys
Eobania vermiculata	**Chocolate-band Snail**	**LC**	**Yes**
Sphincterochila candidissima	**A Snail**	**LC**	**Yes**
Xeroplana doumeti	**A Snail**	**LC**	**Yes**
Eugaster guyony	**A Cricket**	**LC**	**Yes**
Julodis sp.	**A Beetle**	**LC**	**Yes**

Scientific Name	Common Name	IUCN Status	Recorded on Baseline Surveys
Geomantis larvoides	**A Ground Mantis**	**LC**	**Yes**
Sphinx caterpillars	**Hawk-moth sp.**	**LC**	**Yes**
Buthus tunetanus	Common Yellow Scorpion	LC	No, but likely present
Androctonus australis	**Yellow Fat-tailed Scorpion**	**LC**	**Yes**
Androctonus bicolor	Black Fat-tailed Scorpion	LC	No, but likely present
Buthacus arenicola	A Scorpion	LC	No, but likely present
Scorpio punicus	Large-claw Scorpion	LC	No, but likely present

Avifauna

A total of 26 species of Avifauna were recorded from within the PV Project Area between April and September 2025, and these are shown in the table below. All of the species recorded are considered to have a global conservation status of Least Concern however Lanner Falcon and Short-toed Snake Eagle are of national conservation concern.

Table 17 - Bird Species Recorded in the PV Project Area (April to September 2025)

Scientific Name	Common Name	IUCN Status	TRDB (where available)
Falco biarmicus	Lanner Falcon	LC	EN
Pterocles orientalis	Black-bellied Sandgrouse	LC	VU
Burhinus oedicnemus	Eurasian Stone-curlew	LC	LC
Corvus corax	Northern Raven	LC	LC
Passer hispaniolensis	Spanish Sparrow	LC	LC
Scotocerca inquieta	Streaked Scrub Warbler	LC	LC
Calandrella brachydactyla	Greater Short-toed Lark	LC	LC
Alaemon alaudipes	Greater Hoopoe-Lark	LC	LC
Oenanthe oenanthe	Northern Wheatear	LC	-
Hirundo rustica	Barn Swallow	LC	LC
Galerida cristata	Crested Lark	LC	Stable
Galerida theklae	Thekla's Lark	LC	LC
Ammomanes cinctura	Bar-tailed Lark	LC	LC
Lanius excubitor	Great Grey Shrike	LC	NT

Scientific Name	Common Name	IUCN Status	TRDB (where available)
Oenanthe halophila	Maghreb Wheatear	LC	-
Oenanthe moesta	Red-rumped Wheatear	LC	LC
Oenanthe deserti	Desert Wheatear	LC	LC
Alaudala rufescens	Mediterranean Short-toed Lark	LC	LC
Ammomanes deserti	Desert Lark	LC	LC
Eremophila bilopha	Temminck's Lark	LC	LC
Melanocorypha calandra	Calandra Lark	LC	VU
Cursorius cursor	Cream-colored Courser	LC	VU
Apus pallidus	Pallid Swift	LC	LC
Buteo rufinus	Long-legged Buzzard	LC	LC
Circaetus gallicus	Short-toed Snake Eagle	LC	CR
Circus aeruginosus	Western Marsh Harrier	LC	LC

An individual Lanner Falcon was seen within the PV site in April, June and July. It is not considered this species is breeding within the PV Project Area but likely breeding locally.

Three individual Cream-coloured Courser were seen within the PV area in June and four in July (flock of 3 plus an individual bird). This species is considered to have possibly bred within the Project AoI in 2025.

Calandra Lark were only recorded within the PV AoI in June and July with small flocks (peak count of 20 birds) scattered across the site. These are likely to be post-breeding flocks foraging in areas of suitable habitat. There were no registrations of this species in April and May and therefore breeding within the PV Project is unlikely.

A single Short-toed Snake Eagle was recorded flying over the Project AoI in September 2025.

A total of 81 species of birds were recorded during the surveys completed along the OHTL between April and September 2025. Of these, fourteen are either of international conservation concern or are raptor / wader species that may be impacted by the OHTL (*Table 15*). No waterfowl species or Herons, Storks, Cranes or their allies were recorded flying over the route of the proposed OHTL.

Table 18 - Bird Species of Interest Recorded in the OHTL Project Area (April to September 2025)

Scientific Name	**Common Name**	**IUCN**	**TRDB (where available)**
Circaetus gallicus	Short-toed Snake Eagle	LC	CR
Aquila chrysaetos	Golden Eagle	LC	VU
Falco biarmicus	Lanner Falcon	LC	EN
Circus pygargus	Montagu's Harrier	LC	DD
Buteo rufinus	Long-legged Buzzard	LC	NT
Circus aeruginosus	Western Marsh Harrier	LC	NT
Milvus migrans	Black Kite	LC	-
Circus macrourus	Pallid Harrier	NT	-
Pernis apivorus	European Honey Buzzard	LC	-
Cursorius cursor	Cream-colored Courser	LC	VU
Burhinus oedicnemus	Eurasian Stone-curlew	LC	LC
Streptopelia turtur	European Turtle Dove	VU	VU
Melanocorypha calandra	Calandra Lark	LC	VU
Ptyonoprogne rupestris	Eurasian Crag Martin	LC	CR

A single Golden Eagle was recorded at OP5 in May 2025. This bird was flying east to west at a height of 180m.

Three individual Crag Martins were recorded in May and June.

Single individuals Short-toed Snake Eagle were recorded in May (three records), July (one record), August (one record) and September (three records). All birds were recorded flying at least 75m and some hunting / foraging behaviour was recorded. It is likely that these registrations were of a locally breeding bird (e.g. within the OHTL AoI), although no nests of this species have been confirmed.

Lanner Falcon were recorded in all months of surveys with multiple registrations of individual birds (two records of two birds). A single nest was confirmed on an existing pylon between OP1 and 2 and registrations were likely of this breeding pair.

Calandra Lark were recorded within the OHTL AoI in May, June, July and September with small flocks (peak count of 50 birds) scattered across the survey area. These were recorded as migratory flocks by the observers and are considered likely to be post-breeding flocks foraging in areas of suitable habitat. It is however possible that low numbers bred within the OHTL AoI.

There were two registrations of Cream-coloured Courser; one in May (one individual) and one in June (three individuals). It is considered unlikely, due the lack of registrations, that this species bred within the OHTL AoI in 2025.

There were 109 registrations of European Turtle Dove between April and September 2025 and breeding is considered probable, especially within olive trees / groves within the OHTL AoI.

CRITICAL HABITAT ASSESSMENT

Introduction

The first stage of the CHA is to undertake a screening exercise where the species of conservation concern or that are range restricted that have been recorded within the Project AoI or those considered to be potentially present are rapidly assessed against the thresholds for determination of CH.

CHA screening has been undertaken for all species considered present or potentially present within the Project AoI that are of global conservation concern; Critically Endangered, Endangered and Vulnerable or that are range restricted, as indicated in the IBAT search or from field surveys.

Species with a global conservation status of Near Threatened or below have been excluded from the CHA screening unless they have a significant national or regional conservation status.

Two fish species; European Eel (*Anguilla anguilla*), and Tunisian Bleak (*Tropidophoxinellus chaignoni*), two reptiles; Hawksbill Turtle (*Eretmochelys imbricata*) and Green Turtle (*Cheloniamydas mydas*) and two species of bird; Slender-Billed Curlew (*Numenius tenirostris*) and Balearic Shearwater (*Puffinus mauretanicus*) were included on the IBAT PS6 report as being of global conservation concern, however these have been discounted from the CHA as the Project does not have suitable habitats for these species. The closest marine area: the Mediterranean Sea, is 47 km east of the Project site and the Project will not affect freshwater watercourses / waterbodies. The Project area does potentially have habitat suitable for Slender-billed Curlew however this species is now considered possibly extinct in the wild (IUCN 2021). Balearic Shearwater were also screened out from the assessment as they are likely to be associated with marine areas. Audouin's Gull were included as being a Range Restricted Species however this species has also been screened out from the assessment as they are also likely to be associated with marine areas.

African Houbara (*Chlamydotis undulata*) is an IUCN Vulnerable species (TRDB: Endangered) which has suffered significant population decline in recent years and is included on the citations for the Sebkhat Noual RAMSAR / IBA / KBA. According to the 2023 IUCN assessment this species is now considered possibly extinct within

northern Tunisia and is therefore not present within the Project AoI. Information presented in the TRDB states 'relict populations confined to the far south of Tunisia with low densities and a heterogeneous distribution'.

There are 32 records of this species on GBIF/eBird in Tunisia. The most recent record relates to a record of two birds seen in 1993 at Oued between Tozeur and Shabikaha, approximately 75 km west of the Project AoI. This species is therefore likely absent from the AoI and is therefore not subject to further assessment.

All other IUCN Vulnerable species have been screened out as they are unlikely to occur in significant numbers within the AoI, where project impacts would result in a change of conservation status from VU to EN or CR. As such the Criteria 1 thresholds would not be met. None of the species listed as IUCN VU are range restricted, or endemic and Criteria 2 thresholds would not be met. None of the waterbirds (*e.g.* waders) are included on the IBA/Ramsar citations as named species and it is also considered unlikely that they would occur in significant concentrations where thresholds for Criteria 3 would be met. All IUCN VU species are however considered to be PBF species. Other species such as turtle sp. are certain to not occur within the AoI and are therefore discounted from further assessment.

Criterion 1 / ii, 2 / iii and 3 / iv

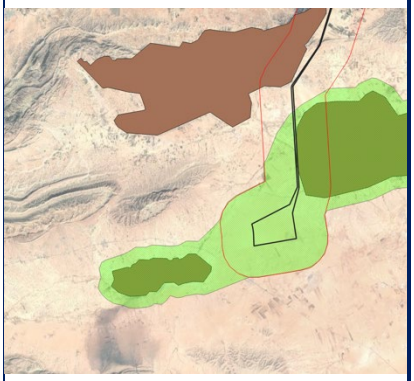
The tables below present information species of international or, where appropriate, of elevated national conservation concern present or potentially present within the AoI as well as other species present or potentially present in significant numbers within the AoI. All other species have been considered and if not included in the tables below have been screened out (as indicated above). In the tables below EAAA for each of the species is discussed where EAAA are relevant.

Criterion 4 / i, and 5 are not considered relevant in the context of the proposed project and the habitats present within the AoI.

Table 19 - CHA Screening and Assessment

White-headed Duck (*Oxyura leucocephala*)

	IUCN – Endangered	Tunisia Red List – Endangered	EAAA Information

Notes	Resident and wintering species in Tunisia and known to occur in IBA and non-IBA wetlands throughout northern Tunisia. Breeding pairs in Tunisia belong to the Tunisian-Algerian biogeographical population, which numbers fewer than 500 individuals. The average national number of wintering individuals during 2000-2020 is estimated at about 850 individuals (Hamdi, 2008; Hamdi & Charfi-Cheikhrouha, 2011; personal observations). This unexpected difference would probably be the consequence of a biased assessment of the population and/or a significant increase in numbers following its protection throughout the last three decades. Not recorded during the surveys completed in April and May 2025. EAAA has been determined to encompass the three wetland designated sites (IBA / Ramsar) within the vicinity of the site.	 ***EAAA for White-headed Duck, includes the site and the three IBA/Ramsar sites within the vicinity of the Project AoI (brown area is the Bouhedma National Park IBA/ KBA which is a non-wetland IBA and therefore not suitable for White-headed Duck)***
Criteria 1	Current global population estimated at 5,400-8,700 individuals distributed in small groups considered to be genetically isolated from each other The Project does not support habitats suitable for this species and White-headed Duck were not recorded during the surveys completed in April and May 2025 and therefore thresholds for determination of Critical Habitat under Criteria 1 would not be met.	
Criteria 2	White-headed Duck are not endemic, or a range-restricted species and this Criteria is not relevant to this species.	
Criteria 3	Winter bird surveys have not been completed however if the entire wintering population of 850 individuals regularly occurred within the EAAA then Critical Habitat would likely be triggered under Criteria 3 (over 10% of the global population). Transfer between these waterbodies would be likely and flight activity would therefore be associated within the Project AoI.	

Saker Falcon (*Falco cherrug*)

	IUCN – Endangered	**Tunisia Red List – Not Listed**	**EAAA Information**
Notes	A migratory species through Tunisia. Estimated global population of between 860-1300. Migration through the AoI is likely.		Not possible to determine EAAA for this globally widespread species.
Criteria 1	Threshold for triggering Criteria 1 is between 61 and 149 birds.		

	The Project AoI does not support suitable breeding habitat that would regularly support significant proportions of the global (or national) population, and the species is only migratory through Tunisia. Saker Falcon migrating along the broad front African-Eurasian flyway, more specifically Central Europe to Central Africa flyway could potentially cross the Project AoI. According to Birdlife Soaring Bird Sensitivity Mapping Tool the project site is in an area of Medium Sensitivity however no information is presented for Saker Falcon within a 250 km buffer of the site and it is therefore unlikely that this species would occur in significant numbers within the AoI on migration. In addition, habitat suitability as a stop-over site is low and as such any birds within the AoI are likely to be associated with airspace only. An EAAA for migrating Saker Falcon can therefore not be determined. The main wintering grounds that are regularly used by Saker Falcon is in Cap Bon, a peninsula in the north-east of the country. This area is a significant distance from the Project site and it is therefore considered that significant wintering populations within the Project AoI are unlikely. The Thresholds for Criteria 1 are not met, and no further assessment required.	
Criteria 2	This species is not an endemic or range-restricted and as such Criteria 2 is not relevant to this species.	
Criteria 3	Saker Falcon migrating along the broad front African-Eurasian (Central Europe to Central Africa) flyway are likely to cross the Project AoI but not in significant concentrations. There are no known important staging sites for this species along the Project AoI and birds are associated with airspace within a very broad migration front. Thresholds for Criteria 3 are not met, and no further assessment required.	

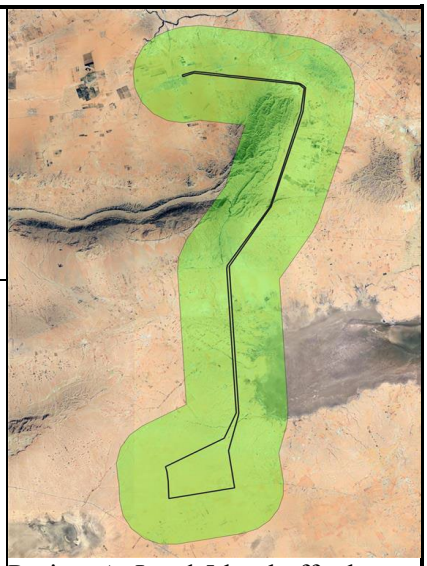
Egyptian Vulture (*Neophron percnopterus*)

	IUCN – Endangered	Tunisia Red List – Critically Endangered	EAAA Information

Notes	Habitat includes cliffs and mountain ranges in Tunisia with approximately 20-25 pairs breeding. Global population is approximately 12,400-36,000 individuals.	Not possible to determine EAAA for this globally widespread species which does not breed within the AoI or its vicinity.
Criteria 1	Not recorded in AoI during April and May 2025 surveys. This species does breed in Tunisia, however only in mountainous regions, particularly within the north-western regions near the Algerian border. This area is a significant distance from the Project AoI. No known stop-over sites present within the AoI. Unlikely that terrestrial habitat within the Project AoI would support ≥ 0.5% of the global population in any given migration season and as such the thresholds for determination of Critical Habitat under Criteria 1 are not met.	
Criteria 2	Egyptian Vulture are not endemic or range-restricted and as such Criteria 2 is not relevant.	
Criteria 3	See Criteria 1. Possible migration through the Project site however not recorded in the April and May 2025 bird surveys. AoI does not support suitable staging habitats and is outside of areas where this species is known to congregate in Tunisa (e.g. mountain ranges) and therefore considered unlikely to regularly support 1% of this globally Endangered species in any given migration season and as such thresholds for determination of Critical Habitat under Criteria 3 are not met. This species may cross the AoI on migration however this would be birds using the airspace only.	

Marmora's Warbler (*Curruca sarda*)

	IUCN – Least Concern	Tunisia Red List – Unknown	EAAA Information
Notes	Wintering species found throughout Tunisia within areas with dense vegetation, like scrubland, garrigue, and steppes. This species is therefore likely to be within the project area and AoI. The global population of Marmora's Warbler is approximately 126,000 – 137,000 individuals.		
Criteria 1	Criteria 1 is not applicable to a species with a global conservation status of Least Concern and is not assessed further.		
Criteria 2	Marmora's Warbler is likely considered as range restricted as its breeding range (Corsica and Sardinia) is approximately 32,000 km^2. The Extent of Occurrence (EOO) of the global range of this species is however considered to be		

	13,000km^2. Marmora's Warbler do not breed within the AoI however are likely to occur within the wintering period. This species will however not trigger thresholds under Criteria 2 as the EAAA is near-certain to not support the ≥10% of the global population and as such Criteria 2 is not considered further.	 Project AoI and 5 km buffer has been used for EAAA
Criteria 3	Whilst Marmora's Warbler are a migratory species they are not considered to be a species that exhibits congregatory behaviours. It is near-certain that this species would not meet the following thresholds that would trigger Critical Habitat under Criteria 3: • EAAA known to sustain, on a cyclical or otherwise regular basis, ≥ 1 percent (threshold 1,260 individuals) of the global population of a migratory or congregatory species at any point of the species' lifecycle. • Areas that predictably support ≥10 percent of the global population (threshold 12,600) of a species during periods of environmental stress.	

A Dung Beetle sp. (*Thorectes puncticollis*)

	IUCN – Endangered	Tunisia Red List – Unknown	EAAA Information
Notes	This species occurs in Algeria, Tunisia and Libya, in eight localities according to Baraud (1985). In Tunisia, it has been recently reported from new localities in Sousse, Sfax, Kairouan and Tataouine (I. Labidi pers. obs. 2010- 2013). Historical records from Tunis and Tripoli correspond to subpopulations which have probably disappeared, due to the expansion of these cities. The area of occupancy (AOO) is very restricted and is estimated between 40-60 km^2. The elevational distribution ranges from zero to 20 m asl. Information about global population size is not available. GBIF data is very limited and known occurrences of this species is limited to records from Algeria *Thorectes puncticollis* likely inhabits Mediterranean ecosystems—such as Oak and Pine forests—in North African countries like Morocco, Algeria, and possibly Tunisia (IUCN). This species has not been recorded on surveys completed to date and the habitats present within the AoI are not those considered suitable for this		 Project AoI and 5 km buffer has been used for EAAA

	species.	
Criteria 1	It is considered unlikely that this species will occur within the AoI based on known (albeit limited) occurrence information and habitat type / preference. Based on the information collected to date it is considered absent from the AoI and Criteria 1 is not triggered.	
Criteria 2	Based on the information collected to date it is considered absent from the AoI and Criteria 2 is not triggered.	
Criteria 3	This Criteria is not relevant for this species.	

Determination of Critical Habitat

Criteria 1 / ii

Based on the results of the CH Screening Exercise it has been determined that thresholds for determination of Critical Habitat under Criterion 1 have not been met for any species that are of global conservation status that could or have been recorded in the Project's AoI and species specific EAAA (where these can be determined).

Criteria 2 / iii

Site specific surveys have not recorded any species that are considered to be endemic or range-restricted nor is it considered that any such species would occur within the relevant EAAA that would meet the thresholds for determination of Critical Habitat under Criteria 2 / iii.

Criteria 3 / iv

Surveys completed to date have not recorded species or populations that would trigger Criteria 3 / iv and therefore at the time of writing Critical Habitat under Criteria 3 / iv has not been triggered.

Survey information collected in the autumn and winter 2025 will be assessed where relevant however it is considered unlikely that the results of these surveys would trigger this criteria. The site is not supporting habitats that would be used as staging habitats for significant populations (1% of their respective global population).

Criteria 3 / iv is for migratory and congregatory species and as discussed in the assessment methodology Critical Habitat can only be determined under this Criteria for sites that functionally supports (*e.g.* staging habitat, roosting habitat, foraging habitat) populations in excess of their thresholds.

Sites must be of critical importance for this species and airspace is not considered to be of critical importance unless it is at bottleneck sites such as due to the presence of landscape features which 'funnel' flocks of soaring birds, or other important points along migration routes (e.g. sea crossing points). Sites are also considered important under this criterion where large aggregations of birds are present during key parts of their life cycle (e.g. stopover sites for roosting and feeding). In this latter context

roosting sites are considered to be those where birds will settle for extended periods of time as opposed to resting sites where birds will settle on the ground for shorter periods of time when conditions are unfavourable for migration, from which they will leave when conditions become more favourable. For airspace to be of importance and thus triggering the criterion for determination of CH there must be a conceptual linkage between the terrestrial or aquatic habitats present and the airspace. It is not considered that the IBAs within the AoI regularly support populations of White-headed Duck (IUCN: EN, TRDB: EN) in excess of 1% of the global population (threshold 53 – 87 individuals). It is also near-certain that the wetland sites within the AoI will not support in excess of 1% of global populations of other migratory wetland birds including White Stork, Common Crane, Greater Flamingo etc. all of which are IUCN LC.

Using this approach, Critical Habitat would not be triggered with respect to the airspace where there is no associated important terrestrial area. Migratory Soaring Birds (MSBs)) have not been recorded on the ground within the AoI and there is no suitable roosting habitat within the Project area. Resting areas are not of regular significance to MSBs and would not be subject to site-based conservation management activities which would result in measurable conservation benefits. The survey data clearly shows that there is an absence of a linkage between the airspace above, and terrestrial habitats of, the Project site and as such is impossible to delineate the airspace EAAA, and without an EAAA, the Critical Habitat thresholds for MSBs cannot be applied.

The migratory/congregatory species criterion described in the CHA section of IFC PS6 and EBRD PR6 is intended to trigger a CH determination only in areas that host continentally significant concentrations of migration activity. In many cases, these sites have already been designated as Important Bird Areas (IBAs) based on the KBA criteria and thresholds.

As has been shown in the CHA the utilized airspace is not linked to an important terrestrial area for migratory soaring birds and as such it is not considered to be Critical Habitat.

Priority Biodiversity Features

PBF Criterion 1: Threatened habitat

Earlier assessment undertaken at the project site and the study area as a whole did not identify any vegetation or ecosystems present in the vicinity of the Project that might be threatened. Therefore, no vegetation type qualifies for Criterion 1 under Priority Biodiversity Features.

PBF Criterion 2 – Threatened species, Range-restricted species, or Congregatory / Migratory species

Species considered to be Priority Biodiversity Features are included in Table 20 along with a brief discussion as to why they are considered PBF species.

Table 20 - Table of Identified PBF Species

Receptor	Conservation Status		Justification
	IUCN	TRDB	
Stipa tenacissima	VU	LC	Present in the OHTL AoI
Mehley's Horseshoe Bat	VU	-	Present in adjacent NP / IBA. Possibly present in AoI.
Schreiber's Bent-winged Bat	VU	-	Present in adjacent NP / IBA. Possibly present in AoI.
Egyptian Vulture	EN	CR	Not recorded in AoI April to August. Possible migrant over the site.
Saker Falcon	EN	-	Not recorded in AoI April to September. Unlikely migrant over the site.
Lanner Falcon	**LC**	**EN**	**Recorded in April / May 2025 surveys. Present in AoI and TRDB EN species**
Short-toed Snake Eagle	**LC**	**CR**	**Recorded in April / May 2025 surveys. Present in AoI and TRDB CR species. IUCN LC.**
European Turtle Dove	**VU**	**VU**	**Recorded on OHTL surveys in May 2025. Present in AoI and species is IUCN and TRDB VU**
White-headed Duck	EN	EN	Not recorded on surveys but likely present in adjacent IBA/KBA/Ramsar site and could cross over OHTL AoI.
Common Pochard	VU		Likely present in adjacent IBA/KBA/Ramsar site. Could cross over the OHTL AoI
Curlew Sandpiper	VU		Likely present in adjacent IBA/KBA/Ramsar site. Could cross over the OHTL AoI
Broad-billed Sandpiper	VU		Likely present in adjacent IBA/KBA/Ramsar site. Could cross over the OHTL AoI
Grey Plover	VU		Likely present in adjacent IBA/KBA/Ramsar site. Could cross over the OHTL AoI
Dorcas Gazelle	VU		Possible presence within the AoI
Red-footed Falcon	VU		Likely present in adjacent IBA/KBA/Ramsar site. Could cross over the OHTL AoI

Receptor	Conservation Status		Justification
	IUCN	TRDB	
Dupont's Lark	VU		Possible presence within the AoI
African Houbara	VU		Possible presence within the designated sites, although likely extinct in northern Tunisia

CONCLUSIONS

Critical Habitat has not been triggered for any species of global or national conservation likely to occur within the Project AoI and species specific EAAA. There are, however, a number of species present within the Project AoI that are considered to be PBF species.

The Project will therefore need to develop a Biodiversity Management Plan which will include all relevant species mitigation included within the ESIA to ensure No Net Loss to these valued ecological receptors.