

## 14. Commercial Fisheries

### Executive Summary: Chapter 14. Commercial Fisheries

The following potential impacts to commercial fisheries will occur in the short and/or long-term:

#### 1) Potential Disruption of Fishing Activities Due to Vessel Movements

During the channel dredge within Southampton Water, there will be a temporary increase in vessel movements in the main navigation channel between the areas proposed for dredging and the Nab Deposit Ground. This is considered to be **insignificant** for fishing activities of lower importance to the local economy (e.g. cod and whiting), and **minor adverse significant** for fishing activities of higher importance to the region (e.g. sole and bass). Outside Southampton Water, the exposure to disturbance from dredger and disposal operations is considered negligible and, therefore, the impact will be **insignificant**.

Following the dredge, the number of vessels using the channel is anticipated to remain the same, subject to present annual variations. With improved access and safety management procedures that will be implemented, the magnitude of disturbance to fishing activities will decrease. The potential impact to fishing activities with the channel in operation is, therefore, considered **insignificant**.

#### 2) Potential Disruption of Fishing Activities Due to Disposal of Arisings

The exposure to the change at the bed of the deposit ground will be high during the 65 week period of the disposal for the dredge. Although, any fishing activities that occur in the area of the deposit ground are already characterised by the effects of regular disturbance through the disposal of maintenance dredge material, the disposal of capital dredge arisings will result in temporary mounds at the site. Fishermen are aware that the Nab is a licensed deposit ground and, therefore, fishing activities, particularly those that involve the use of static gear (e.g. potting), are unlikely to occur within the site. However, any trawl activity over the deposit ground (should this activity be taken) will be affected by the temporary disposal. The disruption to commercial fishing activity is, therefore, considered **minor adverse significant** over the site itself, and **insignificant to minor adverse significant** further afield, depending on the commercial value of the species exploited.

#### 3) Potential Disruption of Fishing Activities Due to Formation of Algal Blooms

The negligible to low risk of nutrient levels being elevated during dredging and resulting in the formation of algal blooms is considered to be **insignificant**, with respect to commercial fishing activities.

#### 4) Potential Impacts to Fin Fisheries

The temporary impact of deposition of material on the majority of the benthic invertebrate community within Southampton Water has been assessed as being insignificant and, therefore, the impact to fish feeding grounds and subsequent impact to commercial fish catch is also considered **insignificant**. The impact of smothering the more sensitive bivalve shellfish in Southampton Water on the commercial fish feeding resource is considered to range from

**insignificant to minor adverse significant**, depending on the economic value of the finfish species.

The temporary impact of elevated suspended sediment concentrations during dredging within Southampton Water for the feeding ability of the majority of commercial fish species will range from **insignificant to moderate adverse significant**, depending on their commercial importance to the fishing industry. Despite this, with respect to the sustainability of commercial stock, the temporary impact of increased suspended sediment levels during dredging is considered to range from **insignificant to minor adverse significant**.

During dredging, the temporary impact of changes to other parameters of water quality is considered to range from **insignificant to minor adverse significant** in Southampton Water, depending on the commercial value of the fish. Outside Southampton Water, the impact of deposition of material and changes to water quality to fish reduces to **insignificant**.

The impact of underwater noise disturbance during dredging activities will be **insignificant** for commercial fish species.

During disposal of arisings, the actual impact of the initial plume is considered **insignificant**, and could be beneficial by providing a potential food source for some fish. The temporary deposition to subtidal habitats further away from the immediate vicinity of the disposal site is considered to have a potential impact on stock that ranges from **insignificant to minor adverse significant**, depending on the economic value of the fish.

The temporary impact of enhanced suspended sediment concentrations to commercial fish stocks during disposal is considered to be insignificant to minor adverse significant directly in the area of the deposit ground, reducing to insignificant with distance.

#### **5) Potential Impacts to Shellfisheries**

During dredging, the temporary impacts of the deposition of sediments and water quality changes on the commercial shellfish beds within Southampton are considered to be **insignificant to minor adverse significant**. Outside Southampton Water, the scale of change that has been predicted is low to negligible and, therefore, despite the fact that certain shellfish in the Solent are of high economic value, the temporary impact will be **insignificant to minor adverse significant**.

During disposal activities, it is not considered that the crustacean shellfish resource surrounding the disposal site will be at risk, given that the magnitude of change outside the area of the deposit ground will be similar to existing and previous deposits at the site. With a negligible exposure to change, the temporary impact to crab and lobster fisheries is considered to be **insignificant**. The overall impact for the nearest commercial shellfish beds is considered to range from **insignificant to minor adverse significant**, depending on the economic value of the species.

#### **6) Potential Impacts During Future Maintenance Dredging**

The effects on future maintenance dredging requirements are expected to be small compared with existing annual variability. The impact of changes to water quality and additional maintenance traffic during maintenance dredging is, therefore, considered to have an **insignificant** impact on the commercial fisheries in Southampton Water and the Solent.

### Mitigation

With the adaptive management strategy that ~~is being discussed~~ **has been agreed** with the Environment Agency as mitigation for the deposition of material and water quality changes occurring during dredging in Southampton Water, the residual impact to commercial fish and shellfish stocks that were assessed as being minor adverse significant will be reduced to **insignificant**, and those that are moderate adverse significant will be reduced to **minor adverse significant**.

### Conclusion

The majority of impacts on commercial fisheries will be insignificant. The only greater impact will be moderate at worst and due to the temporary changes in water quality during dredging.

## Fisheries Regulation

- 14.1 The Southern ~~Sea Fisheries Committee (SSFC)~~ **Inshore Fisheries and Conservation Authority (SIFCA)** regulates fishing activities to the 6 nautical mile (nm) limit from ~~Lyme Regis in the west to Hayling Island in the east~~, covering the entire Dorset, Hampshire and Isle of Wight coastline. ~~There are currently 470 registered commercial fishing vessels and 96 known charter fishing boats operating (SSFC website).~~ A stricter legislative regime has seen a marked decline in the number of part-time fishermen, and over 80% that are actively fishing are now full-time (Walmsley and Pawson, 2007).
- 14.2 ~~Sea Fisheries Committees~~ The **Inshore Fisheries and Conservation Authorities** are empowered not only to enforce local fishery byelaws, but also National and European legislation relating to sea and migratory fish. These responsibilities are shared with both the Marine and Fisheries Agency (MFA) and the Environment Agency. The Environment Agency has a general duty to maintain, improve and develop freshwater fisheries of migratory species, including salmon, trout and freshwater eels, with jurisdiction over fishing activities six miles from freshwater baselines. The impact on the resource and ecological functioning of fish in general is assessed in detail in the Fish Chapter (Chapter 12).

## Baseline Information

- 14.3 The commercial fisheries in Southampton Water and the Solent are mixed, in terms of catch and methods used. The Solent is an important fishing ground, and the East Solent from Southampton Water to beyond the Nab Deposit Ground is an active inshore finfishing area, dredging and potting ground for several species of fish, shellfish, crabs and lobsters. However, the constant flow of marine traffic within Southampton Water restricts most of the commercial fishing activities to the Solent and further offshore. Figure 14.1 shows the broad distribution of commercial fisheries in Southampton Water and the Solent.
- 14.4 The Solent fishing industry makes an important contribution to the area's economy. The landing value of catches was estimated at around £5 million per annum in 1996 (Halcrow, 1996) and had increased to £7.9 million by 2006 (Walmsley and Pawson, 2007). Recently there has been an increase in charter and casual angling vessels, which is now a year-round

industry of considerable importance to the local economy (Walmsley and Pawson, 2007). A summary of 2006 landings in the Southern Sea Fisheries District that covers the entire Dorset, Hampshire and Isle of Wight coastline is presented in Table 14.1. Crab and lobster provide half of the value of all landings in the District, with other shellfish making up a further 25% and finfish the balance. A large proportion of the shellfish catch is exported directly to the Continent (where better prices are often offered than in Britain) via the local ferry ports, whilst the finfish supply local markets or is transported to Billingsgate.

**Table 14.1 Summary of 2006 landings in Southern Sea Fisheries District**

Species		Landed Weight (tonnes)	Landed Value (£1,000s)
Finfish	Cod	14	32
	Other gadoids	25	19
	Sole	96	736
	Turbot and brill	12	62
	Other flatfish	56	119
	Small pelagics	6	4
	Bass	103	644
	Other finfish	112	113
	Sharks and rays	81	141
Shellfish	Whelks	2,236	1,210
	Scallops	402	712
	Cockles	83	110
	Other bivalves	3,390	1,252
	Edible crab	874	1,158
	Other crabs	151	102
	Lobsters	137	1,249
	Shrimps and prawns	2	27
	Cephalopods	190	196
<b>Total</b>		<b>7970</b>	<b>7886</b>

(Source: Walmsley and Pawson, 2007)

14.5 The fishing industry is very dynamic given that each fishery varies according to market demand, regulation, weather and availability of species (Jensen, 2000). For example, in recent years, the market in the SSF District has seen a halving of oyster prices and an increased demand for cuttlefish (Walmsley and Pawson, 2007). High densities of seaweed have also been known to hinder fisheries in the Solent by affecting certain fishing methods, including netting, trawling and potting (SSFC, 2005).

14.6 The following sections review the baseline commercial fishery interests in the study area, focusing on the areas that are predicted to be impacted by the proposal:

- Finfish; and
- Shellfish.

**Finfish**

14.7 There are a number of fishing ports in the Solent, including Langstone Harbour, Portsmouth, Lymington, Cowes and Bembridge. Trawling, netting and angling take place throughout the year in the Solent but are weather dependent, with the greatest activity occurring during the

warmer months. The main commercial species include sole, plaice, cod, whiting, bass, mullet, skate and rays. Other less commercially important species include mackerel, dogfish and eels, and there is a licensed salmon and sea trout seine net fishery in the Beaulieu River.

- 14.8 The main fishing port in Southampton Water is the new fisherman's landing jetty in the Hamble, though a few vessels are also based in Hythe and Marchwood. A constant stream of marine traffic restricts fishing activities within Southampton Water and most local fishing takes place elsewhere. Two or three vessels operating from the fishing port use otter trawls and several small boats use gill nets to take small amounts of cod and whiting. Other vessels use nets for bass, mullet and flatfish. During the spring and summer, 3 vessels trawl for sole, plaice and bass, and the others use longlines, rod and line and nets for bass, nets for mullet and several boats set nets for flatfish. The inner part of Southampton Water, including the tidal rivers Hamble, Itchen and Test, are a designated bass nursery area (Figure 13.1). There are salmon and sea trout runs but no commercial fishery in the Rivers Test and Itchen (Walmsley and Pawson, 2007).

#### *Demersal Fish*

- 14.9 Tangle and trammel nets are used for sole and plaice from spring through to autumn, when landings of plaice in the SSF District are often greatest on spring tides when they are more active (Walmsley and Pawson, 2007). Larger meshed tangle nets are set for turbot and brill during the warmer months, and cuckoo, starry and blonde rays are landed in addition to the thornback ray. Gill nets are used close inshore for cod and whiting during the colder months, though the southern coast is not renowned for its cod fishery. Larger boats use otter and beam trawls for flatfish during the warmer months and, in winter, some trawlers switch to oyster and scallop dredging, whilst others continue to trawl for demersal fish, landing cod, whiting, flatfish and rays. Red mullet and black bream are caught in otter and pair trawls in spring and summer.

#### *Pelagic Fish*

- 14.10 Bass is fished in the Solent area using a variety of methods and the production of young bass and recruitment to the fishery has been relatively high in the Solent nursery areas over the last 10 years (Cefas, 2007b). The bass fishery involves gill and trammel nets throughout the region and provides income for many part-time and casual fishermen between May and November (Walmsley and Pawson, 2007). This species is also important to the charter angling industry. Problems with weed and the success of using sandeels as bait for bass has prompted many commercial fishermen to switch from netting to rod and lining, which usually takes place at dusk and dawn. Fishing for bass from a boat and using sandeels as bait are prohibited from protected bass nursery areas between 1 May and 31 October. Bass are taken further offshore by visiting pair trawlers that sometimes land into France. Sandeels are exploited in many of the harbours and bays using light trawls or beach seines to provide bait for the bass fishery. Other pelagic fish that are exploited are grey and golden-grey mullet, which are taken in gill nets set in most harbours. Gill nets are also used for herring, and mackerel and sprat are taken in otter and pair trawls during the colder months, though these fisheries suffer from low market demand. Mackerel catches are mainly sold for bait.

### Diadromous Fish

- 14.11 The salmon and sea trout fishery is regulated by the Salmon and Freshwater Fisheries Act 1975, and fishing takes place under licence obtained from the Environment Agency. The only licensed salmon and sea trout seine net fishery in the study area is in the Beaulieu River. In Southampton Water, there is a fixed net exclusion zone to protect salmon stocks between Redbridge and Marchwood, and Portswood and the mouth of the River Itchen. Salmon catch and release fisheries occur in the River Test upstream of Redbridge and the River Itchen upstream of Portswood.
- 14.12 Table 14.2 shows the total rod catch of salmon reported by the main fisheries on the Rivers Test and Itchen over the last ten years. The total catch is very variable between years, ranging from 49 to 459 catches in 1997 and 2004 respectively in the River Test and from 58 to 261 catches in 2003 and 1996 respectively in the River Itchen. The average catch over the ten-year period was 216 in the River Test and 142 in the River Itchen. Although there does not appear to be a substantial long-term trend in the River Itchen, there has been a slight increasing trend in rod catch in the River Test.

**Table 14.2 Total rod catches of Salmon 1995-2006**

Year	River Test	River Itchen
1995	168	132
1996	122	261
1997	49	95
1998	204	161
1999	159	92
2000	147	168
2001	215	190
2002	342	189
2003	167	58
2004	459	150
2005	351	87
2006	210	121

(Source: Environment Agency Fishery Statistics, 2006)

- 14.13 The rod-fishing season for sea trout in both rivers is restricted to between 1 May and 31 October. Table 14.3 shows the total rod catch of sea trout reported in the Rivers Test and Itchen. The total catch is very variable between years, ranging from 24 to 357 catches in 1997 and 2003 respectively in the River Test and from 117 to 1067 catches in 1997 and 2001 respectively in the River Itchen. The average sea trout catch over the ten-year period was 189 in the River Test and 477 in the River Itchen and there does not appear to be a long-term trend in either of the rivers.

**Table 14.3 Total rod catches of Sea Trout 1995-2006**

Year	River Test	River Itchen
1995	326	206
1996	227	455
1997	24	117
1998	86	709
1999	113	269
2000	147	481
2001	280	1067
2002	260	866
2003	357	676
2004	216	411
2005	114	147
2006	115	324

(Source: Environment Agency Fishery Statistics, 2006)

- 14.14 There are licensed fisheries for eels in many of the estuaries and harbours within the SSF District. Yellow eels are taken in fyke nets between spring and autumn and silver eels in traps in autumn (Walmsley and Pawson, 2007). Eel licences are issued by the Environment Agency for catching eels with racks in the Rivers Test and Itchen (Fisheries Joint Data Group, 2001).

## Shellfish

### *Native Oyster*

- 14.15 The Solent supports the largest natural fishery for native oysters, *Ostrea edulis*, in the UK, providing one of the largest self-sustaining stocks in Europe. Commercial oyster shellfish beds lie around the entrance to Southampton Water and in the Central Solent around the Thorn Channel (Figure 14.1). These include beds at Calshot, Stanswood, Thorn Knoll, Bramble Bank and North Channel. Oyster beds in the East Solent include Warner's Shoal, which lies off the Isle of Wight.
- 14.16 There are some small native oyster beds along the eastern shore of Southampton Water and the entrance to the River Hamble. They are mainly harvested in commercial quantities in the outer estuary at Chilling but also within the main entrance channels of the Hamble Harbour, where dredging for oysters takes place by six locally licensed fishing boats between November and February (Tony Clatworthy, Hamble Harbour Authority, pers. comm.). The unmanaged oyster beds of the Weston to Netley Shore are generally considered of poorer quality and of lower importance for commercial harvesting.
- 14.17 The oyster fishery is managed through a set of byelaws to ensure the sustainable management of the resource, such as the setting of a closed season between 1 March and 31 October (SSFC website). In addition, a large part of the Solent itself is designated as a regulated fishery with access limited to licence holders. Exclusion areas that are regulated under the Stanswood Bay Oyster Fishery Order 1973 and Calshot Oyster Fishery Order 1982, grant oyster fishery rights to particular companies in Stanswood Bay and Calshot and allow the oyster beds to be seeded from the wild stock. A mixture of dead shell, known as 'culch', is deposited to encourage the settlement of oyster spat from surrounding beds in the Solent. The

recent recovery of the Continental oyster fisheries, however, has seen a decline in demand and a consequent 50% drop in first-sale prices (Walmsley and Pawson, 2007).

- 14.18 Most of the shellfish beds are protected under the EC Shellfish Waters Directive (2006/113/EC), which provides water quality requirements for designated areas (Para 10.26). Health conditions of shellfish beds are classified under the Food Hygiene (England) Regulations 2006, according to the extent of contamination by *Escherichia coli* or faecal coliform bacteria in the shellfish flesh (Paras 10.27 to 10.28). Apart from one *O. edulis* bed in the Solent at Spit Bank, which is, graded Class C, the oyster designated shellfish harvesting areas in Southampton Water and the 26 oyster beds in the Solent are all graded Class B (Food Standards Agency, 2008). Class B shellfish contain less than 4,600 *E. coli* per 100 grams of flesh and Class C shellfish contain less than 46,000 *E. coli* per 100 grams of flesh and need to be re-laid or heat-treated prior to being placed on the market. The impacts of the proposed scheme on Shellfish Waters and Shellfish Hygiene Standards are assessed in the Water Quality Chapter (Chapter 10).

#### *American Clam*

- 14.19 In the late 1970s and early 1980s, the stock of American hard-shelled clams, *Mercenaria mercenaria*, was subject to a very productive dredge fishery in Southampton Water, the northern part of the Solent and in Portsmouth and Langstone Harbours. Overfishing has, however, left it much reduced and it is now only occasionally exploited (Walmsley and Pawson, 2007).
- 14.20 There is no closed season for public clam beds in Southampton Water and the Solent, although, they can be temporarily closed by the SSFC in order to protect or allow recovery of beds. There are approximately 40 full-time hand pickers working in the intertidal beds of the Solent and up to 30 clam licences are issued annually for the regulated clam fishery, which is fished on an opportunistic basis (Fisheries Joint Data Group, 2001). Small pockets of American hard-shell clams are found in Southampton Water, mainly scattered around the western shore (Figure 14.1). Under the Food Hygiene (England) Regulations 2006 the *M. mercenaria* beds in Southampton Water and the Solent are all Class B (Food Standards Agency, 2008).

#### *Lobsters and Crabs*

- 14.21 Potting for lobster, edible (brown) crab, spider crab and velvet crab takes place from the south of the Isle of Wight to inshore intertidal waters in the Solent. Smaller animals are found inshore and larger animals are found in deeper water, particularly south of the Isle of Wight on banks and around wrecks and rocks. Some fishing fleets, particularly those to the west and around the Isle of Wight, are almost entirely dependent on lobsters (Walmsley and Pawson, 2007). This fishery attracts the greatest amount of effort during the summer, when many part-time fishermen participate. In some sheltered areas, lobsters are caught during the winter, when the higher market prices make it viable despite low catch levels. Edible crabs are targeted for much of the year and since the 1980s, effort has increased towards spider, velvet and green shore crabs.



14.22 There is no closed season for the crab and lobster fishery, but minimum landing sizes are specified by the SSFC. Pots are laid in many areas between the Isle of Wight and Selsey Bill and to the south of the Nab Deposit Ground. Within the three-mile coastal limit, the SSFC has restricted the maximum number of pots. Outside the six-mile limit, there is no limitation on pot numbers. There are no controls on potting within the Nab Deposit Ground, however, shellfishermen are aware that the Nab is a licensed deposit ground and potting is done at their own risk.

#### *Other Shellfisheries*

14.23 There are four designated cockle, *Cerastoderma edule*, beds in the central Solent that are Class C, i.e. containing less than 46,000 *E. coli* per 100 grams of flesh (Food Standards Agency, 2008). Harvesting is not permitted from areas that are not classified. A variety of methods, including hand picking, are allowed to fish cockles and the closed fishing season is between 1 February and 30 April (SSFC website). The introduction of a Ministerial Order to stop the pump-scoop method of fishing for cockles, however, has reduced the activity of cockle fishing in the Solent (SSFC, 2005). Periwinkles and cockles are hand-picked commercially in the Solent by 70 full-time pickers and 200 part-time pickers (Fisheries Joint Data Group, 2001). The exploitation of periwinkles is only permitted by hand and the closed season is between 15 May and 15 September.

14.24 Cuttlefish and squid are caught in the Solent in traps and by otter trawling between April and June. Catches can fluctuate widely but they have provided a welcome spring fishery to the industry in recent years, especially when quota restrictions constrain landings of species such as sole (Walmsley and Pawson, 2007). Pots are also used to catch prawns in some of the harbours and bays in the SFC District (Walmsley and Pawson, 2007).

## **Impact Assessment**

### **Key Impact Pathways**

14.25 The potential for impact to commercial fisheries arises either directly by disrupting the fishing activity, such as the movement of fishing boats or damage to fishing gear, or indirectly by reducing or disturbing commercial stock as a result of the disturbance of material during excavation and disposal. The ultimate potential impact of the proposed dredging on commercial fisheries would be economic, which could arise should the construction (capital dredge and disposal) and/or operational impacts of the capital dredging give rise to a significant impact on the finfish and/or shellfish resource of Southampton Water and the Solent area. At the local level, a reduction in economic success in the fishing industry could have significant implications through reductions in income and potential job losses.

14.26 The following sections address the key impact pathways:

- Potential Disruption of Fishing Activities Due to Vessel Movements;
- Potential Disruption of Fishing Activities Due to Disposal of Arisings;
- Potential Disruption of Fishing Activities Due to Formation of Algal Blooms;

- Potential Impacts to Finfish Stocks;
- Potential Impacts to Shellfish Stocks; and
- Potential Impacts during Future Maintenance Dredging.

14.27 The impact on the resource and ecological functioning of fish is assessed in the Fish Chapter (Chapter 12). The impact of the proposed scheme on shellfish in the context of nature conservation is reviewed in the Marine and Coastal Ecology Chapter (Chapter 11). This section of the assessment focuses on the potential for disruption to fishing activity and stocks of key commercial species in the study area and potential impacts on the financial value of affected fisheries, in the light of these preceding assessments and in the context of the baseline review above.

### **Potential Disruption to Fishing Activities Due to Vessel Movements**

#### *During Capital Dredging*

14.28 During the channel dredge, there will be a temporary increase in vessel movements in the main navigation channel between the areas proposed for dredging and the Nab Deposit Ground, where the arisings will be disposed of subject to a beneficial use being identified. The proposed works will most likely involve the removal of material by a combination of backhoe dredger, loading into barges and a trailing suction hopper dredger (TSHD), with the material transported to the deposit ground. The programme of dredging works is estimated to be approximately 65 weeks, based on a continuous 24-hour programme, and will involve around 3500 to 3800 dredger loads to be disposed of at the Nab Deposit Ground, subject to the identification of alternative beneficial use (Chapter 3). Based upon mean annual shipping movements within Southampton Water between 2000 and 2007 (Chapter 16), the vessel movements during the dredging activity constitute around a 7-8% increase in total vessel movements.

#### **Southampton Water and Test Estuary**

14.29 In Southampton Water and the Test Estuary, there is potential for conflict to occur between the movement of fishing vessels and the movement of dredgers and commercial vessels during the dredging of the approach channel. There will be some level of exclusion of vessels from the immediate area around the dredging operations for health and safety reasons and all vessels would be subject to Harbour control, as is currently the case for navigation in the statutory harbour area. Most fishing activity within Southampton Water takes place outside the main navigation channel against a background of heavy shipping movements. Fishing boats should be able to easily avoid and work around the dredgers and, therefore, the sensitivity is considered to be low. Given the high probability of occurrence and small magnitude, the exposure to disturbance of fishing activity within Southampton Water due to vessel movements during dredging is low and localised to the area where the dredger is operating. Given the management procedures that will be implemented during dredging (Chapter 16), the temporary impact is considered to be **insignificant** for fishing activities of lower importance to the local economy (e.g. cod, whiting, clams and oysters), and **minor adverse significant** for fishing activities of higher importance to the region (e.g. sole and bass).

### **Solent and Nab Deposit Ground**

- 14.30 Fishing activities in the Solent and Nab Deposit Ground area largely takes place outside the main channel and deposit ground site, against a background of heavy commercial vessel traffic and regular disposal operations. Furthermore, the movement of dredgers and commercial vessels during dredging will be confined within the already maintained navigation channel and, therefore, no risk to fishing gear is predicted as a result of the proposed dredging. The movement of vessels to and from the Nab Deposit Ground during dredging is also unlikely to cause a disruption given the amount of available space for manoeuvre. Overall, the exposure to disturbance from dredger and disposal operations in the Solent is negligible and, therefore, impact is considered **insignificant**.

### *Post Capital Dredging*

- 14.31 The overall number of shipping movements is not expected to increase above present levels, subject to annual fluctuations, given that the number of berths at the port is remaining the same. Therefore, there is a negligible potential for conflict with fishing activities after the construction phase has been completed. Furthermore, the channel width available along the main navigation channel will be increased at several strategic locations along Southampton Water and the Test Estuary (Chapter 2), which will provide more space for manoeuvring and will enable ships to pass one another between Dock Head and Fawley, further improving the accessibility to and from the Port. As such and in light of the safety management procedures that will be implemented following the dredge (Chapter 21), the magnitude of disturbance is considered to be lower with the proposed approach channel than that which currently exists. The exposure to disturbance with the proposed channel in place is, therefore, negligible and the impact to fishing activities is considered to be **insignificant**, and if anything reduced.

### **Potential Disruption of Fishing Activities Due to Disposal of Arisings**

- 14.32 The offshore disposal of dredged material has the potential to result in the loss or damage to fishing gear on the disposal ground as a plume of dredged material descends to the seabed prior to dispersing on the tidal currents. The intended spread of the material over the complete disposal ground is likely to cause humps on the sea bed up to 3-4m in height at different locations within the ground, which will reduce in height over time, leaving minimal trace on the seabed within a few weeks following cessation of the deposits.
- 14.33 Therefore, the exposure to the change at the bed of the disposal ground will be high during the 65 week period of the deposits during construction. Fishermen are aware that the Nab is a licensed deposit ground and, therefore, fishing activities, particularly those that involve the use of static gear (e.g. potting), are unlikely to occur within the site. Any trawl activity over the deposit ground could be affected, since temporary mounds could exist for extended periods, which do not occur for current maintenance dredging disposals. The overall impact to fishing activities occurring within the disposal ground itself is, therefore, considered **minor adverse significant**.
- 14.34 Simulation of the dispersal and deposition of sediments from the deposit ground indicates that the maximum extent of dispersal of sediments of all sizes to be deposited is large, covering an approximately rectangular area of around 1500km<sup>2</sup> from the east coast of the Isle of Wight and extending from Bracklesham Bay in a southwest direction. The scale of seabed smothering

will, however, be very small, ranging from around 1 to 10mm depending on the distance from the deposit ground and lasting for very short periods of time following deposits (i.e. transient in nature). Therefore, the overall magnitude of the impact on shallow coastal waters of the East Solent, and around the east and south coasts of the Isle of Wight is considered to be small to negligible (Chapter 8). The fishing activities that occur in the area of the Nab are already characterised by the effects of regular disturbance through the disposal of maintenance dredge material. Therefore, the sensitivity of fishing gear to these deposits is considered low. Overall, the impact for fishing activities of greater commercial importance, such as lobster potting, is considered **minor adverse significant** and for species of lower commercial value, such as spider crab, the impact is considered **insignificant**.

### **Potential Disruption to Fishing Activities Due to Formation of Algal Blooms**

- 14.35 High densities of seaweed have been known to hinder fisheries in the Solent by affecting certain fishing methods, including netting, trawling and potting (SSFC, 2005). There will be a negligible to low risk of enhanced nutrient levels in Southampton Water and Solent during dredging, and the formation of macroalgal blooms was considered to be insignificant (Para 11.81). Therefore, the subsequent impact to fishing activities is considered to be **insignificant**.

### **Potential Impacts to Fin Fisheries**

#### *During Capital Dredging*

- 14.36 The main changes during dredging that may potentially impact the fin fisheries of the study area are the indirect impacts due to temporary deposition of disturbed material and direct impacts due to changes to water quality and generation of underwater noise. These changes will vary in time and space depending on tidal state, range of tide, location of dredging, material type and method of dredging, lasting for a few minutes up to several days. The scale of these changes in relation to fish nature conservation features were assessed in detail in Chapter 12. This section reviews these assessments in the context of commercial fin fisheries in the study area.
- 14.37 The temporary impact of deposition of material on the majority of the benthic invertebrate community within Southampton Water has been assessed as being insignificant and, therefore, the impact to fish feeding grounds and subsequent impact to fish catch in the context of commercial fin fisheries, is considered **insignificant**. The impact of smothering the more sensitive bivalve shellfish in Southampton Water on the commercial fish that may choose to eat such prey items is considered to be **insignificant** for fishing activities of lower importance to the fishing industry (e.g. cod and whiting), and **minor adverse significant** at worst for fishing activities of higher economic value to the region (e.g. sole and bass).
- 14.38 The temporary impact of elevated suspended sediment concentrations during dredging within Southampton Water for the feeding ability of the majority of commercial fish species will be **insignificant to minor adverse significant**, and **minor to moderate adverse significant** for fish of higher commercial importance (e.g. sole and bass). Despite this, with respect to sustainability of commercial stock (i.e. spawning and juvenile fish), the temporary impact of increased suspended sediment levels during dredging is considered to range from **insignificant to minor adverse significant** depending on the commercial value of the fish.

- 14.39 During dredging, the temporary impact of changes to other parameters of water quality, including the release of contaminants associated with the dredged materials and any oxygen depletion, is considered to range from **insignificant to minor adverse significant** in Southampton Water, depending on the commercial value of the fish.
- 14.40 Outside Southampton Water, the impact of deposition of material and changes to water quality to fish reduces to **insignificant**, given that the unconstrained nature of the area enables fish to move more easily away from any disturbance.
- 14.41 With the adaptive management strategy that is being discussed with the Environment Agency as mitigation for the deposition of material and water quality changes occurring during dredging in the middle part of the estuary, the residual impact to commercial fin fisheries in Southampton Water is considered to be reduced to **insignificant to minor adverse significant**. These proposed mitigation measures are described in more detail in Chapter 21.
- 14.42 The underwater noise impacts of dredging activities are considered **insignificant** for fish (see Chapter 12).

#### *During Disposal of Dredge Arisings*

- 14.43 The temporary direct impact to fish as a result of the falling plume of deposits at the Nab Deposit Ground has been assessed as being insignificant for pelagic fish and insignificant to minor adverse significant for bottom-dwelling demersal fish that are less likely to be able to rapidly move and avoid the impact. However, the initial disposal plume will impact on a very localised area of seabed and, therefore, the actual impact to fin fisheries within the study area as a whole is considered **insignificant**. Furthermore, it is likely that a relatively small number of fish may benefit from the potential food source, however, the scale is considered negligible and the impact to commercial fin fisheries will be **insignificant**.
- 14.44 During disposal, the temporary deposition and resulting disturbance to subtidal habitats further away from the immediate vicinity of the disposal site that provide a feeding resource, as well as nursery and spawning grounds for commercial fish (e.g. bass and sole), is considered to range from **insignificant to minor adverse significant**, depending on the commercial value of the fish.
- 14.45 At the disposal ground, the temporary impact of enhanced suspended sediment concentrations on fish directly in the area of the deposit ground is considered to be **insignificant to minor adverse significant**. Away from the immediate vicinity of the deposit location, the impact on the feeding, nursery and spawning activity of commercial fish in the surrounding area is considered to be **insignificant** for fish populations and the long-term recruitment to the commercial fishery.

## Potential Impacts to Shellfisheries

### *During Capital Dredging*

- 14.46 The main changes during dredging that may potentially impact the shellfisheries are temporary deposition of sediment (smothering), increased suspended sediment concentrations and potential uptake of chemical and microbiological contamination as a result of the release and redistribution of any sediment-bound contaminants. The oyster is particularly sensitive to these effects given that it is a suspension feeding, surface dweller (epifaunal). The oyster becomes attached to the substrate by a process of cementation and are, therefore, sessile, in contrast to clams. They also tend to live on hard or mixed substrata where sedimentation is less of a problem, and require a clean substrate of shell, shingle or other suitable material for the settlement of larvae (spat), which occurs during April to July. During this time and the summer, when feeding rates are at a maximum, a clean substrate is important, and any increase in siltation as a result of sediment dispersion from activities could have economic implications as well as detrimental effects to the fishery in the long-term.
- 14.47 Concerns about the smothering or siltation of shellfish beds in Southampton Water were raised following the dredging for the Southampton Water main channel deepening in 1996/97. The use of cut to bed and “double-handling” methods that were used during the last main channel deepening have been discounted by ABP as a feasible option for this proposal on environmental grounds due to the spread of suspended sediment concentrations and deposition of material that resulted in the short-term. It should, however, be noted that the ten year monitoring study found no evidence to suggest the channel deepening affected the long-term natural processes occurring in the estuary (ABPmer, 2007b). The global dredging industry has expended considerable time and effort in researching methods to minimise the impacts of dredging activity, for example noise reduction, minimising overspill and sedimentation effects. The latest techniques have been explored and will be developed into the scheme, as part of the dredge tendering process as far as is practicable.

### *Southampton Water*

- 14.48 Simulations of the dispersion and deposition of sediments from the dredged areas within Southampton Water indicate that the temporary exposure to increased siltation and elevated suspended sediments will be low to negligible for the commercial oyster beds along the eastern shore (including those located at the mouth of the River Hamble) and low to medium for the clam beds along the western shore of Southampton Water (Chapter 11). There will also be a very low to negligible temporary exposure of shellfish to contamination in the water column during dredging activities. In actual fact, the dredge is likely to provide an improved sediment quality environment for shellfish in the longer-term as any contaminants in the proposed dredge areas will be removed from the estuary. Given the fact that the commercial shellfisheries located in Southampton Water are only harvested on a small-scale basis and are of relatively low importance to the fishing economy, despite the fact that shellfish have a high sensitivity to smothering and water quality changes, the temporary impact is considered to be **insignificant to minor adverse significant**.
- 14.49 With the adaptive management strategy that ~~is being discussed~~ **has been agreed** with the Environment Agency as mitigation for the deposition of material and water quality changes

occurring during dredging in the middle part of the estuary, the residual impact to commercial shellfisheries in Southampton Water would be reduced to **insignificant**. These proposed mitigation measures are described in more detail in Chapter 21.

### *Solent*

- 14.50 The magnitude of the deposition and suspended sediment concentrations that are predicted over the shellfish occurring outside of Southampton Water as a result of the capital dredging is considered to be low to negligible (Chapter 11). Therefore, despite the fact that certain shellfish in the Solent are of high economic value (e.g. oysters and cuttlefish), given the scale of change, the temporary impact will be **insignificant to minor adverse significant**. The impact to shellfish of lower economic importance to the fishing industry that occur in the Solent (e.g. cockles and periwinkles) will be **insignificant**.

### *During Disposal of Dredge Arisings*

- 14.51 During the last main channel deepening in Southampton Water, some concern was expressed about the increased suspended sediment concentrations and deposition on the lobster and crab fisheries in the area as a result of the disposal of material (ABP Research, 2000b). With the aid of the fishermen, pots were placed and monitored before and throughout the dredge to determine whether any changes in numbers and health of the crabs/lobsters occurred as the dredge progressed. The results indicated that no significant changes occurred during the eight months when sediments were being deposited at the deposit ground. The changes in suspended sediments and deposition in the vicinity of the Nab Deposit Ground will be of a similar magnitude to those normally experienced during existing and previous disposal operations at the site. It is, therefore, unlikely that the crustacean shellfish resource around the deposit ground will be at risk during disposal activities. With a negligible exposure to change, the temporary impact to crab and lobster fisheries is considered to be **insignificant**.
- 14.52 The exposure of the nearest commercial bivalve shellfish beds in the Eastern Solent to the short-term increases in suspended sediment concentrations that are predicted to occur after disposal of capital dredge material is considered to be very small to negligible. In the context of existing and previous disposal activities at the Nab Deposit Ground, the overall impact of the disposal of arisings at the Nab is considered to be **insignificant to minor adverse significant** for the nearest commercial beds of higher importance to the economy (e.g. oysters) and **insignificant** for those of lower economic value (e.g. cockles and periwinkles). [ABP has agreed with Cefas that disposal of material will be subject to gridding to ensure that deposits are placed evenly within the area of the deposit ground.](#)

### *Potential Impacts During Future Maintenance Dredging*

- 14.53 The same potential indirect impact to commercial fisheries as a result of changes in water quality and sedimentation, will apply during maintenance dredging as for capital dredging, although the scale of impact is substantially less. Furthermore, the effects on future maintenance dredging requirements are expected to be small compared with existing annual variability (Chapter 8). It is anticipated that there will be a marginal increase in maintenance dredging commitment, anticipated to be 30,000m<sup>3</sup> *in situ* per annum, which will extend the maintenance campaigns by a few days and require an additional 8-10 loads or 16-20 vessel

movements annually. Considering the frequency of these additional movements and scale of the estuary, the potential for noticeable changes to vessel traffic density due to maintenance dredging movements is negligible. Therefore, the impact of changes to water quality and additional traffic during maintenance dredging will have an **insignificant** impact on the commercial fisheries in the study area.

## **Conclusions**

- 14.54 The main impacts will occur during the capital dredging and disposal of arisings, where on the whole, the scale of impacts to commercial fisheries interests will be insignificant to minor adverse significant. Given the magnitude of change in suspended sediment concentrations during dredging within Southampton Water, albeit transient and short-term, the impact will reach moderate adverse significant for fish species of high commercial value in the estuary, such as bass and sole. With the adaptive management strategy that will be implemented as mitigation for the dredge, the residual impact to commercial stocks will be reduced to acceptable levels. Following the channel dredge, the impacts to commercial fishing activities and fish resource will be insignificant.