

8 COASTAL AND TERRESTRIAL ECOLOGY

8.1 EXISTING ENVIRONMENT

- 8.1.1 This section presents a description of the terrestrial and coastal ecology of Poole Harbour and Poole Bay (i.e. the land above mean high water springs) insofar as it is relevant to the proposed scheme, focussing in particular on designated sites. It is recognised that the boundaries of some of these sites (e.g. the Dorset Heaths and Studland Dunes cSAC) extend below the mean high water mark, but effects on these sites are assessed in this section because the designated interest features of the site are considered to be predominantly 'coastal' (e.g. dunes) rather than 'marine'. The potential impacts of the proposed scheme on marine ecological and ornithological interests, and sites designated for these interests, are assessed in Sections 6, 7 and 22.
- 8.1.2 There are a number sites that are designated under international legislation for their terrestrial and coastal nature conservation interest adjacent to Poole Harbour and Poole Bay, namely (these sites comprise a number of SSSIs designated under national legislation):
- Dorset Heathlands Ramsar site (see Figure 8.1);
 - Dorset Heathlands SPA (see Figure 8.2);
 - Dorset Heaths cSAC (see Figure 8.3);
 - Dorset Heaths (Purbeck and Wareham) and Studland Dunes cSAC (see Figure 8.3); and,
 - Isle of Portland to Studland Cliffs cSAC (see Figure 8.3).
- 8.1.3 The following paragraphs provide an overview of the primary interest features of each of the above sites. The following information is largely derived from the citations for each site.
- 8.1.4 The *Dorset Heathlands Ramsar site* is of international importance because it supports particularly good examples of wet heathland habitats which are characteristic of the heathlands of the Atlantic biogeographical region of western Europe and, therefore, qualifies under Criterion 1a of the Ramsar Convention. Northern wet heaths with cross-leaved heath and bog mosses are the most ubiquitous feature of these habitats covered by the Ramsar site, although the site also contains examples of southern wet heaths with Dorset heath and cross-leaved heath (Criterion 1d). The site also meets Criterion 2b of the Ramsar Convention because of the species richness and high ecological diversity of the mire communities and their associated transition zones. The Ramsar site comprises a suite of 39 SSSIs and, although much of the Ramsar site is situated well inland, parts of the site border Poole Harbour (e.g. to the south of the Wareham Channel) and Poole Bay (e.g. at Shell Bay and Studland Bay).
- 8.1.5 The *Dorset Heathlands SPA* qualifies under Article 4.1 of the Birds Directive as it is used regularly by 1% or more of the Great Britain population of Dartford warbler, nightjar, woodlark, hen harrier and merlin. As for the Dorset Heathlands Ramsar site described above, parts of the SPA border Poole Harbour and Poole Bay, and Brownsea Island is included within the Dorset Heathlands SPA.

8.1.6 The *Dorset Heaths* cSAC is designated for the following European priority interest features:

- a) Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*

8.1.7 In addition, the site is also designated for the following interest:

- b) Alkaline fens;
- c) *Coenagrion mercuriale* (southern damselfly);
- d) Depressions on peat substrates of the *Rhynchosporion*;
- e) European dry heaths;
- f) *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils;
- g) Northern Atlantic wet heaths with *Erica tetralix*;
- h) Old acidophilous oak woods with *Quercus robur* on sandy plains; and,
- i) *Triturus cristatus* (great crested newt).

8.1.8 The cSAC comprises 37 SSSIs and relatively small parts of the site border Poole Harbour; the southern part of Brownsea Island is included within the cSAC.

8.1.9 The *Dorset Heaths (Purbeck and Wareham)* and *Studland Dunes* cSAC contains important examples of the following habitats and species listed on Annex I and Annex II of the Habitats Directive:

- a) Embryonic shifting dunes;
- b) Shifting dunes along the shoreline with *Ammophila arenaria*;
- c) Atlantic decalcified fixed dunes;
- d) Humid dune slacks;
- e) Oligotrophic waters containing very few minerals of sandy plains, *Littorelletalia uniflorae*;
- f) Northern Atlantic wet heaths with *Erica tetralix*;
- g) Temperate Atlantic wet heaths with *Erica ciliaris* and *Erica tetralix*;
- h) European dry heaths;
- i) *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils;
- j) Depressions on peat substrates of the *Rhynchosporion*;
- k) Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*;
- l) Alkaline fens;
- m) Old acidophilous oak woods with *Quercus robur* on sandy plains;
- n) Bog woodland;
- o) *Coenagrion mercuriale* (southern damselfly); and,
- p) *Triturus cristatus* (great crested newt).

8.1.10 The site comprises 12 component SSSIs and borders Poole Harbour in the Wareham Channel area and Shell Bay and Studland Bay.

8.1.11 The *Isle of Portland to Studland Cliffs* cSAC contains the following Annex I and II habitats and species:

- a) Vegetated sea cliffs of the Atlantic and Baltic coasts;
- b) Semi-natural dry grasslands and scrubland facies on calcareous substrates;

- c) Annual vegetation of drift lines; and,
- d) *Gentianella anglica* (early gentian).

8.1.12 In addition to the above, there are three National Nature Reserves (NNR) which are declared under the National Parks and Access to the Countryside Act 1949 or Wildlife and Countryside Act 1981; all NNRs are also SSSIs.

8.2 POTENTIAL IMPACTS ASSOCIATED WITH THE APPROACH CHANNEL DEEPENING

Construction phase

Potential for direct impact on sites designated for coastal and terrestrial ecological interest

8.2.1 There is no potential for the approach channel deepening to have a direct impact on any site designated for coastal or terrestrial ecological interest (i.e. interests above the mean high water mark) given that all of the dredge would take place within the subtidal zone. The potential for indirect impacts (e.g. due to effects on the hydrodynamic regime) arise on completion of the construction phase and, therefore, are addressed in below ('Operational phase'). Therefore, **no impact** is predicted.

Mitigation and residual impact

No mitigation measures are required and there would be **no residual impact**.

Operational phase

Potential for indirect impact on sites designated for coastal and terrestrial ecological interest

8.2.2 The proposed channel deepening has the potential to have an impact on sites designated for coastal and terrestrial ecological interest around Poole Harbour and Poole Bay via effects on coastal processes that may arise. Such effects are described in detail in Section 3.

8.2.3 In Swanage Bay it is predicted that there would be no change to the existing hydrodynamic processes and, furthermore, that coastal processes would not be affected by the proposed deepening. In Studland Bay, some minor changes to tidal currents are predicted but such changes are local to the area of the channel and are not predicted to influence the coastline. There would be little change in wave conditions over much of Studland Bay and minor reductions in wave height in the north of the Bay. The northward drift of beach sand would be slightly enhanced potentially leading to a tendency for erosion in the centre of Studland Bay. Very minor changes to current speeds are also predicted in the entrance to Poole Harbour and wave heights are predicted to marginally increase on the Harbour side of the chain ferry and decrease in Shell Bay.

8.2.4 Overall, any effects of the scheme on the hydrodynamic regime in the above areas and elsewhere within Poole Bay are predicted to be minor, although it is predicted that there

would be a tendency for erosion in the centre of Studland Bay. This erosion would occur within the boundaries of the Dorset Heaths and Studland Dunes cSAC given that the boundary of this site extends across the intertidal area. In view of the existing northwards drift of material, the changes due to the proposed channel deepening are very minor, although this change is viewed as negative for the area where erosion would occur. It should be noted that there would be an associated build up of sediment further north. It is predicted that in the foreseeable future, such minor changes would be of **negligible significance** for the coastal and terrestrial ecological interest of this designated site. This predicted change would not have any implications for the Isle of Portland to Studland Cliffs cSAC.

- 8.2.5 Within Poole Harbour, the Dorset Heathlands SPA and Ramsar site and the Dorset Heaths cSAC are designated for their terrestrial ecological interest. Much of Brownsea Island and the Arne area to the west of Poole Harbour are covered by these designations.
- 8.2.6 The proposed channel deepening is predicted to result in some localised changes to coastal processes around the shoreline of Brownsea Island. Wave heights and tidal currents on the south-eastern shoreline of Brownsea Island (to the south of Castle Pier) would marginally increase. This area currently experiences a relatively high rate of erosion. To the north of Castle Pier (i.e. along the frontage of the lagoon on Brownsea Island), tidal current speeds are predicted to decrease.
- 8.2.7 The effects of the proposed scheme to the south of Brownsea Castle would be expected to marginally contribute towards the existing erosion problem along this frontage (the implications of this on coast protection and flood defences in this area are discussed in Section 17). This would not have a direct impact on sites designated for coastal and terrestrial ecological interest, but would contribute to the existing problem of protection of such sites from tidal inundation. To the north of Brownsea Castle given that the tidal currents are predicted to decrease, with the result that this area would become less erosive and possibly accrete.
- 8.2.8 Although making a small contribution to an existing problem in the south-eastern area of Brownsea Island, the scheme would not in itself have an impact on the integrity of the existing coastal defences. In the long term, the existing erosion at this location would, without further intervention, be expected to result in failure of the existing defences that are present. Such an effect would result in an impact on the designated status of those protected sites present landward of the existing coast protection.
- 8.2.9 When the predicted effects of the scheme are viewed in this context, it is concluded that the slightly enhanced erosion contributes to the potential for an adverse impact on sites designated for coastal and terrestrial ecological interest. Consequently, it is concluded that there is the potential for an impact of **minor adverse significance** to arise.

Mitigation and residual impact

No mitigation is required with respect to the Dorset Heaths and Studland Dunes cSAC and the residual impact would be of **negligible significance**.

The problem of erosion at Brownsea Island is currently being addressed through coast protection structures. Overall, the proposed scheme would give rise to very minor changes (increases and decreases in erosion rate depending on location) compared with the existing conditions. It is not feasible to place dredged material on the foreshore at this location as it would not be retained on the foreshore given the prevailing conditions.

It is concluded that the problem of erosion at this location should be addressed through an integrated strategy for management of the coastline, given that there are various interests (i.e. nature conservation, heritage and coastal protection) and, therefore, a number of stakeholders.

The residual impact of the proposed scheme is considered to be of **minor adverse significance**.

8.3 POTENTIAL IMPACTS ASSOCIATED WITH THE OFFSHORE DISPOSAL OF DREDGED MATERIAL

Construction phase

Potential for direct impact on coastal and terrestrial ecology

- 8.3.1 There is no potential for impact on any site designated for coastal or terrestrial ecological interest (i.e. interests above the mean high water mark) associated with the offshore disposal as it would occur in the subtidal zone. The potential for indirect impacts (e.g. due to effects on the hydrodynamic regime) arise on completion of the construction phase and, therefore, are addressed below ('Operational phase').

Mitigation and residual impact

No mitigation measures are required and there would be **no residual impact**.

Operational phase

Potential for indirect impact on coastal and terrestrial ecology

- 8.3.2 The disposal of dredged material is not predicted to have any effect on tidal currents and wave conditions and, therefore, no potential exists for coastal processes or designated sites in Poole Bay or Poole Harbour to be affected. Furthermore, the deposition of fine

material is not expected within the intertidal areas of Studland Bay. As a result, **no impact** is predicted on sites designated for coastal and terrestrial ecological interest.

Mitigation and residual impact

No mitigation measures are required and there would be **no residual impact**.

8.4 POTENTIAL IMPACTS ASSOCIATED WITH BEACH NOURISHMENT

Construction phase

Potential for direct impact on coastal and terrestrial ecological interest

- 8.4.1 The locations for the proposed beach nourishment works are sandy recreational beaches which are backed by low seawalls or cliffs. All proposed locations are outside the boundaries of sites designated for their coastal and terrestrial ecological interest and, therefore, any potential impact would be of **negligible significance**.

Mitigation and residual impact

No mitigation measures are required and the residual impact would be of **negligible significance**.

Operational phase

Potential for indirect impact on coastal and terrestrial ecological interest

- 8.4.2 The beach nourishment schemes are not predicted to have an effect on tidal currents or wave conditions beyond the immediate vicinity of the works themselves and, therefore, no effects are predicted elsewhere on the coastline. As a result, it is predicted that there would be **no impact** on coastal and terrestrial ecological interest.

Mitigation and residual impact

No mitigation measures are required. There would be **no residual impact**.

