

# Langstone Harbour

## Unit limits

Approximately 25km of shoreline, including Ports Creek to the railway bridge and meeting Chichester Harbour at the A3023 road bridge, but excluding tide locked marinas and islands. For shoreline management purposes the harbour ends at the Ferry landings on either side of the main entrance channel.

## General characteristics

The margins of Langstone Harbour are developed on Portsea Island and undeveloped to the north and on Hayling Island except for the south shore. There are large areas of backshore land on Portsea Island and along the north shoreline that have been reclaimed for land fill sites. Natural shorelines are only found along parts of the Hayling Island coast and along several other short frontages. The remaining shoreline is defined by walls and revetments built to prevent erosion or flooding.

## Coastal processes

The shoreline is influenced by waves generated in the harbour, by tidal currents and by water levels. Relative to the open coast the processes are low in energy, so natural shoreline evolution takes place over long time periods, except for occasional important changes caused by severe storms. Greater and more rapid changes are caused by human intervention in the form of reclamation or dredging.

- Geology*
- Underlying geology comprises easily eroded Tertiary strata, except in the north where there is more resistant Upper Chalk
  - Surface deposits comprise
    - Alluvium within the intertidal area, and along low lying margins to the north
    - Sandy deposits forming substantial flood tide banks opposite the entrance channel
    - Reclaimed ground along much of the Portsea Island shore, along the A27 corridor to the north, to the west of Langstone and around the old Oyster Beds on Hayling Island
    - Brickearth deposits along Hayling Island, apart from a short length of Raised Beach deposit
- Wave climate*
- Depends on fetch and nearshore bathymetry
  - 1.2m H<sub>s</sub> waves are predicted for 1:50 years storms in areas exposed to the south and southwest
- Tidal regime*
- Currents are weak along the shoreline, but are stronger in the main channels and particularly in the entrance
  - Maximum water levels are similar throughout the harbour

**Table 1 Extreme water levels**

| Probability               | 1:1 year | 1:10 years | 1:50 years | 1:200 years |
|---------------------------|----------|------------|------------|-------------|
| Maximum water level (MoD) | 2.69     | 3.02       | 3.14       | 3.30        |

- Saltmarshes*
- Active *Spartina* in the northwest only
  - Degenerate *Spartina* in south east
  - Upper saltmarsh on islands east of Farlington Marshes
  - *Spartina* marshes generally in slow recession, allowing greater wave attack along shoreline, particularly along Hayling Island
- Sediment transport*
- Influx of sand through entrance to flood tide banks
  - Fine sediment carried in suspension throughout harbour
  - Deposition of muds in sheltered areas
  - Some wave driven erosion and transport of muds and coarser sediment in areas exposed to larger waves
  - Saltmarsh areas generally contracting and releasing sediments for redistribution
- Possible future change*
- 300 - 500mm sea level rise over 50 years
  - Increased wave energy
  - Increased tidal currents due to greater tidal volume

## Existing defences

The Langstone Harbour shoreline comprises a mixture of erosion and flood defences, structures built to enclose land reclamation sites, harbour walls and some stretches of natural coastline. Some parts of the shoreline benefit from natural protection due to saltmarshes, particularly to the east and west of Farlington Marshes. Recent surveys indicate that substantial lengths of the existing defences are in need of repair or upgrading in order to provide a reasonable standard of service, taking account of future water levels and local wave conditions.

Areas of particular concern include Milton Bund in front of the land fill site, Eastern Road seawall, Farlington Marshes revetment, South Moor defences west of Langstone and the west shore of Hayling Island.

## Natural environment

The entire shoreline and intertidal areas, plus Farlington and Southmoor Marshes, are within the Langstone Harbour SSSI, SPA, Ramsar site and proposed Maritime SAC. The area is designated for a variety of habitats and is of particular importance for its bird populations. Shoreline management must give due consideration to environmental impacts and legislation, including the Habitats Directive.

In addition to the SSSI there are several small areas around the harbour margin that are of local importance as nature reserves.

## Land use

The margins of Langstone Harbour are in varied use. There are residential areas at Eastney, Milton and Anchorage Park on Portsea Island and at West Town on Hayling Island. Industrial developments are sited in northeast Portsea Island and to the west of Langstone. There is a large marina at Eastney and small commercial jetties at Great Salterns Quay, Kendall's Wharf and Brockhampton Quay. Much of the west side of Hayling Island, part of Farlington Marshes and some of the area west of Langstone is either grazing or arable land. Major transport routes run along the east side of Portsea Island (Eastern Road) and along the north shore of the harbour (A27), while the disused Hayling Billy railway embankment separates farm land from the shoreline along west Hayling Island. There are major land fill sites at Milton, either side of the Brockhampton Quay west of Langstone and to landward of the old Oyster Beds off north west Hayling Island.

## Human environment

The harbour is valued for water based recreation and for its bird populations. There are public access routes around most of the harbour, forming part of the Solent Way. There are numerous sites of historical/archaeological importance, particularly on the islands off Farlington Marshes, and there are several Scheduled Monuments on Portsea Island. The harbour encompasses a commercial native oyster fishery and includes other fisheries interest such as designation as a bass nursery area.

## Planning policies

Although most of the harbour margins are designated as Countryside or Public Open Space there are a few areas set aside for development. These are as follows:

1. Land for Housing, the allocated sites are:
  - Eastney Barracks area (Portsmouth City)
  - Various small infill sites on Hayling Island (Havant Borough)
  
2. Land for Industry, Business and Services, the allocated sites are:
  - Fort Cumberland underground treatment works, the former MEME Depot site and a berth for the removal of sewage sludge by ship (Portsmouth City)
  - Portsmouth Incinerator, Quatermaine Road, Copnor, to serve southern Hampshire
  - An extension of Portsmouth Water plc's site and a site proposed for improved access and sailing facilities to the west of Langstone (Havant Borough)

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|-------------------------------------|---|
| <i>Statutory policy documents</i> : | <ul style="list-style-type: none"> <li>- Hampshire County Structure Plan, Deposit Draft</li> <li>- Hampshire Minerals and Waste Local Plan, Deposit Draft</li> <li>- Portsmouth City Local Plan</li> <li>- Havant Borough District Wide Local Plan, Consultation Draft</li> </ul> |
| <i>Non-statutory harbour policy</i> | <ul style="list-style-type: none"> <li>- Langstone Harbour Management Plan, Draft</li> </ul>  |

## Strategic defence option

Many of the existing defences around the harbour are in a poor state of repair or do not provide an adequate standard of defence under the existing or future sea conditions. Lack of maintenance would result in a failure of some defences within the short to medium term. Failure may lead to loss of transport infrastructure, flooding of extensive areas, erosion of landfill sites, loss of public access and loss of existing natural habitats.

As discussed in the introductory section of this document, the harbour shoreline has been classified by management types according to potential for flooding or erosion, the existing defences and the existing land use.

The frontages referred to by each type are presented on the accompanying map. The preferred options for most lengths of frontage are in line with the statements in Chapter 4 and summarized in Table 2 below. Alternative options are proposed for seven sites that are indicated on the map and are discussed individually below. The text also provides preliminary guidance for setting boundaries relevant to the scheme strategy studies that will follow the adoption of the SMP.

**Table 2 Preferred options for management types**

| Type | Description  | Preferred option   |
|------|--|--|
| 1    | No risk, or minor risk of flooding/erosion<br>Undeveloped area<br>No existing protection | Non-intervention   |
| 2    | No risk<br>Developed or sensitive area<br>No existing protection                         | Non-intervention   |
| 3    | Erosion risk, no flooding<br>Undeveloped area<br>Existing protection                     | Maintain standards along the existing line of defence  |
| 4    | Erosion risk, no flooding<br>Developed or sensitive area<br>Existing protection          | Maintain standards along the existing line of defence  |
| 5    | Flooding risk (possible erosion)<br>Undeveloped area<br>Existing protection              | Maintain or upgrade standards along the existing line of defence   |
| 6    | Flooding risk (possible erosion)<br>Developed or sensitive area<br>Existing protection   | Maintain or upgrade standards along the existing line of defence   |
| 7    | Shoreline formed by structure designed for purpose other than defence                    | Maintain or upgrade standards along the existing line of defence (review when structure becomes redundant) |

Existing defences around Eastney Lake provide flood defences to low lying residential areas and should be maintained and upgraded to provide adequate future defence. There is a length of undefended shoreline along the north shore of Eastney Lake where the backshore is similarly at risk from flooding. At present the extent of the area at risk is uncertain but is believed to include only undeveloped areas (allotments, open space); if this correct then the non-intervention option is appropriate. However the frontage should be investigated further with a view to a future review. The area is discussed below as Site 1. The full shoreline of Eastney Lake from the entrance channel spit to Milton should be considered as a unit at the follow up stage of scheme strategy plans.

North from Eastney along the Portsea Island shore as far as Ports Creek the shoreline is defined by walls, revetments, embankments and jetties in varying condition. The backshore is all sensitive to flooding or erosion due to residential or industrial development, roads, recreation or landfill sites. The existing defences should be maintained and upgraded to provide adequate flood and erosion protection in the future. The standard of defence provided by the Type 7 frontage at Kendall's Wharf should be investigated and upgraded if necessary; tiered defences may be appropriate to avoid disruption of quay operations. The potential flood area extends across the north of Portsea Island via Ports Creek to Tipner Lake within Portsmouth Harbour and the whole of this shoreline should be considered as a unit for scheme strategy purposes.

The A27 embankment, including the north shore of Ports Creek and the Eastern Road bridge abutment, forms the northwest shore of the harbour. Apart from a short length of undefended shoreline at the entrance to Ports Creek, the roads are protected by substantial revetments. The undefended section needs to be monitored, but is believed to be under no present or future risk. The remaining defences need to be maintained or upgraded.

Farlington Marshes extends both north and south of the A27. The larger southern portion comprises low lying ground of high environmental value, and is protected by a revetment. Costs of maintaining the extensive defences around the marshes suggest that a realignment to a shorter line fronted by upper saltmarsh would be more sustainable as a coastal defence. Consultation for the SMP revealed strong opposition to realignment on environmental and recreational grounds. The frontage is discussed in more detail as Site 2 below.

The A27-A3(M) frontage to the east of Farlington Marshes is largely undefended, but is not at risk at present. The shoreline should be monitored to ensure that no future risks develop, particularly if the islands or saltmarshes to the south suffer further erosion, allowing larger waves to reach the north shore.

For scheme strategy purposes the shoreline from Ports Creek to the A3(M) junction should be considered as a unit, including the area set out as Site 2 below. Consideration must be given to the long term development of the islands and saltmarshes to seaward of the existing defences, both for their importance in providing natural defence and as part of the regional management of the natural environment.

East of the A27 frontage the shoreline is defined by walls, revetments and embankments as far as the former Hayling Island railway bridge abutments. The backshore areas either side of Brockhampton Quay are land fill sites and the existing defences must be maintained to prevent exposure of the fill. Towards Langstone the backshore is low lying reclaimed saltmarsh defended by a wall in need of costly maintenance. This frontage is a site for possible realignment or tiered defences and is discussed below as Site 3. For scheme strategy purposes these areas are independent of each other and can be considered in shorter lengths.

The frontage leading down to the A3023 Hayling - Langstone road bridge is defended by revetments and embankments. At present the old railway bridge embankment west of the road bridge provides a degree of protection to the road and to the sailing club beside the road. This embankment is suffering erosion and will fail in the short term. Defences in the lee of the embankment are not able to prevent flooding of houses, the road and the sailing club, and will need upgrading to achieve an adequate standard of service. This frontage is discussed further as Site 4 below. This frontage crosses the recognised boundary between Langstone and Chichester Harbours.

The old Oyster Beds on the northwest shore of Hayling Island have been subject to works in 1996-97 to remove parts of the existing embankments and redevelop the area for the benefit of the environment and recreation. The resulting shoreline is a return to an earlier line defined by reclamation. This line will need to be defended against future erosion to prevent exposure of the land fill site and to retain public access along the disused Hayling Billy railway embankment. This area is noted below as Site 5.

West of Stoke the existing shoreline should be maintained against erosion and flooding. Erosion would result in the loss of public access along the Hayling Billy embankment, while flooding would damage residential areas in Stoke and some farmland. Consideration should be given to potential flooding of this area from a failure of the defences to the north between the A3023 road bridge and the former rail bridge.

South from the Stoke frontage down to the shorefront residential area at West Town the shore is suffering erosion and is liable to flooding along some parts. The land at risk includes the bridle path along the Hayling Billy railway embankment and a limited area of farmland. Maintaining the existing line may not be justified against the benefits gained to landowners and users of the bridlepath. Defence works may also be opposed for environmental reasons. This frontage is discussed further as Site 6.

Follow up studies for scheme strategy purposes should consider the full length of the west Hayling shore, from the A3023 road bridge to West Town. For shoreline management purposes this area is independent of the remaining Hayling Island shore.

The south shore of the harbour from West Town to the Langstone Ferry is defended in places to protect private gardens and a holiday development, while other lengths have a natural transition to the foreshore. Although existing land use indicates that defences should be maintained in the short term it may be appropriate for the planning authority to consider ways of altering the future land use around the Kench. A return to open space or recreational use would reduce the need for costly future defences and would enhance the local environment. This area is noted below as Site 7.

### *Sites for alternative management policies*

- Site 1 The unprotected frontage along the north shore of Eastney Lake is at risk from flooding, but the extent and consequences of flooding are not certain. Further investigations are required to determine the potential risk under present and future sea levels. If these risk are shown to be significant then defences may be required. As construction of hard defences along the existing shoreline will be opposed on environmental grounds, the construction of set back defences may be appropriate. This approach would have less environmental impact and would be less costly as the existing upper foreshore and immediate backshore would continue to provide a natural line of defence. This approach of upgrading standards along a new alignment to landward would leave the intervening area at risk from occasional flooding, but would allow the natural shoreline to be retained and would ensure appropriate protection for developed areas to landward.
- Site 2 Farlington Marshes is an area of low lying land of high environmental value, including grazing meadows, brackish lagoons, upper saltmarsh and other habitats of national and international importance. These existing habitats depend on the continued maintenance of the existing defences which allow only occasional and localized inundation by sea water. The costs of maintaining and upgrading these defences has been high due to the length of the shoreline involved. Works have been justified in the past against the environmental value of the area and the popularity of the embankment as a public footpath. In view of the continued future maintenance costs, the lack of risk to developed areas or human life and the accepted English Nature approach of encouraging natural evolution of the coastline where possible, then the long term sustainability of the existing embankment as a coastal defence must be questioned. A landward realignment of defences should therefore be investigated. The extent of the realignment and the time scale will need careful consideration of land drainage, recreational and environmental impacts, and particularly the obligations under the Habitats Directive for compensatory measures for significant damage to designated habitats. Recent maintenance work on the existing defences ensures that the present shoreline is not at risk in the immediate short term, allowing time for further investigations to determine the most appropriate long term policy.
- Site 3 A seawall in a general state of disrepair fronts the reclaimed saltmarsh at Southmoor, west of Langstone. Costs of upgrading defences along the existing line will be high relative to the value of the agricultural land at risk and may damage the natural environment. Costs of providing a new line of defence to landward may be much lower and will allow upper saltmarsh to re-establish as a natural defence while providing a higher standard of protection to developed areas to landward that are at risk from future flooding. The area is part of the Langstone Harbour SSSI but not the SPA/SAC. Existing grazing marsh habitats will be lost in favour of a more natural transitional environment. Upgrading the defence standard by a landward realignment should therefore be investigated. This does imply that the existing defences should be abandoned or that the footpath will be lost. Future defences could be tiered by undertaking minor maintenance of the existing wall and establishing a new flood embankment. This would retain existing recreational and environmental values while providing cost-effective future protection to the developed areas to landward. The alignment of the proposed new defence is not defined and further investigations of benefits and costs will be required to determine the most appropriate method of achieving a satisfactory and sustainable level of defence.
- Site 4 The old railway embankment on the Langstone shore provides shelter to the sailing club and prevents flooding of the road and adjacent houses due to wave overtopping. The embankment is suffering erosion and will cease to provide protection in the short term. It has no intrinsic value at present and does not need protection, but its future loss will create a requirement for the upgrading of defence standards for the residential areas, the road and the sailing club as they will be subject to erosion and flooding. A proposal has been put forward to redevelop the embankment as the abutment for a new footbridge to Hayling Island. If this goes ahead then the coast defence requirements will be met by the new works. If not, further investigations will be required to determine the most effective approach to upgrading the defence standards.
- Site 5 The old Oyster Beds on the northwest shore of Hayling Island have been transformed by recent works. Severely eroded bunds have been partially removed and the shoreline re-established to landward. The works were intended to enhance both the environmental and recreational value of the site. The

presence of a landfill site dictates the position and future management of the new shoreline. A 7 hectare lagoon has been formed and will be designated as an LNR.

Site 6 The west shore of Hayling Island south from Stoke to West Town suffers erosion or flooding along some sections. Costs of maintaining the whole frontage at the existing line will be high relative to the benefits gained. Existing piecemeal defences provide limited protection to short stretches, but have a limited life. A mixed approach for the frontage is suggested. The bridle path could be diverted to landward, with appropriate compensation for lost farmland to the landowner. This would then allow a non-intervention policy to be established for most of the shoreline, with limited lengths of low cost protection along critical sections.

This area provides an opportunity to create saltmarsh and grazing marsh habitats that may contribute to compensatory measures for habitats lost elsewhere through sea defence works, in accordance with the Habitats Directive.

Site 7 The harbour margin from Langstone Ferry east around the Kench and along the shore north of the Sinah Warren Holiday development is subject to flooding and erosion. The shoreline is partially protected by existing defences, but these may prove to be inadequate in the future under conditions of higher sea level and greater wave energy. Rather than upgrading the defences, the Local Authority should consider planning restrictions to discourage further development and to encourage a future return to open space or minimal recreational developments that would not be significantly damaged by occasional flooding.

## Management operations

Upgrading of existing defences will be required around part of the harbour. Designs should take account of the factors discussed in Chapter 4 of the introductory section, and particularly the obligations set out by the Habitats Directive. Frontages that are currently undefended should be protected from backshore development to ensure that there is no future need to interfere with the natural transition from sea to land. All frontages will require ongoing monitoring to ensure that the management policies and operations continue to provide an appropriate standard of service.

In view of likely environmental restrictions on operations impacting on the intertidal areas, shoreline managers should consider tiered defences where ever upgrading is required and the backshore situation is favourable. This approach would typically involve maintenance or downgrading of the existing defences, together with construction of a set back wall or embankment to control flooding under extreme future conditions. The area between the two defence lines would be subject to occasional flooding, acceptable for promenades, low value recreation areas, minor roads etc.

There are limited opportunities for implementing novel defences except off the west coast of Hayling Island, where saltmarsh enhancement or the construction of islands may be appropriate, providing protection and possible environmental benefits.