

10 Nature Conservation

- 10.1 Introduction
- 10.2 Assessment Methodology
- 10.3 Baseline Conditions
- 10.4 Predicted Impacts
- 10.5 Mitigation Measures
- 10.6 Residual Impacts
- 10.7 Cumulative Effects
- 10.8 Transboundary Effects
- 10.9 Uncertainty
- 10.10 Summary

10 Nature Conservation

10.1 Introduction

This chapter of the Environmental Statement (ES) considers the impact of the proposed Eastside development on nature conservation interests and therefore concerns impacts on designated nature conservation areas and the protection they are afforded under legislation.

In addition to informing the Environmental Impact Assessment (EIA) process, this chapter of the ES also informs the Appropriate Assessment process under the EC Habitats Directive. In accordance with the Town Planner's Scoping Opinion (Government of Gibraltar (GoG) 2005 – see Appendix A), it has been necessary to include this information because the EIA process identified that Eastside could have potentially significant effects on a species protected under the EC Habitats Directive, namely *Patella ferruginea*, and therefore this species is subject to impact assessment. The intertidal ecology survey (see Section 9.3) identified 24 individuals of this species along Gibraltar's east coast.

In addition to information concerning *P. ferruginea*, this chapter concerns impacts on a protected area – the Southern Waters of Gibraltar Marine Nature Area.

Finally, this chapter of the ES also considers the potential for habitat change and creation as a result of the proposed Eastside development. The potential for habitat creation was identified during consultation with Gibraltar Ornithological and Natural History Society (GONHS) and is identified in the Town Planner's Scoping Opinion which recommends “that consideration be given to the opportunities for the creation of littoral and coastal habitat and specifically the provision of artificial ‘natural’ habitats to include rocky shore, sandy areas, a lagoon and reedbeds, as well as viewing facilities.”

The current proposal regarding World Heritage Status is currently under review.

10.2 Assessment Methodology

10.2.1 Data Collection

This is as described in Section 9.2.

10.2.2 Subtidal and Intertidal Survey

This is as described in Section 9.2.

10.2.3 Appropriate Assessment – Protected Sites

Appropriate Assessment is a requirement of Article 6(3) of the Habitats Directive (92/43/EEC) and extends to all European sites that may be the subject of significant effects due to the implementation of a plan or project. A European site includes Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and any other site that a member state and the EU agree to be a Site of Community Importance. Its objective is to assess the implications of a proposed plan or project in respect of a site's conservation objectives (i.e. the reasons why the site was designated). The conclusions of an Appropriate Assessment should allow the regulatory authority to ascertain whether the plan or project would adversely affect the integrity of the site. Appropriate Assessment applies to a plan and project that is not situated within a European site if there is the potential for that plan or project to have significant effects on a European site.

In the case of Eastside, it is the Southern Waters of Gibraltar Marine Nature Area (MNA) and the Rock of Gibraltar Nature Conservation Area (NCA) that could be the subject of significant effects, even though Eastside is not situated within either site. In addition, we have been advised that a Special Area of Conservation (SAC) has now been formally

approved by GoG. As no formal information is currently available we have not assessed potential impacts to the SAC associated with the Eastside development.

10.2.4 *Appropriate Assessment – Protected Species*

As noted in the Town Planner’s Scoping Opinion, it is necessary to conduct “a marine survey to identify the presence of any protected species under the EU Habitats Directive” and conduct an appropriate assessment “in the event that any protected species, such as *Murex brandaris* and *Patella ferruginea*, are located.”

Since Appropriate Assessment relates to the EC Habitats Directive and *M brandaris* is not included under Annex IV (a) of the EC Habitats Directive, then technically *M brandaris* is not included in the Appropriate Assessment.

10.2.5 *Appropriate Assessment – Methodology*

Given this remit, the key stages of the methodology for the Appropriate Assessment process is:

- Identify, by data collection, the presence of protected sites under the EC Habitats Directive;
- Locate, by survey, the presence of protected species under the EC Habitats Directive;
- Undertake, by numerical modelling, an assessment of Eastside’s potential to have significant environmental effects on protected sites and species; and
- Provide, by qualitative description, information to inform an Appropriate Assessment to be undertaken by GoG.

10.2.6 *Habitat Creation Opportunities*

Opportunities for littoral and coastal habitat creation, including rocky shore and sandy areas, have been considered through Eastside’s architecture and design process for the marine structures.

10.3 **Baseline Conditions**

10.3.1 *Legislation*

Two pieces of legislation are in place to protect the nature conservation interests of Gibraltar. These are:

- European Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Fauna and Flora (i.e. the EU Habitats Directive); and
- Nature Protection Ordinance 1991 (Ord. No. 91-11) and amendments.

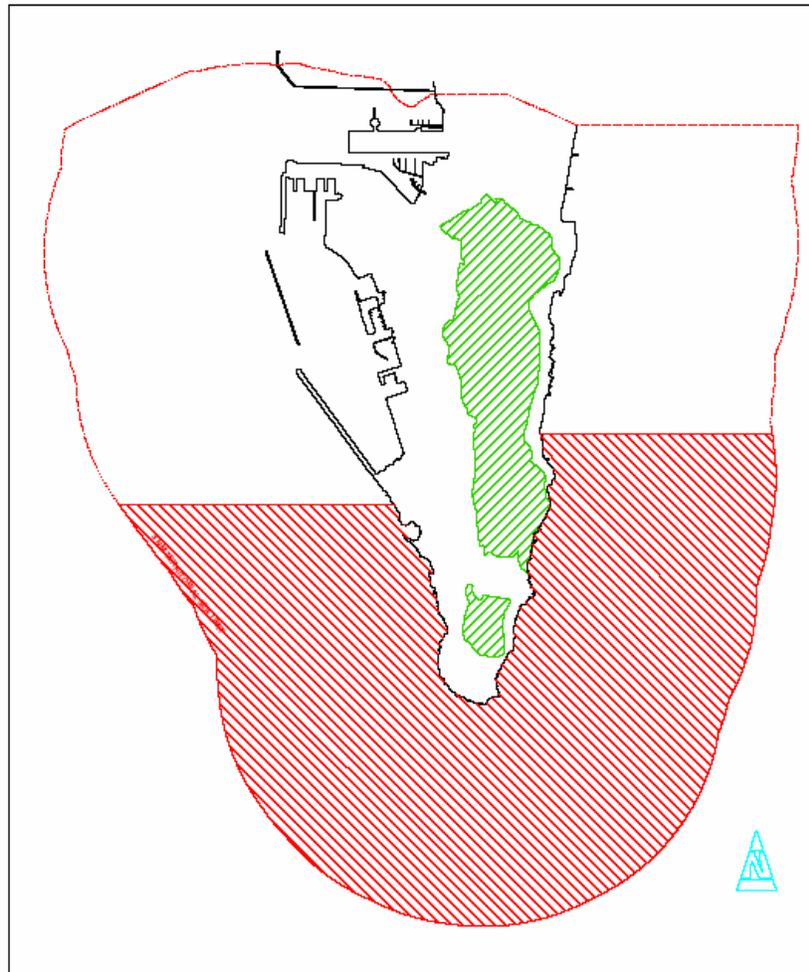
This legalisation establishes protected sites and species.

10.3.2 *Protected Areas*

Gibraltar has two European sites designated under the EU Habitats Directive, via the Nature Protection Ordinance, which form part of the European Union’s Natura 2000 network of sites; namely (see Figure 10.1):

- Southern Waters of Gibraltar Marine Nature Area; and
- Rock of Gibraltar Nature Conservation Area.

In addition, we have been advised that a Special Area of Conservation (SAC) has now been formally approved by GoG. As no formal information is currently available we have not assessed potential impacts to the SAC associated with the Eastside development.

Figure 10.1 Geographical Extent of Gibraltar's European Sites

Key: red shading = Southern Waters of Gibraltar MNA, green shading = Rock of Gibraltar NCA

The MNA covers a marine area of 2600ha including the Mediterranean Sea to the east, the Straits of Gibraltar to the south, and the Bay of Gibraltar to the west. The nutrient-rich waters range in depth from 0m to 700m and attract diverse marine life. Habitats within the MNA include natural and artificial reefs and sandy seabed.

The Strait of Gibraltar provides an important connection for marine life migrating between the Atlantic Ocean and Mediterranean Sea. The waters are an important crossing point for migrating birds between Europe and Africa.

The MNA hosts a number of EU Habitats Directive Annex IV (a) species of animals, namely:

- The red Mediterranean limpet *Patella ferruginea*;
- The date mussel *Lithophaga lithophaga*;
- The noble pen shell *Pinna nobilis*; and
- Various migratory cetaceans.

According to the MNA's Standard Data Form (compiled by GoG in June 2004), there is monitoring for littoral organisms but no management plan, so for the purpose of this impact assessment, the conservation objective for the seabed habitat and protected species is assumed to be no adverse affect on integrity.

The Rock of Gibraltar NCA comprises maquis (60%), sea cliffs (22%), dry grassland (8%) and a range of other habitat types. Olive (*Olea sp*) dominated maquis is present on the west side of the rock. Sea cliffs are present to the north and east.

The site description includes the sea cliffs near the Ammunition Jetty. It is assumed that Eastside could have significant effects on the sea caves, and therefore it is this aspect of the NCA that is subject to impact assessment.

According to the NCA's Standard Data Form (compiled by GoG in June 2004), there is no site management and plan for the sea caves, so for the purpose of this impact assessment, the conservation objective for the sea caves is assumed to be no adverse affect on integrity.

10.3.3 *Protected Species*

Subtidal and intertidal surveys were undertaken to identify and locate any Annex IV species. Although the MNA hosts a number of EU Habitats Directive Annex IV (a) species of animals, as listed above, only the intertidal survey identified a protected species - *P ferruginea*. In total, 24 *P ferruginea* individuals were found along the coastline of the study area to the south of Eastside (see Figure 9.1).

The surveys did not identify the presence of *L lithophaga* and *P nobilis*, although individuals of these species may be present in the intertidal and/or subtidal areas off Gibraltar's east coast. For example, the date mussel (*L lithophaga*) was observed being collected from the intertidal area around the Caleta Hotel whilst the project's subtidal surveys were taking place. Since the mussel buries itself into the substrate, collection involves substantial damage to the habitat.

Various cetacean species are prominent or occasionally seen in Gibraltar (see Section 9.3) and according to the BAP (GONHS, 2006), cetaceans are seen in Gibraltar Bay and in the Strait.

10.4 *Predicted Impacts*

10.4.1 *Construction Phase: Impact on the Integrity of the Southern Waters of Gibraltar Marine Nature Area*

The dredging and marine construction works for Eastside have the potential to have significant effects on the conservation objectives for the MNA by adversely affecting the site's integrity in terms of habitat change to the sandy seabed and rock outcrops (see Figure 9.2).

The principal issues with the potential to affect the seabed and rock habitats are:

- Direct habitat loss and/or disturbance;
- Habitat loss / disturbance due to suspended sediment; and
- Habitat loss / disturbance due to sediment deposition.

As assessed in Section 9.4, there will be direct habitat loss of 850m of intertidal shoreline (at the rubble tip), disturbance of 65.8ha by 1.52m depth of sandy seabed (i.e. ~ 1 million cubic metres) at the northern borrow area, and disturbance of 158.7ha by 0.63m depth of sandy seabed (i.e. ~ 1 million cubic metres) at the southern borrow area. Of these effects, only dredging at the southern borrow area affects the MNA in terms of direct habitat loss and disturbance.

As assessed in Sections 6.4 and 9.4, there will be peak maximum total suspended solid (TSS) concentrations at and above 512mg/l locally around Eastside and at the northern and southern borrow areas but reducing considerably with distance from the dredger to 1mg/l depending on the currents and wind conditions, with the longest period of these conditions expected to be in the order of six weeks. Of these effects, only dredging at the southern borrow area affects the MNA in terms of significant TSS concentrations in sediment plumes.

As assessed in Sections 5.4 and 9.4, there will be peak sediment deposition at and above 0.1m (100mm) locally around Eastside and at the northern and southern borrow areas but

reducing considerably with distance from the dredger to 0mm, depending on the currents and wind conditions. Of these effects, only dredging at the southern borrow area affects the MNA in terms of significant sediment deposition.

Dredging at the southern borrow area has the potential to adversely affect the integrity of the sandy seabed habitat at and around the dredging locations. The maximum impact magnitude for direct loss is 158.7ha by 0.63m depth, i.e. the entire dredged area. The maximum impact magnitudes for sediment plumes and sediment deposition are shown in Figures 10.2 and 10.3.

Figure 10.2 Maximum TSS Concentrations in the MNA Due to Dredging at the Southern Borrow Area and Works at the Eastside Development

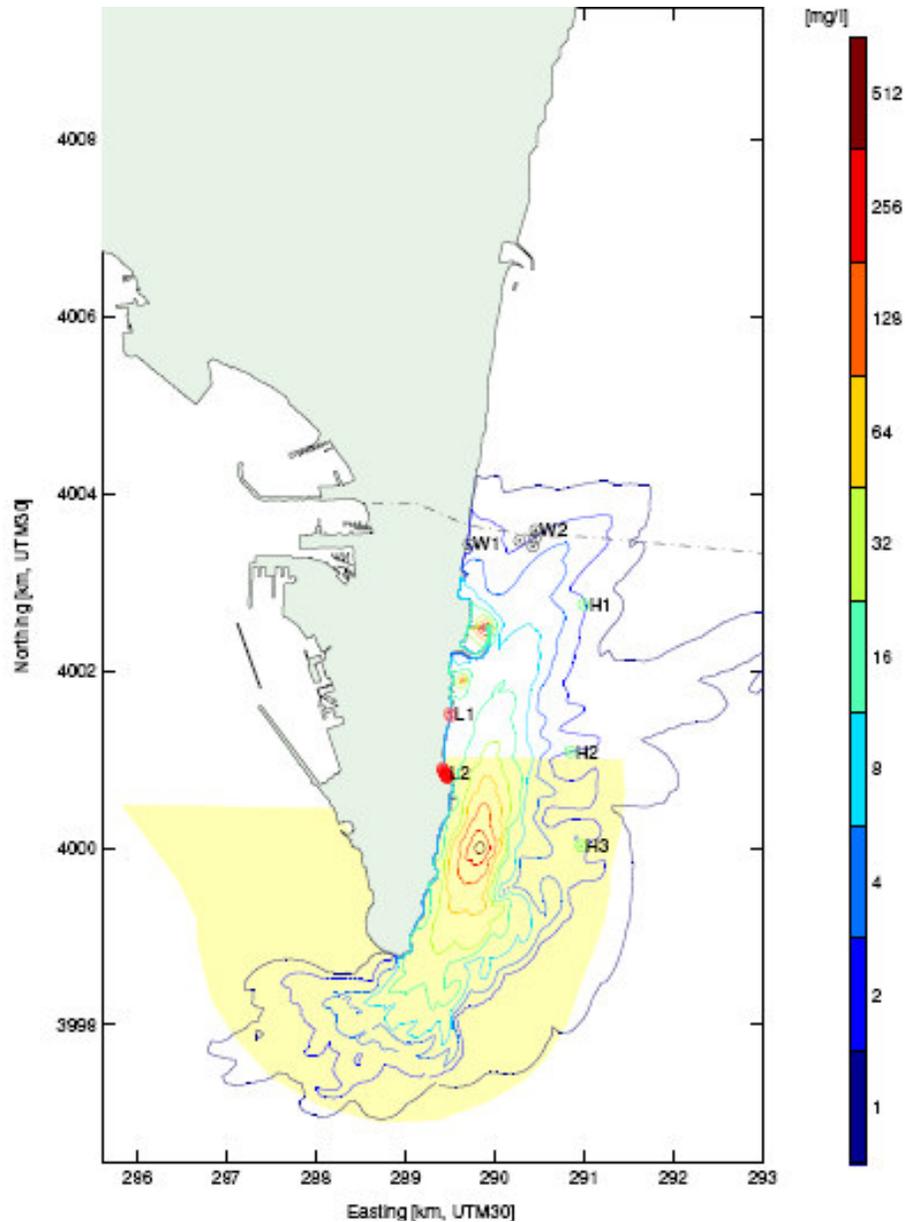
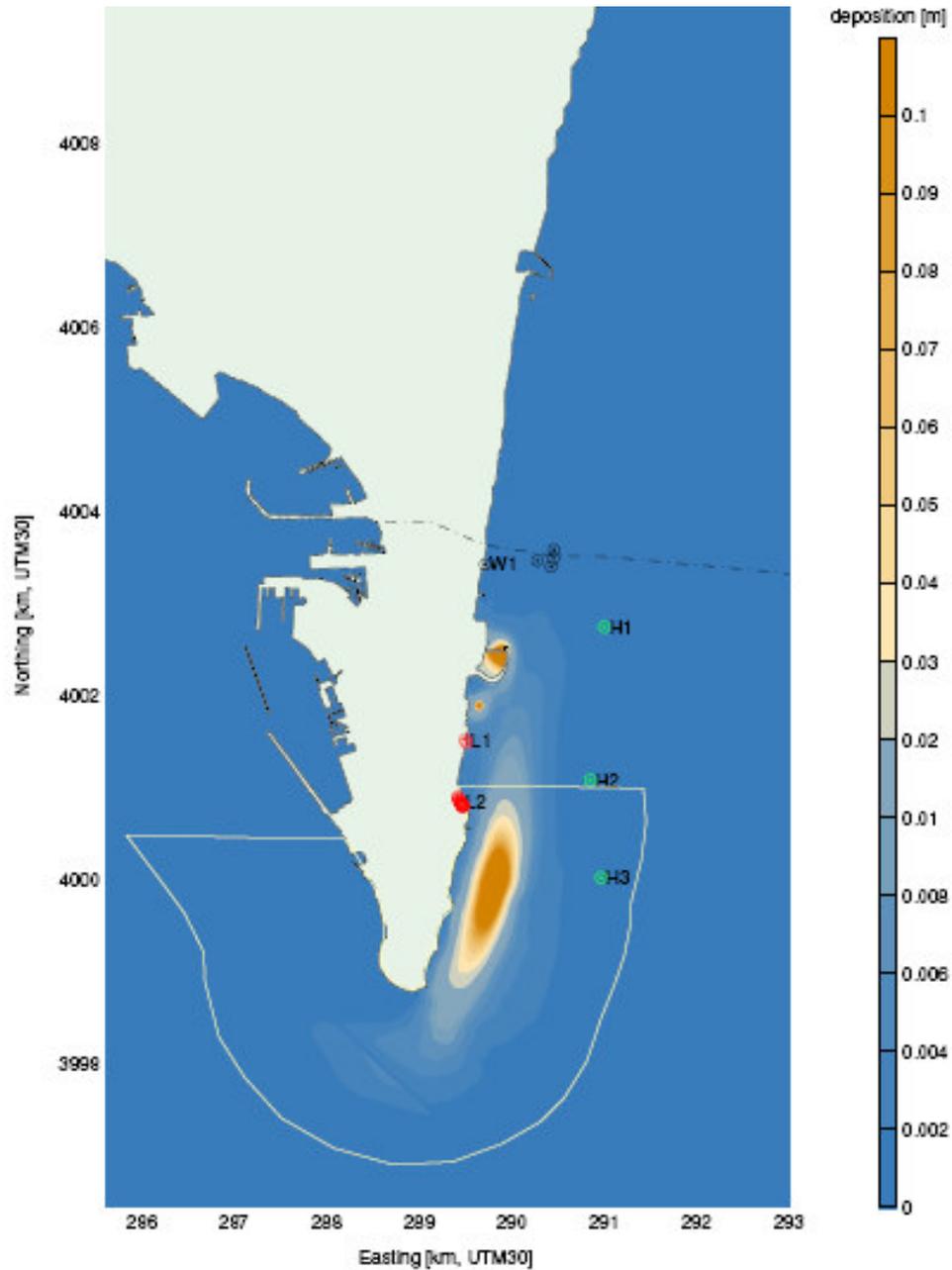


Figure 10.3 Maximum Sediment Deposition Thicknesses in the MNA Due to Dredging at the Southern Borrow Area and Works at the Eastside Development



Given the previous dredging at the southern borrow area and the ongoing conch rake fishing, it is likely that the existing sandy seabed habitat within the MNA is relatively impoverished in terms of its nature conservation importance. However, continued dredging at the southern borrow area for Eastside is likely to only worsen this situation, and therefore a minor adverse impact on the integrity of the MNA is predicted.

Dredging at the southern borrow area has no potential to adversely affect the integrity of the rocky outcrops due to direct loss and negligible potential to adversely affect the integrity of the rocky outcrops due to sediment plumes and sediment deposition (see Section 9.4). No impact on the integrity of the MNA is predicted.

10.4.2 Construction Phase: Impact on the Integrity of the Rock of Gibraltar Nature Conservation Area

The dredging and marine construction works for Eastside have the potential to have significant effects on the conservation objectives of the NCA by adversely affecting the site's integrity in terms of habitat change to the sea caves near Ammunition Jetty (location just south of L2 on Figure 9.1).

The principal issues with the potential to affect the sea cave habitats are:

- Direct habitat loss and/or disturbance;
- Habitat loss / disturbance due to suspended sediment; and
- Habitat loss / disturbance due to sediment deposition.

As assessed in Section 9.4, there will be direct habitat loss of 900 metres of intertidal shoreline (at the rubble tip), disturbance of 65.8ha by 1.52m depth of sandy seabed at the northern borrow area, and disturbance of 158.7ha by 0.63m depth of sandy seabed at the southern borrow area. None of the losses will affect the integrity of the sea cave habitats.

As assessed in Sections 6.4 and 9.4, there will be peak TSS concentrations at and above 512mg/l locally around Eastside and at the northern and southern borrow areas, reducing considerably with distance from the dredger to 1mg/l depending on the currents and wind conditions, with the longest period of these conditions expected to be in the order of six weeks. Of these effects, only dredging at the southern borrow area affects the NCA in terms of sediment plumes, but the TSS concentrations will be low and are predicted to have a negligible impact on integrity.

As assessed in Sections 5.4 and 9.4, there will be peak sediment deposition at and above 0.1m (100mm) locally around Eastside and at the northern and southern borrow areas, reducing considerably with distance from the dredger to 0mm, depending on the currents and wind conditions.

Of these effects, only dredging at the southern borrow area affects the NCA in terms of sediment deposition, but the deposited sediment thicknesses will be low and are predicted to have a negligible impact on integrity.

Given the above, a negligible impact on the integrity of the NCA is predicted.

10.4.2 Construction Phase: Impact on Protected Species under Annex IV(a) to the EU Habitats Directive

Of the protected species listed under Annex IV of the EC Habitats Directive, only one - *P ferruginea* – was recorded during the intertidal and subtidal ecological surveys undertaken for the EIA process. In total, 24 *P ferruginea* individuals were found along the coastline of the study area to the south of Eastside (see Figure 9.1).

The surveys did not identify the presence of *L lithophaga* and *P nobilis*, although individuals of these species may be present in the subtidal areas concerned and individuals of *L lithophaga* were in fact observed being taken by fishermen near the Caleta Hotel during one of the subtidal surveys, off Gibraltar's east coast. However, given that the presence of *L lithophaga* and *P nobilis* was not confirmed by the survey work, it has to be assumed that these species are not present and that they have not been included in this assessment.

According to the BAP (GONHS, 2006), cetacean species are seen in Gibraltar Bay and in the Strait, but have not been observed within the study area. Therefore these species are excluded from this assessment.

The dredging and marine construction works for Eastside have the potential to have significant effects on the conservation objectives for the MNA by adversely affecting the site's integrity in terms of habitat change of the sandy seabed and rock outcrops (see Figure 9.2).

The principal issues with the potential to affect *P ferruginea* are:

- Direct species loss and/or disturbance;
- Species loss / disturbance due to suspended sediment; and
- Species loss / disturbance due to sediment deposition.

As assessed in Section 9.4, there will be direct habitat loss of c.900m of intertidal shoreline (at the rubble tip), disturbance of 65.8ha by 1.52m depth of sandy seabed at the northern borrow area, and disturbance of 158.7ha by 0.63m depth of sandy seabed at the southern borrow area. None of these losses will affect *P ferruginea*.

As assessed in Sections 6.4 and 9.4, there will be peak TSS concentrations at and above 512mg/l locally around Eastside and at the northern and southern borrow areas but reducing considerably with distance from the dredger to 1mg/l depending on the currents and wind conditions, with the longest period of these conditions expected to be in the order of six weeks. Of these effects, only dredging at the southern borrow area has the potential to affect *P ferruginea*, and the effect of TSS concentrations is assessed as a minor adverse impact (see Section 9.4).

As assessed in Sections 5.4 and 9.4, there will be peak sediment deposition at and above 0.1m (100mm) locally around Eastside and at the northern and southern borrow areas, reducing considerably with distance from the dredger to 0mm, depending on the currents and wind conditions. Of these effects, only dredging at the southern borrow area has the potential to affect *P ferruginea*, but the impact of sediment deposition is assessed as negligible (see Section 9.4).

Overall, given the relatively small increases in TSS concentrations predicted to affect *P ferruginea* under the worst case impact scenarios and some evidence that this species may be able to tolerate this change, a minor-moderate adverse impact on the integrity of this species is predicted. An assessment of minor significance has been made - despite the rarity of this species - against a background of this species being exposed to increased TSS concentrations due to ongoing regular sediment disturbance along the coast caused by conch rake fishing and dredging at the southern borrow area. The impact could be assessed to be of moderate significance if the impact is considered sufficient to potentially hinder the short-term future development of *P ferruginea* in terms of reproduction and colonisation of new sites.

10.4.3 *Opportunities for Littoral and Coastal Habitat Creation*

Although not part of the Appropriate Assessment process, the construction of Eastside may present an opportunity to create new littoral and coastal habitat.

As identified in Section 9.4, given the nature of the reclamation for Eastside, it can be assumed that the entire length of the rubble tip (and the associated subtidal and intertidal habitat and species) will be lost. This is a length of shoreline that is calculated to be approximately 900m. The loose rubble provides most of the rocky coastline in this part of Gibraltar, but it is a highly unstable environment which is not conducive to the settlement of rocky intertidal organisms.

The proposed reclamation will be protected from wave action by rock and/or concrete armour units along its seaward faces. These materials will provide new rocky substrate within the intertidal and subtidal areas thereby extending the rocky littoral habitat over the existing environmental conditions. The reclamation works will result in the creation of more than 900 metres of rocky coastline habitat. Given that rocky intertidal habitat elsewhere provides the most diverse habitat, the additional rock substrate provided by Eastside is predicted to have a minor beneficial impact on subtidal and intertidal ecology.

It should be noted here however that better results in terms of colonisation by new habitats would be obtained by using a rocky limestone revetment as opposed to concrete (i.e. using Accropodes). The chemical and physical characteristics of limestone are known to make it

better suited for colonisation by a wide range of marine organisms. A local example indicates, for instance, that the endangered *P. ferruginea* exist on limestone blocks along the western end of the runway and along the north Mole on limestone blocks, but *not* on the adjoining concrete elements. Unfortunately the limited availability of the correct size and weight of limestone rocks, required to construct the revetment, makes their use impractical.

10.4.4 *Operation Phase*

No impacts have been identified for ecology for the operational phase of Eastside as a result of direct habitat loss, suspended sediment and sediment deposition. However, it should be noted that the minor beneficial impact identified in Section 10.4 concerning littoral and coastal habitat enhancement will come into effect after construction (i.e. in the development's operational phase).

10.5 **Mitigation Measures**

10.5.1 *Construction Phase: Impact on the Integrity of the Southern Waters of Gibraltar Marine Nature Area*
Should the predicted impact on integrity be assessed by regulators as unacceptable under the terms of the EC Habitats Directive, then a suitable mitigation measure would be to avoid dredging in the southern borrow area.

If any dredging is undertaken at the southern borrow area, it is recommended that monitoring be conducted at sites selected with relevant stakeholders (e.g. GONHS) for habitat and species recovery. In particular, it may be necessary to monitor the known sites directly at the borrow area that will be lost due to the dredging and at sites around the borrow area that will be indirectly affected by sediment deposition from the dredging. The monitoring will be established as part of an Environmental Management Plan (EMP).

10.5.2 *Impact on the Integrity of the Rock of Gibraltar Nature Conservation Area*

No mitigation measures are recommended in order to protect the NCA's integrity.

10.5.3 *Construction Phase Impact on Protected Species under Annex IV(a) to the EU Habitats Directive*

In order to reduce the risk of impact to *P. ferruginea*, it is recommended that consideration is given to either undertaking more dredging from the northern borrow area, or undertaking dredging at the southern borrow area when prevailing currents and/or winds limit the transport of sediment plumes towards the shore.

If any dredging is undertaken at the southern borrow area, it is recommended that monitoring be conducted at sites selected with relevant stakeholders (e.g. GONHS) for dredging induced suspended sediment (as TSS concentrations in mg/l) and sediment deposition (as thickness in mm). In particular, it may be necessary to monitor the known sites of *P. ferruginea*. The monitoring will be established as part of an EMP.

10.5.4 *Opportunities for Littoral and Coastal Habitat Creation*

No mitigation measures are recommended regarding habitat creation.

10.6 **Residual Impacts**

10.6.1 *Construction Phase: Impact on the Integrity of the Southern Waters of Gibraltar Marine Nature Area*
The measures identified in Section 10.5 would avoid direct losses and significantly reduce the magnitude of sediment plumes and deposition affecting sandy seabed habitat within the MNA, leaving a residual negligible impact on site integrity.

10.6.2 *Impact on the Integrity of the Rock of Gibraltar Nature Conservation Area*

A negligible residual impact is predicted on the integrity of the NCA.

10.6.3 *Construction Phase: Impact on Protected Species under Annex IV(a) to the EU Habitats Directive*

With the mitigation in place, the potential for a moderate adverse impact on species integrity will have been addressed and there should remain a short-term minor adverse residual impact only.

10.6.4 *Opportunities for Littoral and Coastal Habitat Creation*

Due to a net gain in habitat, there will be a minor beneficial residual impact.

10.7 **Cumulative Effects**

10.7.1 *Construction Phase: Cumulative Effect on the Integrity of the Southern Waters of Gibraltar Marine Nature Area*

The dredging and marine construction works for Eastside in combination with other plans or projects (see Section 4.10) have the potential to have significant effects on the conservation objectives for the MNA by adversely affecting the site's integrity in terms of habitat change to the sandy seabed and rock outcrops (see Figure 9.2).

At the time of writing there was no information available on the proposed GoG works to the beaches at Catalan Bay. We are therefore unable to assess the potential for in-combination (cumulative) effects associated with beach works at Catalan Bay.

Dredging and reclamation is required for Eastside but not for the Both Worlds project at Sandy Bay (see Figure 9.6). Dredging is predicted to take place at the proposed northern and southern borrow areas for Eastside only and reclamation and marine works are predicted to take place for Eastside and the Both Worlds project (small reclamation only).

The principal issues with the potential to affect the seabed and rock habitats are:

- Direct habitat loss and/or disturbance;
- Habitat loss / disturbance due to suspended sediment; and
- Habitat loss / disturbance due to sediment deposition.

The Both Worlds project requires some land reclamation which will cause direct habitat loss, but this is outside the MNA. As a result no cumulative effect on the integrity of the MNA associated with this project is predicted.

10.7.2 *Cumulative Effect on the Integrity of the Rock of Gibraltar Nature Conservation Area*

The dredging and marine construction works for Eastside in combination with other plans or projects (see Section 4.10) have the potential to have significant effects on the conservation objectives for the NCA by adversely affecting the site's integrity in terms of habitat change to the sea caves near Ammunition Jetty (location just south of L2 on Figure 9.1).

At the time of writing there was no information available on the proposed GoG works to the beaches at Catalan Bay. We are therefore unable to assess the potential for in-combination (cumulative) effects associated with beach works at Catalan Bay.

The principal issues with the potential to affect the sea cave habitats are:

- Direct habitat loss and/or disturbance;
- Habitat loss / disturbance due to suspended sediment; and
- Habitat loss / disturbance due to sediment deposition.

In addition to the impacts described for Eastside (see Section 10.4), the Both Worlds project requires some land reclamation which will cause direct habitat loss, but this is outside the NCA. In summary, none of the losses will affect the integrity of the sea cave habitats.

10.7.3 *Cumulative Effect on Protected Species under Annex IV(a) to the EU Habitats Directive*

The dredging and marine construction works for Eastside in combination with other plans or projects (see Section 4.10) have the potential to have significant effects on protected species listed under Annex IV of the EC Habitats Directive. Only one species - *P. ferruginea* – was found to be present by the intertidal and subtidal ecology surveys undertaken for the

EIA process. In total, 24 *P. ferruginea* individuals were found along the coastline to the south of Eastside and adjacent to the Both Worlds project at Sandy Bay (see Figure 9.1).

At the time of writing there was no information available on the proposed GoG works to the beaches at Catalan Bay. We are therefore unable to assess the potential for in-combination (cumulative) effects associated with beach works at Catalan Bay.

The surveys did not identify the presence of *L. lithophaga* and *P. nobilis*, and although individuals of these species may be present in the subtidal areas concerned and individuals of *L. lithophaga* were in fact observed being taken by fishermen near the Caleta Hotel during one of the subtidal surveys, they have not been included in this assessment.

According to the BAP (GONHS, 2006), cetacean species are seen in Gibraltar Bay and in the Strait, but have not been observed in within the study area. Therefore these species are excluded from this assessment.

The principal issues with the potential to affect *P. ferruginea* are:

- Direct species loss and/or disturbance;
- Species loss / disturbance due to suspended sediment; and
- Species loss / disturbance due to sediment deposition.

As assessed in Section 9.7, none of the direct losses associated with Eastside will affect *P. ferruginea*. However, the Both Worlds project is believed to require land reclamation works at the southern end of Sandy Bay and these would cause an unavoidable loss of the benthic habitat and species within the footprint of the reclamation area. The intertidal survey (see Section 9.3 and Appendix F) identified that the intertidal area at this location is mainly composed of hard sandstone, and two *P. ferruginea* individuals were found along this stretch of coastline. In essence, the Both Worlds project's reclamation will replace the existing natural rocky shore habitat with reclaimed land. The reclamation should not directly cause the loss of *P. ferruginea* individuals but a minor adverse cumulative effect is predicted due to the proximity of the reclamation proposed for the Both Worlds project to *P. ferruginea* individuals.

Assuming that the two *P. ferruginea* individuals are not impacted, no mitigation measures are recommended and there will be a minor adverse residual cumulative effect associated with the Both Worlds project.

10.8 Transboundary Effects

There will be no transboundary effects on nature conservation with respect to protected sites and species. There are no European sites (and therefore no protected species) designated under the EC Habitats Directive directly north of Gibraltar's east coast.

10.9 Uncertainty

The results of the modelling studies are valid given the applied assumptions and conditions, including coral and tunicate indicator species to predict impact on rocky outcrop and cave habitats respectively. It should be noted, however, that when there is a significant change in these assumptions, the results may change. For example, the results of the sediment plume modelling may change with different dredging methods, different dredging locations and/or different sediment particle size distribution. In cases of relatively small differences (e.g. in the proportion of fine grained particles in the sediment), then linear scaling of the model results is possible. Uncertainty has been addressed by using the best available data to inform the modelling.

10.10 Summary

This chapter has assessed the potential impacts, cumulative effects and transboundary effects of Eastside on nature conservation. In particular, this chapter considers potential impacts on sites, habitats and species protected under the EC Habitats Directive to inform an

Appropriate Assessment. Impacts could occur due to direct losses and disturbance, dredging induced suspended sediment in the water column, and sediment deposition.

Despite the previous dredging at the southern borrow area and the ongoing conch rake fishing, it is predicted that dredging at the southern borrow area for Eastside (and other plans or projects) is likely to worsen this habitat, and therefore a minor adverse impact on the integrity of the Southern Waters of Gibraltar MNA is predicted. The MNA is a European site designated under the EU Habitats Directive. A potential mitigation measure would be to avoid dredging from the southern borrow area.

No significant impact is predicted on the Rock of Gibraltar NCA. The NCA is a European site designated under the EU Habitats Directive.

Suspended sediment (measured as TSS concentrations) is predicted to adversely affect the red Mediterranean limpet *P ferruginea* under the worst case impact scenarios. *P ferruginea* is protected under Annex IV(a) of the EC Habitats Directive. Therefore, it is recommended that consideration is given to either undertaking more dredging at the northern borrow area, or undertaking dredging at the southern borrow area when prevailing currents and/or winds limit the transport of sediment plumes towards the shore. In addition, stringent monitoring measures will be implemented at the sites where protected species could be affected. Details of all monitoring measures will be included as part of the EMP.

Indirectly, Eastside has the potential to create additional artificial rocky shoreline habitat, which will be a minor benefit to nature conservation.