The Tunisia-Italy Electrical Interconnection (ELMED) Project

Biodiversity Action Plan

Report for the European Bank for Reconstruction Development

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Revision 01

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CONTENTS

Tables

Figures

Table of abbreviations

ACA	Additional Conservation Action
BAP	Biodiversity Action Plan
BMEP	Biodiversity Monitoring and Evaluation Program
BMP	Biodiversity Management Plan
BOMP	Biodiversity Offset Management Plan
CEMP	Construction Environmental Management Plans
CHA	Critical Habitat Assessment
EAAA	Ecologically Appropriate Area of Analysis
EBRD	European Bank for Reconstruction Development
EBSA	Ecologically or Biologically Significant Marine Area
EMF	Electromagnetic Field Effects
EMS	Environmental Management System
ESIA	Environmental and Social Impact Assessment
ESPIU	Environmental and Social Project Implementation Unit
GIP	Good International Practice
HDD	Horizontal Directional Drilling
IBA	Important Bird Area
IMMA	Important Marine Mammal Area
ISRA	Important Shark and Ray Area
KPI	Key Performance Indicator
NNL	No Net Loss
PBF	Priority Biodiversity Feature
ROV	Remotely Operated Video
SACs	Special Areas of Conservation
SPR	State-Pressure-Response
STEG	Société Tunisienne de l'Eléctricité et du Gaz

Executive Summary

This Biodiversity Action Plan (BAP) presents the strategy and actions to achieve no net loss and net gain outcomes for Priority Biodiversity Features (PBFs) and critical habitat associated with the Tunisia-Italy electrical interconnection (ELMED) Project. The BAP includes a series of objectives and management measures to mitigate impacts to achieve no net loss/net gains for PBFs and critical habitat to comply with the requirements of EBRD Performance Requirement 6 (PR 6). As a development operating in an area of high biodiversity sensitivity, this Biodiversity Action Plan (BAP) is an EBRD requirement for the ELMED Project. It forms part of a series of assessments and biodiversity-related outputs to identify and manage biodiversity risks and impacts related to the Project.

The Project BAP is presented around a state-pressure-response framework which provides a logical stepwise process to help the Project to understand and address its impacts and contribute to positive outcomes for biodiversity:

State: determines the biodiversity context including PBFs and critical habitat (as per PR 6 definitions) within the wider seascape the Project is operating. These have already been identified through the Project's Critical Habitat Assessment (CHA) and are summarised in Section 4 for context.

Pressures: Identifies key pressures on priority biodiversity from Project activities and wider pressures that are influencing biodiversity in the area where natural and critical habitat has been defined. This includes consideration of the influence the Project has on exacerbating or reducing these through different direct and indirect impacts. Pressures, including the magnitude of different impacts, are presented in Section 5.

This section also identifies key mitigation responses to address Project impacts, and their estimated effectiveness in mitigating impacts through on-site avoidance, minimisation and restoration actions. The assessment determines that based on the current mitigation plan, and what is known about the priority biodiversity features and impacts, the Project is not expected to result in any significant residual impacts. However, these findings will need to be reviewed again based on the outcomes of additional marine surveys and the Contractor's supplementary ecological assessment to confirm the status and impacts to sensitive marine habitats along the cable corridor.

Responses: As the Project is operating in critical habitat, it will need to achieve an overall net gain for biodiversity. Given that no significant residual impacts are expected at this time, the Project can undertake additional conservation actions to deliver gains. Section 6 reviews a number of these potential net gain actions and identifies conservation and restoration of seagrass meadows (*Posidonia oceanica*) as the most promising and cost-effective means to achieve a net gain.

Ongoing monitoring of Project impacts, mitigation and net gain actions is needed to ensure there are no unforeseen impacts and that the conservation actions are delivering

meaningful conservation outcomes on the ground. Monitoring actions are presented in Section 7.

Note that this BAP presents preliminary findings based on information gathered to date. It should be seen as a "living document" which will be updated as further information is derived from additional surveys and assessments. This information may change the significance of impacts and therefore the scale of mitigation required.

1 Introduction

1.1 Context

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'Eléctricité 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, 2023), 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, 2023) 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, a review of the BMP was undertaken, and an addendum was produced to ensure that outcomes of the latest studies were integrated (Bluedot Associates, 2023c).

The CHA determined that the Project is in an important biodiversity hotspot providing a range of priority habitats that support multiple species of conservation note; and that the Project lies in area comprising critical habitat across multiple criteria. In addition to these multiple habitats and species have been defined as PBF. The project also lies within or has some potential connectivity to several legally protected areas and other areas with recognised high biodiversity values.

PR 6 requires that mitigation measures are put in place, in accordance with the mitigation hierarchy. For PBF, there is a requirement to ensure no net loss (NNL)[1] and preferably a net gain[2] of priority biodiversity features and the habitats and ecological functions that support them over the long term to achieve measurable conservation outcomes.

This Biodiversity Action Plan (BAP) has been produced to set out the approach to mitigate residual impacts to achieve no net loss and/or net gains of PBF and critical habitat. As stated, a BMP has already been produced. However, the BAP differs from the BMP in that the latter focuses on on-site mitigation actions related to Project construction and operations, whereas the BAP provides the plan for addressing biodiversity risks and achieving no NNL or net gain outcomes.

1.2 Purpose and Objectives

This BAP has been produced in line with PR 6, which states that:

"BAPs typically include a series of goals, objectives, and management measures and scheduled milestones to mitigate residual impacts to achieve no net loss/net gains of priority biodiversity features or critical habitat. The goal/objectives should be realistic and based on measurable targets. Each objective should outline a series of actions and include completion indicators or monitoring targets, and the responsible party and a timeframe. BAPs should be developed in consultation with relevant stakeholders, including government, external experts, local/international conservation organisations and project-affected communities."

During the review of impacts and mitigation (Bluedot Associates, 2023b) outlined requirements for additional surveys to collect further baseline information to support the understanding of impacts and to inform the development of mitigation approaches; this information must be available prior to the application of mitigation measures and commencement of construction. This will be reported in the Contractor's supplementary ecological assessment. Once this information is available the approach to deliver NNL and net gains will need to be re-assessed; and a net gain strategy will be produced to guide implementation of actions to achieve these outcomes in consultation with relevant stakeholders, including government, external experts, local/international conservation

[1] PR 6 defines no net loss as the point at which project-related biodiversity losses are balanced by gains resulting from measures taken to avoid and minimise these impacts, to undertake on-site restoration and finally to offset significant residual impacts, if any, on an appropriate geographic scale.

[2] PR 6 states that net gains are additional conservation outcomes that can be achieved for the biodiversity values for which the critical habitat was designated. Net gains may be achieved through the development of a biodiversity offset and/or, in instances where the client could meet the requirements of paragraph 14 of this Performance Requirement without a biodiversity offset, the client should achieve net gains through the implementation of programs that could be implemented in situ (on-the-ground) to enhance habitat, and protect and conserve biodiversity.

organisations and project-affected communities. As such, specific actions and objectives around offsets still need to be defined.

1.3 Relationship with other documents

As previously stated, the BAP has not been created in isolation. To understand and be able to manage its biodiversity risks and deliver positive outcomes for biodiversity, the Project is undertaking a range of assessments and planning exercises. Key Project documents that provide this information are presented in Table 1. Figure 1 presents the relationship and interaction between these documents.

Table 1: Key project documents relating to biodiversity

Project document	Relevance to biodiversity assessment and management
Already undertaken by the Project	
Environmental and Social Impact Assessment (IDEA Consult, 2023a)	Assessing the scale and magnitude of impacts to biodiversity. Undertakes assessment of alternatives. Identifies potential mitigation actions to avoid, minimise and reduce impacts to acceptable levels.
BMP (IDEA Consult, 2023b)	Details on-site mitigation actions and control measures, as well as monitoring actions, roles and responsibilities.
Critical Habitat Assessment (Bluedot Associates, 2023a)	Identifies PBFs and critical habitat for focus of assessment and mitigation.
Review impacts and mitigation (Bluedot Associates, 2023b)	Provides a review and update of the potential for impacts on critical habitat and PBF. This review acts as addendum to the ESIA.
BMP Addendum (Bluedot Associates, 2023c)	Ensures that mitigation and monitoring requirements are consistent with the needs to address impacts on coastal and marine critical habitat and PBF following completion of the CHA.
Review of Remotely Operated Video (ROV) data (Bluedot Associates, 2024)	Reviews all seabed imagery collected in 2021 to determine the habitats present in the potential footprint of the cable. Provides recommendations for additional survey effort based on the review and potential for impacts on critical habitat.
Biodiversity Action Plan (this document)	Provides the overall strategy for how the Project will manage biodiversity risk and achieve NNL/net gain outcomes, including the application of additional conservation actions (ACAs).

Project document	Relevance to biodiversity assessment and management
Proposed to be undertaken	
Net gain strategy	Confirms scale of residual impacts (losses) and identifies approaches to deliver necessary gains to achieve net gain goals through ACAs.
Supplementary ecological assessment	Once commissioned the Contractor will undertake further surveys as set out in this BAP and produce a supplementary ecological assessment.
Biodiversity Management and Worksite Restoration Plan	Based on the supplementary ecological assessment and information contained in the BMP addendum and BAP surveys, this plan will be created by the Contractor to include all contractor-implemented mitigation and monitoring measures.
Updated BMP	Following completion of or in parallel with the development of the supplementary ecological assessment and Biodiversity Management and Worksite Restoration Plan an updated BMP will be required. This will consolidate all mitigation using the latest information. It will also include the biodiversity monitoring and evaluation program to demonstrate impacts are mitigated as intended, and conservation actions are delivering net gains. This includes all measures contained in this BAP and the proposed net gain strategy. It will also identify needs for adaptive management where there are unintended impacts or mitigation is ineffective.

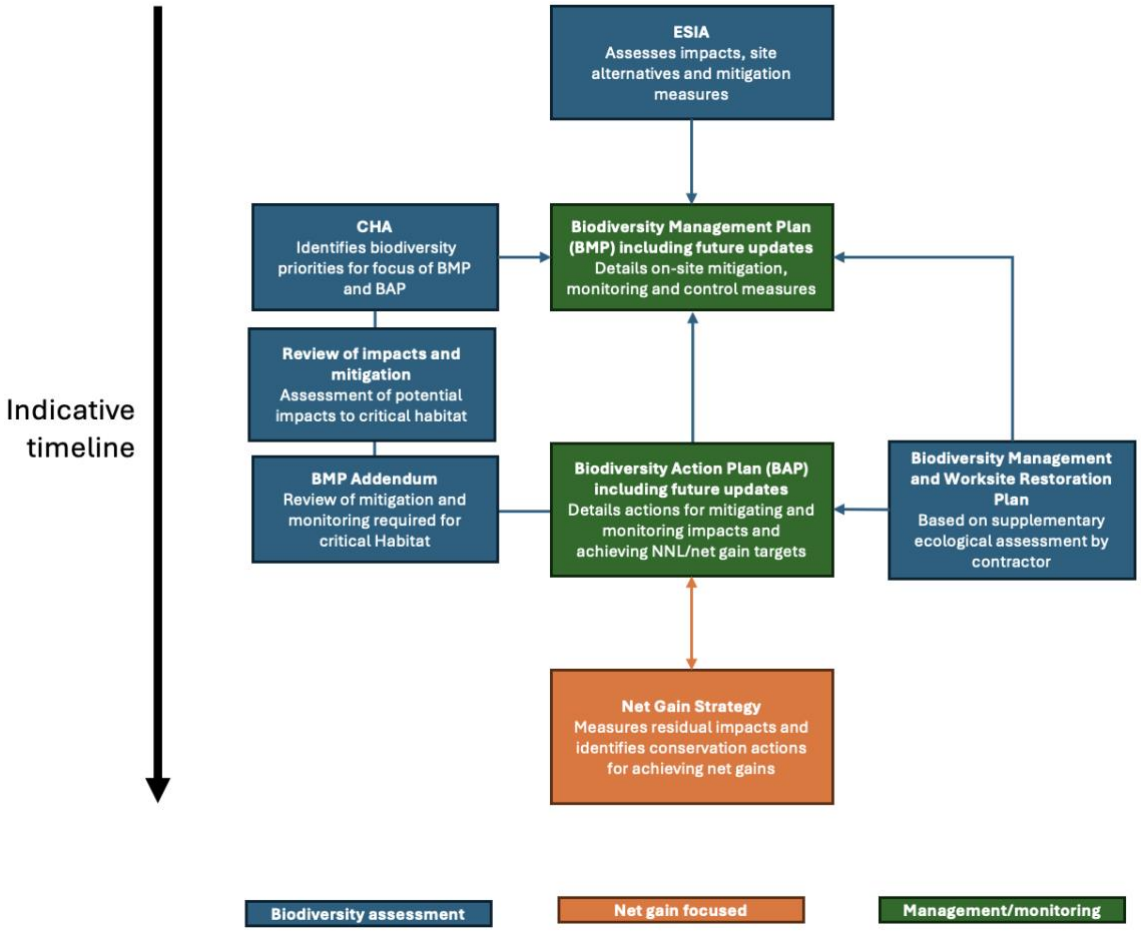

Figure 1: Relationships between biodiversity-related outputs

1.4 Project Description

A description of the coastal and marine components of the Project is given in the ESIA Report (IDEA Consult, 2023a). From the landfall areas, the cable will be connected to terrestrial infrastructure. However, assessment of such terrestrial infrastructure lies outside of the scope for the review and update being undertaken. The main components that are subject to review in this document are summarised below:

- Power and telecommunication cables will be laid under the sea between the two landing positions. These cables will be in the same footprint, i.e., in the same trench.
- The submarine power cable will extend approximately 200 km across the territorial waters of Tunisia and Italy. The depth of the cable in Italian waters will range to 160 m; and will be 800 m in Tunisian waters. The electrical cable is proposed to have a diameter of 100-140 mm, whilst the telecommunications cable will have a diameter of 25-37 mm.
- A subtidal electrode anode or cathode configuration is also proposed in the nearshore areas. Depending upon, the configuration, the electrode will be

connected to the seabed by anchors. In Tunisian waters, the electrode will be located approximately 9 km from the coast; in Italian waters it will be located approximately 4.5 km from the coastline. In addition to the construction of the electrode configuration, deterrents may be placed on the seabed to add protection from trawling. These comprise large concrete structures that are placed on the seabed.

- The undersea electrode will be connected to land by two undersea cables. These cables are expected to have a diameter of 70-100 mm.
- Submarine cables will be laid by a dedicated cable-laying vessel. Prior to laying the cable the route will be cleared using a grapnel. Cable laying activities are proposed to be undertaken over 24 hours over the time required for installation.
- Submarine cable burial is proposed to protect the cable. The cable will be buried by jetting or trenching. In nearshore areas, jetting may be supported by divers. Natural backfilling of disturbed areas will occur. For jetting, the burial depth will be 1-2 m with trench width if 0.3-0.4 m. For trenching, the burial depth will be up to 2 m, the trench width will be 0.2-0.5 m. The footprint of the equipment under both approaches will be 3-4 m. In hard substrate areas, cable emplacement will be achieved by cutting.
- The project description in the ESIA states that where burial is not feasible due to seabed conditions, the cable will be laid on the seabed and covered by rock dumping. However, no details are provided to confirm that such works will be required. It is assumed that this burial will occur along the whole length of the cable, but this should be confirmed by the Project.
- The project description in the ESIA states that various techniques may be adopted when crossing other undersea utilities. This may include materials to separate and cover the cable, including shells in plastic material, concrete mattresses, sacks filled with sand and aggregate etc. However, no details are provided on the presence of such features that require crossing. It is assumed that this will not be required, but this should be confirmed by the Project.
- In the nearshore area, horizontal directional drilling (HDD) will be undertaken to transit the cable from sea to land. No excavations for the cable connection will therefore be undertaken on the coast. Three drillings will be required for the electrode cable, power cable and telecommunications cable. The ESIA states that the maximum length for such drilling is proposed is 600-800 m. However, this is to be assessed by the Contractor; and the distance for drilling should seek to avoid impacts on nearshore sensitive marine habitats as far as is technically feasible. The depth of the exit hole in the sea is not confirmed and will require assessment by the contractor. Drilling will be from the land towards sea. The drilling will require a working area on land, which will cover approximately 1200 m^2. This will be located on the coastal inland of the coastal dune areas.
- At the landfall site the cable will be connected underground using joint boxes. Separate joint boxes, with different dimensions, will house power, electrode and

telecommunications cable. These will be located on the coastal inland of the coastal dune areas.

- The construction period for all the above elements is expected to be around 2.5 months.

During operation cable maintenance may be required, which may require some activities that are like those undertaken during construction.

1.5 Scope

1.5.1 Geographic scope

Although impacts will occur predominantly along the cable corridor, identification of threats and means to address these need to be considered within a wider interconnected seascape. The Project CHA identified a single Ecologically Appropriate Area of Analysis (EAAA) which covers the whole Sicilian Channel area. This includes two coastal EAAAs along Tunisia and Sicily which both lie within the overall marine EAAA (Figure 2). These areas provide a commonly shared mosaic of habitat features that have shared associations with species as described above. The aim is to ensure that measures to deliver NNL or net gain is focused within the EAAAs as relevant to PBF or critical habitat.

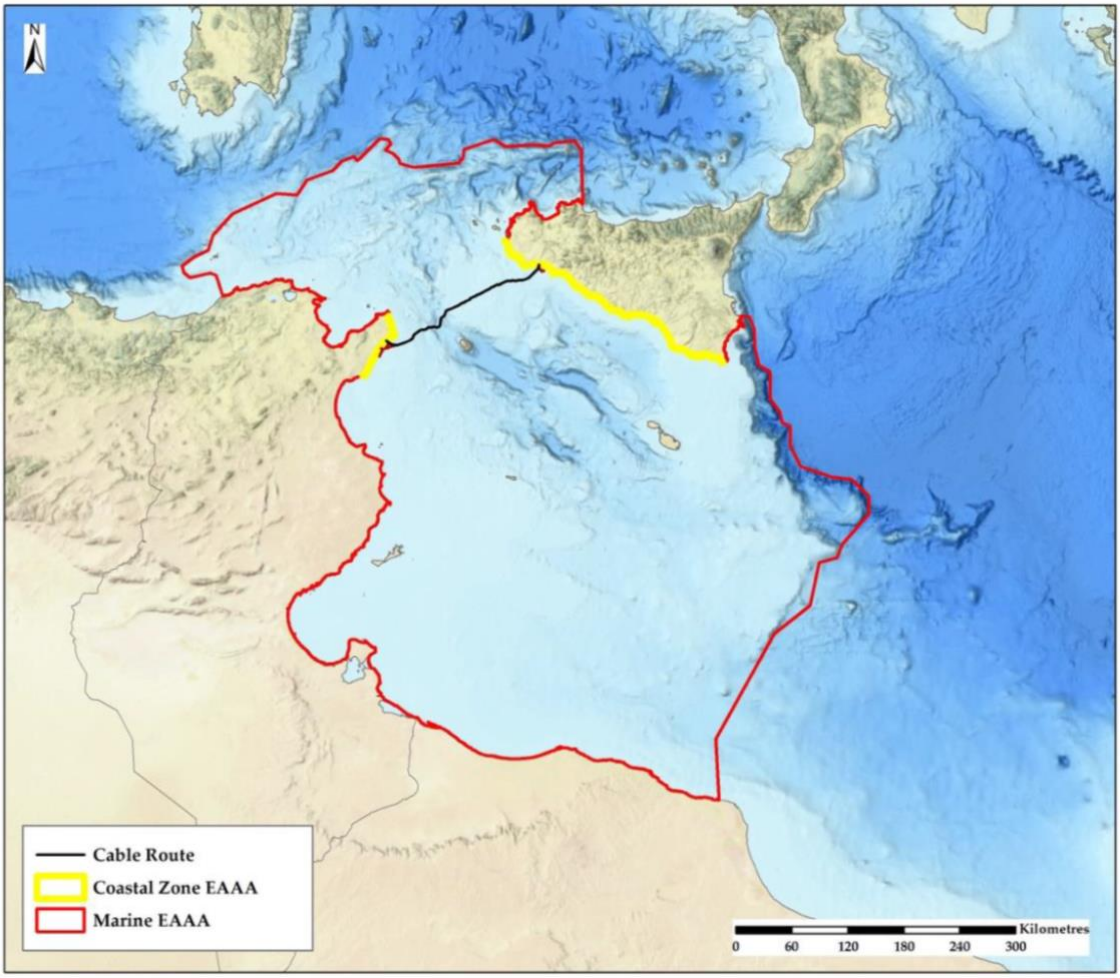

Figure 2: Geographic scope of this BAP

1.5.2 Biodiversity scope

Section 5 of the CHA summarises the presence of PBF and critical habitat; and these features are the focus of this BAP. Note that only a small subset of these is likely to be impacted by the Project. Offsets only apply to those features where impacts cannot be sufficiently mitigated though on-site mitigation.

1.5.3 Temporal scope

Mitigation will need to be addressed for at least as long as there are Project impacts. This is typically for the duration of the Project but can be shorter if on-site restoration and net gain targets are met earlier. The temporal scope will be confirmed following completion of additional studies but is aligned with the Project duration for now.

1.6 Framing the delivery of NNL and net gains

The Project is applying a biodiversity risk management framework based on a state-pressure-response (SPR) approach. This approach has been widely adopted in mitigation

and management planning and provides a logical stepwise process to help the Project to understand and address its impacts and contribute to positive outcomes for biodiversity (Cousins and Pittman, 2023). The framework focuses around three consecutive components widely used in similar risk-based approaches (see Figure 3).

The S-P-R approach is being applied as shown in Table 2.

Table 2: Framing approach for NNL and net gains

Components	Description	Project approach
State	Determine the biodiversity context and priority features within the wider, interconnected seascape within which the Project is operating	The Project has undertaken a CHA to define the study area for assessment. The CHA has defined priority biodiversity features in line with the requirements of PR 6. The conclusion of the assessment is to define the presence of PBF and critical habitat in the study area.
Pressures	Identify key pressures on priority biodiversity features and the influence of the Project on exacerbating or reducing these pressures.	Project impacts on PBF and critical habitat have been assessed applying biodiversity pressure indicators that determine the magnitude of impact on ecosystem integrity. At this time, mitigation has been defined to address Project impacts applying the mitigation hierarchy. In addition, to inform the development of offsets and ACAs, a review of seascape pressures has been undertaken to frame the understanding of how response actions may support the delivery of NNL and net gains.
Response	Identify appropriate and effective actions to address the pressures and threats, and to achieve sustainable and positive biodiversity outcomes	Net gain approaches (including ACAs) have been defined to address pressures resulting from Project activities and seascape pressures to ensure NNL and net gains are achieved.

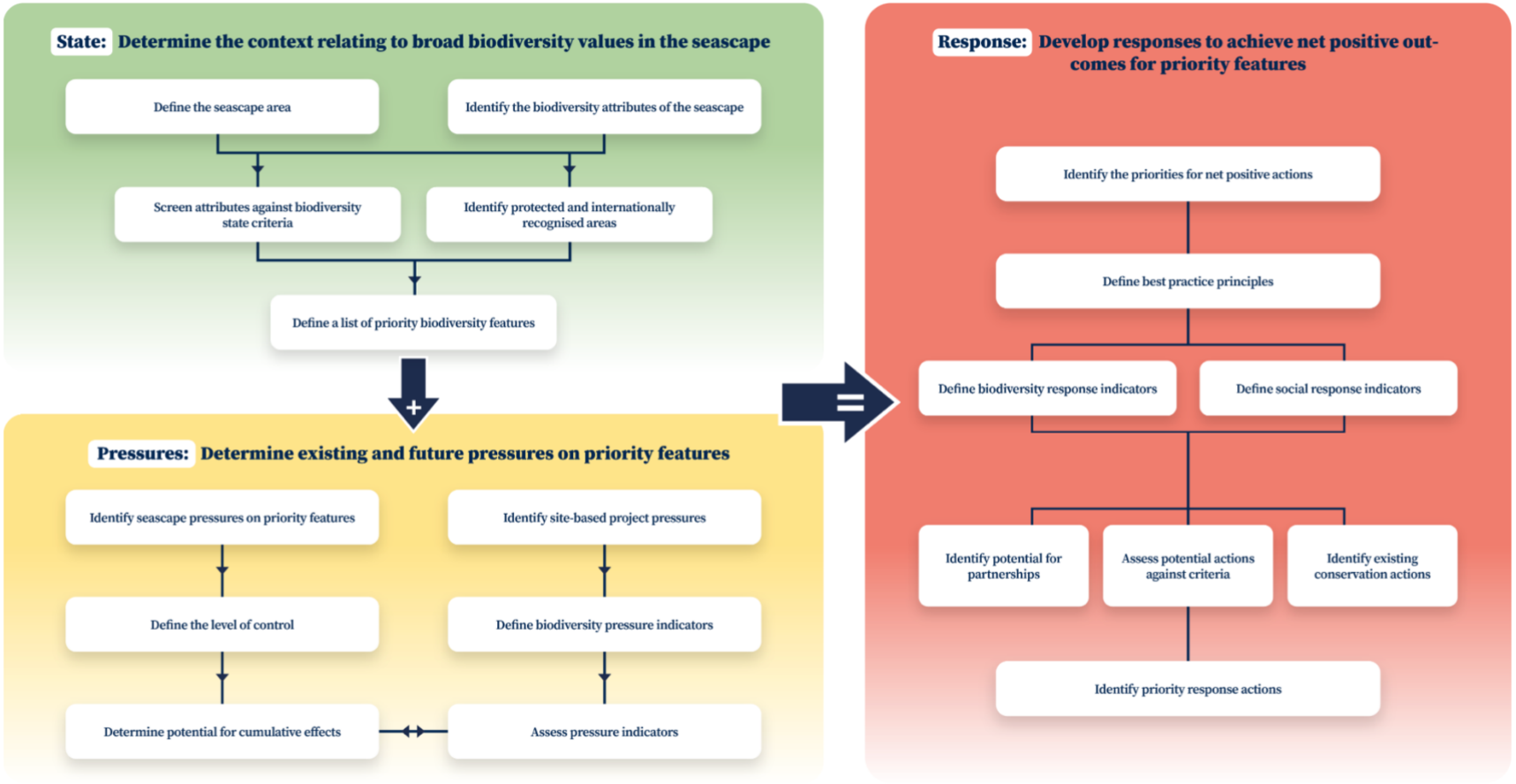

Figure 3: A general outline for applying a State-Pressure-Response approach to achieve NNL and net gains. (Source: Cousins and Pittman, 2023)

2 Compliance framework for BAP commitments

2.1 Compliance with PR 6

To manage its biodiversity risks and achieve positive outcomes for biodiversity, the Project is committed to complying with PR6 (EBRD, 2019). PR 6 has a general requirement that where the assessment for a project has identified potential project related impacts to biodiversity, risks should be managed in accordance with the mitigation hierarchy and good international practice (GIP). As appropriate, the precautionary approach should be adopted, and adaptive management applied for the implementation of mitigation and management measures. The Project is committed to comply with the requirements for critical habitat, PBF, and legally protected and internationally recognised areas of importance. Such requirements are set out below.

2.1.1 PBF

PR 6 states that where the assessment has identified that a project could have significant, adverse and irreversible impacts to PBF, the client shall not implement any project related activities unless:

- the client can demonstrate that there are no technically and economically feasible alternatives.
- stakeholders are consulted in accordance with Performance Requirement 10 (PR 10).
- the project is permitted under applicable environmental laws, recognising the PBF.
- appropriate mitigation measures are put in place, in accordance with the mitigation hierarchy, to ensure no net loss and preferably a net gain of priority biodiversity features and the habitats and ecological functions that support them over the long term to achieve measurable conservation outcomes.

2.1.2 Critical habitat

PR states that in areas of critical habitat, the client will not implement any project activities unless the following conditions are met:

- no other viable alternatives within the region exist for development of the project in habitats of lesser biodiversity value.
- stakeholders are consulted in accordance with PR 10.
- the project is permitted under applicable environmental laws, recognising the priority biodiversity features.

- the project does not lead to measurable adverse impacts[3] on those biodiversity features for which the critical habitat was designated as outlined in paragraph 14 of PR 6.
- the project is designed to deliver net gains for critical habitat impacted by the project.
- the project is not anticipated to lead to a net reduction in the population of any endangered or critically endangered species, over a reasonable time period.
- a robust and appropriately designed, long-term biodiversity monitoring and evaluation program aimed at assessing the status of critical habitat is integrated into the client's adaptive management program.

PR 6 further states that where a client can meet these requirements, the project's mitigation strategy will be described in a biodiversity management plan (BMP) or BAP, wherever appropriate.

2.1.3 Legally protected and internationally recognised areas of biodiversity value

PR 6 requires that where the project occurs within or has the potential to adversely affect an area that is legally protected and/or is internationally recognised (as per the definitions presented in Section 3.1.4), or proposed for such status by national governments, the client shall ensure it does not compromise the integrity, conservation objectives and/or biodiversity importance of such an area. If a project identifies the potential to adversely impact the conservation objectives and integrity of the site, priority biodiversity features and/ or critical habitat within the legally protected areas or internationally recognised areas of biodiversity value, the client will seek to avoid such impacts in line with the application of the mitigation hierarchy. In addition, the client will be required to:

- demonstrate that any proposed development is legally permitted, which may have entailed that a specific assessment of the project related impacts on the protected area has been carried out as required under national law.
- act in a manner consistent with any government recognised management plans for such areas.
- consult protected area managers, relevant authorities, local communities and other stakeholders on the proposed project in accordance with PR 10.
- implement additional programmes, as appropriate, to promote and enhance the conservation objectives of the protected area.

[3] Measurable adverse impacts mean the project's direct and indirect impacts will jeopardise the persistence within the study area of any biodiversity value that triggers a critical habitat designation.

2.2 Legislative and planning context

The national legislation, international conventions and local plans that provide a context to the Project are discussed in detail in the ESIA Report and BMP (IDEA Consult, 2023a, b). The legal and planning context of relevance to this BAP are set out below relating to jurisdictions in which the Project is located.

2.2.1 Tunisia

Tunisian Law n° 2005-13 of 16 January 2005, the Forest Code, constitutes the national legal framework for the conservation of the natural environment (forest, reserves, parks, wildlife, wetlands, pasture areas, etc.). An authorization is required for any project/activity to be developed in the areas covered by this code.

In terms of international conventions and treaties, the following are relevant to biodiversity protection and ratified by the Tunisian government:

- Convention on Biological Diversity, 1991 (ratified by Law n° 93-45 of 3 May 1993)
- Convention on the conservation of migratory species of wild animals, adopted in Bonn on 23 Jun 1979 (ratified by Law n° 86-63 of 16 July 1986)
- Convention on International Trade in Endangered Species of Wild Fauna and Flora 1975 (ratified by Law n° 74-11 of 11 May 1974-CITES)
- Convention on wetlands of international importance especially as waterflow habitat, adopted at Ramsar Convention on Wetlands 1971 (adherence by Law n° 80-9 of 3 March 1980)

In November 2017 as part of the requirements under the Convention on Biological Diversity, a national strategy and action plan for biodiversity was published for the period 2018-2030. The national plan for biodiversity sets out priority actions to be delivered nationally.

2.2.2 Italy

Constitutional Law of 11 February 2022, No. 1 amended the Italian Constitution by giving full constitutional dignity to environmental protection. The amendment inserts in Article 9 a third paragraph that provides that the Republic shall protect: "the environment, biodiversity and ecosystems, including in the interest of future generations. The law of the State shall regulate the ways and forms of protection of animals."

In terms of international conventions and treaties, the following are relevant to biodiversity protection in Italy:

- UNESCO Convention concerning the Protection of World Cultural and Natural Heritage 2003 (Law 29/09/2007, n. 167).
- Bern Convention 1976: Conservation of European Wildlife and Natural Habitats (Law 5/08/1981, n. 503).
- Convention on Biodiversity Diversity 1991 (Law 14/02/1994, n. 124).

- Ramsar Convention on Wetlands 1971(Presidential Decree 11/02/1987, n. 184).
- Convention on International Trade in Endangered Species of Wild Fauna and Flora 1975 (Law 25/01/1979, n. 30).
- Habitats Directive 92/43/EC.
- Birds Directive 2009/147/EC.

The Italian national biodiversity strategy was published in 2022 and covers the period up to 2030. This national plan has been developed in coherence with European Biodiversity Strategy for 2030 and the Kunming-Montreal Global Biodiversity Framework adopted under the CBD in 2022.

3 Principles guiding the BAP

3.1 Application of the mitigation hierarchy

EBRD expects all projects to which PR 6 applies to mitigate biodiversity and ecosystem service impacts following the mitigation hierarchy. The mitigation plan should follow a hierarchy of actions:

- **Avoidance**: actions taken to fully prevent impacts, such as relocating a project or changing its spatial layout to prevent impacts in specific locations.
- **Minimisation**: actions taken to reduce the duration, intensity and/or extent of impacts that cannot be completely avoided.
- **Restoration**: actions taken to assist in the recovery of a feature that has been degraded, damaged, or destroyed.
- **Offset**: measurable conservation outcomes resulting from actions designed to compensate for significant residual adverse biodiversity impacts arising from project development and persisting after appropriate avoidance, minimisation, and restoration measures have been taken.

It should be stressed that biodiversity offsets should only be considered as a last resort.

3.2 Assessing residual impacts

EBRD requires its clients to take a precautionary approach to biodiversity conservation. Where there is evidence that an action may have an adverse impact on biodiversity, but there is uncertainty as to its likelihood or consequence, it should be assumed that there will be a significant adverse impact and require appropriate mitigation. The precautionary approach is highly relevant to managing risks and impacts to biodiversity as nature is inherently complex and science continues to have important gaps (see EBRD PR6 Guidance Note page 5) (EBRD, 2022).

The rigor of the analysis of residual impacts will be commensurate to the risk, ranging from qualitative expert opinion in low-risk scenarios to in-depth quantitative analysis, performed by specialists, for scenarios where risks and/or impacts are higher (EBRD, 2022).

3.3 Offsets and Additional Conservation Actions

In some instances, offsets may need to be designed and implemented to achieve measurable conservation outcomes that can reasonably be expected to result in NNL and preferably a net gain of biodiversity.

Figure 4 shows how the mitigation hierarchy may be applied to achieve NNL or net gain relating to a project's impacts; and how 'additional conservation actions' (ACAs) can be applied outside of mitigation delivery to achieve net gains.

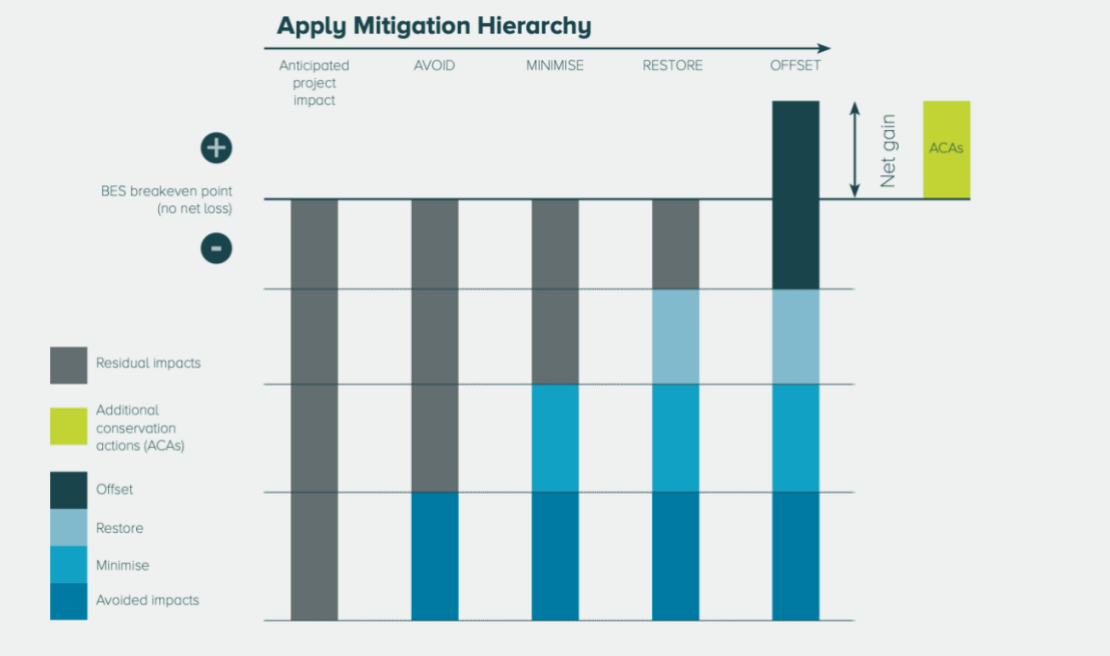

Figure 4: Schematic of the application of how the mitigation hierarchy may be applied to achieve NNL or net gain (Source: FFI, 2017)

EBRD (2022) identifies core principles of biodiversity offsets. These are:

- To deliver conservation gains beyond those that would have occurred in the absence of the offset (often referred to as "additionality").
- To conserve biodiversity features that are the same as, or in some cases of higher conservation priority than those impacted by the planned development ("like for like" or better).
- To generate conservation benefits that endure as long as the residual impact of the Project.

Furthermore, offset approaches should be guided by good practice principles. Key principles for offsets have been expressed in various ways (IUCN, 2014; BBOP 2012b; World Bank Group, 2016). BBOP (2012b) provides 10 good practice principles that are often applied for biodiversity offsets, and these can be used by the Project as a primary guide.

Biodiversity offsets can take the form of conservation projects that restore and protect areas degraded by impacts unrelated to the planned development or that avert the loss of biodiversity from impacts unrelated to the planned development.

In addition to mitigation, ACAs are positive interventions for impacts that may be hard to quantify (CSBI, 2015) or where no significant residual impacts remain. ACAs may or may not target features that have been significantly impacted by a project, but unlike offsets they are not designed to provide measurable gains that can be set against those impacts (CSBI, 2015). However, in the context of PR 6, ACAs must demonstrate that gains can be

achieved on-the-ground. Unlike offsets, it is sufficient to provide qualitative evidence and expert opinion to validate a net gain related to ACAs.

3.4 Restoration

Where ecological restoration is undertaken, either through on-site actions or as part of biodiversity offsets, the Project will apply the Society of Ecological Restoration's (SER) International Principles and Standards for the Practice of Ecological Restoration (Gann et al., 2019). These are comprised of eight principles that recognise, *inter alia*, the importance of engaging with local stakeholders, clear and measurable restoration targets and indicators and the importance of understanding restoration potential and limitations within wider ecological processes and spatial scales.

3.5 People-positive approaches

Any activities undertaken should do so through actions that are positive for people as well as biodiversity. This means that the social, economic, and cultural context of the region should be understood to drive effective marine conservation initiatives. Not only should the project prioritise actions which support equitable approaches but should also support those that drive positive contributions to local communities. Where applicable, the vital knowledge held by Indigenous People and Local Communities will be recognised and used respectfully to provide the most effective outcomes.

4 State

The CHA included consideration of habitat extent and the components of ecosystem integrity (composition, structure and function) to define an appropriate study area and EAAAs for PBF and critical habitat determination. This assessment identified biodiversity state in relation to key criteria as defined by PR 6 (EBRD, 2019, 2022); and identified the presence of PBF and critical habitat. The CHA confirmed that the Project lies within an area of high biodiversity importance within the Mediterranean Sea and the Project must clearly demonstrate that the requirements of PR 6 have been met.

4.1 Priority ecosystems

4.1.1 Critical habitat

Three habitat types triggered critical habitat criteria - *Posidonia* meadows, coastal lagoons and biogenic reefs. Site-specific survey information has been reviewed where available to confirm presence of these features (Bluedot Associates, 2024). In addition, the EAAA is deemed to comprise critical habitat as it is of high priority for conservation by national systematic conservation planning relating to a network of marine Natura 2000 sites subject to conservation planning and management. Additionally, EBSAs, ISRAs and IMMAs are defined in the EAAA (Figure 5). Table 3 summarises the critical habitat that was defined in the CHA.

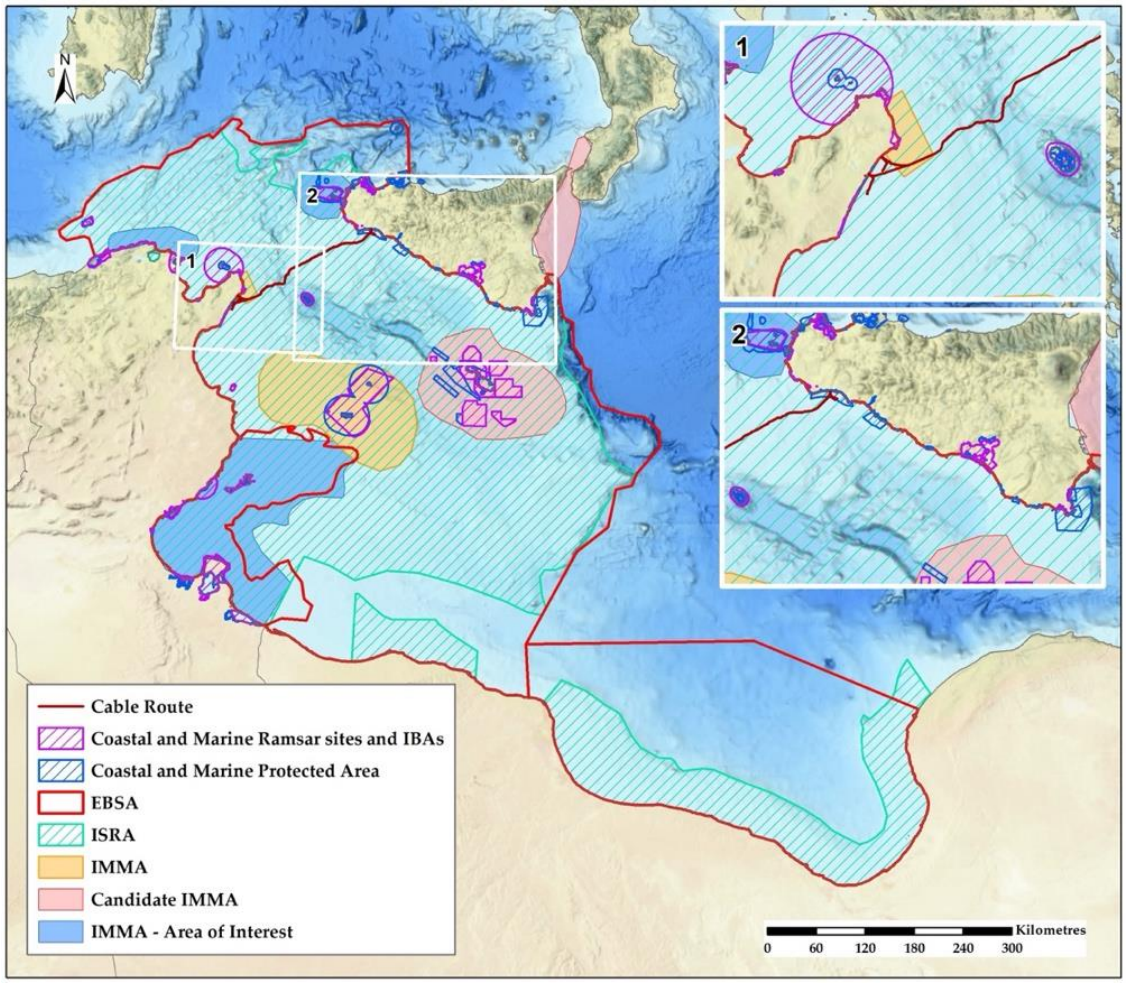

Figure 5: Mapping of legally protected and internationally recognised areas

Table 3: Coastal and marine critical habitat

Criteria	Qualifying coastal habitat	Qualifying marine habitat
(a) EAAA is habitat type listed in Annex 1 of EU Habitats Directive marked as "priority habitat type"	Coastal lagoons.	*Posidonia* beds.
(b) EAAA ≥5% of global extent of an ecosystem type with IUCN status of CR or EN	Not assessed by IUCN.	Not assessed by IUCN.
(c) EAAA is ecosystem determined to be of high priority for conservation	Coastal lagoons. The whole coastal EAAAs, including a network of coastal Natura 2000 sites or	*Posidonia* beds. Reefs and their associated structures, including deep-sea coral and sponge

Criteria	Qualifying coastal habitat	Qualifying marine habitat
by national systematic conservation planning	Ramsar sites subject to conservation planning and management. Additionally, IBAs are present.	communities and nearshore biogenic reefs (*Cladocora caespitosa* and coralline algae formations). The whole EAAA comprising a network of marine Natura 2000 sites subject to conservation planning and management. Additionally, EBSAs, ISRAs and IMMAs are defined. There is expected to be with broad critical habitat species interconnectivity within and across all these areas.

4.1.2 PBF

In addition, to define the presence of PBF, broad-scale seabed mapping was reviewed to identify those with potential overlap with habitats listed in Annex I Habitats Directive and Resolution 4 of the Bern Convention (Figure 6). The potential for overlap does not necessarily mean that PBF or CH habitats are present, however without fine-scale mapping the exact locations of where these habitats occur is uncertain. Table 4 summarises the priority ecosystem qualifying as PBF.

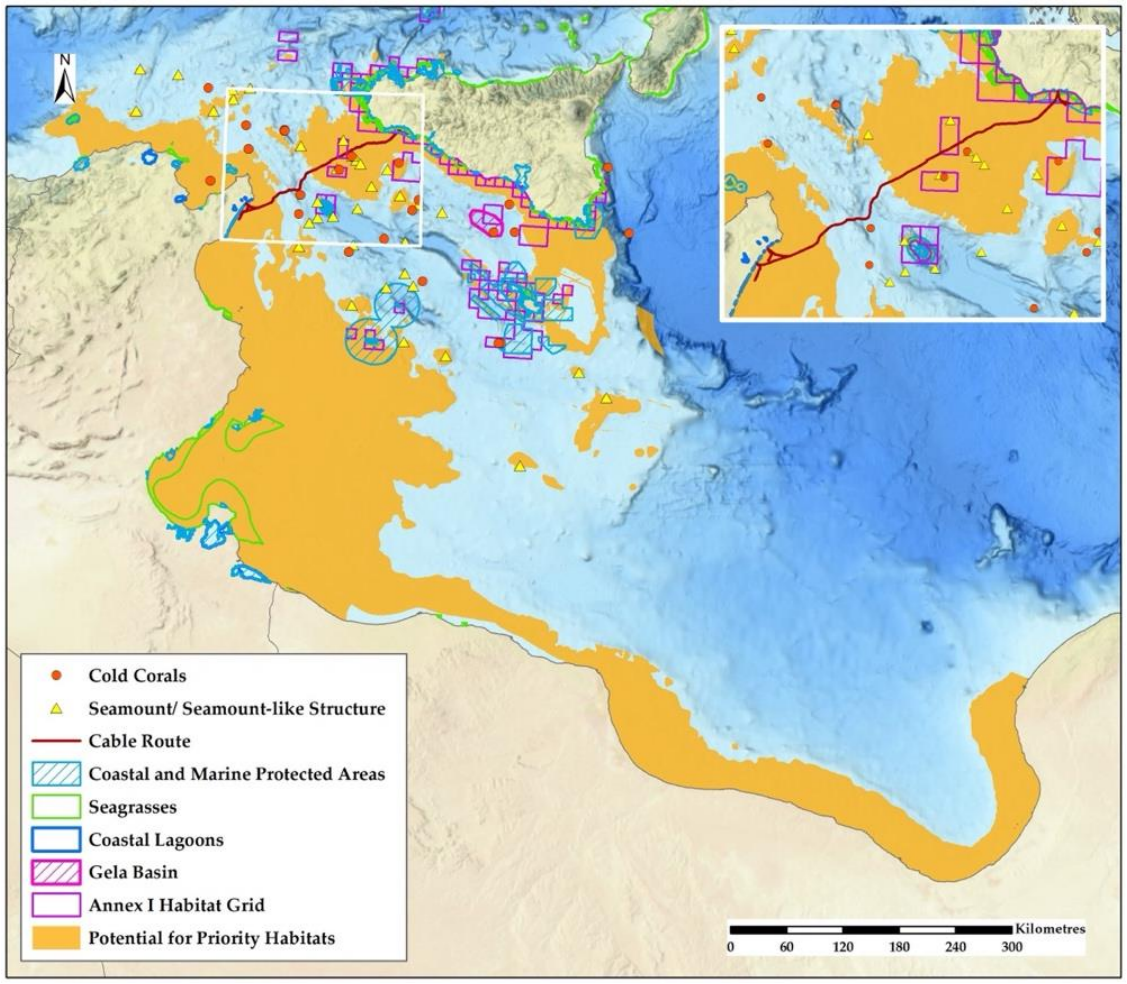

Figure 6: Mapping of marine habitats that could include priority habitats within the EAAA

Table 4: Habitat type listed in Annex 1 of EU Habitats Directive or Resolution 4 of Bern Convention and thus qualifying as PBF

Qualifying coastal habitat	Qualifying marine habitat
Coastal EAAAs broadly enclose Annex 1 and Resolution 4 habitats. On the Sicilian coast, this includes all habitats listed in Appendix B that are not classified as critical habitat. For the Tunisian EAAA further site-specific survey information is needed, but broad mapping suggest that the site may include qualifying dune habitats that may qualify as PBF and estuaries that do qualify as PBF.	Annex 1 and Resolution 4 habitats are found broadly across the marine EAAA. The specific qualifying features that apply under this Criterion include: - Widespread sandbanks which are slightly covered by sea water all the time. - Widespread sublittoral sediment. - Patches of submerged or partially submerged sea caves.

4.2 Priority species and their habitats

4.2.1 Critical habitat

Taking a precautionary approach, 34 species have been identified that may support the classification of critical habitat across multiple criteria. In some instances, a high-level certainty for species forming critical habitat can be confirmed. However, in many instances there is some uncertainty, but conclusions have been drawn on the likelihood of triggering critical habitat based on ranges, habitat associations and support for important functions. The coastal and marine critical habitat species are presented in Table 5.

Table 5: Coastal and marine critical habitat species

Criteria	**Qualifying coastal and marine species**
Threatened species	
(a) EAAA for species and their habitats listed in Annex IV of the Habitats Directive (See EU restrictions)	The marine EAAA encloses multiple species that qualify under this criterion. Qualifying species where the marine EAAA is of known conservation importance include: - Fan mussel - Loggerhead turtle - Common bottlenose dolphin - Common dolphin - Fin whale Other species where the marine EAAA is unlikely to support significant populations or be of high importance in comparison to other areas: - Green turtle - Mediterranean slipper lobster - Mediterranean monk seal - Leatherback turtle - Sperm whale - Risso's dolphin - Cuvier's beaked whale Other qualifying species that are listed in literature as being within the marine EAAA, but are likely to be regionally extinct* or would be, at best, infrequent visitors in the marine EAAA, include: - European sturgeon* - Hawksbill turtle - Kemp ridley turtle

Criteria	Qualifying coastal and marine species
	- Long-finned pilot whale
(b) EAAA supports ≥0.5% of the global population AND ≥5 reproductive units of a CR or EN species	The EAAAs encloses multiple species that qualify under this criterion. Qualifying species globally on the IUCN Red List characterised with relatively high levels of certainty based on functions and distribution, include: - Maltese skate - Tortonese's goby - Fan mussel Likely qualifying species based on extent of occurrence and presence of important functions, include: - Fin whale – for the Mediterranean subpopulation Potential qualifying species with uncertainty related to populations and/ or ranges, include: - North African shad - Sawback angelshark - Smoothback angelshark - Blackchin guitarfish - Rough skate - Angelshark
(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)	The marine EAAA encloses multiple species that qualify under this criterion. Qualifying species with high certainty, include: - Yelkouan Shearwater - *Haliotis stomatiaeformis* Possible qualifying species based on extent of occurrence and/ or functions, include: - Blackspotted smoothhound
(d) EAAA for important concentrations of a nationally or regionally listed EN or CR species	The EAAAs enclose multiple species that qualify under this criterion. Likely qualifying species related to their population, functions and are listed as key features within areas with recognised high biodiversity values, include: - Loggerhead turtle – for Mediterranean Sea subpopulation and in-water habitat

Criteria	Qualifying coastal and marine species
	- Bluefin tuna - Common dolphin - for the Mediterranean subpopulation only - Fin whale - for the Mediterranean subpopulation only - Sawback angelshark - Smoothback angelshark - Common guitarfish - Blackchin guitarfish - Blackspotted smoothhound - Marbled Teal - Common smoothhound - Shortfin mako - Sandbar shark - White shark - Sicilian pond turtle
Restricted range species	
(a) EAAA regularly holds ≥ 10% of global population AND ≥10 reproductive units of the species	Sufficient information is not available to confirm that this Criterion is met. However, based on the distribution of species and definition of important areas, possible qualifying species in the marine EAAA, include: - *Haliotis stomatiaeformis* - Maltese skate - Tortonese's goby
Migratory and congregatory species	
(a) EAAA sustains, on a cyclical or otherwise regular basis, ≥1 percent of the global population at any point of the species' lifecycle	The EAAAs enclose multiple species that qualify under this criterion. Qualifying species with high certainty, include: - Loggerhead turtle – relating to Mediterranean Sea subpopulation in-water habitat - Yelkouan Shearwater - Scopoli's Shearwater - Mediterranean Storm-petrel - Marbled Teal Likely qualifying species based on functions , include: - Fin whale – for the Mediterranean subpopulation - Bluefin tuna

Criteria	Qualifying coastal and marine species
	- Swordfish Possible qualifying species with high levels of uncertainty: - Mediterranean shortbill spearfish - White shark
(b) EAAA predictably supports ≥10 percent of global population during periods of environmental stress	Species that may predictably qualify relating to expected large current populations in the area, provision of vital attributes and/ or very limited spatial ranges. The following species would predictably qualify: - Loggerhead turtle - relating to Mediterranean Sea subpopulation in-water habitat - Scopoli's Shearwater - Yelkouan Shearwater - Mediterranean Storm-petrel - *Haliotis stomatiaeformis* - Maltese skate - Tortonese's goby

4.2.2 PBF

54 species have been identified as PBF. Table 6 presents species identified as being PBF based on their range being confirmed in the EAAA, but in numbers that do not meet critical habitat criteria. These features may qualify for one or more criteria.

Table 6: Qualifying PBF in the coastal and marine EAAAs

Higher taxon	Species common name	Species scientific name
Mollusc	Green ormer	*Haliotis tuberculata*
Cartilaginous fish	Tope	*Galeorhinus galeus*
Cartilaginous fish	Common eagle ray	*Myliobatis aquila*
Cartilaginous fish	Basking shark	*Cetorhinus maximus*
Cartilaginous fish	Little gulper shark	*Centrophorus uyato*
Cartilaginous fish	Bramble shark	*Echinorhinus brucus*
Cartilaginous fish	White skate	*Rostroraja alba*
Cartilaginous fish	Angular roughshark	*Oxynotus centrina*
Cartilaginous fish	Spiny butterfly ray	*Gymnura altavela*
Cartilaginous fish	Sandy skate	*Leucoraja circularis*
Cartilaginous fish	Spinetail devil ray	*Mobula mobular*

Higher taxon	Species common name	Species scientific name
Cartilaginous fish	Blacktip shark	*Carcharhinus limbatus*
Cartilaginous fish	Common thresher	*Alopias vulpinus*
Cartilaginous fish	Spinner shark	*Carcharhinus brevipinna*
Cartilaginous fish	Copper shark	*Carcharhinus brachyurus*
Cartilaginous fish	Smalltooth sandtiger	*Odontaspis ferox*
Cartilaginous fish	Rabbitfish	*Chimaera monstrosa*
Cartilaginous fish	Common stingray	*Dasyatis pastinaca*
Cartilaginous fish	Shagreen skate	*Leucoraja fullonica*
Cartilaginous fish	Bigeye thresher	*Alopias superciliosus*
Cartilaginous fish	Spiny dogfish	*Squalus acanthias*
Cartilaginous fish	Brown stingray	*Bathytoshia lata*
Bony fish	European eel	*Anguilla anguilla*
Bony fish	Dusky grouper	*Mycteroperca marginatus*
Bony fish	Common dentex	*Dentex dentex*
Bony fish	Shi Drum	*Umbrina cirrosa*
Bony fish	Atlantic mackerel	*Scomber scombrus*
Bony fish	Meagre	*Argyrosomus regius*
Jawless fish	Sea lamprey	*Petromyzon marinus*
Reptile	Leatherback turtle	*Dermochelys coriacea*
Coastal and seabirds	Balearic Shearwater	*Puffinus mauretanicus*
Coastal and seabirds	Mediterranean Gull	*Larus melanocephalus*
Coastal and seabirds	Audouin's Gull	*Larus audouinii*
Coastal and seabirds	Sandwich Tern	*Thalasseus sandvicensis*
Coastal and seabirds	Whiskered Tern	*Chlidonias hybrida*
Coastal and seabirds	Black Tern	*Chlidonias niger*
Coastal and seabirds	Mediterranean Shag	*Phalacrocorax aristotelis desmarestii*
Coastal and seabirds	European Shag	*Gulosus aristotelis*
Nearshore coastal birds	Ferruginous Duck	*Aythya nyroca*
Nearshore coastal birds	Blacktailed Godwit	*Limosa limosa*
Nearshore coastal birds	Eurasian Oystercatcher	*Haematopus ostralegus*
Nearshore coastal birds	Common Pochard	*Aythya ferina*

Higher taxon	Species common name	Species scientific name
Nearshore coastal birds	Common Shelduck	*Tadorna tadorna*
Nearshore coastal birds	Northern Shoveler	*Spatula clypeata*
Nearshore coastal birds	Garganey	*Spatula querquedula*
Nearshore coastal birds	Tufted Duck	*Aythya fuligula*
Nearshore coastal birds	Eurasian Wryneck	*Jynx torquilla*
Nearshore coastal birds	Glossy Ibis	*Plegadis falcinellus*
Nearshore coastal birds	Northern Bittern	*Botaurus stellaris*
Nearshore coastal birds	Little Bittern	*Ixobrychus minutus*
Nearshore coastal birds	Woodchat Shrike	*Lanius senator*
Birds of prey	Osprey	*Pandion haliaetus*
Birds of prey	Eleonora's Falcon	*Falco eleonorae*
Birds of prey	Western Marsh-harrier	*Circus aeruginosus*

4.2.3 Legally protected areas and other areas with recognised high biodiversity values

As discussed above, the key features within legally protected areas and other areas with recognised high biodiversity values have been considered within the CHA. As per the definitions of the PR 6 for such areas, this includes Natura 2000 and Ramsar sites.

The physical footprint of the project lies within two SACs and is immediately adjacent to a national reserve on the southern coast of Sicily at the Marinella cable landfall as shown in Table 7.

Table 7: Legally protected areas within and adjacent to the Marinella cable landfall

Site name	Summary of key features
Fondali di Capo San Marco – Sciacca SAC	This marine site is designated for the presence if *Posidonia* beds, reefs and sandbanks which are slightly covered by sea water all the time. The site is also designated for the presence of loggerhead turtles and common bottlenose dolphins.
Sistema dunale Capo Granitola, Porto Palo e Foce del Belice SAC	The cable dissects this coastal SAC. The site includes a range of Annex 1 coastal habitats that are shown in Appendix B. The site also supports range of coastal bird species, as well as loggerhead turtles and the Sicilian pond turtle.

Site name	Summary of key features
Riserva naturale Foce del Fiume Belice e dune limitrofe	The cable route lies within approximately 90 m of this national reserve. This reserve is recognised for dunes and other habitats such as cliffs. Occasional wetlands are present, and the area supports several shorebirds.

Outside of these areas of the cable route does not lie within the boundaries of any legally protected areas and other areas with recognised high biodiversity values. However, there is potential for species to be present outside of these areas that form part of the reasons for designation of such sites and are connected to them. A review of the marine protected areas in the Sicilian Channel indicates that this relates to loggerhead turtles, seabirds (including critical habitat, PBF and other listed species) and common bottlenose dolphin.

5 Pressures

5.1 Site-based project impacts

5.1.1 Approach

As previously stated, assessments have been completed to understand project impacts on biodiversity (IDEA Consult, 2023a; Bluedot Associates, 2023b). Of note, the assessment reported by Bluedot Associates (2023b) focused on the potential impacts to critical habitat and PBF. The review of impacts on critical habitat and PBF used a stepwise process shown in Figure 7. The aim is to provide an indication of impacts on priority features to provide the basis for determining residual impacts after application of the mitigation hierarchy. The conclusions provide a general and precautionary indication of where impacts of potential significance to ecosystem integrity may occur.

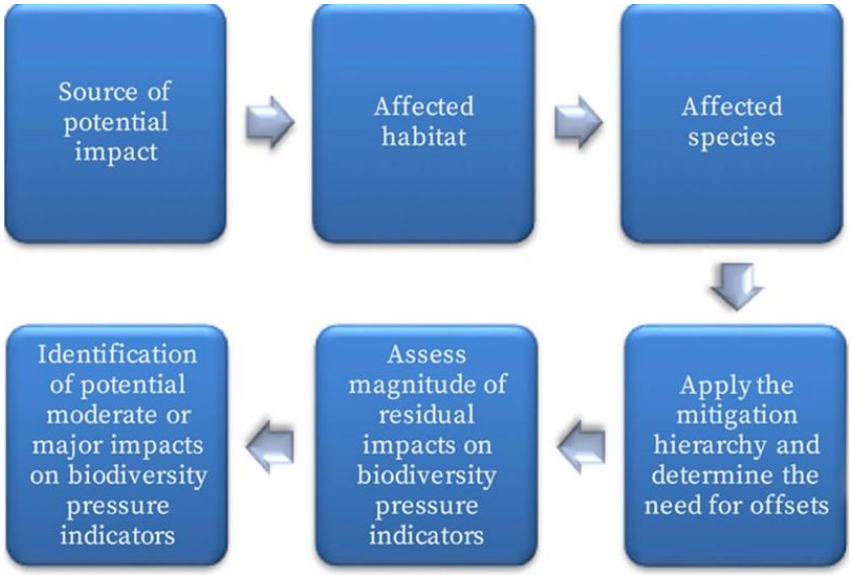

Figure 7: Process for the review of impacts and application of mitigation

Impacts have been assessed in relation to a pre-defined set of ecosystem integrity pressure indicators as shown in Figure 8.

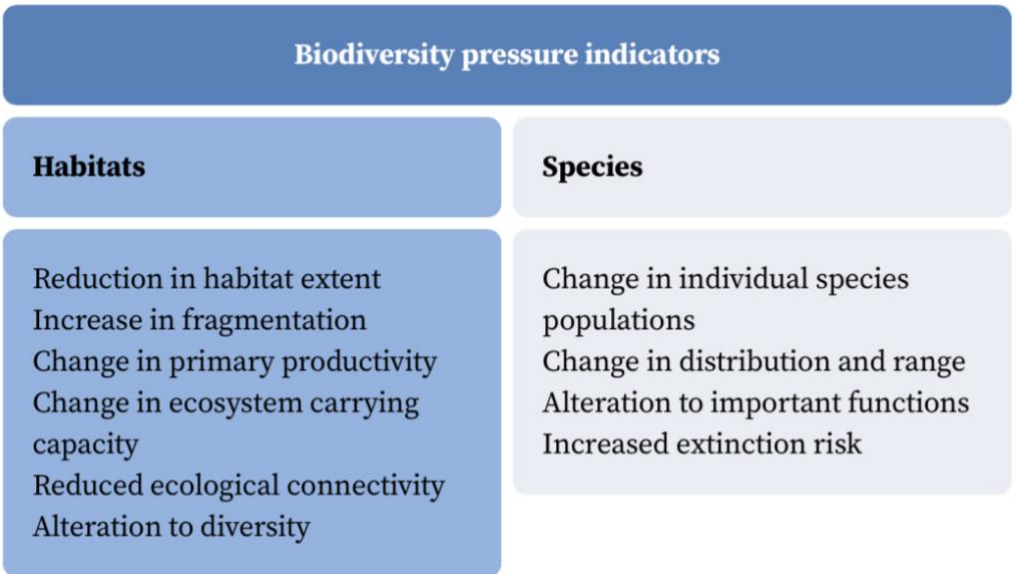

Figure 8: Ecosystem integrity indicators applied to inform the significance of impacts on PBF and critical habitat.

Magnitude of impacts for the ecosystem integrity criteria have been defined using the categories shown in Figure 9.

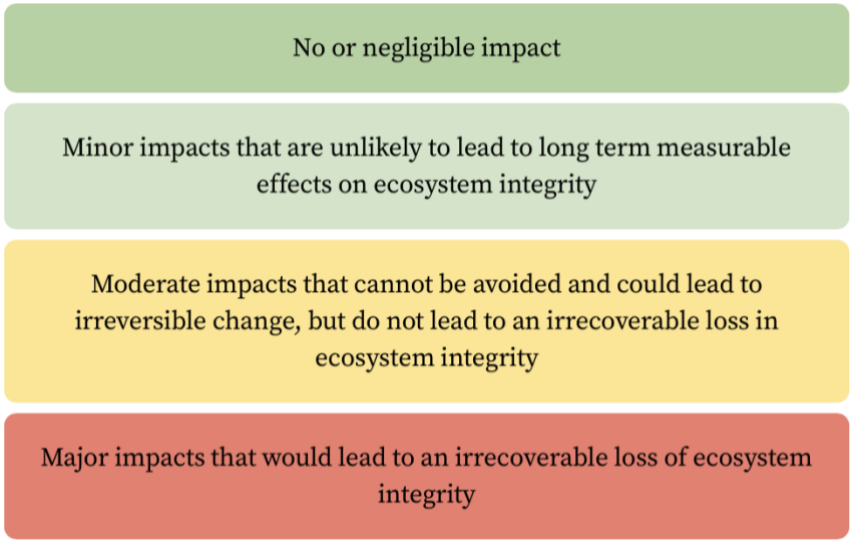

Figure 9: Categories for determining impacts on PBF and critical habitat following the application of mitigation

5.1.2 Pre-mitigation impacts

Although forming part of mitigation, the Project has embedded design avoidance measures that address some impacts on critical habitat and PBF with a high level of certainty. As these are embedded, the assessment of impacts prior to the application of additional mitigation was assessed. An outline of requirements relating to these measures is provided in Table **8** 8. As previously stated, a BMP has already been developed by the Project, which

requires update to incorporate recommendations that have been provided related to mitigation for PBF and critical habitat. The Environmental and Social Project Implementation Unit (ESPIU) within STEG will have overall responsibility to ensure that all provisions stated within the BMP will be delivered (see Section 11).

Table 8: Mitigation embedded in the Project design›

Mitigation action	Timing	Relevant management plan	Responsibility	Means of verification
Avoidance of dense *Posidonia* meadows in the nearshore waters of Sicily	Prior to construction	Updated BMP	ESPIU and Construction Contractor	Environmental Manager
Avoidance of the construction of the electrode array in the footprint of sensitive reef habitat	Prior to construction	Updated BMP	ESPIU and Construction Contractor	Environmental Manager
Use of HDD to avoid sea turtle nesting beach habitat	Prior to construction	Updated BMP	ESPIU and Construction Contractor	Environmental Manager
Burial of the cable as far as possible to limit electromagnetic field effects (EMF) on elasmobranchs	Prior to construction	Updated BMP	ESPIU and Construction Contractor	Environmental Manager

For most of these features, impacts are expected to be at non-significant levels. For a subset of six critical habitat qualifying features and additional Annex 1 coastal habitats and threatened mollusc species, the Project may result in adverse pre-mitigation impacts (Table 9). The shading within Table 9 relates to the categories presented in Figure 9.

Table 9: Potential significance of pre-mitigation adverse impacts to critical habitat and PBF. Only features currently assessed as having potential significant impacts are included.

Features	Suspended Sediments	Sediment deposition	Pollution	Scour	Underwater sound	Habitat loss & disturbance	Artificial light	IAS	Artificial habitat	EMF	Heat radiation	Vessel collision	Discharges & spills
Critical habitat													
Posidonia meadows													
Reefs													
Fan mussel (*Pinna nobilis*)													
Haliotis stomatiaeformis													
Loggerhead turtle (*Caretta caretta*)													
Sicilian pond turtle (*Emys trinacris*)													
PBF													
Annex 1 and Resolution 4 coastal habitats													
Haliotis tuberculata													

5.1.3 Additional mitigation measures

Bluedot Associates (2023b,c) proposed additional mitigation measures to address the impacts on critical habitat and PBF and reduce these to non-significant levels. A summary of measures is presented in Table 10. These measures include existing measures in the BMP and provide additional mitigation that has been recommended for critical habitat and PBF. An updated BMP will be required to integrate all these recommendations and based on information from additional surveys and design. It is important to note that prior to construction and as part of project planning, there is a requirement for the Contractor to provide a supplementary ecological assessment. This assessment will inform the mitigation measures presented in Table 10.

Table 10: Additional mitigation measures required to address the potential for moderate impacts for critical habitat and PBF

Type of mitigation	Relevant plan	Mitigation action	Relevant feature	Timing	Responsibility	Means of verification
Avoidance	Updated BMP	The distance of HDD should extend offshore as far as is technically feasible	*Posidonia* meadows and associated fan mussel (*Pinna nobilis*), *Haliotis tuberculata*, and *Haliotis stomatiaeformis*	Prior to construction as part of Project planning	ESPIU and Construction Contractor	Environmental Manager
Avoidance	Updated BMP	Project route study to avoid sensitive habitats to be informed by additional biodiversity surveys. This will include 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	Biogenic reefs including coral and sponge communities and coralline algae formations (including the associated *Haliotis tuberculata*), *Haliotis stomatiaeformis;* Sicilian pond turtle; and Annex 1 and Resolution 4 listed coastal habitats	Prior to construction as part of Project planning	ESPIU and Construction Contractor	Environmental Manager

Type of mitigation	Relevant plan	Mitigation action	Relevant feature	Timing	Responsibility	Means of verification
Avoidance	Updated BMP	Plan works to avoid important periods of nesting of sea turtle species (May to August)	Loggerhead turtle	Prior to construction as part of Project planning	ESPIU and Construction Contractor	Environmental Manager
Minimisation	Updated BMP	Use of the best available techniques and equipment to minimise the area of disturbance. This will include prioritisation of ploughing and jetting techniques; and trenching techniques will only be used as last resort and only if technically feasible	*Posidonia* meadows and associated fan mussel (*Pinna nobilis*); biogenic reefs; and *Haliotis stomatiaeformis and Haliotis tuberculata*	During construction	ESPIU and Construction Contractor	Environmental Manager
Minimisation	Updated BMP	Undertake measures to reduce water quality impacts, such as avoiding areas with high sediment contamination if identified in pre-construction surveys; conducting works in the winter season when seawater temperatures are low to minimise	*Posidonia* meadows and associated fan mussel (*Pinna nobilis*); biogenic reefs; and *Haliotis stomatiaeformis and Haliotis tuberculata*	During construction	ESPIU and Construction Contractor	Environmental Manager

Type of mitigation	Relevant plan	Mitigation action	Relevant feature	Timing	Responsibility	Means of verification
		eutrophication from nutrient loading (low productivity periods); and applying best available techniques to reduce sediment disturbance, suspension and deposition				
Minimisation	Updated BMP	Anchoring areas outside of areas where critical habitat and PBF are present should also be identified	*Posidonia* meadows and associated fan mussel (*Pinna nobilis*); biogenic reefs; and *Haliotis stomatiaeformis* and *Haliotis tuberculata*	During construction	ESPIU and Construction Contractor	Environmental Manager
Minimisation	Updated BMP	Time works in winter when habitats may be least sensitive to impacts taking account of the above avoidance measure for sea turtles. This includes avoiding works in August and September and December and February. For Caulerpa sp. works are	*Posidonia* meadows	During construction	ESPIU and Construction Contractor	Environmental Manager

Type of mitigation	Relevant plan	Mitigation action	Relevant feature	Timing	Responsibility	Means of verification
		recommended to take place between the month of December and June. Visual inspection that the plants have shed all their fruits if works are to be conducted in the summer should determine the beginning of works while visual inspection about the stage of the developing fruits and length of the leaves is also important for winter works (leaves are usually still sprouting and if fruits. started to develop, they are not too ripe).				
Minimisation	Updated BMP	The extent of additional cable protection on critical habitat should be limited wherever possible	Biogenic reefs	During construction	ESPIU and Construction Contractor	Environmental Manager
Minimisation	Updated BMP	If avoidance is not possible, assess the implication of light on sensitive species	Loggerhead turtle	During construction	ESPIU and Construction Contractor	Environmental Manager

Type of mitigation	Relevant plan	Mitigation action	Relevant feature	Timing	Responsibility	Means of verification
		and apply best practice mitigation to minimise the potential for adverse impacts				
Restoration	Updated BMP	Undertake on-site restoration of impacted habitat where feasible following construction if residual impacts remain after application of avoidance and minimisation measures	*Posidonia* meadows and associated fan mussel (*Pinna nobilis*); biogenic reefs where restoration is feasible (i.e. coralline algae formations), including habitat for *Haliotis tuberculata*; habitat supporting *Haliotis stomatiaeformis*; and Annex 1 and Resolution 4 listed coastal habitats	Post construction	ESPIU and Construction Contractor	Environmental Manager

5.1.4 Restoration feasibility

As stated in Table 10 on-site restoration is proposed as part of the mitigation strategy for some critical habitat and PBF values. When applying restoration, it is important to consider feasibility and the likely success to frame the understanding of the potential for residual impacts after actions are applied. With respect to the mitigation strategy, restoration is suggested on land and in the nearshore environment. Restoration approaches in the marine environment can present greater challenges and do not always lead to successful outcomes. Approaches are discussed below for the habitat values where it is proposed, which will have benefits for associated critical habitat and PBF species. Proposed restoration on land is expected to be very feasible and is not considered in more detail here.

5.1.4.1 Coralline algae communities

There is limited evidence that provides information relating to the restoration of coral algae communities in temperate waters. However, where research has been undertaken, there is little evidence to indicate the potential to deliver successful restoration. Tillin et al. (2022a,b) and Scottish National Heritage (2015) reported upon a review of the irreplaceability of marine habitats in UK waters. They reported that living maerl beds (coralline algae habitat) are irreplaceable based on the low feasibility for restoration, including a review of approaches that sought to undertake translocation of living and dead maerl. The consideration of feasibility relates to the overall functional community that is supported by this habitat. Key issues for maerl bed restoration include low levels of natural recruitment, dispersal capacity and extremely slow growth rate. The potential timeframe for recovery from a successful restoration approach will be very long. However, the communities associated with maerl occur on both live and dead maerl and if left undisturbed, may potentially recover regardless of the low reproductive capacity of maerl. This assumes that the overall integrity of the remaining maerl has been maintained (or can recover) to support an associated community. The timeframe for such recovery is uncertain. Further research is needed to fully understand the potential for restoration in the Mediterranean Sea and would require long-term monitoring.

5.1.4.2 *Posidonia* meadows

The potential for the restoration of *Posidonia* meadows is higher than for coralline algae. In a review of *Posidonia* restoration projects, Escandell-Westcott et al. (2023) found survival rates were higher than 75% for most projects. Specific examples exist where survival rates of *Posidonia* are over 90% (REE, 2020). Of the current known information, it seems that transplanting seedlings onto consolidated substrate (dead matte and rocks) provides the highest success rates (Pansini et al., 2022). Crustose algae additionally appeared to improve success since the added complexity and roughness facilitates seedling settlement (Escandell-Westcott et al., 2023). Although the current reviews of projects suggest there is good potential for *Posidonia* restoration, it should be noted that there tends to be a publication bias for successful restoration.

In addition, *Posidonia* is a long-lived and slow-growing species, where orthotropic rhizomes grow at 1-7 cm per year, and the plagiotropic rhizomes grow at 14 cm per year (Boudouresque et al., 2021). Therefore, the potential timeframe for *Posidonia* restoration is likely to be relatively long and long-term monitoring is required. However, there are no examples of *Posidonia* restoration projects over 10 years in the Mediterranean (Boudouresque et al., 2021). Therefore, long-term success of restoration is currently uncertain. Whilst some level of restoration may be achievable there is a need for careful planning to minimise any losses that occur; and there will be a requirement to set realistic timeframes to determine the outcomes supported by ongoing monitoring. Given the slow growth and the fact that the substrate will be disturbed in the footprint the likelihood of natural restoration is uncertain. Therefore, it is expected that some active restoration will be required. Also, the invasive *Caulerpa sp.* is present in the nearshore waters of Tunisia in dense beds, and this can pose a risk to the restoration of disturbed areas as this species may colonise first. It is therefore noteworthy that full restoration may not be achievable leading to some residual losses if impacts occur.

5.1.5 Residual impacts

It is expected NNL will be achieved for PBF and critical habitat following the application of avoidance, minimisation and restoration mitigation measures presented in this BAP. A summary of residual losses is provided in Table 11.

Note that some of the findings from this preliminary assessment require additional surveys and assessment to be confirmed. Where this is the case notes are provided.

The assessment has also determined that it is expected NNL to the ecosystem integrity will be achieved without using offsets. Bluedot Associates (2023b,c) identified the potential need for offsets to achieve NNL (and to deliver net gains). This related to post-restoration residual impacts that may result for biogenic reefs. However, since the completion of these assessments, a review of ROV data has been completed (Bluedot Associates, 2024). This review suggests that it is possible to promote avoidance and/or no significant impacts on ecosystem integrity will likely occur.

These conclusions will need to be re-assessed as part of the net gain strategy and following the review of further survey information; and any changes to this conclusion reported upon in an updated BAP.

The interim conclusions that have been drawn means that net gains will be achieved using ACAs.

Table 11: Summary of residual impacts relating to where there is potential for moderate impacts on critical habitat and PBF

PBF and CH feature	Summary of residual impacts	Residual impact significance	Notes
Posidonia meadows and the associated Fan mussel (*Pinna nobilis*)	Following the application of mitigation measures no significant residual losses are expected. However, based on the success of restoration some minor loss will occur, but this will not lead to a measurable impact on overall ecosystem integrity of this habitat. This especially relates to the density and extent of this habitat across a broad area in the nearshore waters of Tunisia.	Minor	Pre-construction surveys (and supplementary ecological assessment) are required to confirm significance and opportunities to avoid and minimise impacts to this habitat. The success of restoration will need to be determined by the Project through monitoring. This includes the need for baseline surveys to establish the area of loss and the footprint for restoration; and post-construction survey to confirm the extent of loss. Monitoring will also be required to establish the success of restoration.
Reefs (including coral and sponge communities, maerl beds, *Cladocora caespitosa* and coralline algae formations). Consideration of coralline	Impacts on deep-sea coral and sponge communities should be completely avoided. For other qualifying biogenic reef features, restoration has low feasibility some losses are expected if mortality occurs. However, functional communities may not be significantly impact and can potentially recover. The extent of residual impact is dependent upon	Moderate	Pre-construction surveys (and supplementary ecological assessment) are required to confirm significance and opportunities to avoid impacts to deep-sea coral and sponge communities through micro-scale rerouting of cable. Further surveys are also required to determine the potential presence of *Haliotis tuberculata* in coralline algae communities in the areas where HDD is not technically feasible. Post-construction survey is required to confirm that loss has been avoided or the extent of loss of biogenic reef areas.

PBF and CH feature	Summary of residual impacts	Residual impact significance	Notes
algae habitat includes the associated *Haliotis tuberculata*	the extent of impact and the resilience and recovery of the functional community. Whilst residual impacts are likely, the scale of impact will be small, and it is not confirmed that this habitat is present in the Area of Influence. It is unlikely that there would be an overall irrecoverable loss to ecosystem integrity of these features across the area where they are present. Following the application of mitigation measures no significant residual losses are expected and impact this will not lead to a measurable impact on ecosystem integrity.		The success of restoration of impacted biogenic reef habitats will need to be determined by the Project through monitoring. This includes the need for baseline surveys to establish the area of loss and the footprint for restoration. Monitoring will also be required to establish the success of restoration.
Haliotis stomatiaeformis	The extension of HDD beyond the suitable habitat range for this species should ensure that no significant impacts occur.	No or negligible impact	Significant impacts should be avoided through HDD, but further surveys are also required to determine the potential presence of *Haliotis stomatiaeformis* where HDD is not technically feasible.

PBF and CH feature	Summary of residual impacts	Residual impact significance	Notes
Loggerhead turtle (*Caretta caretta*)	Avoiding construction during the nesting season (May to August) would ensure no impacts would occur relating to artificial light. If not possible, the application of minimisation measures should ensure there will be no long-term effects on ecosystem integrity.	Minor	Further assessment (to be reported in the supplementary ecological assessment) is needed to determine if there is potential for nesting in the potential area of influence of light. Also, to improve context to understand the potential for impacts the likely additional implications of light from the Project should be assessed.
Sicilian pond turtle (*Emys trinacris*)	The application of avoidance should ensure that no impacts on this species occur.	No or negligible impact	Pre-construction surveys (and supplementary ecological assessment) are needed to confirm the potential presence of this species in the impacted area; and to deliver an approach that ensures avoidance.
Annex 1 and Resolution 4 coastal habitats	The application of mitigation should ensure that there would be no significant impacts on ecosystem integrity.	Minor	Pre-construction surveys (and supplementary ecological assessment) are needed within the cable route on the coasts at both landfall sites to confirm if these habitats are present, their status, and whether they will be impacted by the Project.

5.2 Seascape pressures

Understanding the extent and severity of seascape pressures provides the context for determining the feasibility and strength of potential conservation actions that may support the delivery of net gains. Also, the ability to deliver positive outcomes related to priority features is dependent upon the ability for the Project to support actions that can exert influence over pressures in the seascape that are leading to marine biodiversity loss. By understanding limits in this regard, it is possible to prioritise actions where it is possible to exert a high level of influence.

Seascape pressures can be categorised in relation to the main direct drivers of change reported in the IPBES global assessment (i.e., land and sea use change, climate change, resource exploitation, pollution and invasive alien species) (IPBES, 2019). The Mediterranean Sea is subject to heavy anthropogenic pressure across the basin. The EAAA lies in the boundary between the eastern and western basins and as such experiences intense pressure related to invasive species introductions, natural resource use, pollution, coastal development, and shipping.

The Mediterranean is a hotspot for invasive species, with approximately 1,000 species estimated to have been introduced, and over half of these now have well-established populations (Tsirintanis K. et al., 2022). In some regions, under climate-change induced warming, native thermal-sensitive species populations have collapsed, and it is now tolerant invasive species providing the ecological niche function. The small islands within the EAAA, for instance Lampedusa and Pantelleria, act as 'stepping stones' for dispersal of non-native species between west and east basins. As such provide a key area for recording rate of invasive species spread through the Mediterranean. An invasive genus of note within the EAAA is *Caulerpa sp.*. This is an invasive macro-alga and due to rapid growth can smoother seagrasses and impact other habitats such as coralline algae. *Caulerpa sp.* has been observed in the nearshore waters of Tunisia (Bluedot Associates, 2024).

The EAAA is a is area of complex geomorphology, characterised by shallow banks, an extensive shelf and deep-water areas with several subsea mountains. This complexity results in significant upwelling which in turn increases productivity. As such, the EAAA historically and currently experiences intense fishing pressure. Off the Italian coast, the Sicilian Channel is the most exploited region in the Mediterranean with respect to the total number of fishing vessels of any kind. Fishing within the EAAA consists of mixed gear types including purse-seine in pelagic waters targeting forage fish; and trawlers in the outer slope, targeting mixed assemblages, and bathyal bottoms on the middle shelf for giant red shrimp (Di Lorenzo et al., 2018). Importantly, in the central Mediterranean region, 'small-scale' vessels represent 85% of the operating fleet (FAO, 2023). Although possibly the largest source of pressure in the EAAA, fishing in this region also provides significant contribution to local livelihoods and economies.

Shipping has a particularly high threat in the EAAA due to the Sicilian Channel being one of the most important traffic lanes connecting the western and eastern basins. The Channel

is one of the most important shipping lanes for crude oil and as such is at very high risk of pollution. The marine traffic concentration in the EAAA results in a high noisescape. Alongside this, there are six oil platforms in the offshore area to the south of Sicily, extracting 280,000 tons of oil from 36 wells annually (Di Lorenzo et al., 2018). The drilling occurring here increases noise levels as well as changes and loss of benthic habitats.

Lastly, urbanisation of the coast for tourism infrastructure, such as resorts and jetties, especially in Sicily and Malta, have increased pressures on fragile habitats. In the case of infrastructure development, these sensitive habitats face direct impact due to physical loss or change to the seabed. However, there are several additional pressures including increased pollution (cumulative effects from inorganic and organic coastal pollution), habitat fragmentation and climate-change induced impacts. The combined pressure of climate-change induced impacts should not be underestimated, especially for fragile species and habitats. For instance, Posidonia is of particular concern with field studies suggesting that warming trends in the western Mediterranean will lead to the functional extinction of Posidonia meadows under a relatively mild greenhouse gas scenario (Jordà et al., 2012).

Coll et al. (2010) identified areas with high threat from various anthropogenic pressures across the Mediterranean basin. The spatial analysis is reproduced below in Figure 10. This highlights the multiple pressures in the EAAA, namely the impacts of trawling, pollution, marine resource use and shipping.

For the identification of effective conservation actions that may help to deliver net gains it is important to consider the severity of the seascape pressures in relation to specific classes and habitats triggering CH or PBF. The matrix in Figure 11 seeks to summarise the severity of the main pressure categories for the priority classes and habitats in the EAAA. The matrix is based on work originally presented by Korpinen et al (2021). In this study Mediterranean regional experts were interviewed and asked to define values of pressure severity from 0 (being low severity) to 5 (being high severity). For the classes/ habitats the matrix by Korpinen et al. had not defined values, key literature was used for the relative CH or PBF triggering features. Gaps relate to a lack of information to be able to define the pressure level for this habitat or class.

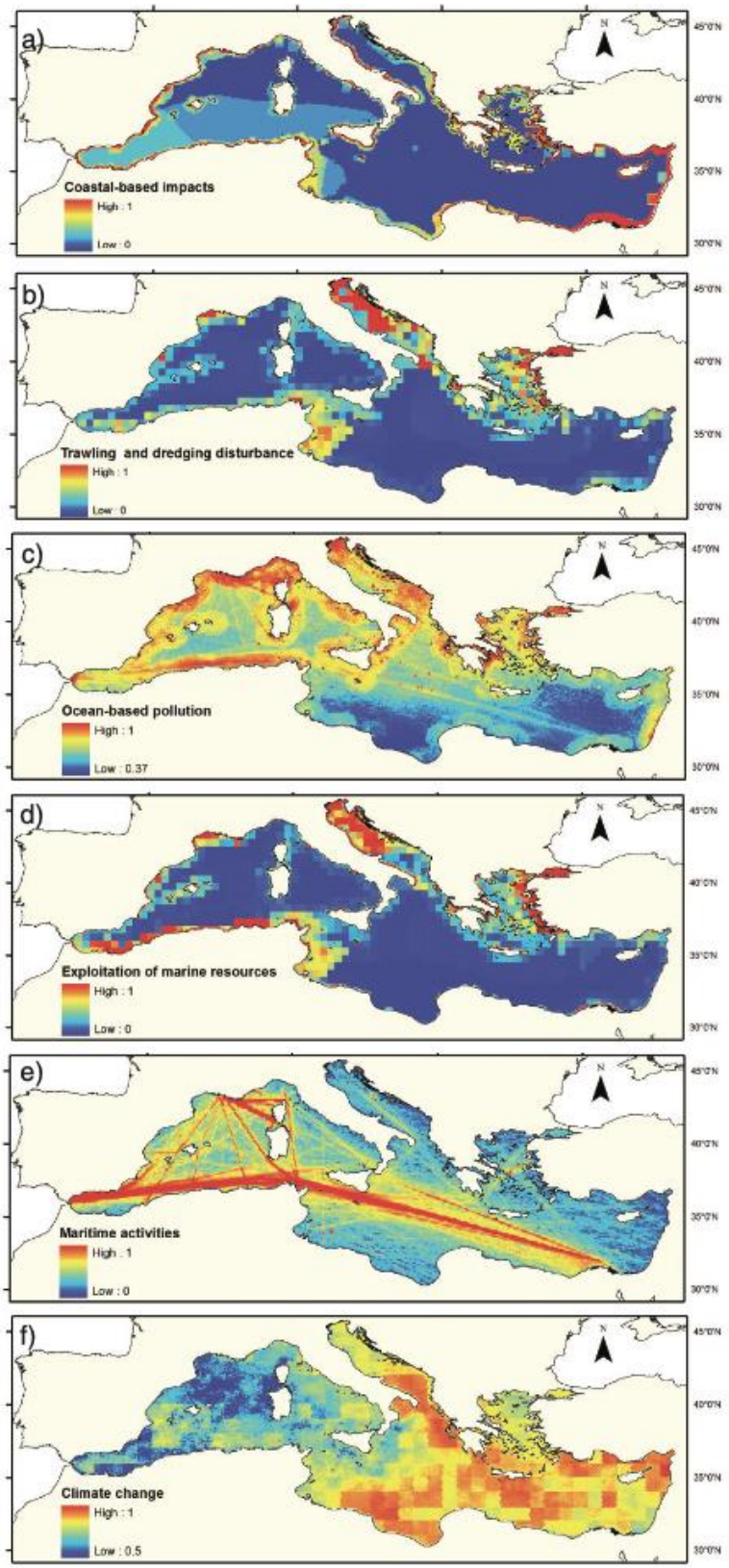

Figure 10: Human pressures with potential impact on marine biodiversity across the Mediterranean Sea. (Source: Coll et al., 2010)

	Invasive species introduction	Pollution	Global climate change	Natural resource use - fishing (pelagic)	Natural resource use - fishing (bottom trawling)	Natural resource use - oil drilling	Sea use change - shipping (noise)	Sea use change - physical change/loss of seabed
Biogenic reefs (*Cladocora caespitosa* and coralline algae formations)	**4**	**3**	**4**	**4**	**4**	**4**	**1**	**3**
Bony Fish	**3**	**4**	**3**	**4**	**4**	**2**	**3**	**3**
Cetaceans	**0**	**4**	**3**	**3.5**	**1.5**	**3**	**4**	**1**
Coastal lagoons[4]	-	*5*	-	-	-	-	-	*5*
Crustaceans[5]	-	-	-	*5*	*5*	-	-	-
Deep-water corals	**3.5**	**2.5**	**4**	**3**	**4**	**4**	**1**	**4**
Elasmobranches	**3**	**4**	**3**	**5**	**5**	**2**	**3**	**3**
Molluscs[6][7]	*4*	-	*3*	-	*5*	-	-	*4*
Posidonia beds	**3**	**3**	**4**	**2**	**5**	**4**	**0**	**5**
Seabirds and coastal birds	**1**	**3**	**3**	**3**	**2**	**2**	**3**	**2**
Seals	**0**	**4**	**3**	**4**	**1**	**3**	**3**	**1.5**
Turtles	**1**	**4**	**4**	**4**	**2**	**2**	**3**	**2**

Figure 11: Matrix presenting the estimated severity of pressures of each of the important habitats and marine classes of CH /PBF species in the EAA. Values in bold have been taken directly from Korpinen et al. (2021). Values in italics are based on further literature review.

[4] Pérez-Ruzafa, A., Marcos, C. and Pérez-Ruzafa, I.M., 2011. Mediterranean coastal lagoons in an ecosystem and aquatic resources management context. Physics and Chemistry of the Earth, Parts a/b/c, 36(5-6), pp.160-166.

[5] Butler, M., MacDiarmid, A. & Cockcroft, A. 2011. Scyllarides latus. The IUCN Red List of Threatened Species 2011: e.T169983A6698918. https://dx.doi.org/10.2305/IUCN.UK.2011-1.RLTS.T169983A6698918.en. Accessed on 01 May 2024.

[6]Kersting, D., Benabdi, M., Čižmek, H., Grau, A., Jimenez, C., Katsanevakis, S., Öztürk, B., Tuncer, S., Tunesi, L., Vázquez-Luis, M., Vicente, N. & Otero Villanueva, M. 2019. *Pinna nobilis*. *The IUCN Red List of Threatened Species* 2019: e.T160075998A160081499. https://dx.doi.org/10.2305/IUCN.UK.2019-3.RLTS.T160075998A160081499.en. Accessed on 01 May 2024.

[7] Peters, H. 2021. Haliotis stomatiaeformis. The IUCN Red List of Threatened Species 2021: e.T78772043A78772613. https://dx.doi.org/10.2305/IUCN.UK.2021-1.RLTS.T78772043A78772613.en. Accessed on 01 May 2024.

6 Responses

As previously stated, PR 6 requires a net gain to critical habitat. For PBF, no net loss is required, but the delivery of a net gain is preferred.

Approaches to delivering net gains can vary relating to the understanding of residual impacts. Where significant residual impacts to the integrity of critical habitat and PBF values will occur after the application of avoidance, minimisation and restoration, net gains should be developed using offsets. However, where no such significant residual impacts remain, net gains can be achieved using ACAs. As previously noted, whilst these should achieve a net gain outcome, unlike offsets they are not designed to provide measurable gains that can be set against residual impacts. However, the ACA should seek to deliver an additional net gain outcome in the EAAA where critical habitat and PBF has been defined. In this instance, the net gain approach does need to provide a specific net gain outcomes for each value but can be achieved through an out-of-kind approach that seeks to provide an overall ecosystem benefit. The key requirement for an ACA approach is to ensure that a project that is in critical habitat delivers a positive contribution to the conservation of important values.

Following completion of the review of 'state' and 'pressures', it has been concluded that the Project's response to deliver net gains can be reasonably achieved through the application of ACAs. However, this conclusion relates to the existing state of knowledge of baseline and impacts. Should further assessment determine that there is potential for more significant residual impacts on critical habitat and PBF values, or proposed monitoring confirms significant residual impacts, then an update to the BAP will be needed to include offset requirements. As previously stated, the BAP is a live document, and this applies to subsequent net gain strategies where adaptive management may be required.

This section reviews potential ACAs that can help the project deliver an overall net gain. The net gain strategy will build on this work to confirm specific actions including implementing partners.

6.1 Net gain strategy

A net gain strategy will be developed by the Project to steer the implementation of net gains. The net gain strategy will also be informed by the results of further survey work that will allow improved the quantification of residual impacts. The net gain strategy will involve the following:

- Finalise residual impact assessment based on survey findings.
- Identify the focus of the net gain approach.
- Determine how the approach will address pressures on features.
- Undertake detailed consultation with potential partners.
- Develop criteria for assessing potential ACAs, including feasibility and biodiversity- and people-positive outcomes that can may be achieved.

- Finalise potential ACA options in the EAAA and identify potential for collaborations
- Provide a qualitative assessment of net gains will be achieved.
- High-level review of costing associated with identified ACAs.
- Provide recommendations for monitoring to confirm that appropriate actions are effectively implemented.

To provide information to confirm the potential to deliver net gains this BAP provides initial contextualisation of net gain options that will be assessed in more detail during the development of the net gain strategy.

6.2 Net gain conservation actions

Response criteria can be applied to understand the feasibility of different net gain conservation actions. The use of these criteria will help identify feasible actions that seek to maximise the positive outcomes for biodiversity and people, as well as offering cost-effective approaches for the Project to deliver net gains. Priorities for conservation actions will need to show high or at least moderate potential for each of the criteria.

Appropriate actions will depend on both the opportunities and challenges presented by the environment. The potential for passive restoration will largely relate to the level of control that an organisation may be able to exert on pressures whereas active restoration will need to factor in the time required to achieve meaningful gains as well as the complexity, cost and potential for success that are associated with undertaking marine restoration. The feasibility for actively restoring marine habitats is dependent on multiple variables. In general, in the deep-water environment active restoration is much more difficult and for this reason passive restoration through the removal of pressures is often preferred. However, for values that are of greatest conservation concern in the EAAA, restoration success is hard to measure, be costly and will take a very long time. For these and other reasons, the feasibility for active interventions is likely to be higher for nearshore and intertidal habitats where there are multiple pressures and where the potential for some intervention or influence is more likely. However, the feasibility and success of active restoration outcomes can also be highly variable relating to pressures (natural and anthropogenic) and the values that are being restored.

As starting point for defining an appropriate net gain approach, a review has been completed to understand existing conservation activities that are being undertaken in the EAAA for critical habitat and PBF values. The aim of this review was to determine if existing programmes may offer opportunity for the Project to deliver net gains without the need to establish a new programme. Also, the review seeks to identify potential conservation partners that the Project can collaborate with to support the implementation of approaches, which has included some initial stakeholder engagement. Consideration has only been given to identifying approaches that can lead to on-the-ground conservation outcomes, i.e. support for actions that only deliver research has not been included in the review.

To identify a preferred approach response criteria have been used to understand preferred actions. As part of this approach consideration was given to actions that focus on habitat or species. In general, approaches that help to restore interconnected mosaics of coastal and nearshore habitat types will be of greatest feasibility and benefit multiple species and connected regional biodiversity. Additional benefits can also accrue for carbon storage, protection from erosion, nutrient cycling and water quality and a wide range of contributions to humans. Species-specific actions are also important, but whilst they will provide direct positive outcomes, the extent of indirect outcomes may be lower.

Based the preliminary assessment of different conservation actions against these criteria, actions to protect and restore *Posidonia* meadows are preferred to deliver an overall net gain to the Project. Such actions meet a wide range of response criteria; and provides an in-kind approach for habitat that is likely to be most disturbed by the Project and delivers an out-of-kind benefits for other values. Table 12 presents a summary of some of the direct and indirect outcomes for ecosystem integrity that can be associated with a strategy that focuses on the providing benefits to *Posidonia* meadows.

Table 12: Summary of direct and indirect outcomes for ecosystem integrity relating to the conservation and restoration of *Posidonia* meadows

Direct outcomes	**Indirect outcomes**
- Restoration of modified or degraded areas - Increased extent of natural and critical ecosystem attributes - Potential for multi-feature benefits - Potential for scalability - Potential for Nature-based solutions - Enhancement of ecological connectivity - Potential for benefits relating the nature's contributions to people	- Reduced threat of species extinctions - Increased diversity

Table 13 13 provides a summary of findings that justifies this conclusion. Note that this is not an exhaustive assessment and additional criteria as well as conservation actions may be identified through the subsequent net gain strategy assessment.

The review has determined that the Project could support existing programmes that have already involved in *Posidonia* restoration and conservation. By doing so, the Project can help to address some of the key regional pressures, not only to *Posidonia* meadows but also to associated species including several other critical habitat and PBF values that have close associations with this habitat or will be indirectly benefitted in some way. Improving this habitat also ensures Ecosystem Service benefits can result, which will lead to people-

positive outcomes. The key benefits of *Posidonia* conservation and restoration are outlined further in Table 14.

Several seagrass conservation and restoration initiatives have been identified that could potentially be supported to deliver net gains for the Project. These are currently:

- Blue Marine Foundation: The 'Blue4Italian' Initiative aims to connect MPAs across Italy. This work includes identification of actions to safeguard *Posidonia* in Plemmirio, Sicily, through reducing impacts of anchoring, in particular. Initiative could be supported and scaled up to help project and restore *Posidonia*.
- BlueSeeds: Developing several projects through collaborate agreements with a range of conservation partners to promote the conservation of *Posidonia* in Tunisia. Opportunities include developing innovative financing schemes for marine conservation; piloting seagrass conservation around Kerkennah island and conserving *Posidonia* by reducing fishing impacts and improving the livelihoods of fishing communities.
- Harmony Project: Undertakes mapping and monitoring of *Posidonia* including habitat integrity. Is supported by research institutes in Italy and Malta including through EU funding. This project has demonstrated good governance and a participatory approach to seagrass conservation. Provides opportunities for expansion to other areas.
- Mediterranean Posidonia Network: Aims to conserve *Posidonia* around the Mediterranean by bringing together a wide range of stakeholders to increase a country's capacity to finance, monitor and protect *Posidonia* and prevent future degradation. Funding could be used to support further capacity and policy development including regional actions to reduce damaging effects of anchoring.
- MEDSea Foundation: Undertakes a range of marine conservation initiatives including the 'MedSeaGrass' project which aims to restore the integrity of *Posidonia* meadows within the "Penisola del Sinis - Isola di Mal di Ventre" MPA. Lessons and experience from this work could potentially be scaled up to restore seagrass elsewhere.
- Kuriat Project: A now completed pilot project (2017-19) in the Kuriat Islands, Tunisia that focused on monitoring and capacity development to conservation managers on seagrass conservation. Included a feasibility assessment for installing mooring buoys to reduce anchoring damage. Funding could be used to continue and expand this initial work. Further assessment needed of project outcomes and opportunities to scale up.
- Project Mania: An initiative using citizen scientists to undertake *Posidonia* restoration and research including planting of seedlings and providing education to dive centres across Sicily and Malta. Funding could be used to expand the project to priority areas.

The net gain strategy will review these and other initiatives, and make recommendations on the best approach, costings and specific actions that could be supported to deliver gains. Should the net gain strategy alter conclusions on the preferred approach, this BAP will be updated.

Table 13: Potential conservation actions to deliver Project gains, scored against different selection criteria

Potential conservation action	Ability to address existing pressures	Restoration potential	Potential to maintain or enhance ecological connectivity	Potential to conserve of multiple biodiversity features	Potential for scalability	Potential to capitalise on existing initiatives	Political support	Potential to deliver people positive outcomes	Cost effectiveness	Overall potential to deliver a net gain for Project
Supporting initiatives focused on seagrass (*Posidonia*) restoration and conservation	High	Moderate	Moderate	High	Moderate	Moderate	High	High	Moderate	**High**
Supporting initiatives focused on reef restoration and conservation	High	Low	Low	Moderate	Moderate	Low	Moderate	Moderate	Low	**Low**
Coastal wetland conservation and restoration	Moderate	High	Moderate	Moderate	High	Moderate	Moderate	Moderate	Moderate	**Moderate**
Supporting protection (e.g. support of existing or new marine protected area)	High	Moderate	Moderate	High	Low	Low	Low	Moderate	Low	**Low**
Reducing threats from fisheries	High	Moderate	Low	High	Moderate	Low	Low	Low	Low	**Low**
Species-targeted conservation actions (loggerhead turtle, Sicilian pond turtle, cetaceans, sharks)	Moderate	n/a	Low	Low	Moderate	Moderate	High	Moderate	Moderate	**Moderate**

Table 14: Justification for selection criteria scoring for undertaking conservation and restoration of *Posidonia* meadows as a Project ACA

Selection criteria	Justification for score
Ability to address existing pressures	High potential by tackling previous habitat loss and degradation including damage from destructive fishing practices such as bottom trawling. Also provides opportunities to help control and prevent further intrusions of invasive alien species, particularly *Caulerpa* spp.
Restoration potential	Moderate potential for active restoration although there are still significant gaps in developing effective propagation techniques and in identifying effective long-term restoration strategies (see Escandell-Westcott et al. (2023) for a review). Passive restoration can be successful although *Posidonia oceanica* exhibits particularly slow growth dynamics, the slowest among all seagrasses, resulting in recovery rates of only a few centimetres per year.
Potential to maintain or enhance ecological connectivity	Moderate potential by prioritising areas that have led to a loss in ecological connectivity. Further engagement with stakeholders needed to identify priority sites.
Potential to conserve of multiple biodiversity features	High potential to support of threatened species associated with *Posidonia* meadows including the fan mussel and maerl beds as well as numerous fish species that use *Posidonia* meadows as nursery grounds.
Potential for scalability	Moderate potential to learn from and apply conservation and restoration lessons to scale up efforts to other priority conservation areas.
Potential to capitalise on existing conservation initiatives	High potential to support existing *Posidonia* conservation and research initiatives that have demonstrated success in *Posidonia* conservation (see list above).
Political support	High potential for political support given *Posidonia* conservation will be recognised as a priority action by government agencies and would build on existing programs in line with existing national conservation programs, alleviating the need for lengthy government consultation processes.

Selection criteria	Justification for score
Potential to deliver people-positive outcomes	High potential to deliver people positive outcomes. Project will not lead to any exclusions of people and enhance key ecosystem services such as fisheries, fisheries and regulating services such as carbon sequestration (i.e. “blue carbon”) and shoreline stabilisation. Further opportunities for involving people through “citizen science” volunteering programs.
Cost effectiveness	Moderate cost effectiveness as investments would go towards existing initiatives with demonstrable success. Ongoing tracking of fund usage would be required to ensure funds are spent effectively.

7 Monitoring and evaluation

Monitoring is required to be undertaken prior to and during construction as well as during operation, to verify that mitigation measures are implemented, track their effectiveness and undertake adaptive management if measures are not performing as anticipated.

A biodiversity monitoring and evaluation program (BMEP) will need to be developed to meet the Project's monitoring requirements. The BMEP will form part of an update BMP that takes account of the measures contained in this BAP. The BMEP will focus on PBFs and critical habitat that are likely to be impacted (or where there is high uncertainty about their status and thus potential impacts) and include monitoring of impacts and mitigation measures. The BMEP will set out the framework, indicators and approaches that the Project will use to track any changes in PBF and critical habitat and evaluate whether the Project's NNL and net gain objectives, including the requirements of EBRD, have been fulfilled.

7.1 Monitoring measures included in the BMP

A summary of the monitoring measures included in the BMP (IDEA Consult, 2023b) are presented in Table 15. These measures have been cross-referenced with the survey and monitoring requirements that are required for critical habitat and PBF (Bluedot Associates, 2023c). 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. The monitoring measures identified, including recommendations should be included in an updated BMP.

Table 15: Marine monitoring activities include the BMP of relevance relating to impacts of note on critical habitat and PBF

BMP monitoring measure	Comments and recommendations for BMP update	Relevant plan	Timing	Responsibility	Means of verification
***Posidonia oceanica* and *Cymodocea nodosa*:** Visual transect survey along the cable corridor from the HDD exit point to a water depth of 40 m. This survey includes visual inspection for *Caulerpa sp.*	The pre-construction 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. A focus on monitoring post-construction should be on the presence of *Caulerpa sp.* in areas disturbed by the works.	Updated BMP	Pre-construction for baseline Construction phase Post-construction	ESPIU and Construction Contractor	Environmental Manager
Bivalvia and Anthozoa: Visual transect survey along the cable corridor from the HDD exit point to a water depth of 40 m.	Monitoring should seek to determine the presence or absence of the fan mussel (*Pinna nobilis*) and *Haliotis stomatiaeformis* and *Haliotis tuberculata*. The baseline survey should seek support the avoidance or minimisation of impacts on these species. If any	Updated BMP	Pre-construction for baseline Construction phase Post-construction	ESPIU and Construction Contractor	Environmental Manager

BMP monitoring measure	Comments and recommendations for BMP update	Relevant plan	Timing	Responsibility	Means of verification
	impacts may occur post-construction monitoring should align with any restoration approaches.				

Table 16 provides a summary of additional survey and monitoring requirements for critical habitat and PBF that will need to be integrated in an updated BMP. These measures are in line with requirements reported by Bluedot Associates (2023c).

Table 16: Additional survey and monitoring requirements for critical habitat and PBF

Monitoring Measure	Relevant plan	Timing	Responsibility	Means of verification
Biogenic reef: Surveys to define presence of sensitive biogenic reef habitat in areas that may be disturbed to support avoidance; to confirm that sensitive deep-sea coral and sponge communities have been avoided and to understand the extent of impact on other biogenic reef habitats. If restoration is undertaken monitoring will be required to determine success	Updated BMP	Pre-construction Post-construction Pre-restoration Post-restoration	ESPIU and Construction Contractor	Environmental Manager
Loggerhead turtles: The avoidance of the nesting season should ensure that impacts associated with artificial light do not occur. Should full seasonal avoidance not be possible, there is a requirement for the Contractor to include within the supplementary ecological assessment a nesting turtle assessment and mitigation procedure (that incorporates the applicable requirements within the Light Pollution Guidelines	Updated BMP	Pre-construction During construction	ESPIU and Construction Contractor	Environmental Manager

Monitoring Measure	Relevant plan	Timing	Responsibility	Means of verification
by the DEE (2020)) is required for approval within ninety (90) days of Contractor commissioning. This may include several measures, including: - A baseline light study is needed to understand the likely implications of light in the context of other development already in the impacted area - 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 70 days before the start of works, which relates to incubation times for hatchlings - Mitigations to minimise impacts, including best available techniques for lighting design and operation - 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 - An assessment of vibration, subsidence, drilling fluid breakout				

Monitoring Measure	Relevant plan	Timing	Responsibility	Means of verification
Sicilian pond turtle: Surveys should be undertaken to ensure avoidance of any habitat where this species may be located at the landfall site on the Sicilian coast.	Updated BMP	Pre-construction During construction	ESPIU and Construction Contractor	Environmental Manager
Annex 1 and Resolution 4 coastal habitats: Baseline surveys should be undertaken to determine the presence of such habitats in 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.	Updated BMP	Pre-construction Post-construction Pre-restoration Post-restoration	ESPIU and Construction Contractor	Environmental Manager

7.2 Monitoring of the implementation of mitigation

The following presents an overview of monitoring requirements for tracking implementation of the mitigation measures identified in this BAP, including KPIs and related targets. The requirements presented below are aligned with those within the BMP and/or are supplementary based on the additional requirements that have been defined for critical habitat and PBF. Monitoring requirements should be included in an updated BMP. This should include alignment of targets and records.

AM1	**Avoidance of dense *Posidonia* meadows in the nearshore waters of Sicily**		
Key Performance Indicator		*Target*	*Record*
KPI 1	Loss of *Posidonia* within dense beds	No loss to habitat extent or quality	Monitoring records

AM2	**Avoidance of the construction of the electrode array in the footprint of sensitive reef habitat**		
Key Performance Indicator		*Target*	*Record*
KPI 2	Loss of critical habitat and PBF in the footprint	No loss to habitat extent or quality (including no measurable change to associated species)	Monitoring records

AM3	**Use of HDD to avoid sea turtle nesting habitats**		
Key Performance Indicator		*Target*	*Record*
KPI 3	Disturbance to sea turtle nesting habitat	Zero disturbance to nesting habitat	Monitoring records

AM4	**Burial of the cable to limit electromagnetic field effects (EMF) on elasmobranchs**		
Key Performance Indicator		*Target*	*Record*
KPI 4	Maximise the potential for cable burial in all areas where it is feasible	Burial implemented as far as is technically feasible	Design information and monitoring records

AM5	**The distance of HDD should extend offshore as far as is technically feasible**		
Key Performance Indicator		*Target*	*Record*
KPI 5	Maximise the distance of HDD as far as it technically feasible to avoid impacts on critical habitat and PBF	Implement HDD to the maximum achievable extent to avoid impacts on critical habitat and PBF	Design information and monitoring records

AM6	**Project route study to avoid sensitive habitats to be informed by additional biodiversity surveys**		
Key Performance Indicator		*Target*	*Record*
KPI 6	Avoid loss to sensitive critical habitat and PBF as far as is technically feasible beyond the areas where HDD is achievable	Burial implemented as far as is technically feasible	Design information and monitoring records

AM7	**Plan works to avoid important periods of nesting of sea turtles**		
Key Performance Indicator		*Target*	*Record*
KPI 7	Avoid disturbance during nesting season as far as is practicable	No measurable loss to populations	Monitoring records

MM1	**Use of the best available techniques and equipment to minimise the area of disturbance**		
Key Performance Indicator		*Target*	*Record*
KPI 8	Minimise disturbance to critical habitat and PBF as far as is practicable	Disturbance is minimised as far as is technically feasible	Design information and monitoring records

MM2	**Undertake measures to reduce water quality impacts**		
Key Performance Indicator		*Target*	*Record*
KPI 9	Minimise the potential for water quality related impacts on critical habitat and PBF	Minimise loss of habitat extent and condition	Monitoring records

MM3	**Anchoring areas outside of areas where critical habitat and PBF are present should also be identified**		
Key Performance Indicator		*Target*	*Record*
KPI 10	Minimise disturbance to critical habitat and PBF as far as is practicable	Zero anchoring disturbance	Monitoring records

MM4	**Time works in to be undertaken at time when sensitive habitats may be least sensitive to impacts; and when the potential for colonisation of *Caulerpa sp.* in disturbed area is lowest**		
Key Performance Indicator		*Target*	*Record*
KPI 11	Use scheduling to minimise the potential for impacts on critical habitat and PBF as far as is practicable	Minimise loss of habitat extent and condition. Zero invasion of *Caulerpa sp.* in disturbed area.	Monitoring records

MM5	**The extent of cable protection in reef areas should be limited wherever possible**		
Key Performance Indicator		*Target*	*Record*
KPI 12	Minimise loss to critical habitat and PBF as far as is practicable	Loss is minimised as far as is technically feasible	Design information and monitoring records

MM6	**If avoidance is not possible assess the implication of light on loggerhead turtles; and apply best practice mitigation to minimise the potential for adverse impacts**		
Key Performance Indicator		*Target*	*Record*
KPI 13	Mortality of hatchlings due to misorientation and disorientation	Zero mortality	Monitoring records

RM1	**On-site restoration of impacted habitat if residual impacts remain after application of avoidance and minimisation measures**		
Key Performance Indicator		*Target*	*Record*
KPI 14	Deliver a programme to achieve restoration and monitor success to determine the extent of loss	Restoration of habitats as far as is technically feasible in a way that maximises successful implementation	Restoration approach and monitoring records

7.3 Monitoring relating to net gains

Net gains will be achieved using ACAs. Whilst the Project is required to undertake approaches to deliver gains on-the-ground, qualitative evidence and expert opinion to validate a net gain related to ACAs. In this regard, it is recommended that monitoring focuses on confirming the successful implementation of conservation actions. The implementing organisation(s) would be required to report to the ESPIU on a bi-annual basis. The report would include budget and expenditure details as well as details on the effectiveness of the conservation and restoration program(s) based on basic criteria including, for example, number of seagrass plants planted, area restored as well as any lessons learned from the program. Specific details for monitoring of net gains will be developed following completion of the net gain strategy.

8 Stakeholder engagement

Engagement with stakeholders is needed to ensure that mitigation, including net gain, actions proposed in this BAP are feasible and aligned with stakeholder priorities. Thus far, engagement with external stakeholders has been limited to understanding the priorities and opportunities of different conservation initiatives and organisations. In turn, this will help identify appropriate ACAs.

Stakeholders that have been engaged thus far are:

- NASTNet – provided insights into priorities for regional loggerhead sea turtle conservation.
- MAVA Med Programmes (through Paule Gross – Ex Director) – helped identify potential partnerships for seagrass mapping and other conservation initiatives.
- Blue Marine Foundation - provided details on their marine conservation initiatives in Italy and elaborated on their collaborative programs.
- WWF North Africa – highlighted WWFs regional conservation priorities. Suggested support for a regional summit to drive this and identify targets on regional resource management and fisheries management agreements.
- BlueSeeds – Discussed their seagrass carbon credit and compensation schemes including their interest in expanding to Tunisia.

The net gain strategy will undertake further targeted engagement to confirm specific actions that the Project can support as part of its net gain strategy.

9 Auditing and reporting

9.1 Auditing

This BAP should be periodically reviewed, and any necessary revisions made to reflect changes or updated information that becomes available. It is recommended that the auditing of the implementation of the BAP be embedded within the wider company Environmental Management System (EMS). Internal audits will include ongoing review of the implementation of the BAP monitoring requirements.

In addition to internal auditing, it is recommended that a review of implementation and compliance be undertaken by EBRD periodically, which may include external independent review. Internal and external audit findings, along with actions, should be recorded and reported.

9.2 Reporting

It is recommended that implementation of the actions within this BAP be reported upon as set out below.

By the Construction Contractor:

- Weekly and monthly progress reports developed by the Contractor's procedures defined in the CEMP.
- Site audit reporting in line with the Contractor's procedures defined in the CEMP.

By the Project:

- Records of monitoring should be kept by the Project. This should include data from field activities and stakeholder engagement reports.
- Regular monthly progress reports should be developed during construction regarding the implementation of the actions in this BAP and issued to internal management and technical leaders, along with other key internal stakeholders.
- Internal and external audit findings, along with actions, should be recorded and reported in line with the internal EMS.

10 Next steps

Short- and medium-term next steps have been identified to address the outstanding gaps identified in this BAP and to enable more accurate assessment of residual impacts and develop detailed net gain responses. These are to:

1. Undertake additional surveys along cable route to map sensitive features and assess feasibility of micro-scale rerouting or rehabilitation/restoration.
2. Review additional recommended on-site mitigation and monitoring actions and integrate into an updated BMP.
3. Based on survey findings and consideration of additional mitigation actions, confirm the magnitude of any residual impacts following additional studies and integration of additional mitigation into Project planning.
4. Undertake a net gain strategy to confirm the significance of residual impacts and assess the feasibility of ACA actions to address impacts and reduce regional pressures on features. Feasibility will be based on different criteria to ensure they deliver biodiversity- and people-positive outcomes. This work will also include further engagement with stakeholders including net gain implementing partners. Currently, pending results of residual impacts assessment (see point 2), net gains are focused on conservation and restoration of *Posidonia* meadows.
5. Develop detailed net gain implementation actions including a qualitative assessment of how net gains will be achieved including costings and implementation timeline and monitoring approach. These can be integrated into the BAP once complete.

11 BAP implementation

This BAP will be implemented through the application of measures presented in an updated BMP. This will be delivered by a team of environmental managers, with oversight from the ESPIU. In addition, the Contractor is required to develop a Biodiversity Management and Worksite Restoration Plan, which should be consistent with the content of the updated BMP. Specific roles related to the delivery of net gains will be defined following completion of the net gain strategy. Table 17 provides an overview of the different roles and responsibilities related to implementation of this measures in this BAP.

Table 17: Roles and responsibilities associated with implementation of the BAP

Role	Responsibility	Details
Biodiversity coordination and oversight (includes implementation of BMP and BAP)	ESPIU (STEG)	- Ensure that the BMP is up to date (incorporating the requirements in this BAP and including the results of the supplementary ecological assessment) and is implemented effectively - Coordinate biodiversity aspects of project procurement in tender documents and contracts - Ensure that the BMP and the Biodiversity Management and Worksite Restoration Plan are consistent and incorporate all appropriate measures - Coordinate implementation of biodiversity mitigation and monitoring measures, including ACAs - Audit the implementation of the BMP and the Biodiversity Management and Worksite Restoration Plan, including monitoring and adaptive management actions - Ensures that any ongoing adaptive management approaches are incorporated into revised BMPs - Ensure that net gains are delivered in relation to ACAs
	HSE Manager (Construction Contractor)	Ensures that: - the Biodiversity Management and Worksite Restoration Plan is up to date and appropriate and ensuring that it is implemented effectively

Role	Responsibility	Details
		- mitigation and monitoring actions are carried out in timely fashion as per specific requirements - Identifies and proposes measures for adaptive management are incorporated into the Biodiversity Management and Worksite Restoration Plan - Ensures that any adaptative management changes are communicated to ESPIU to allow the BMP to be updated in a consistent manner
	Environment Manager (Construction Contractor)	- Oversee the implementation of the Biodiversity Management and Worksite Restoration Plan and BMP including site activities pertaining to implementation - Interact with contractor and sub-contractor personnel and instructs them on the implementation of the mitigation measures contained in the Biodiversity Management and Worksite Restoration Plan and BMP - Keep track of monitoring results and other reporting mechanisms and ensure corrective measures are implemented - Lead synthesis and dissemination of monitoring and evaluation reports.
Implementation of on-site mitigation measures	Construction Contractor	- Responsible for complying with all relevant national and international legislation and adhere to all site-based mitigation and monitoring measures specified in Biodiversity Management and Worksite Restoration Plan and BMP. During construction, the Construction Contractor will assume overall responsibility for implementation and monitoring of the Biodiversity Management and Worksite Restoration Plan and related BMP components

Role	Responsibility	Details
Support and biodiversity expertise	Environmental and species specialists (external third parties employed by the Construction Contractor)	- 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 implementation reports - Propose changes and integrations to the mitigation and monitoring activities as required, the proposed changes shall be evaluated and approved by STEG's Management.
Conservation action partners	Conservation organisation(s) and initiatives (external third parties)	- Implement conservation actions, focused around *Posidonia* conservation and restoration (to be confirmed through net gain strategy) - Undertake ongoing monitoring to demonstrate program effectiveness - Report back to ESPIU on implementation success and lessons learned

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