



The Tunisia-Italy Electrical Interconnection (ELMED) Project

Biodiversity Management Plan Addendum

Report for the European Bank for Reconstruction Development

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Revision 01

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1 Introduction

The European Bank for Reconstruction Development (EBRD) are supporting the development of the Tunisia-Italy electrical interconnection (ELMED) project (the “Project”). The Project comprises the construction of a new two-way High Voltage Direct Current (HVDC) submarine electrical interconnection cable between Tunisia (Cap Bon) and Italy (Sicily). The Project will be jointly implemented by a partnership between the Italian Electricity Transmission System Operator Rete Elettrica Nazionale S.p.a (TERNA) and the Tunisian energy and electricity company Société Tunisienne de l’Électricité et du Gaz (STEG).

Several studies have been completed to support the evaluation of the Project to date. This has included work commissioned by the Project directly, including an Environmental and Social Impact Assessment (ESIA) (IDEA Consult, 2023a), marine feasibility studies (RINA, 2021; 2023) and underwater surveys. In addition, a Biodiversity Management Plan (BMP) has been developed to include the mitigation measures set out in the ESIA (IDEA Consult, 2023b) and to provide additional details on management and monitoring proposals.

EBRD identified the need to undertake a Critical Habitat Assessment (CHA) in accordance with the PR 6 Guidance Note (EBRD, 2022) for the coastal and marine elements of the Project. This was required to determine if the Project can achieve an outcome consistent with Performance Requirement 6 (PR 6) (EBRD, 2019). A CHA has therefore been undertaken (Bluedot Associates, 2023a). Following completion of the CHA, on behalf of EBRD, a review of the potential impacts and mitigation for on critical habitat and priority biodiversity features (PBF) was completed building upon previous assessments (Bluedot Associates, 2023b). Further to this work, EBRD have requested a review of the BMP to ensure that the findings of work completed is provided as an addendum to the existing BMP. This document provides this addendum. The focus of the addendum is to ensure that mitigation and monitoring requirements are consistent with the needs to address impacts on coastal and marine critical habitat and PBF. The remaining sections follow the headings included in the existing BMP.

2 Mitigation measures and management controls

The measures included in the BMP (IDEA Consult, 2023b) for the different project phases are presented in Table 1. These measures have been cross-referenced with the mitigation proposed within the review of impacts and mitigation on critical habitat and PBF (Bluedot Associates, 2023b).

Table 1: Marine biodiversity management measures and comments and recommendations relating to critical habitat and PBF.

BMP management measure	Comments and recommendations
<i>Project development phase</i>	
HDD will be used for the construction of the marine cables' landfall, avoiding direct interferences with the coastal environments and related habitats.	This measure embedded in project design is priority mitigation to avoid impacts on critical habitat and PBF. However, it may not be possible to undertake HDD across the whole distance where PBF and critical habitat is present. The distance of HDD should extend offshore as far as is technically feasible to aid the avoidance of impacts on PBF and critical habitat. Given the potential technical limitations other measures will likely be required.
Beach areas will be restored as needed following construction	Beach areas will be avoided by the HDD so restoration should not be necessary. It is assumed that this relates to footprints impacts on working behind the beach and it is recommended that this measure be updated to be more focused in this regard. Within the review of impacts and mitigation report, it is recommended that avoidance is prioritised for Annex 1 and Resolution 4 coastal habitats. If this is not possible then impacts should be minimised as far as possible. For any residual impacts, full restoration is required. It is recommended that this sequence of actions is followed for any habitat disturbance.
Cable burying techniques will prioritize ploughing and jetting techniques	These measures are acceptable to minimise the potential for disturbance.
Trenching techniques will be used as a last resort and only if technically	However, it is recommended that for PBF and critical habitat that may be present that any disturbance of such areas minimised as far as possible through appropriate localised routing

BMP management measure	Comments and recommendations
needed; a technical justification will be required to adopt this technique	<p>informed by pre-construction survey information.</p> <p>As part of such an approach, the best available techniques and equipment should be used to minimise the width of both the trench and the neighbouring area potentially impacted by the footprint of the machinery used for the burying. The technique should also seek to minimise the potential for smothering of adjacent PBF and critical habitat.</p>
A Final BMP will be prepared based on additional information and detailed design	The BMP should be a live document that should be updated as more information becomes available. The BMP should be updated prior to construction to include recommendations in this addendum.
Nearshore and offshore surveys as per monitoring plan to further describe benthic habitats	<p>For some features there is a requirement that survey information must be available prior to the application of mitigation measures and commencement of construction. This may include a detailed review of existing information and additional survey where gaps are present to inform the implementation of avoidance. This information should be used to deliver avoidance as priority first step following by other measures that have been detailed for minimisation, restoration and offsets.</p> <p>The requirement does not only relate to nearshore and offshore areas. There is also a need to undertake surveys in coastal areas to avoid impacts on Annex 1 and Resolution 4 coastal habitats and the Sicilian pond turtle.</p>
Project route study to avoid sensitive habitats to be informed by additional biodiversity surveys	This is consistent with the requirements set out for PBF and critical habitat as appropriate.
Pre-construction and construction phase	
General measures	
Use HDD for the construction of the marine cables' landfall, avoiding direct interferences with the coastal environments and related habitats (avoidance)	The same comments as provided under the project development phase apply.

BMP management measure	Comments and recommendations
Cable burying techniques will prioritize ploughing and jetting techniques	The same comments as provided under the project development phase apply.
Trenching techniques will be used as a last resort and only if technically needed; a technical justification will be required to adopt this technique	The same comments as provided under the project development phase apply.
Plan works to avoid periods of migration of sensitive species	<p>No information is provided to the species that this measure is related. It is recommended that the BMP specifies this and what windows are proposed to be avoided. It is assumed it relates to underwater sound impacts. This measure has not been proposed to manage significant ecological outcomes on PBF and critical habitat. However, seasonal avoidance will help to manage impacts and is generally supported.</p> <p>This measure is aligned with the requirement to avoid coastal construction works during the nesting season for loggerhead turtles (May to August). No other scheduling avoidance measures have been determined related to the potential for significant impacts on critical habitat and PBF.</p>
Reduce residence time of vessels and related equipment in marine waters (reduction)	This measure is not applicable to addressing significant measurable effects on marine biodiversity. However, it's application is supported as it will reduce any impacts on marine biodiversity.
<i>Posidonia oceanica and Cymodocea nodosa</i>	
Use HDD for the construction of the marine cables' landfall, avoiding direct interferences with the coastal environments and related habitats (avoidance)	<p>This aligned as being a primary avoidance measure for Posidonia meadows. However, as noted above, HDD may not lead to full avoidance.</p> <p>Therefore, If it is not possible to extend HDD across all seagrass habitat or to avoid areas where the fan mussel is located, survey information should be used to try to avoid footprint impacts associated with cable burial and anchoring wherever possible.</p> <p>Monitoring should be completed post works in areas to confirm that avoidance has been achieved.</p>

BMP management measure	Comments and recommendations
Cable burying techniques will prioritize ploughing and jetting techniques	<p>If full avoidance of seagrass habitat is not possible, any disturbance of such areas minimised as far as possible. As part of such an approach, the best available techniques and equipment should be used to minimise the width of both the trench and the neighbouring area potentially impacted by the footprint of the machinery used for the burying. Anchoring areas outside of seagrass habitat should also be identified to minimise impacts as far as possible.</p> <p>The ESIA and BMP recommend that construction may be avoided in periods where there is re-growth (autumn) and/ or where fruiting and germination occurs (spring to mid-summer). This measure will help minimise any impacts associated with the works. The application of such approaches will need to be informed by survey and monitoring to ensure the correct windows for work are identified.</p>
Trenching techniques will be used as a last resort and only if technically needed; a technical justification will be required to adopt this technique	
Plan works to avoid growth period of <i>Caulerpa sp.</i> (Kélibia, Tunisia)	This measure is supported to help the restoration of affected seagrass areas.
Actinopterygii and Chondrichthyes	
Use HDD for the construction of the marine cables' landfall, avoiding direct interferences with the coastal environments and related habitats (avoidance)	This measure is supported but is not relevant relating to critical habitat and PBF
Cable burying techniques will prioritize ploughing and jetting techniques	This measure is supported but is not relevant relating to critical habitat and PBF
Trenching techniques will be used as a last resort and only if technically needed; a technical justification will be required to adopt this technique	This measure is supported but is not relevant relating to critical habitat and PBF
Plan works to avoid periods of migration of sensitive species	No information is provided on what species this measure is related. It is recommended that the BMP specifies this. This measure is supported but is not relevant relating to critical habitat and PBF
Aves	
Reduce residence time of vessels and related equipment in marine waters	This measure is not applicable to addressing significant measurable effects on marine biodiversity. However, it's application is

BMP management measure	Comments and recommendations
	supported as it will reduce any impacts on species that trigger critical habitat and PBF.
Bivalvia and Anthozoa	
Use HDD for the construction of the marine cables’ landfall, avoiding direct interferences with the coastal environments and related habitats (avoidance)	<p>This aligned as being a primary avoidance measure for critical habitat and PBF. However, it may not be possible to undertake HDD across the whole distance where PBF and critical habitat is present.</p> <p>If it is not possible to extend HDD to avoid areas where this species is located, survey information should be used to try to avoid footprint impacts associated with cable burial and anchoring wherever possible.</p> <p>Monitoring should be completed post works in areas to confirm that avoidance has been achieved.</p>
Cable burying techniques will prioritize ploughing and jetting techniques	The best available techniques and equipment should be used to minimise the width of both the trench and the neighbouring area potentially impacted by the footprint of the machinery used for the burying.
Trenching techniques will be used as a last resort and only if technically needed; a technical justification will be required to adopt this technique	
Marine turtles	
MMO on board of ship (avoidance, reduction)	<p>These measures are not applicable to addressing significant measurable effects on marine biodiversity. However, their application is supported as it will reduce any impacts on species that trigger critical habitat and PBF.</p> <p>Additional measures have been identified in the review of impacts and mitigation for loggerhead turtles and the Sicilian pond turtle. This includes the need to mitigation impacts associated with artificial light for nesting loggerhead turtles and footprint impacts on the Sicilian pond turtle. Surveys must also be undertaken before applying mitigation for these species. These measures should be incorporated into the BMP to ensure that they form part of the biodiversity management approach for the project.</p>
Cable burying techniques will prioritize ploughing and jetting techniques	
Trenching techniques will be used as a last resort and only if technically needed; a technical justification will be required to adopt this technique	
Reduce residence time of vessels and related equipment in marine waters	

BMP management measure	Comments and recommendations
Cetaceans	
MMO on board of ship (avoidance, reduction)	These measures are not applicable to addressing significant measurable effects on marine biodiversity. However, their application is supported as it will reduce any impacts on species that trigger critical habitat and PBF.
Reduce residence time of vessels and related equipment in marine waters	
Operation phase	
Do not remove the marine cable upon project decommissioning to avoid disturbance to the marine environment	This measure is supported to mitigate impacts on critical habitat and PBF

The mitigation and management measures proposed within the BMP exclude any consideration of the potential impacts on reef habitat. The review of impacts and mitigation on critical habitat and PBF (Bluedot Associates, 2023b) identified the potential impacts to occur for deep-sea and nearshore reef communities that comprise critical habitat. Therefore, in addition to the measures included in the BMP the measures included in Table 2 are required for reefs.

Table 2: Additional management measures required for reef habitats relating to impacts.

Physical loss and disturbance
<p>Avoid</p> <p>Use survey information to avoid the disturbance of all deep-sea coral and sponge communities as a priority. This measure should be robustly implemented to ensure there are no impacts on these features.</p> <p>Also, using survey information, avoid biogenic reefs comprised of <i>Cladocora caespitosa</i> and coralline algal formations wherever possible along the cable route. This is especially important for communities that have low restoration feasibility (e.g., maerl beds).</p> <p>Monitoring should be completed post works in areas where critical habitat forming reefs are present to confirm that avoidance has been achieved.</p>
<p>Minimise</p> <p>If full avoidance of <i>Cladocora caespitosa</i> reef and coralline algal formations is not possible, any disturbance of such areas minimised as far as possible through appropriate localised routing. As part of such an approach, the best available techniques and equipment should be used to minimise the width of both the trench and the neighbouring area potentially impacted by the footprint of the machinery used for the burying.</p> <p>The extent of additional cable protection on reef areas that comprise critical habitat should be limited wherever possible.</p>

<p>Restore</p> <p>If any residual effects on <i>Cladocora caespitosa</i> reef and coralline algal formations remain after the adoption of the preceding measures, restoration could be undertaken to ensure that the integrity of reef systems is not affected in the long term. However, the feasibility of restoration should be assessed along with the timeframes for recovery. In general, such habitats can take a long time to recover and may have relatively low restoration feasibility. If restoration is feasible, baseline surveys should be undertaken prior to works to quantify the area affected; and monitoring should be undertaken to define the success of restoration measures. A BAP should be produced to provide details on the restoration approach.</p>
<p>Offset</p> <p>Full restoration is unlikely to be feasible where disturbance to biogenic reefs occur. Therefore, like-for-like restoration offsets will be required. Such offsets should seek to deliver NGs. The approach to offsets should be detailed in a BAP and offset strategy.</p>
<p>Redistribution and deposition of disturbed sediments</p>
<p>Avoid</p> <p>Use survey information to avoid cable installation works in soft sediments in proximity to deep-sea coral and sponge communities. The works should ensure no smothering of these habitats. An appropriate exclusion area should be defined through detailed assessment of settling areas.</p> <p>Also, using survey information, biogenic reefs comprised of <i>Cladocora caespitosa</i> and coralline algal formations should be avoided wherever possible along the cable route. This is especially important for communities that have low levels of recovery (e.g., maerl beds).</p>
<p>Minimise</p> <p>The best available techniques and equipment should be used to minimise the area of disturbance to limit the potential for sediment disturbance. Monitoring should be undertaken post-survey to ensure that reefs comprised of critical habitat have not been smothered.</p>
<p>Restore</p> <p>If significant smothering effects lead to significant residual effects on <i>Cladocora caespitosa</i> reef and coralline algal formations, the feasibility of restoration should be assessed, along with the timeframes for recovery. If restoration is feasible, baseline surveys should be undertaken prior to works to quantify the areas affected and monitoring should be undertaken to define the success of restoration measures. A BAP should be produced to provide details on the restoration approach.</p>
<p>Offset</p> <p>If restoration is not feasible, like-for-like restoration offsets will be required. Such offsets should seek to deliver NGs. The approach to offsets should be detailed in a BAP and offset strategy.</p>

3 Monitoring activities

A summary of the monitoring measures included in the BMP (IDEA Consult, 2023b) are presented in Table 3. These measures have been cross-referenced with the survey and monitoring requirements that are required for critical habitat and PBF (Bluedot Associates, 2023b). The measures in the BMP seek to address wider impacts that relate to conclusions made in the ESIA. The focus for critical habitat and PBF is to ensure that the recommendations for significant ecological outcomes are included in Project monitoring activities. No changes to the Project’s existing monitoring commitments are therefore made unless there is a consequence for critical habitat and PBF.

Table 3: Marine monitoring activities in the BMP and comments and recommendations relating to critical habitat and PBF.

BMP monitoring measure	Comments and recommendations
<i>Posidonia oceanica</i> and <i>Cymodocea nodosa</i>	The monitoring approach is generally supported. Baseline survey should provide sufficient information to avoid or minimise impacts to these habitats. This includes consideration of footprint impacts and issues associated with sediment suspension and deposition. Monitoring post-construction should inform the requirements for restoration and to monitor the outcomes of restoration approaches.
<i>Caulerpa sp.</i>	The monitoring approach is generally supported. The focus on monitoring post-construction should be on the presence of this species in areas disturbed by the works.
Actinopterygii and Chondrichthyes	These features do not trigger critical habitat or PBF. Therefore, there is no comment on the proposed monitoring.
Aves	No monitoring is required to address significant ecological outcomes for birds. Therefore, there is no comment on the proposed monitoring.
Bivalvia and Anthozoa	The monitoring approach is generally supported. However, monitoring should focus upon determining the presence of the fan mussel (<i>Pinna nobilis</i>) and <i>Haliotis stomatiaeformis</i> . The baseline survey should seek support the avoidance or minimisation of impacts on these species. If any impacts may occur post-construction monitoring should align with any restoration approaches.

BMP monitoring measure	Comments and recommendations
Marine turtles	The proposed monitoring is not relevant relating to the significant ecological outcomes that may ensue.
Cetaceans	The proposed monitoring is not relevant relating to the significant ecological outcomes that may ensue.
Sediments	The proposed monitoring is not relevant relating to the significant ecological outcomes that may ensue.
Sediments – EMF and thermal radiation	The proposed monitoring is not relevant relating to the significant ecological outcomes that may ensue.
Water column – physico-chemical parameters	The proposed monitoring is supported relating to potential impacts on reef and seagrass meadows.
Water column - chlorophyll, nutrient	The proposed monitoring is supported relating to potential impacts on reef and seagrass meadows.

Table 4 provided a summary of additional survey and monitoring requirements that were proposed in the review of impacts of mitigation for critical habitat and PBF.

Table 4: Additional survey and monitoring requirements for critical habitat and PBF.

BMP monitoring measure	Comments and recommendations
Reef	<p>A detailed review of pre-construction survey information must be undertaken to ensure full avoidance of deep-sea coral and sponge communities; and to maximise avoidance of shallow water reef communities. It is possible that such avoidance can be informed by the more detailed review of existing data or through the commissioning of additional baseline surveys. The extent of monitoring should be sufficient to inform the potential for avoidance, i.e. be not only along the cable route where reef areas may extend broadly.</p> <p>Monitoring should be completed post-construction in areas where critical habitat forming reefs are present to confirm if avoidance has been achieved and if any adverse impacts have arisen from smothering.</p> <p>If restoration is proposed, then monitoring will be required over time to review success of</p>

BMP monitoring measure	Comments and recommendations
	<p>approaches. Such monitoring should be set out in a restoration management plan.</p> <p>If offsets are proposed to address residual impacts after all other mitigation has been applied, monitoring will be required in offset areas to provide a baseline and in the long term to measure the success of offset approaches. Such monitoring should be set out in an offset strategy.</p>
<p>Loggerhead turtles</p>	<p>The avoidance of the nesting season should ensure that impacts associated with artificial light do not occur. However, should full seasonal avoidance not be possible, the likely implications of light in the context of other development may be assessed through the undertaking of a baseline light study.</p> <p>Beaches should also be surveyed before works commence to see if nesting has occurred in an area that may be impacted by light arising from the Project. Monitoring should commence around 60 days before the start of works, which relates to incubation times for hatchlings.</p> <p>Monitoring of nesting should continue during the construction period. Beaches should be monitored at night relating to period of possible hatching to translocate misoriented hatchlings to the sea and redirect or transport disoriented adults back to the sea if lighting from the Project may be causing a problem for sea turtles. Monitoring should identify the transient any ‘problem lights’ and address as appropriate with through applying minimisation measures.</p>
<p>Sicilian pond turtle</p>	<p>Surveys should be undertaken to ensure avoidance of any habitat where this species may be located at the landfall site on the Sicilian coast. This information must be available prior to the application of mitigation measures and commencement of construction activities.</p>
<p>Annex 1 and Resolution 4 coastal habitats</p>	<p>Surveys should be undertaken prior to the application of mitigation measures and commencement of construction activities to determine the presence of such habitats in</p>

BMP monitoring measure	Comments and recommendations
	areas that may be affected by construction. If present, such information should be used to prioritise avoidance of impacts wherever possible. If restoration is required, monitoring should be completed to review the success of restoration approaches.

4 References

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