POOLE HARBOUR IS a large, shallow bay (38 km²) just to the west of Bournemouth on the south coast of England. It is sheltered from the sea by two spits (Studland and Sandbanks) on either side of a narrow entrance (300 metres) which is kept open by the flow of four rivers (Figure 1). There is a wide variety of natural water and land based environments along the 100 km shoreline of the bay (Figure 2), especially in the southern part of the Harbour, which makes it a sensitive marine area.

One consequence of the wide variety and importance of natural areas in and around the Harbour is that it has received many national and international conservation designations (Figure 3).

As well as this wide range of natural areas, archaeological investigations show that people have used the area since pre-Iron Age times. Today a number of diverse human activities are found in and around Poole Harbour:

- Urbanisation has taken place on the northern shore, with the settlement of Poole (population 147,600 in 2011) now merging with Bournemouth (Figure 1). As well as housing there are roads and railways, and light industries such as building luxury watercraft and pottery-making. Some redevelopment has taken place (e.g. Twin Sails Bridge).

- There is a small port (24 ha) with regular ferry services to France and the Channel Islands (Figure 1). Cargo ships carry imports of steel, timber and grain, and exports of clay, grain and gravel. In 2010/11 the port handled 991,000 tonnes of cargo.

- There is a small commercial fishing fleet of 100 boats, including shellfish cultivation within the Harbour (e.g. oysters, clams, cockles).

- There is a Ministry of Defence site on the northern shore (Hamworthy Royal Marine base).
- Most controversially, Europe’s largest onshore oilfield (Wytch Farm) started production in 1979, with oilwells on Furzey Island (1,700 metres deep) and on the southern shore. At the peak in the 1990s, 111,000 barrels of oil a day were produced, which...
Tourism and recreation are significant in the area, given the warm climate of southern England and the close proximity to London and its commuter belt, which allows day trips to the Harbour area. Water-based activities include yachting, waterskiing, windsurfing, kitesurfing (Whitley Lake), swimming in the sea, sub-aqua diving, and the use of personal watercraft (canoes, rowing-boats, jetskis). There are many marinas (e.g. at Poole and Wareham) and yacht clubs, as the warm, shallow waters are ideal for water-based recreation. Land-based activities include walking, horse-riding, bird watching, wildfowling, camping and caravanning, and use of beaches (sunbathing, naturists, barbecues). Studland peninsula (a 5 km sand spit) is a tourist honeypot, attracting up to 25,000 people on a sunny summer day.

Issues affecting future development
A number of issues and concerns affect Poole Harbour’s future.

Climate change
- Sea level in and around the Harbour is predicted to rise by 34 cm by 2035 and 1 metre by 2105, flooding low-lying areas. By 2102, 5,000 properties will be at risk in the north of Poole Harbour, including some of the UK’s most expensive houses, along with large areas of saltmarsh and land in river valleys (Figure 1).
- There will be increased storm activity, with destructive waves, putting pressure on coastal defences (150 metre recession at Sandbanks and 60 metres at Studland spit).
- Temperatures and precipitation levels are likely to increase, changing the growing conditions in natural habitats.
- Any oil or chemical spill in the English Channel could find its way into the Harbour, settling in the mudflats and polluting shellfish.
- A Mediterranean climate may develop, encouraging more tourism and recreational activities.
- Coastal defences (e.g. seawalls, embankments) are found in a number of places within the Harbour and on the Sandbanks and Studland spits.
- There will be increased storm activity, changing the warm climate of southern England and the close proximity to London and its commuter belt, which allows day trips to the Harbour area.
- Sea level in and around the Harbour.

<table>
<thead>
<tr>
<th>Designation</th>
<th>Year</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Nature Reserve (NNR)</td>
<td>1946</td>
<td>Protect significant habitat or geological formation areas, e.g. Studland and Godlingston Heaths</td>
</tr>
<tr>
<td>Area of Outstanding Natural Beauty (AONB), Dorset</td>
<td>1956</td>
<td>Conserve and enhance natural beauty of the landscape</td>
</tr>
<tr>
<td>Heritage Coast (Purbeck)</td>
<td>1970</td>
<td>Manage and conserve the natural beauty of undeveloped coastline, e.g. Studland sand cliffs</td>
</tr>
<tr>
<td>Site of Special Scientific Interest (SSSI)</td>
<td>1987 and 1991</td>
<td>Protect and allow people to enjoy the best wildlife and geological sites, e.g. Ham Common and Poole Harbour</td>
</tr>
<tr>
<td>Ramsar</td>
<td>1999</td>
<td>Conservation and wise use of wetlands</td>
</tr>
<tr>
<td>European Marine Site (EMS): Special Protection Area (SPA) or Special Area of Conservation (SAC)</td>
<td>1999</td>
<td>Strictly protected sites of high-quality habitats and species, including reducing the impacts of recreational and other uses on waterfowl and waders, e.g. Dorset heathlands, Poole Harbour</td>
</tr>
<tr>
<td>World Heritage Site (UNESCO)</td>
<td>2001</td>
<td>Identify natural features of world importance, such as geology and geomorphology, e.g. Old Harry rocks</td>
</tr>
</tbody>
</table>

Figure 3: Conservation designations for the Poole Harbour area

Food webs.
- Illegal fishing or shellfish dredging could create an imbalance in the local food webs.
- Some buildings close to the shoreline are unsightly.
- Port activities are limited by the size of vessels that can use it; alternative uses could include a wind farm, or facilities for specialised marine cargo.
- Ferry traffic is in decline (passenger numbers halved between 1998 and 2011).
- There is a loss of underwater archaeological remains due to dredging of Main Channel.

Urbanisation and redevelopment
- There is increasing demand for housing, especially along the northern shore (Figure 4), and this could have an impact on some habitats.
- Redevelopment of inner urban areas of Poole may affect the shoreline and intertidal areas, particularly through disposal of sewage and other wastes.
- Poole has an ageing population (in 2011, 20.5% of the population was over 65 – that is 4% above the national average), which puts pressure on support services such as hospitals.

Tourism and recreation
- There are conflicts between different users of land and water in and around the Harbour.

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Tourism and recreation
- There are conflicts between different users of land and water in and around the Harbour.
Too many people on the water cause damage, for example by boat anchors dragging, litter, antifouling paints on watercraft, moorings and marinas, disturbance of species (e.g. wildfowl), and excessive bait digging (e.g. at Holes Bay).

Large numbers of people damage land areas, for example by dune destabilisation, erosion due to trampling (blowouts), fire (natural areas take six years to recover), disturbance of wildlife, litter and other waste, and car parking.

There are many people on the water causing damage, for example by boat anchors dragging, litter, antifouling paints on watercraft, moorings and marinas, disturbance of species (e.g. wildfowl), and excessive bait digging (e.g. at Holes Bay).

### Management

Poole Harbour Commissioners have managed the area for over a hundred years, and today an Integrated Coastal Zone Management (ICZM) approach (e.g. Dorset Coast Forum) is necessary because all human activities and natural processes are interlinked. There is wide consultation among a number of organisations including Natural England, Dorset County Council, Wessex Water and the National Trust. In 1994 the first Aquatic Management Plan (AMP) was introduced with guidelines and byelaws, and was followed by a recreational zoning scheme in 1995. A revised version of the AMP was produced in 2006 by the Poole Harbour Steering Group using the 1998 Poole Harbour Management Policies, and it was reviewed again in 2011.

<table>
<thead>
<tr>
<th>Year</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>138,300</td>
</tr>
<tr>
<td>1994</td>
<td>137,000</td>
</tr>
<tr>
<td>2001</td>
<td>140,000</td>
</tr>
<tr>
<td>2006</td>
<td>140,000</td>
</tr>
<tr>
<td>2011</td>
<td>147,600</td>
</tr>
</tbody>
</table>

Figure 4: Population change in Poole

- There are conflicts between people and natural environments (e.g. disturbance of nesting birds in May and June).
- Often there are too many people in one place at the same time at specific ‘honeypot’ areas such as Studland (SSSI) and Godlingston Heaths (NNR), which received a million visitors in 2005/06.
- Large numbers of people damage land areas, for example by dune destabilisation, erosion due to trampling (blowouts), fire (natural areas take six years to recover), disturbance of wildlife, litter and other waste, and car parking.
- Too many people on the water cause damage, for example by boat anchors dragging, litter, antifouling paints on watercraft, moorings and marinas, disturbance of species (e.g. wildfowl), and excessive bait digging (e.g. at Holes Bay).

The aim of the AMP is:

*To provide the safe and sustainable use of Poole Harbour, balancing the demands on its natural resources, minimising risk, and resolving conflicts of interest.*

Essentially the AMP tries to separate conflicting uses, and to keep people away from the most sensitive natural areas (Figure 5). It does this by zoning the water areas (including a quiet area), setting speed limits for watercraft (8 knots near bathing beaches), and providing information on, and enforcing, regulations (e.g. Conservation Regulations No.34 1994).

The National Trust (NT) plays an important management role on Brownsea Island, and at Studland (Figures 1 and 5). It has provided large car parks (four car parks with 2,300 spaces), educational materials, signage and displays, barbecue areas, fencing for fragile areas of dunes, boardwalks, replanting of dune grasses (e.g. marram), litter collection on a daily basis in the summer (4,000 kilos a day), beach zoning (e.g. for naturists), swim safety zones, and patrols by wardens and rangers.

There is a wide range of other management tools, including the 1998 Oil Spill Contingency Plan (‘Poolspill’), an Environmental Impact Assessment for Wytch Farm oilfield, European Union directives (2000) on monitoring cleanliness of coastal waters, a Navigational Safety Management Plan using a radar and automatic identification system and a 24-hour watch by the Harbour Control Centre, a Moorings Policy (2008) which will phase out boat moorings in environmentally sensitive areas, the control of sea bed leasing for cultivation of shellfish through the Poole Fishery Order (1985), and a byelaw to prohibit bait digging in Holes Bay (PHC Master Plan 2011).

**Summary**

Poole Harbour is a beautiful, thriving and often overcrowded area that needs careful management and a coherent plan for the future in the face of both natural and human threats.
1. Describe the location and main features of Poole Harbour.

2. Study the data in Figure 6.
   (a) How could this information be best presented?
   (b) What issues are raised by the trends shown in Figure 6?
   (c) Are these trends a benefit or a problem for the natural areas of Poole Harbour? Explain your answer.

Figure 6: Cargo and passenger data for the port of Poole, 1990–2011

<table>
<thead>
<tr>
<th>Year</th>
<th>Cargo (thousand tonnes)</th>
<th>Ferry passengers (thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990/91</td>
<td>2,353</td>
<td>781</td>
</tr>
<tr>
<td>1993/94</td>
<td>2,302</td>
<td>611</td>
</tr>
<tr>
<td>2000/01</td>
<td>1,953</td>
<td>555</td>
</tr>
<tr>
<td>2005/06</td>
<td>1,766</td>
<td>440</td>
</tr>
<tr>
<td>2010/11</td>
<td>991</td>
<td>258</td>
</tr>
</tbody>
</table>

Source: Dorset County Council

3. Why can Poole Harbour be considered to be a sensitive marine ecosystem?

4. Study the list of issues affecting future development in and around Poole Harbour. Which two issues do you think are the most serious? Explain your answer.

5. Study Figure 7. Describe and explain the issues and consequences of the situation shown.

6. Study Figure 8.
   (a) Describe the location of zones and designated areas within the Aquatic Management Plan.
   (b) Explain why certain uses of Poole Harbour have been separated.

7. Consider all of the information provided about the AMP (text and Figures 5 and 8). Identify, and write about, three strengths and three weaknesses of this plan (this is called an evaluation).

8. (a) Which issue affecting Poole Harbour does each designation in Figure 8 try to tackle?

(b) Which issues are not tackled by any of the designations given in Figure 8?
(c) Write three of your own objectives for a revised Aquatic Management Plan, and for each objective identify what would need to be done by people in practical terms.

9. What is a likely problem when trying to manage a coastal area, such as Poole Harbour, when it involves a large number of organisations?

Extension activity
10. (a) Why is the Shoreline Management Plan (SMP) for Sandbanks ‘hold the line’, while the Studland SMP is ‘limited intervention’?
    (b) What do you think would be the most sustainable way of managing Poole Harbour as the sea level rises?