Shellfish Association
of Great Britain

# English Shellfish Industry Development Strategy

## ‘Securing the industry’s future’

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Co-ordinated by Seafish

Shellfish Association of Great Britain

SEAFISH

# Contents

# 1. Executive summary

This Strategy for the Development of the Shellfish Industry in England considers what support is needed for the sustainable and profitable development of the sector. The sustainable development of the industry, through the long term management of stocks and supporting ecosystems from the socio-economic and environmental perspectives, is paramount to delivering the Strategy. Comments were gathered from a wide range of stakeholders, including from within the industry, to help formulate the text of the Strategy.

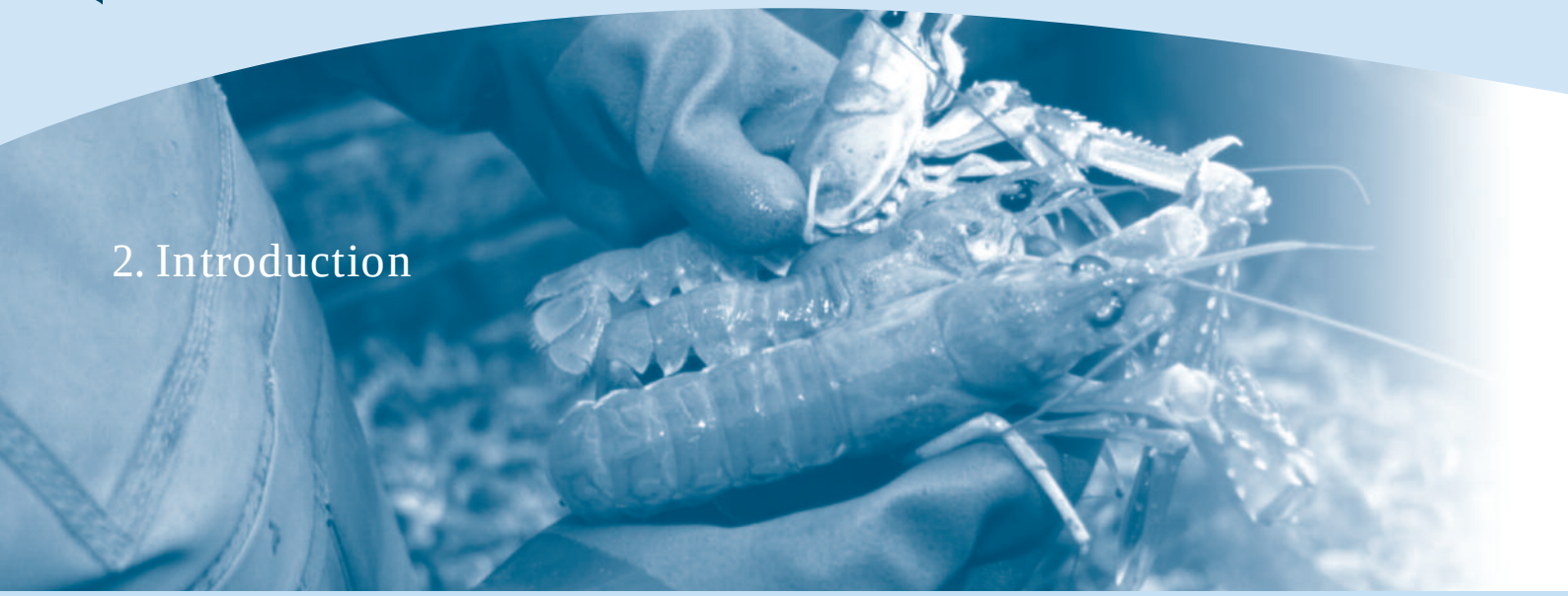
In 2004, based on Defra's official statistics, the total first sale value for shellfish production (ie landings from capture fisheries and outputs from cultivation) in England was just under £70 million. This is considered to be an under-estimate with first sale value being at least £115 million. Around 50% of shellfish production goes for export, at three times the average first sale value. If value is added to the remaining 50% in the UK, products to the consumer could be worth around £400 million. An overall value of the English shellfish industry in 2004 was estimated to be £570 million.

Shellfish are well regarded for their freshness, health benefits and suitability for market but problems with seasonal availability and quality can be an issue for processors. Some retailers are becoming more understanding of these limitations and some are accommodating seasonal ranges. Independent certification that fish and shellfish come from environmentally sustainable sources is becoming a prerequisite for processors and retailers. Increasingly, the consumer is also seeking these assurances. Currently, fisheries management does not recognise market conditions and the merit of regulating supply to help ensure quality of product. There is a strong market driver to link product supply, and accreditation schemes, with shellfisheries management.

If the market is going to require certificated products, then the current shellfish industry will be at a great disadvantage unless measures can be put in place so that the stocks and fisheries qualify for accreditation. This will require effective management of the main stocks (for which management measures are in place) to maintain their favourable stock status, as well as taking precautionary measures to ensure that developing fisheries do not overexploit stocks that are not currently assessed or managed. There will also be a need to ensure that any wider environmental impact of shellfisheries is managed and minimised appropriately. All of this will require a comprehensive management framework, sound science and advice based on good data, a commitment to achieving management objectives (from the fisheries and environmental perspectives), stakeholder 'buy-in' and compliance with the regulations. Reasons for national management measures and control of shellfish stocks out to 12 nm, to help ensure long term sustainability of the stocks and their environments are presented.

The Strategy lists a number of issues that affect the industry as a whole, as well as issues that are specific to each sector (hand gatherers, the static and mobile gear sectors and the cultivation sector, ie aquaculture businesses). Recommendations are given for the sustainable development of the shellfish industry. While various organisations and stakeholders have been identified to support the implementation of the Strategy, it has to be recognised that this will depend on their having the remit and resources available.

The Strategy was received by Defra's Inshore Fisheries Working Group in March 2007, having taken this into account.



# 2. Introduction

The potential development opportunities of the UK shellfish sector were highlighted in the Prime Minister's Strategy Unit report 'Net Benefits' (2004[1]). In response to:

Recommendation 6: *Fisheries departments should focus on support for the development of the inshore/shellfish industry to take advantage of its large growth opportunities*

Defra's Inshore Fisheries Working Group recommended that a Strategy for the Development of the Shellfish Industry in England was needed to direct support for the sustainable and profitable development of the sector for the future. As a first step and through a FIFG-funded project, the scale and activities of the existing industry were reviewed to identify any future development opportunities and to make recommendations on how this might be achieved (Bannister, 2006[2]).

This Strategy will be owned by the industry and builds on the Shellfish Association of Great Britain's Strategy[3] (amended in 2004). Comments from a wide range of stakeholders were gathered to help formulate the text. The responsibility for co-ordinating the drafting of the Strategy was assigned to the Sea Fish Industry Authority (Seafish).

Presently, English shellfish production (landings from capture fisheries and outputs from cultivation) has a value at first sale of around £70 million. However, this figure seriously undervalues the industry because value is added to this primary/raw material downstream along the food supply chain. This can be through export, often as live products, or through processing of the primary product for sale to the home or export markets. Also, shellfish processors import raw material to produce products for home markets or for re-export.

In his Executive Report (2006[2]), Bannister identified development opportunities for the shellfish industry. This Strategy is the next step in the process and aims to achieve sustainable development of the sector through ecosystem-based management, especially as the industry relies primarily on natural resources.

The timing of this Strategy coincides with the Marine Bill White Paper (March, 2007) and Defra's Vision on marine fisheries[4]. While the Strategy is supported by the shellfish production industry, constituent parts will need to be implemented by government and a range of other stakeholders to allow for developments at various levels to be realised. These have been identified accordingly but it has to be recognised that implementation of the Strategy will depend on them having the necessary remit and resources available.

## 2.1 Strategy Formulation

The need for a Strategy has been acknowledged by the capture and cultivation industries in England as a result of increasing pressures and constraints on development from a range of sources, while at the same time recognising new and evolving opportunities for the sectors. The desire to remain competitive and efficient within the local and global market place for shellfish products, combined with the need to utilise marine resources in a sustainable way, requires forward planning by industry, and for industry. The main objective and the key aims in seeking to formulate this Strategy are as follows:

Objective:

To formulate a strategy detailing ways to achieve the sustainable development of the English shellfish production (capture and cultivation) industry, that fully recognises the need for environmental and social sustainability as well as commercial development, and to gain stakeholder support for a programme of implementation.

Key Aims:

- Identify the strategic requirements on a short, medium and long-term basis for the sustainable development of the English shellfish production industry, and devise a national development strategy for implementation.
- Seek the adoption of and support for the development strategy by all sectors of the shellfish industry.
- Facilitate action by government, modernised Sea Fisheries Committees (mSFCs and including the Environment Agency if acting as an SFC) and other key stakeholders to devise and implement legislative and administrative systems in support of the strategy objective.
- Formulate development plans to encourage uptake and implementation of the strategy by all industry sectors at local, regional and national levels. Identify key targets for implementation and monitoring of outcomes.
- Identify key issues for government, Natural England, modernised Sea Fisheries Committees (including the Environment Agency if acting as an SFC), industry and environmental NGOs in relation to consultation on the proposed Marine Bill.

# 3. Overview of the shellfish industry

The shellfish production industry is important in all regions of the UK although the nature of the industry does result in regional variations due to geographical differences in the distribution of habitats and species. Estuaries are important for the cultivation of bivalve molluscs, as well as wild stocks of molluscs and some crustacea. The main crustacean and key molluscan fisheries occur within inshore waters in England, and are principally managed by the SFCs with considerable fishing pressure exerted by the <10m fleet. Significant fisheries for molluscs and crustacea also occur between 6 – 12nm with historic access rights for non-UK vessels. Some shellfish stocks are further out on the continental shelf and are exploited by various countries.

## 3.1 Shellfish Production

The UK production industry can be broken down into two main sectors, the capture and cultivation industries. These supply both home and export markets with significant import and export trade occurring (Table 1).

The principle shellfish activities in England are given in Table 2. These data were as reported by Bannister (2006[2]), based on official Defra statistics for 2004 tonnages and with species ranked by value and indicative values (£/t) given for each species. Total value for the production industry was just under £70 million based on Defra's official statistics. The Table also summarises the gear used, the status of the fishery and cultivation potential for each species (extracted from Bannister, 2006[2]).

Bannister showed that first sale figures should be increased by at least 20% (Table 18 in his report) based on differences he found between Defra and SFC data. Landings of some species, such as lobster, brown crabs and velvet crabs could be increased 50% above Defra official statistics. Landings from hand gathering (cockles and winkles) were seriously under-recorded. Annual cockle landings are probably around 50,000 tonnes and one SFC reported hand gathering of 40 tonnes of winkles valued at £0.04 million.

Taking these points into consideration, a value-added extrapolation has been used to give a more realistic indicative value for English shellfish production in 2004, as follows. First sale value (£70 million) can be increased by 20% to include additional landings (see above) and landings from hand gathering can be as much as £30 million. This raises first sale value to approximately £114 million. Assuming around 50% of production goes for export (at x3 the average first sale value of £1,000 per tonne (see Box 5, Bannister, 2006[2]), exports are worth around £170 million. If value is added to the remaining 50% through the supply chain at an average level of seven times the first sale value (based on Seafish reports on value chain evaluation for Nephrops[5], mussels and scallops[6]), value-added products to the consumer could be worth around £400 million. Adding together the value of exports and value-added products, this gives an indicative value of £570 million for shellfish production in England in 2004.

The sectors of the shellfish industry have been further sub-divided based on the production methods and types of gear used (Table 3) and a value apportioned accordingly to each sector (based on information in Table 10, in Bannister, 2006[2] and an estimate included for bycatch). Shellfish cultivation represents approximately 5% of total production (see Table 18, Bannister, 2006[2]). An indicative value for the cultivation sector is given in Table 4.

Table 1. UK Production and Trade in Shellfish Products 2004 Source: DEFRA and SFIA

| Production (tonnes) | | UK vessel landings | UK Cultivation | | UK imports | UK exports |
|---|---|---|---|---|---|---|
| Species | | | Farms | Fishery orders* | | |
| Crustacea | Crawfish | 10 | | | 235 | 146 |
| | Crabs | 21,740 | | | 2,039 | 14,442 |
| | Lobster | 1,360 | | | 1,677 | 1,485 |
| | Nephrops | 30,390 | | | 1,566 | 20,842 |
| | Shrimp/Prawn | 500 | | | 91,448 | 25,039 |
| | Other | 110 | | | 814 | 861 |
| TOTAL | | 54,110 | | | 97,779 | 62,815 |
| Bivalve molluscs | Clams | 250 | 18 | 409 | | |
| | Cockles | 12,890 | 10 | 14,459 | | |
| | Mussels | 12,070 | 26,611 | 16,865 | 5,617 | 13,660 |
| | Oysters | 540 | 1,137 | 783 | 395 | 945 |
| | Queens | 5,100 | 45 | | | |
| | Scallops | 21,090 | 10 | | 1,261 | 8,855 |
| Gastropod molluscs | Whelks | 12,210 | | | | |
| | Winkles | 60 | | | | |
| Cephalopod molluscs | Cuttlefish | 5,020 | | | | |
| | Squid | 730 | | | | |
| | Squid/Cuttle. | | | | 5,714 | 10,696 |
| | Octopus | | | | 257 | 22 |
| | Other | 2,200 | | | 2,227 | 6,479 |
| TOTAL | | 72,160 | 27,831 | 32,516 | 15,471 | 40,657 |
| Other | | | | | 129 | 739 |
| GRAND TOTAL | | 126,270 | 27,831 | 32,516 | 113,379 | 104,211 |
| Official value £m | | 173 | 23 | 21 | 409 | 336 |

* Fishery Order production for England and Wales

## 3. Overview of the shellfish industry (continued)

### Table 2. Principle shellfish activities in England in 2004 ranked on production value

| Species | Value £m | Tonnes | Unit value £/tonne | Gear Type | | | | Fishery status | Potential for stock enhancement or cultivation |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Hand | Static | Mobile | Non-target | | |
| Scallop | 12.70 | 8,407 | 1,510 | | | dredge | x | *** | * |
| Brown crab | 11.33 | 10,392 | 1,090 | | x | | x | *** | O |
| Cockle | 10.03 | 13,548 | 740 | x | | dredge | | ** | * |
| Lobster | 8.01 | 863 | 9,280 | | x | | x | *** | * |
| Nephrops | 5.86 | 2,536 | 2,310 | | | trawl | | *** | O |
| Whelk | 5.79 | 11,824 | 490 | | x | | | ** | O |
| Cuttlefish | 4.10 | 4,825 | 850 | | | trawl | x | *** | O |
| Squid | 2.34 | 805 | 2,910 | | | trawl | | *** | O |
| Mussel | 1.56 | 9,965 | 160 | x | | dredge | | * | ** and *** |
| Pacific oyster | 1.20 | 446 | 2,830 | x | | | | * | *** |
| Native oyster | 0.72 | 527 | 1,360 | | | dredge | | ** | ** and *** |
| Brown shrimp | 0.65 | 482 | 1,350 | | | trawl | | ** | O |
| Queen scallop | 0.65 | 1,760 | 370 | | | dredge | | ** | * |
| Spider crab | 0.46 | 536 | 850 | | x | | x | ** | O |
| Velvet crab | 0.46 | 343 | 1,330 | | x | | | ** | O |
| Others: not ranked | | | | | | | | | |
| Crawfish | | | 18,200 | | x | | x | *** | O |
| Razor clam | | | 2,740 | x | | dredge | | * | * |
| Winkle | | | 1,230 | x | | | | * | O |
| Other clams | | | 1,910 | | | dredge | | * | *** (for some spp) |
| Green crab | | | 520 | x | | | | * | * |

### Key to Table

Fishery status:
*** = maximum sustainable yield level;
** = local development opportunities;
* = development opportunity

Enhancement or cultivation:
o = no techniques known;
* = experimental;
** = extensive;
*** = intensive

Table 3. Principle shellfish sectors in England and indicative value in 2004

| Sector | Gear type | Typical species | Indicative value (£m)* |
|---|---|---|---|
| Hand gathering | Non-mechanised | Cockle<br>Winkle<br>Green crab (soft)<br>Mussel | 86 |
| Static gear | Pots<br>Traps<br>Netting | Crabs<br>Lobster<br>Cuttlefish<br>etc. | 171 |
| Mobile gear | Dredges<br>Trawls | Scallop<br>Cockles<br>Clams<br>Mussel/Seed<br>Native oyster<br>Nephrops<br>Shrimps<br>etc. | 216 |
| Non-targeted | Trawls<br>Dredges<br>Finfish nets | King scallop<br>Crabs<br>Lobster<br>etc. | 97 |
| Total value | | | 570 |

* Estimated value to the consumer

Until more reliable data are available, it has to be assumed that the shellfish industry is still under valued even when based on the figures given in this document. For example, unreliable data on numbers of registered shellfish vessels (<10m, 10 – 12m, >12m etc.) and vessels taking a by-catch of shellfish; the potential scale of the employment generated by hand gathering operations under permit, and also those without public control; the catch from un-registered shellfish vessels and recreational harvesting of shellfish (eg divers with catch often sold to pay expenses); under reporting of landings in relation to the significant scale of the real industry, with many small landing places and vessels (<8m).

The development of shellfish production, and principally bivalve mollusc outputs during recent years, has seen a merging of fisheries management and cultivation techniques. Consequently, it has become increasingly difficult to separate molluscan capture and cultivation activities in some coastal waters. However, for aid of clarification it is proposed that all activities where resources are expended in securing seed or half-ware from hatcheries or from the wild for subsequent on-growing (on registered farm sites or under Fishery Orders), should be considered to be cultivation operations (Table 4).

Table 4. Principle shellfish cultivation activities undertaken in England and indicative value in 2004

| Cultivation technique | Equipment / Property rights | Typical species cultivated | Indicative value (£m)* |
|---|---|---|---|
| Hatchery production | Onshore purpose built seed production facility | Pacific/Native oyster<br>Clams<br>Lobster | 0.5 |
| Intensive production | Hatchery seed contained on foreshore lease | Pacific oyster<br>Manila clam<br>Palourde | 2.5 |
| Semi-intensive production | Hatchery/Wild seed Suspension/Seabed | Mussel (Rope)<br>Oysters/Clams<br>King scallop | 4.0 |
| Extensive production | Wild seed Seabed areas | Mussel<br>Native oyster<br>Cockle | 21.0 |
| Ranching / Enhancement | Hatchery seed Extensive seabed | Lobster<br>King scallop<br>Native oyster | 0.5 |
| Total value | | | 28.5 |

* Estimated value to the consumer

The size of the shellfish industry, in terms of numbers of vessels, is estimated to be around 2,325 for England and Wales, of which just less than 2,000 are in England (see Table 19, Bannister, (2006[2])). The employment generated by shellfish production for England and Wales was estimated at 10,000 of which at least 6,000 can be attributed to businesses in England.

## 3.2 Markets and Market Demand

Using import/export and production data from Table 1, it is possible to identify the UK market for shellfish products and that 56% of the product is exported. The scale of internal movement of product between devolved regions is not known in detail but shellfish are mainly traded as fresh if exported with little value-adding in the UK. The potential for export earnings from this trade is good and the processing sector is equally good at taking products from abroad, modifying them and then exporting after adding value. (For a comprehensive review of the UK processing industry see Curtis & White, 2005[7].)

Market sales of seafood are increasing in the UK and the promotion of more healthy eating options offers significant opportunities for further development. Shellfish are well regarded for their freshness, health benefits and suitability for market but problems with seasonal availability and quality are an issue for processors; though some retailers are becoming more aware of seasonality issues and are accommodating these products accordingly. The global market offers opportunities, eg China and its demand for fresh product, as well as additional risks, eg competition from the projected mussel production from countries such as Chile.

Accreditation of fisheries and certification of products that come from environmentally sustainable sources are becoming a requisite for processors and retailers when sourcing product. Increasingly, the consumer is seeking these assurances too. This offers the possibility for local/regional food production and for cultivation and farm assurance type schemes. In 'Net Benefits', Recommendation 7 states that the *'Fishing industry should maintain and enhance its market opportunities*

*by aiming to achieve Marine Stewardship Council (or equivalent certification) for all stocks of major interest to the UK by 2015'*. If we assume that English shellfish stocks are 'of major interest' and that they could benefit from accreditation schemes, then it is vitally important that reliable systems of stock management are in place. Although the major shellfish stocks are being managed through a variety of management measures, it is doubtful how many would currently reach the standards required to qualify for certification.

When sourcing shellfish from the UK, the processing industry is faced with difficulties of consistency of supply (through issues of seasonality, assured volume etc.), quality of shellfish when landed and cost structure (tending towards foreign processing due to higher costs of labour intensive activities in the UK). Recent investment into the capture industry has started to address maintaining the quality of shellfish during handling and transport to help ensure quality at point of first sale. Measures have included modernisation of facilities on-board vessels and at landing points to improve traceability, development of good practice guidelines and training of crew and other handlers of shellfish. The industry will need to continue to invest in such initiatives at the local and regional level. Buyers should seek to reward the supplier for the reliable and regular supply of highest quality produce.

Another way to improve shellfish quality would be for fisheries management measures to recognise market conditions and the merit of regulating supply to maximise quality of product. Equally, better supply/demand intelligence would help, especially at the local level where fisheries are landing insufficient volumes of some species to justify marketing (eg octopus in NE England). Therefore, there is a need to link market supply with fisheries management. This can be assisted by MSC certification (and other certification such as organic etc.) since some retailers are giving preferential status to such suppliers to meet their 'green' commitments.

In summary, the supply chain needs product that is the right quality at the right price and at the right time if it is to service key identifiable markets, whether for local and regional markets or for export. The production sector needs to be allowed to be competitive within these markets through production efficiency and scale. There is potential for adding value if the right product can be delivered to the market and there is potential for export earnings if overseas markets are accessible. Fisheries managers will need to work with the capture and cultivation sectors to identify optimum market opportunities and the merit of regulating supply to ensure product quality and traceability. To achieve all of this, investment and support will be needed (eg through Regional Development Agencies, the European Fisheries Fund, etc.).

## 3.3 Industry Organisation

The shellfish catching sector does not have a single voice through one representative body. Some fishermen are represented through a range of fishermen's associations and some are represented through a national federation. Representation has often been achieved at a local level through the district SFC, although this is by default as the SFCs are management bodies with no remit for representing the sector. The SAGB is the trade body at a national level covering all shellfish sector interests but no single forum exists for the production industry to consider national development issues.

The production industry has historically not organised itself on a co-operative basis and suffers from limited economies of scale on a local and national basis. Public investment in the sector has historically been piecemeal due to the size of vessels operating (<10m) and the small scale of typically family businesses. Training of operators and business managers is relatively limited. Information flow is poor and the recognition of fisheries products as food products is limited. There is no national perspective on improving efficiency in the sector, so opportunities will need to be made available through the European Fisheries Fund (EFF) to encourage a more co-operative approach.

## 3.4 Fish Industry and Shellfish Production

There are links between the shellfish sector and other sectors of the fish industry that cannot be ignored. These include merchanting and distribution, through employment generated downstream of the production sector for example. Also, beam trawlers rely on the scallop catch in addition to high value flatfish and there is also bycatch of crustacea by the fish industry (eg crab claw bycatch levels etc.). These issues need to be questioned in terms of efficient and sustainable use of limited shellfish resources. Clearly this demonstrates the links between finfish capture activities and those for shellfish and highlights the need for a process of fish and shellfish management.

Additional pressure on shellfish stocks from whitefish vessel decommissioning is now capped by shellfish licensing. However, recreational use of unregistered fishing vessels and removal of high value shellfish, as well as shellfish taken by divers need to be considered.

## 3.5 Shellfisheries Management and Industry Administration

District SFCs have responsibility for managing inshore fisheries (shellfish and finfish) out to 6nm from baselines. The Environment Agency (EA) acts as the SFC in certain estuaries including the Severn and the middle Thames and has responsibilities for migratory species and conservation species such as hagfish, lamprey and shad etc. out to 6nm. There are difficulties controlling shellfishing activity (including hand gathering) both registered and un-registered, within and outwith 6nm and policing the rights of foreign vessels in the 6-12nm zone. There is also a lack of control over some cultivation operations (i.e. Several Orders within a Regulating Order Fishery) and the movement of stock between areas.

The status of shellfisheries is given in Table 2 and demonstrates that many species are fully exploited. For species that are considered not to be fully exploited, there still needs to be effective stock management to ensure sustainability of stocks in the long term. *Nephrops* is the only TAC species. Lack of national resources will prevent stock assessments and management at national level for the other main species of crustacea and molluscs. Stock biomass is estimated for some intertidal species at a local level. Bannister (2006[2]) stressed the need for more empirical estimates of shellfish stocks, as science is too costly and slow to provide stock management advice for all stocks. There is difficulty in managing even at an empirical level, however, if accurate catch and effort statistics are not available. The current lack of knowledge of some valuable stocks may be overcome through improvements in total landings data. This should in part provide some answers to improve stock assessments at the local level.

There is a strong desire to have integrated fisheries and environmental management delivered through mSFCs (and the EA if acting as an SFC) under the Sea Fisheries (Wildlife Conservation) Act 1992. However, there is no national framework to guide mSFC activities. Currently, activities are partly determined by the extent of resources available within each local government area and not revenue generated from the fisheries/cultivation in the district – though they do make a contribution[8]. The SFC districts, as currently managed may not match the extent or scale of resources needing to be managed. There is no direct linkage between management measures within 6nm and controls within 6-12nm, a demarcation line that does not reflect the occurrence of many shellfish stocks. Between 6 –12nm, it is the responsibility of the MFA to enforce national and EU regulations that apply to that zone. Some foreign vessels have historical rights of access to fisheries, which though not necessarily targeted at shellfisheries still take shellfish as bycatch. In 'Net Benefits' (2004), inshore is defined as out to 12nm. Provision for equivalent national control measures

out to 12nm would improve the management of many shellfish stocks and enhance the sustainable development of the shellfish industry in the long term. This would be beneficial for meeting the stock management standards that are required when seeking accreditation/certification of shellfisheries (see 3.2), an increasingly important market driver.

There are a number of government control mechanisms for shellfishing including local SFC byelaws, Shellfish Licensing, Buyers and Sellers, and Fishery Order legislation as well as national regulations such as managing *Nephrops* TAC, enforcing EU/national MLS and technical measures etc. The system for administering shellfish cultivation activities and the control of disease is through the registration of farm sites, and through the approved/non-approved zone status for molluscan diseases.

## 3.6 Environmental Issues

Class A shellfish harvesting areas are the optimum requirement for the bivalve mollusc industry since major retailers prefer to accept live animals from Class A areas, and depuration is generally not a substitute. The co-ordination and cost of testing is a local government public health function and is resourced at the minimum level required to meet public health standards. The production industry requires increased monitoring to ensure the status of harvesting areas are maintained. There is also a need to ensure that testing regimes and methodologies and the classification process for shellfish harvesting areas are undertaken to the same standards throughout the EU. To help assure Class A can be achieved (currently the government aim is to achieve the standard of at least Class B as an interim step to achieving this standard), the 'polluter pays' principle should apply and monitoring should be resourced accordingly.

The implementation of the Water Framework Directive (WFD) is likely to have both positive and negative impacts on industry. The control of diffuse and intermittent pollution will be targeted to help restore 'ecological status', and mechanisms to ensure the 'polluter pays' for maintenance. The WFD will be relevant out to 1nm and will need to be enforced by a statutory body with marine capability. The WFD will enable commercial shellfish stocks and cultivation sites to be designated under areas 'designated for the protection of economically significant aquatic species'. It will also provide the opportunity to re-establish shellfish beds and the conditions for enhancement, particularly for species like the native oyster.

The recent impact on industry from closures relating to biotoxins has been significant. Again, procedures used in the biotoxin monitoring programme need to be best practice and harmonised within the EU.

The sustainable development of the industry will depend on a balance between fisheries and environmental management, particularly in Natura 2000 sites. At the national level, fisheries management objectives must be rationalised with environmental conservation objectives. To assist the process, a Memorandum of Understanding (MoU) for Appropriate Assessments in marine sites was proposed between the Shellfish Association of Great Britain and English Nature. Discussions on an MoU continue now with Natural England as it has taken on the role of statutory advisor to government on nature conservation issues. A number of new European Marine Sites (EMS) are likely to appear in the 0-12nm zone and management of these sites and the fisheries affected will need a collaborative approach between industry, fisheries managers and conservation agencies.

The concept of ecosystem-based shellfisheries management needs to be developed. The use of Strategic Environmental Assessment (SEA) would be a good first step and highly applicable to shellfish activities. (NB. A pilot SEA, being carried out by the North Eastern SFC, has been started.)

## 3.7 Marine Resource Use

Greater development pressures are being placed on shellfish production waters from a range of interests. Equitable access arrangements will be required through systems such as Integrated Coastal Zone Management (ICZM). Therefore, a national perspective needs to be developed. Marine Spatial Planning (MSP) and nature conservation and fisheries Marine Protected Areas (MPAs) will both impact on the industry and are particularly relevant for shellfish stocks, which have low mobility and specific habitat requirements. MPAs for shellfish resources may be particularly relevant for nursery/spawning areas faced with aggregate extraction or energy development operations (wind farms, wave/tidal power and oil/gas production).

## 3.8 Climate Change

Inshore shellfisheries and the cultivation industry are particularly vulnerable to the effects of habitat loss or change due to sea level rise and inundation. A medium term view needs to be taken on the possible loss of some areas for shellfish production and the potential for new areas to be created through managed retreat. A species shift in the capture fisheries is also a potential issue. Other issues may be that Pacific oyster and Manila clam will become self-recruiting in new areas, crab species will migrate further north and displace other species, recruitment failure may occur in some cephalopod stocks in the English Channel, etc.

# 4. Development requirements

This overview of industry activities, set within the context of environmental and market considerations, indicates the complexity of managing development within the sector. The issues relevant to the sustainable development of the sector can be identified within three clear categories.

## 4.1 Cross Sectoral Issues

These are directly relevant to both the capture and cultivation industries and include:

- Management and administrative structure
- Water quality criteria
- Biotoxin monitoring standards
- European marine site management
- Strategic environmental assessment and Environmental impact assessment
- Water framework directive implementation
- Accredited fisheries and products
- Climate change implications
- Ecosystem-based management
- Integrated coastal zone management

## 4.2 Sectoral Issues

Within each of the sectors identified, there are priority development concerns to be addressed and include:

- Hand gathering
  - Management control
  - Public health control
  - Environmental and access management
- Static gear
  - Effort control
  - Stock structure, monitoring and assessment
  - Catch and effort recording
  - Market value
- Mobile gear
  - Environmental conservation measures
  - Foreign vessel access and monitoring
  - Stock structure, monitoring and assessment
  - Bycatch reporting
  - Bycatch reduction
  - Interaction with static gear
- Non-Targeted production
  - Enforcement and penalties
  - Bycatch reporting
  - Bycatch reduction
- Cultivation
  - Designation and availability of sites
  - Stock security measures
  - Seed resource access

## 4.3 Key Species Issues

There are a range of development issues for individual species within each of the production sectors (Table 5). (Note: Table 5 summarises information in Bannister's Executive Report (2006[2]). For more details and comprehensive information, refer to Chapters 4 and 5 in that Report). These issues should be resolved through management and/or marketing measures identified within the sectoral development strategies (see Notes in the Appendix). In addition, three key shellfish species require specific strategic intervention if development is to be maximised; all centre on enhancement.

- Native oyster
  - Biodiversity action plan species
  - Water framework directive – ecological status indicator
- Mussel
  - Seed resource availability
  - Offshore production
- Lobster
  - Habitat availability

# 5. Development opportunities

To achieve a sustainable and economically viable industry, the development issues identified will need to be resolved. This will be facilitated through the formulation and implementation of a development strategy that seeks to maximise the production and market opportunities available to each sector, whilst recognising the needs of the industry as a whole, and, most importantly, the principle of sustainable use of environmental resources.

The primary development opportunity for the shellfish industry is to enhance its performance, and hence the economic value to the country as a whole. This can be achieved and viewed in a range of ways for the various species (Table 5). The overall economic value of the shellfish industry depends particularly on the capture industry, which is the largest generator of shellfish revenue and employment. A key principle to adopt is that of sustainability, in order to:

- maintain economic viability long term;
- alleviate concerns about harvesting in the context of statutory nature conservation designations; and
- give shellfish a positive image in a retail market that increasingly requires supplies from fisheries that are managed *sustainably* and are accredited.

This requires:
- managing the main assessed stocks effectively in order to maintain their favourable status, and seeking appropriate accreditation; and
- taking precautionary measures to ensure that developing fisheries do not overexploit stocks that are not currently assessed or managed, and for which there is little prior information.

This in turn requires:
- a comprehensive management framework;
- sound science and advice based on good data;
- a commitment to achieving management objectives; and
- effective compliance with the regulations.

## Key to Table

Fishery status:
*** = maximum sustainable yield level;
** = local development opportunities;
* = development opportunity.

Stocks:
*** = significant lack of information on stocks to
* = good information available.

Markets & marketing:
*** = significant support needed, through to
* = established long term markets

## Table 5 Development opportunities per species, summarised from Bannister (2006)

| Species | Fishery status | Stocks | Markets and marketing | Notes |
|---|---|---|---|---|
| Category A | | | | Stocks fully exploited, expansion not recommended, manage existing stocks and fisheries effectively; enhance value at first point of sale and/or new markets and products; research on stocks may be required. |
| Brown crab | *** | *** | *** | Science gap on stock structure, recruitment processes and assessment methods; increasing pot numbers, mobile gear and gravel dredging issues; need consistent supply of quality live product to processor; new products other than live crab. |
| Scallop | *** | *** | * | Science gap on stock structure, recruitment processes and assessment methods; conflicts between large and small scallopers on inshore grounds, nature conservation and algal toxin issues. Strong market demand. |
| Cuttlefish | *** | *** | ** | Science gap on spawning sites, lack of information on North Sea and Irish Sea stocks. |
| Nephrops | *** | * | * | Considerable market opportunity. Industry asks - is management of stocks unduly precautious? |
| Lobster | *** | ** | * | Science gap on stock and recruitment relationship; increasing pot numbers; need quality live product & value added. |
| Squid | *** | *** | ** | Science gap on stocks, especially North Sea and Irish Sea. |
| Crawfish | *** | *** | * | Science gap on stock and fishery decline since 1920s. |
| Category B | | | | Opportunities to further develop some fisheries; new markets and products required; research on stocks generally required. |
| Cockle | ** | *** | *** | Stock assessments to reduce risk of recruitment failure; new markets for live product.; algal toxin issues. |
| Whelk | ** | *** | *** | Science gap on stocks and assessment methods – EU MLS too small to be effective in most districts; re-assess markets. |
| Queen scallop | ** | *** | * | Science gap on stock. |
| Spider crab | ** | *** | *** | Science gap on stock structure and assessment methods; improved handling of live product required; access to new markets and development of products other than live. |
| Native oyster | ** | ** | ** | New markets needed if production rises (NOSAP initiative). |
| Brown shrimp | ** | *** | ** | Science gap on stock structure, assessment and management; new markets needed. |
| Velvet crab | ** | *** | *** | Science gap on stock structure and assessment methods; improved handling of live product required; access to new markets & development of new products. |
| Category C | | | | Good opportunities for further development; new markets needed as supply increases; research on stocks generally required. |
| Mussel | * | ** | ** | Extensive cultivation opportunity provided issues with seed supply, site availability and water classification are resolved. |
| Pacific oyster | * | * | *** | New products and new markets. |
| Razor clam | * | *** | ** | Science gap on stocks; major issue on invasive harvesting techniques. |
| Winkle | * | *** | ** | Science gap on stocks; increase market potential. |
| Clams – Manilas and palourdes | * | *** | ** | Extensive and intensive cultivation opportunities; science gap on natural palourde stocks. |
| Other clams | * | *** | ** | Science gap on stocks. |
| Green crab | * | ** | ** | Scope for markets other than for bait; potential environmental issues at local level. |

# 6. National strategic support

Taking the development opportunities and constraints identified within Bannister's report (2006[2]) and the overview above, this section outlines the initiatives needed to allow the future development of the English shellfish production industry. All of the measures identified are intended to be cross-sectoral covering both the cultivation and capture industries.

The Key Recommendations are those that need to be considered by central government and are felt to be priority measures that are needed to facilitate implementation of the *Recommendations* by industry, inshore managers or other key stakeholders.

In terms of the prioritisation of implementation and the urgency required the Key Recommendations are considered to be of the highest importance with the timeframes considered as: Short term, 1 – 2 years; Medium term, 2 – 4 years; and Long term, 4 – 8 years. More in-depth details of the recommendations are given in the Appendix, with background notes and specific bodies identified to undertake implementation or support.

The reader is also advised to refer to Bannister (2006[2]) because he presented several recommendations in his Executive Report. The intention is that his recommendations have been covered and included in this Strategy.

Proposals within the Marine Bill White Paper (published after this Strategy was drafted) cover some of the recommendations put forward. This is noted where appropriate.

## 6.1 Cross-sectoral initiatives

### 6.1.1 KEY RECOMMENDATIONS (for government facilitation)

*Short Term*

Revised Local Management Structure (Note 1)
*Modernise SFCs and provisions for stock management within 12nm*

Shellfish stock management responsibilities need to be defined for all inshore managers with clear fisheries and environmental management functions and objectives. For shellfish, this will be most effective if mSFC and other inshore manager powers include the capability to manage fishing effort by appropriate means (such as permit schemes based on stock conservation and environmental objectives) and these powers are extended to all inshore waters.

(NB Proposal in the Marine Bill White Paper.)

Stock Assessment and Resource Management (Note 2)
*Establish national co-ordinating group on shellfish resource management*

The modernisation, development and accreditation of the shellfisheries require that stock monitoring and assessment programmes are extended to reflect the full economic value, species diversity and specialist technical requirements of the shellfish sector. To be fully effective, there is a strong case for providing national coordination of the district functions undertaken by inshore managers and fisheries agencies by integrating existing shellfisheries and environmental management expertise in a National Shellfish Resource Group (NSRG). This Group, meeting as and when required, would coordinate existing technical and scientific expertise, develop appropriate national guidance on stock assessment and management, and establish best fisheries and environmental practice for shellfish production.

Water Framework Directive Implementation (Note 3)
*Recognition of economically important shellfish resources*

Through the implementation of the Water Framework Directive within transitional waters (<1nm), provision should be made for all commercial shellfish stocks and cultivation sites to be considered as areas 'designated for the protection of economically significant aquatic species'. Measures to replace and enhance the provisions of the Shellfish Waters Directive (to be repealed in 2013) should be determined as part of the WFD implementation process, with improvements identified for pollution monitoring and control.

Shellfish Harvesting Areas – Revised Quality Monitoring (Note 4)
*Strengthen national monitoring system*

The harmonisation of testing regimes and methodologies together with the classification process for shellfish harvesting areas should be pursued by government at the EU level. In addition, provision should be made during the implementation of the WFD for shellfish interests to be recognised and links established to the classification of shellfish harvesting areas.

*Medium Term*
Harmonised Biotoxin Monitoring (Note 5)
*Standardise techniques and procedures for analysis and monitoring*

The harmonisation of protocols for biotoxin testing should be pursued at the EU level by government to ensure that best practice guidelines are established and implemented. Public health measures for area closures should utilise inshore managers' permit schemes to ensure all relevant commercial operations are controlled.

European Marine Site (EMS) Management (Note 6)
*Develop integrated shellfish production and EMS management policy*

National policy needs to be established to integrate nature conservation objectives within EMSs with those for shellfish production and management. Equally, the impact of Water Framework Directive designations for shellfish production areas and the interactions with EMSs need to be considered.

Climate Change Planning (Note 7)
*Strategic review of implications for shellfish production*

Provision should be made for a fundamental review of the potential environmental and socio-economic implications of climate change on the shellfish production industry.

Marine Energy Production (Note 8)
*Implications for shellfish resources*

National guidelines are required to ensure the design and location of inshore wind and wave farms take due account of the activities of the shellfish production industry, and take into account any impacts (positive and negative) on the natural resources on which the industry depends.

*Long Term*
Recognition of Natural Resource Requirements (Note 9)
*Shellfish production activities and marine spatial planning*

Through the implementation of the Water Framework Directive, government should make provision to recognise the economic importance of shellfish stocks underscoring the activities of both the capture and cultivation sectors. The importance and use of shellfish resources should act as the basis for any Integrated Coastal Zone Management initiatives. Equally, in any future Marine Spatial Planning developments, the requirement for fisheries Marine Protected Areas to safeguard recruitment or migration of shellfish species should be given consideration.

# 6. National strategic support (continued)

## 6.1.2 *RECOMMENDATIONS*
*(for industry, inshore managers, key stakeholders)*

*Short Term*

### Water Framework Directive (WFD) (Note 10)
*Industry awareness of implications within 1nm*

The shellfish production sector should be proactive in the WFD implementation process. Determining Protected Areas for 'economically important aquatic species' will require comprehensive documentation. All industry operations will need to be assessed as to their impact on the objective of maintaining 'ecological status' and if necessary amended to address negative impacts. The commercial industry will need to be kept advised of, and require assistance with this process. Inshore managers should act to co-ordinate the input from industry into the management process.

Inshore managers and associated agencies should engage with the implementation process for the WFD at the earliest opportunity in order to determine the implications for stock management, and control of production activities.

The inshore managers and Shellfish Producers' Boards (see Note 14) should seek improved monitoring and reporting of pollution events to safeguard public health controls and inform shellfish producers within transitional waters.

### European Marine Sites (EMSs) (Note 11)
*Industry involvement with management objectives*

The commercial production industry should be kept fully advised of its obligations with respect to the designation and maintenance of EMSs. The inshore managers should set clear management objectives for each EMS guided by national government policy. The requirement to undertake Appropriate Assessments of production activities should receive technical support from the NSRG. Permit allocation and fees for fishing activities within EMSs should be restricted in proportion to the scale of the shellfish resource.

### Industry Investment (Note 12)
*Development of sustainable and efficient business operations*

Both public and private investment measures are required to ensure that the fisheries and cultivation sectors remain sustainable and competitive. Tailored financial programmes should be developed using European Fisheries Fund (EFF) and national funds to support the individual production sectors at national, regional and local levels. Investment for sustainable production/efficiency should be based on natural resource availability and effective management measures being in place. The mSFCs should advise investors at all levels of district requirements and opportunities.

*Medium Term*

Accredited Fisheries and Shellfish Products (Note 13)

*Development of markets through accreditation schemes*

The production industry should be assisted by the Sea Fish Industry Authority and trade associations, to recognise the market opportunities for accredited fisheries and products. Inshore managers should seek to achieve accredited management standards for stocks and fisheries at the earliest opportunity. Investment in such schemes should be made available through Regional Development Agencies (RDAs) and the European Fisheries Fund (EFF).

Shellfish Producers' Board (Note 14)

*Integrating production opportunities with the markets*

Inshore managers should establish a Shellfish Producers' Board within each district with representation from all industry sectors (in the respective district) in order to represent commercial interests within the management process. The Sea Fish Industry Authority, together with the inshore managers, should investigate the scope for establishing an internet-based information system, on district and regional shellfish supply, to assist market development.

*Long Term*

Marine Spatial Planning (MSP) (Note 15)

*Recognition of production industry operations*

In recognising MSP initiatives, inshore managers should identify the resource needs of the shellfish production industry within inshore waters. Also, through the NSRG, the associated and overarching requirements for the natural resource should be recognised. Where appropriate, fisheries Marine Protected Area status should be sought to maintain key stocks, with consideration given to factors such as recruitment and migration areas.

# 7. Sectoral development strategies

While some aspects of the development of the shellfish production industry can be undertaken at the national strategic level, the complexity of the individual production sectors will require targeted intervention. Equally, when the individual sectors are considered, it is appropriate to include measures for specific shellfish species and stocks, as they are often major economic drivers for the sector in question.

## 7.1 Hand harvesting sector

### 7.1.1 KEY RECOMMENDATIONS (for government facilitation)

*Short Term*

Management of Commercial Hand Harvesting (Note 16)
*All commercial hand gathering brought under management control*

There should be provision for all commercial hand gathering of shellfish to be under the control of inshore managers through district permit schemes. Limits for personal use should be set for all non-commercial activities. Permit conditions should allow the control of harvesting on environmental grounds with restricted permits for EMS operations as appropriate.

(NB Proposal in the Marine Bill White Paper.)

Hand Harvesting - Public Health Control (Note 17)
*All commercial hand-harvested (molluscan) shellfish areas to be classified*

To tighten the public health control provisions for commercial hand harvesting of molluscan shellfish, there should be provision to ensure all hand-harvesting areas and stocks are designated.

Commercial Hand Harvesting (Note 18)
*All commercial hand gathering to be brought under management control*

All commercial hand harvesting of shellfish should be brought under legislative control (eg Regulating Fishery Orders, permit conditions established by inshore managers, powers equivalent to those in Buyers & Sellers) to improve public health controls and/or stock management.

Shellfish Intended for Bait (Note 19)
*All commercial gathering for bait brought under management control*

Provision should be made for the commercial collection of shellfish intended for angling bait to be regulated through permit conditions established by inshore managers, with limits for personal use established for non-commercial activities.

(NB Proposal in the Marine Bill White Paper.)

*Medium Term*

Control of Landward Access (Note 20)
*Provision for management control of fishery access points*

The management of hand gathering shellfisheries by inshore managers under permit schemes should be strengthened through legislative provisions for onshore enforcement of permit conditions, and the ability to designate access arrangements.

(NB Proposal in the Marine Bill White Paper.)

### 7.1.2 *RECOMMENDATIONS (for industry, inshore managers, key stakeholders)*

*Short Term*

Sustainable Harvesting Activities (Note 21)
*Establishing production standards for the sector*

The hand harvesting sector, assisted by the inshore managers together with the NSRG, should compile codes of best practice for the sustainable harvesting of molluscan and crustacean stocks. The inshore managers should seek to develop accredited hand gathering fisheries based on such management measures.

## 7.2 Static gear sector

### 7.2.1 KEY RECOMMENDATIONS (for government facilitation)

*Short Term*

UK Shellfish Licence Scheme (Note 22)
*Existing legislation revised to improve stock management*

There should be provision for the UK Shellfish Licence scheme to be revised. This should ensure that mSFC permit conditions for specific fisheries with respect to the reporting of catch and effort within the mSFCs districts prevail, whilst maintaining the ability to implement national controls through UK Shellfish Licence conditions.

Permit Scheme for Static Gear Fisheries (Note 23)
*Permit schemes to operate in inshore waters and mSFC districts*

Provision is needed for inshore managers to implement permit schemes for static gear fisheries within inshore waters, to assist stock assessment and management. Agreement should be sought at the EU level on the application of reporting conditions for foreign vessels with historic access rights within inshore waters to improve stock conservation and environmental controls.

### 7.2.2 *RECOMMENDATIONS (for industry, inshore managers, key stakeholders)*

*Short Term*

Improved Management Control of Fisheries (Note 24)
*Optimising sustainable yields from inshore waters*

Inshore managers should seek to implement measures through fishery permit conditions to ensure sustainable use of shellfish stocks by the static gear sector. Advice should be provided by the NSRG as to the most appropriate measures for monitoring and control of significant stocks.

Market Development and Management (Note 25)
*Improved quality and sustainability of landings*

The NSRG together with inshore managers and the Shellfish Producers' Boards should seek to identify sustainable stock management measures to improve the landing quality and volumes of those species with traditional markets and development opportunities. The Sea Fish Industry Authority together with national and regional investment programmes should identify suitable product development and market opportunities.

## 7.3 Mobile gear sector

### 7.3.1 KEY RECOMMENDATIONS (for government facilitation)

*Short Term*

Permit Scheme for Targeted Mobile Gear Shellfisheries (Note 26)
*Permit scheme to operate in inshore waters and mSFC districts*

Provision is needed for inshore managers to implement permit schemes for mobile gear fisheries within inshore waters to assist stock assessment and management. Agreement should be sought at the EU level on the application of reporting conditions for foreign vessels with historic access rights within inshore waters to improve stock conservation and environmental controls.

## 7. Sectoral development strategies (continued)

Environmental Assessment and Conservation Management (Note 27)
*Reduction of environmental impact from mobile gears*

There should be provision (through the NSRG) for Strategic Environmental Assessments (SEAs) of mobile gear activities to be undertaken in conjunction with the identification of sensitive habitat types. The potential for bycatch reduction and development of best practice techniques should advise the management process of the inshore managers. The potential impact of the Water Framework Directive implementation on mobile gears within transitional waters should be a priority consideration.

### 7.3.2 *RECOMMENDATIONS*
*(for industry, inshore managers, key stakeholders)*

*Short Term*
Sustainable Fishing Practice (Note 28)
*Best practice developed to minimise environmental disturbance*

Inshore managers, together with industry and government agencies, should seek to establish best practice operations for mobile gear fisheries in areas of low environmental impact taking account of SEA and habitat conservation objectives. The management objectives for such fisheries should be recognised within fishery permit scheme conditions.

Access to Under-utilised Shellfish Stocks (Note 29)
*Improved access through management and technical measures*

Inshore managers, using restricted permit scheme conditions, together with commercial mobile gear operators should seek to develop best practice for the exploitation of under-utilised stocks. The identification of low impact habitats and fishing gear, together with revised SEAs for fishery techniques should be undertaken by the NSRG.

Access to Shellfish Seed Stocks (Note 30)
*Improved access through management and technical measures*

Inshore managers together with the NSRG should seek to identify shellfish seed resources within inshore waters that are suitable for sustainable commercial exploitation. To utilise ephemeral stocks, management systems should be developed and be in place for rapid implementation. Access to such resources should be regulated through restricted fisheries permit schemes and provisions for environmental monitoring.

Market Development and Management (Note 31)
*Improved quality and sustainability of landings*

The NSRG together with the inshore managers and industry (through the Shellfish Producers' Boards) should seek to identify sustainable stock management measures to improve the landing quality and volumes of species with market development opportunities. The Sea Fish Industry Authority together with national and regional investment programmes should seek to identify suitable product development and market opportunities.

## 7.4 Non-targeted production sector

This category of production includes bycatch of shellfish from other fishing activities, unlicensed vessel operation and operators without appropriate fishery permits, together with unregulated activities such as diving.

### 7.4.1 KEY RECOMMENDATIONS (for government facilitation)

*Short Term*

Control of Unlicensed/Non-Permitted Activities (Note 32)
*Commercial harvesting outside management controls*

Provision is needed to ensure that the inshore managers have appropriate powers and resources to control unlicensed/non-permitted commercial activity out with fishery permit schemes. Legislative powers of enforcement for hand gathering and divers should be introduced with confiscation of catch and appropriate disposal able to be undertaken at sea or onshore.

(NB Proposal in the Marine Bill White Paper to take this forward.)

Reporting of Shellfish Bycatch from all Fisheries (Note 33)
*Monitoring of bycatch levels for stock conservation purposes*

There should be provision for the reporting of shellfish bycatch levels from all UK registered vessels operating within inshore waters, and to seek agreement at EU level for reciprocal reporting conditions for foreign vessels with historic access rights. The monitoring of bycatch from targeted and non-targeted fisheries should form part of the management measures for stock assessment and conservation within inshore waters.

### 7.4.2 *RECOMMENDATIONS (for industry, inshore managers, key stakeholders)*

*Short Term*

Management of Fishery Bycatch Issues (Note 34)
*Integration of fish and shellfish stock management*

Inshore managers should identify shellfish discard and bycatch levels for all fisheries within inshore waters. Together with the NSRG and commercial operators, best practice management and technical measures should be developed to minimise such practices and optimise the use of shellfish resource. Reporting and management measures should be introduced through fishery permit scheme conditions.

Monitoring of Unlicensed Activities (Note 35)
*Safeguarding the interests of legitimate industry operators*

Inshore managers should seek to establish a close working relationship with the industry within their districts in order to facilitate the co-operative monitoring of fisheries activities. Such liaison should safeguard legitimate business interests and promote resource and environmental conservation.

# 7. Sectoral development strategies (continued)

## 7.5 Cultivation sector

### 7.5.1 KEY RECOMMENDATIONS (for government facilitation)

*Short Term*

Management Framework (Note 36)
*Improved monitoring and integration of shellfish cultivation operations*

Provision should be made to bring the overall management of shellfish cultivation activities within districts under the control of the inshore managers. The allocation of production sites should be subject to permit scheme conditions with each area classified as a registered farm site for disease control and reporting production. (NB. The option for a business to apply for a Several Order would remain.)

(NB Modernised powers for mSFCs in Marine Bill White Paper should allow this.)

Development of Cultivation Sites (Note 37)
*Overcoming potential environmental impacts of cultivation operations*

Provision should be made for cultivation operations to be the subject of SEA and impact mitigation measures to facilitate the location and expansion of sites in (or into) environmentally sensitive areas. The NSRG should establish best practice guidelines for operations and provide inshore managers with management advice.

Access to Wild Seed Resources (Note 38)
*Development of seed stock monitoring and management techniques*

Provision should be made for the sustainable and optimal utilisation of ephemeral shellfish seed resources within inshore waters. The NSRG will need to assure that best practice protocols are established and identify environmental considerations. Inshore managers should be provided with management advice to allow sustainable exploitation through permit scheme conditions.

*Medium Term*

Shellfish Cultivation Sites Outside Transitional Waters (Note 39)
*Recognition of production activities and offshore sites in inshore areas*

Provision should be made to facilitate the development of shellfish cultivation operations in inshore areas beyond 1nm. Mechanisms to ensure that products can be placed on the market (equivalent to the shellfish harvesting areas classification under the Food Hygiene (England) Regulations 2006) will be required that are appropriate to production in offshore areas.

### 7.5.2 *RECOMMENDATIONS (for industry, inshore managers, key stakeholders)*

*Short Term*

Improved Management Control and Resource Use (Note 40)
*Management of cultivation activities through permit schemes*

Inshore managers should seek to implement measures to facilitate development of the shellfish cultivation sector. Management objectives should be established for the locations, and operations controlled through permit scheme conditions. Based on advice and best practice developed by the NSRG such activities should be subject to SEA and operate to objectives for the sustainable use of resources.

Market and Product Development (Note 41)
*Improved products to enhance market opportunities*

The shellfish cultivation sector should seek to identify specific market opportunities for both volume and niche products based on improved production standards and economies of scale. Integration of product supply with that from fisheries should be facilitated through involvement with the Shellfish Producers' Boards and inshore managers permit schemes. The Sea Fish Industry Authority together with national and regional investment programmes should identify suitable product development and market opportunities.

*Medium Term*
Market Assurance (Note 42)
*Expanding market opportunities through assurance schemes*

The shellfish cultivation industry through its trade organisations and with guidance from the NSRG should seek to formulate an appropriate national assurance scheme for its products. The requirement for environmentally sustainable production should be recognised through the inshore managers' management objectives and permit scheme conditions. The Sea Fish Industry Authority together with the industry should seek to identify market development opportunities associated with the accreditation of all forms of sustainably cultivated shellfish.

## 7.6 Priority species – strategic intervention

The national significance of a small number of species dictates that targeted intervention is required to achieve specific management objectives. All are based around various aspects of stock enhancement.

### 7.6.1 KEY RECOMMENDATIONS (for government facilitation)

Native Oyster (Note 43)
*Important conservation and commercial species*

The unique status of the native oyster should be recognised by government and provisions made to ensure any development activities whether commercial, leisure, coastal defence or other should have regard to the natural resource and conservation needs of the species.

Mussel (Note 44)
*Important commercial species with potential for resource enhancement*

There should be provision to consider the potential for mussel production facilities to be integrated into the planning and design process for the location and operation of energy farms located in inshore waters.

Native Lobster (Note 45)
*Important commercial species with potential for enhanced outputs*

Within the planning process and design of coastal defence and service structures, provision is required to consider the inclusion of habitat types suitable for lobster stocks. Where feasible, management of any habitats created should be under the control of the inshore manager through its permit schemes.

# 8. Implementation programme

The Strategy as outlined will need to be implemented by a range of organisations and stakeholders, including its adoption by those within the industry whose livelihoods will be directly affected. There is an obvious need for a revised national management structure to be put in place to facilitate the development of the commercial industry. This is seen to be a clear priority for national government in order that the raft of other development initiatives can be tackled and directed in a cohesive way. In 2003, the preservation of the 12 mile derogation was consolidated granting national control under the Common Fisheries Policy for another 10 years. The position post-2013 will influence the long term future of the industry and is a priority issue.

While issues that relate to the shellfish sector have been clearly identified within the Strategy, only a passing reference has been made on any interactions with finfish activities. In the majority of situations, both sectors of the fishing industry currently operate, and are managed, in tandem. The SFCs manage both sectors out to 6nm, while other agencies have varying responsibilities for fish species, stocks and fishing activities. The Environment Agency acting as a SFC currently has responsibility for managing some shellfish stocks in estuaries, and it would be inefficient if these were not subject to the same permit scheme conditions if set in place by mSFCs.

The division of responsibilities for fish stock management *per se* is not an issue for this Strategy. However, there are clear and rational management justifications for linkages between the control of finfish vessel activities and the management of shellfish resources. These are particularly evident where gear conflict or bycatch situations exist and use of the natural resource is sub-optimal. In this context, district mSFCs structure should be directly linked with the management of commercial inshore finfish resources.

While government action on the key recommendations is required as a prerequisite for the Strategy to be taken forward, the timescale involved is likely to be considerable due to legislative timetables. Once a decision has been made by government on its preferred management options, the opportunity exists for various elements of this Strategy to be taken forward. To ensure that the industry does not suffer unduly in any policy vacuum, the Strategy will be actively promoted to industry and associated bodies. A range of bodies external to government have also been identified to help take forward various measures and where possible these should be pursued at the earliest opportunity. In support of this, and external to this current document, the Sea Fish Industry Authority should continue to act as a facilitator to the SAGB for the implementation of initiatives in conjunction with industry and partners, in order to support industry development.

Public and private investment will be a key to realising many of the opportunities for the sustainable development of all sectors of the shellfish production industry (see *Note 12* in Appendix for more detail). Regional investment, delivered through the RDAs, will need to be structured towards efficiency improvements and business development within both primary production and downstream in the supply chain.

## 8.1 UK Marine Bill White Paper

The proposed UK Marine Bill is seen as a unique opportunity to comprehensively restructure the legislative framework for inshore fisheries and environmental management within England and the rest of the UK. There is a need to ensure that an ecosystem-based approach can be developed as shellfish production is inherently linked to the availability and sustainable use of natural resources. The increasing pressures on natural resources, brought to bear by a range of stakeholders within the inshore environment, has resulted in a decline in production opportunities in many areas. The inshore nature of the shellfish industry has allowed local exploitation to develop with fishing communities established in most areas. This has been complemented by the activities of the shellfish cultivation industry, which relies primarily on access to the sheltered coastal waters and natural resources. In this respect, legislative provisions outlined within the Marine Bill White Paper are considered fundamental to maintaining the socio-economic fabric of the shellfish production industry. Already, there are proposals within the white paper that cover some of the recommendations put forward in this Strategy.

The Strategy has identified a range of proposals requiring in most instances limited amendments to existing legislation. These need to be brought to the fore in detail during the consultation process for the Marine Bill White Paper.

# 9. Conclusion

The Strategy as presented is an attempt at balancing the development needs of the shellfish production industry with the requirement to safeguard and optimise the use of public natural resources. The shellfish production industry and the associated businesses that are supported are a fundamental part of the UK economy, and as such require potential for growth and development.

As in all business sectors, there is a need to embrace change and seek development opportunities in order to remain competitive within the market place. This is particularly relevant for the shellfish sector as change in environmental conditions and the availability of natural resources are at the core of production activities and business decisions. Such a reliance on naturally variable resources means that for any strategic development of the sector to take place, flexibility in the management and control regime must be inherent. The sector is not only faced with competitive global markets but also longer-term change in climate conditions and resultant impact on species and natural resources.

It is considered that the Strategy presented represents the best opportunity for the industry to encompass sustainable production with market demand, whilst maintaining the integrity of natural resources. Defra's Vision for 'Fisheries 2027' provides an opportunity for industry to engage with government in seeking to meet the long term aims of the Strategy.

[1] Net Benefits – A sustainable and profitable future for UK fishing (2004). Cabinet Office, Prime Minister's Strategy Unit, 166pp.

[2] Bannister, C., (2006). Towards a National Development Strategy for Shellfish in England: Executive Report. Seafish publication ISBN: 0903941449, 84pp.

[3] Strategy for the Control and Development of the Shellfish Industry (2004). Shellfish Association of Great Britain, 20pp.

[4] Defra (2007). Fisheries 2027 – towards a contract for the future of marine fisheries. Consultation, 12pp.

[5] Seafood Industry Value Chain Analysis – cod, haddock and nephrops (2004). KPMG & Seafish publication, 159pp.

[6] Slaski, R., (2001). The UK Bivalve Mollusc Market and Supply, Seafish, 42 pp.

[7] Curtis, H. C. & White, R., (2005). 2004 Survey of the UK Fish Processing Industry. Seafish publication: ISBN 0 903941 33 3, 89pp.

[8] In 2003/2004, the SFCs generated £173,607 income from Fishery Order administration (Bradley Report, page 99).

# 10. Appendix

This appendix provides additional background to the recommendations made in the Development Strategy. The following notes relate to the Key Recommendations and *Recommendations* identified within the strategy text. These are intended to provide more detail of the individual initiatives in the overall Development Strategy. Where it is appropriate, specific bodies or groups are identified as to who should take the lead on implementing the initiatives (although this will depend on their remit and resources that are available).

For all Key Recommendations the assumption is that they will need to be considered and facilitated by central government or one of its agencies. The *Recommendations* are directed towards industry operators including fisheries managers, development agencies, the commercial sector and associated interests. Numbering of the notes corresponds to that in the Strategy text.

## Strategic national support

## Cross-sectoral initiatives

### KEY RECOMMENDATIONS (for government/agencies)

Note 1.
Revised Local Management Structure

Provision should be made for the modernisation of the existing system and powers of Sea Fisheries Committees (mSFCs). Inshore managers should be provided with enhanced legislative provisions for shellfisheries management, enforcement and control purposes. Management of all commercial shellfish stocks within inshore waters (<12nm) should be on the basis of ecosystem-based principles and stock sustainability. Permit schemes should be introduced to ensure more accurate catch and effort statistics are available at district and national levels and to provide data for stock assessment and conservation measures. The management of hand gathering and cultivation activities by inshore managers should also be under permit conditions. These permit schemes should act as management tools for the control of effort and implementation of stock conservation measures whilst recognising the need for market orientation. The requirement for ecosystem-based management should ensure all commercial activities within inshore waters are the subject of Strategic Environmental Assessment (SEA).

The inshore management system should reflect the need for ecosystem-based fisheries management of shellfish stocks. Bannister (2006[2]) suggested that local fisheries management is the most appropriate tool in order to monitor and control shellfisheries sustainably. The current SFC system is outdated both in terms of legislative provision to manage stocks and enforce fisheries control measures, and also in the way it is structured with little national co-ordination or support. The Marine Bill White Paper is expected to announce changes that will modernise the inshore management system. As many shellfisheries are dynamic by nature, any constraints on access and effort must be able to be applied at short notice if stocks are to be managed sustainably. A flexible and pro-active management system allowing day-to-day monitoring, as well as control measures with locally variable permit conditions would be more appropriate than a more rigid system of byelaws.

## 10. Appendix (continued)

Bannister (2006[2]) recognised that if stock management for all shellfish species is to be radically improved in the short term, scientific appraisals will need to be more responsive and limited to the finite financial resources that are available. One solution is to introduce more simplistic and empirical assessments with well-defined input and output controls. This will need extensive data gathering on catch, bycatch and effort within all the shellfisheries as the basis for such an empirical process. The UK Shellfish Licence scheme has already begun to deal with this issue. However, it is tailored to controlling access to certain species and is not defined for catch and effort reporting on which to make reliable stock assessments. Nonetheless, once sufficient data have been collected through the Shellfish Licence scheme, these data need to be evaluated against the data collected by district SFCs to determine and resolve any discrepancies.

Permit schemes with detailed reporting requirements would help to ensure that sufficient and reliable data are available for stock management purposes at the mSFC and fisheries agency level. A 'bottom up' approach is required for catch and effort data, with the mSFCs charged with collecting and verifying at a local level all fisheries data for stock management purposes, before supplying it for national assessment. Management of all shellfish production by the mSFCs, using permit schemes, should allow the exploitation of stocks on a sustainable basis within local districts. Such schemes should provide the flexibility to control both access and effort based on clear stock conservation and management objectives. Equally, it should enable market considerations to be taken account of in the overall context of stock sustainability. The ability to regulate cultivation activities and those for hand gathering, through dedicated permit schemes, should ensure greater integration between the production sectors. This is particularly relevant for extensive cultivation operations that often interact directly with the wild fisheries.

As with stocks in the 0-6nm zone, stocks within the 6-12nm require assessment so permit reporting schemes need to extend to all commercial stocks within the 0-12nm zone. Some shellfish stocks straddle the 6nm and 12nm boundaries, so to improve stock conservation and sustainability they should be monitored and managed as single entities rather than as units within artificial boundaries. Any permit scheme needs to apply equally to vessels from EU Member States with historic rights of access in the 6-12nm zone. The EU Commission should support such measures to ensure that systems are non-discriminatory and very importantly, to support stock conservation goals through an ecosystem-based approach. If support is not forthcoming for this at EU level, then provision needs to be strengthened for more effective national control and management of shellfish stocks in the 6-12 nm zone.

The designation of European Marine Sites (EMSs) for nature conservation purposes can occur throughout inshore waters bringing with it associated monitoring, control and management issues. Ecosystem-based fisheries management seeks to ensure the sustainable exploitation of targeted stocks whilst minimising the impact on the wider marine environment. An integrated, ecosystem-based approach can be achieved through a range of management tools. Two key assessment tools within the ecosystem-based approach are Strategic Environmental Assessment (SEA) and Environmental Impact Assessment (EIA). To optimise this process, all shellfishing activities should be considered for Strategic Environmental Assessment (SEA). In our inshore waters, those EU Member State vessels with historic access rights should equally be the subject of SEA and reporting conditions. The requirement for all fishing activities to be the subject of a SEA enhances the ecosystem-based management objectives for the inshore waters and should be a principle supported by the EU Commission. Importantly, multi-sectoral SEA, undertaken on a 'sea area' approach in the broader context of Marine Spatial Planning (see Note 15), would greatly increase the cost-efficiency of the process and lay foundations for genuine integrated management of UK waters.

Probably the greatest challenge faced by the existing system of SFCs is the integration of marine environmental legislation with public fisheries management. There is currently no central government guidance on the relative importance attached to economic development of fisheries in relation to commitments entered into at EU level for nature conservation (see Note 6). While legislative provision has been made to ensure SFCs take account of environmental considerations, no extra resources have been made available for additional expertise, or to develop best practice for integrated environmental management. Consequently, while SFCs strive for ecosystem-based fisheries management, currently there is little opportunity to integrate the decision making process with that for statutory marine nature conservation. The mSFCs should be provided with clear policy guidance and have the technical resources necessary to ensure fisheries management objectives are compatible and integrate with those for national marine environmental protection.

For mSFCs to effectively implement sustainable inshore shellfisheries management, some fundamental changes are required to the current SFC administrative structure, and its resources. The districts managed by the mSFCs should be realigned and restructured on the presence and extent of the shellfish stocks and fisheries. This will require some consideration of the overall technical resources that are required to meet the stock management objectives. Core funding from local government needs to be established for the corporate infrastructure to be put in place for each mSFC district. The management objectives and administrative regimes established by central government for the mSFCs will dictate the overall resource requirements, with links to national fisheries management and environmental initiatives facilitated through central government co-ordination (see Note 2).

To fully encompass the technically onerous responsibility of shellfish stock management, control and enforcement, together with the environmental considerations tasked to the mSFCs, these functions should be separated from corporate management responsibilities. Reliance on local government funding, if only in part under a mSFC system, seems unlikely to change and as such, public accountability will be required. While this can be achieved at the corporate level and the interests of other relevant groups encompassed, a delegated chief officer group should be accountable for all decisions on fisheries management. There is a move towards sustainable ecosystem-based shellfisheries management and integration with national marine nature conservation objectives as a management goal. This will require significant technical and logistical support and co-ordination at the national level if the management process is to be effective (see Note 2). The chief officer group should be capable of accessing and using such technical support for the sustainable management of local stocks and associated environmental interests. Equally, stock assessment data collected at the local level (from the proposed permit schemes) should be made available for national stock assessment purposes.

The issue of funding fisheries management costs has been addressed within the Net Benefits Report (Cabinet Office, 2004[1]) with a general presumption that the production sector will progressively bear such costs where it is economically feasible. The potential for fees to be levied on industry must relate directly to the availability and sustainability of local fisheries resources and commercial opportunities for individuals to exploit them, and be proportionate to direct mSFC management costs. Any peripheral costs associated with meeting national nature conservation objectives to generate public benefits ought to be through direct public funding.

In summary, the control of all commercial shellfish activities (wild and cultivated stocks) within a district by mSFCs should ensure a greater cohesion of management objectives with resultant benefits for the sustainability of natural resources, and commercial interests. Updated legislation will ensure that effective inshore and onshore enforcement and control measures can be implemented.

## 10. Appendix (continued)

Note 2.
Stock Assessment and Resource Management

Provision should be made for the reorganisation and allocation of national resources to address the shortfalls in shellfish stock monitoring and assessment. Several key shellfish stocks, with economic values exceeding leading TAC finfish species, have limited management data and many shellfish stocks have little or no provision for assessment and monitoring to gather such data. National resources need to be allocated more equitably for carrying out shellfish stock assessment, and be based on the overall economic value of the shellfish resource to the UK.

Provision should also be made for a central government co-ordinating group that will facilitate the formulation and co-ordination of procedures for sustainable shellfish stock management in inshore waters. This National Shellfish Resource Group (NSRG), constituted from existing government agencies and departments, would meet as and when required and should aim to establish standardised protocols for reporting and data collection for all commercial shellfish stocks. Co-ordination and standardisation of permit reporting schemes between the mSFC districts and between the 0-6nm zone and the 6-12nm zone would allow the assimilation of fishery management statistics at district and national levels. The NSRG should provide the mSFCs with technical guidance for in-house stock monitoring and assessment procedures, together with annual recommendations on district management for all stocks. National stock monitoring and management recommendations for inshore waters should be made by the NSRG based on all mSFC districts and a seamless system of stock management out to 12nm, including those fisheries with historic access rights by EU vessels. The NSRG should establish best practice guidance for Strategic Environmental Assessment (SEA) of fishing techniques, provide appropriate technical advice to the mSFCs and fisheries agencies and inform national management decisions. The requirement for scientific and technical guidance on the maintenance of statutory European Marine Sites and environmentally sensitive areas, in the context of fishing industry activities, should also be provided. Another function of the NSRG should be to formulate protocols for sustainable stock management to allow accreditation of fisheries and to provide guidance on developing accredited stocks.

Members of the NSRG should include (but not necessarily be limited to) Defra, MFA (or MMO if MFA integrated as proposed in Marine Bill White Paper), mSFC representative(s), Environment Agency, Cefas, Natural England.

The present lack of national resources for shellfish stock assessments impacts on all sectors of the production industry. The static gear sector targets a wide range of species from whelks through a large number of crustacea and also highly mobile molluscs such as cuttlefish. The economic value of the main shellfisheries is highly significant in terms of the UK fish industry as a whole, yet in the majority of cases the information upon which stock management should be based is not gathered routinely. Consequently, significant stocks have limited monitoring or control and this position is compounded by the wide-ranging distribution of some species, with stocks straddling fishery boundaries and national limits. The efforts and resources given to the management of finfish TAC stocks and species has become disproportionate in relation to their overall economic significance, with several shellfish species coming higher up in the statistics for UK landings and values (see Box 3 in Bannister, 2006[2]). An example is the King scallop, where the economic value of the resource exceeds virtually all individual finfish species landings, but scallop stocks have virtually no management and assessment data upon which to base fisheries controls. In addition, the mobile gear sector is unique in exploiting juvenile stock for relaying or cultivation purposes (eg mussel seed) but no national monitoring of such stocks within British Fishery limits is undertaken.

Given the scarcity of information on national shellfish stocks, scientific and technical resources should be allocated to establish the basic stock dynamics of the most economically important species, together with an estimation of stock levels throughout inshore waters. Sustainable exploitation levels need to be established for each species, and appropriate management programmes and controls put in place to help achieve these. The allocation of resources for such tasks will be finite and outcomes are unlikely to be achieved in the required timeframe using traditional assessment techniques. More simplistic and empirical methods are needed. Allied to this is the need for standardised catch and effort data. Such information could be generated by the mSFCs but a national system of co-ordination is required.

District inshore managers could undertake ecosystem-based management of shellfish resources in a co-ordinated way, if given dedicated technical support and guidance. In addition to expert advice on stock management issues, there is an increasing requirement for environmental considerations to be taken into account. This is clearly evident with the implementation of EMSs covering large areas of inshore waters with further areas anticipated offshore. There is a requirement to ensure that all other areas are also subject to controls to prevent degradation from fishing activities. This indicates the need for techniques such as SEA to be encompassed.

Drawing together a NSRG from existing government departments and agencies with specialisms in the core functions should be a cost effective solution for co-ordinating ecosystem-based fisheries management. The resources that are required to achieve this are largely already in place. Some reorientation and reorganisation of effort is required rather than any fundamental change. The advisory and co-ordinating role of such a Group, coupled with the ability to conduct specialist investigations and enable local survey work by the mSFCs and agencies, would improve the relevance and quality of decisions on shellfish stock management both at local and national levels. The provision of advice with respect to SEAs and the establishment of EMSs, and associated management issues (including monitoring and control of fishing activities to ensure compatibility) would greatly improve the current situation and lead to cost efficiencies. In addition, the over-arching role of the Group would make it well placed to provide advice on national shellfish stock management and associated marine environmental policy.

The Net Benefits Report (Cabinet Office, 2004[1]) highlighted the increasing requirement for accreditation of fisheries and products to provide an assurance of sustainable production. This has led to the situation where stock management techniques need to be formalised as part of the overall assurance process. Currently, there is limited scientific and technical expertise to support such measures on a national or local basis. The availability of commercial accreditation schemes is limited and they are largely untested with respect to the management of shellfish resources (see Note 13). To provide a framework of national standards against which accreditation schemes should be independently assessed and developed, the NSRG should establish best practice guidelines for management of all types of shellfish stocks.

## 10. Appendix (continued)

Note 3.
Water Framework Directive Implementation

Provision should be made to ensure that the adoption of the EU Water Framework Directive into UK legislation establishes safeguards for shellfish resources within transitional waters (<1nm). The designation of 'economically significant aquatic species' should be undertaken for all commercially harvested stocks. The designation process should also reflect opportunities for commercial exploitation and the need for environmental change to be taken into account. The implementation of the Directive should encompass the principles of Integrated Coastal Zone Management (ICZM) and resource allocation, with measures introduced to ensure water quality standards are maintained. In the context of shellfish cultivation, provisions should be made for water quality safeguards to be as robust as previously identified under the Shellfish Waters Directive (to be repealed in 2013).

The Water Framework Directive's primary aim is to establish and maintain water quality standards based on river basin management principles and the maintenance of 'ecological status'. The Directive also covers so-called transitional waters out to 1nm and makes provision for 'economically significant aquatic species' and hence shellfish stocks to be identified, with a view to their long-term maintenance. This places a requirement on shellfisheries managers to ensure that the control of harvesting activities is sustainable and will maintain the 'ecological status' or 'pristine condition' of the water environment covered by the Directive. The definitions of such terms have yet to be determined, as has the reference point for the establishment of the target 'ecological status'.

The implementation of the Water Framework Directive provides the opportunity for shellfish stocks within 1nm, and upon which the various commercial production sectors are dependent, to be identified. Such designations of both crustacean and molluscan stocks should serve to recognise the commercial interests of the various sectors. In this context, there is scope for the principles of Integrated Coastal Zone Management (ICZM) to be introduced into the process with stocks and sustainable harvesting techniques identified within defined areas.

The activities of the shellfish cultivation sector are currently almost solely located within the designated transitional waters (<1nm) and consequently their management must integrate with the Directive's objectives. The implementation of the Directive will replace the safeguards that existed (for molluscan species only), under the Shellfish Waters Directive (79/923 EC). It is important that the measures implemented under the WFD are at least as robust as those being replaced. These provide for basic water quality monitoring, and establish baseline targets to ensure quality is maintained. Under Directive 79/923 EC, where water quality deteriorates remedial action should be implemented to re-establish the baseline standards. With catastrophic pollution events, such a target should be achievable but where diffuse or sporadic sources of pollution lower standards, remedial action is likely to be more difficult. The implementation of the WFD should take account of such diffuse pollution occurrences and make provision for remedial action. The Shellfish Waters Directive also established a legal provision for the recognition of shellfish waters used to cultivate and harvest shellfish and this should be continued through the WFD. The designation of areas 'designated for the protection of economically significant aquatic species' should encompass operational areas for the shellfish cultivation sector and the requirement for all cultivation operations to be classified as 'Registered Farm Sites' for disease control and reporting purposes (see Note 39). Consequently, such sites should form the basis for cultivation designations under WFD provisions. The designation of shellfish seed resources utilised by the cultivation sector and occurring within transitional waters should also be encompassed.

Of key importance to the shellfish cultivation sector is the improvement and maintenance of harvesting area classifications (see Note 4). The ability for the introduction of the WFD to integrate pollution monitoring and control with overall water quality standards, and hence link to public health monitoring, should be built upon through the implementation of the Directive.

The impact of climate and associated environmental change is likely to be most evident within the transitional water areas used for shellfish harvesting. Consequently, there is a need to ensure that designation of "economically significant aquatic species" and hence locations, provides for change and is flexible enough to encompass under-utilised stocks, and potential new species and areas.

## Note 4.
## Shellfish Harvesting Areas - Revised Quality Monitoring

Provision should be made to strengthen the monitoring and control system safeguarding shellfish harvesting areas. This should be undertaken through standardisation of protocols and techniques at the EU level, an increase in statutory monitoring and control provisions, and improved co-ordination of pollution and public health controls.

There is a requirement at the EU level to seek harmonisation of both testing regimes/methodologies and the overall classification of harvesting areas under the EU Food Hygiene Regulations 2006 (previously Directive 91/492 EC), to prevent disparities between Member States. This objective must be pursued to ensure that its implementation does not become a constraint on the industry placing products on the market, through additional cost burdens associated with potential anomalies in classification.

The implementation of the Water Framework Directive (WFD) (see Note 3) presents the opportunity to improve the linkage between pollution monitoring and control, and public health monitoring that is undertaken to establish risks associated with shellfish consumption. Although the WFD is not targeted at public health issues, it does provide the opportunity for the 'polluter pays' principle to be introduced into the risk management process. The occurrence of sporadic pollution events (such as storm water overflows) or consent to discharge agreements being exceeded by water companies can lead to both short and long term lowering of water quality standards, and constrain the placing on the market of shellfish products. Such pollution events have the potential to impact on transitional waters and the objectives of the WFD in maintaining 'ecological status' and 'pristine condition'. The monitoring requirements under the Directive to establish whether 'ecological status' has been maintained could be equally applicable to designated shellfish harvesting areas (Food Hygiene (England) Regulations 2006).

Where short or long term monitoring is required, as a consequence of pollution events, the cost of such should be borne by the polluter. This should be recovered through the standard consent to discharge licence conditions. In addition, the management of pollution incidents should be improved through the implementation of the WFD by ensuring that the system of notification from the water companies to the Environment Agency is revised to include the interests of shellfish producers. There are currently no formal links between the reporting of pollution incidents and notification of shellfish producers, except through local environmental health departments. The potential delay in reporting pollution incidents and the possible public health risks could easily be overcome by the water companies having to report incidents to registered operators in the affected catchments, or to a statutory body taking responsibility for such actions.

## 10. Appendix (continued)

### Note 5.
### Harmonised Biotoxin Monitoring

Provision should be made for improved techniques of biotoxin analyses and standardisation of testing procedures to ensure appropriate monitoring and controls are in place.

The need for public health monitoring measures to detect biotoxins within shellfish products placed on the market is fully recognised by the production industry. While 'end product standards' monitoring has an important role to play in overall assurance control, the monitoring of production areas allows proactive management and intervention, when required, to prevent harvesting of affected stock. Ensuring that such area testing is undertaken to the highest standards is paramount, as multiple operators and businesses are affected by geographic controls. In this respect there is a requirement to ensure that best practice is determined and implemented for extensive monitoring and testing programmes.

It is important to ensure that the harvesting of potentially contaminated products is strictly controlled. The management of all shellfish resources within a mSFC district through appropriate permit schemes for hand gathering, for static and mobile gear, and for cultivation should allow appropriate controls to be implemented at short notice. This would greatly assist the process of managing biotoxin events and notifying all commercial operators of any necessary constraints on production.

### Note 6.
### European Marine Site (EMS) Management

Provision should be made for the integration of sustainable management of shellfish resources with the maintenance of EMSs, and national policy objectives should be established. The conservation objectives for EMSs should be balanced with those for sustainable shellfish production, and recognise socio-economic implications. Within inshore waters, the roles of inshore managers in the management of EMSs should be identified and appropriate resources allocated. The implications of the WFD objectives for transitional waters should be identified for EMSs, together with the impact on shellfish resources of offshore EMS designations.

The introduction of the Natura 2000 network of sites for the conservation of habitats and species within Europe, has led to a new concept of resource management within British fishery limits. The designation and establishment of EMSs has been undertaken based on conservation objectives determined by the statutory nature conservation agencies, aimed at conserving designated features. The establishment of an EMS instils a legal requirement for all operators to have regard for the conservation features, and where a competent authority licenses production activities, control measures must recognise the conservation objectives for the site.

At the national level, little has been done to reconcile the needs of the Natura 2000 network with the existing system of management of public fisheries and cultivation. While shellfisheries are the primary economic activity based on natural resources within inshore waters, no policy objectives have been established for the integration of fisheries management with that for the EMSs. The lack of such policy is causing difficulties for fisheries managers attempting to balance opportunities for public fishery production with the stated EMS conservation objectives. The implementation of the Water Framework Directive is likely to add further confusion within transitional waters, as areas designated for their 'economically significant aquatic species' should be made.

The potential for the mSFCs to operate permit schemes for all shellfish production activities should allow for management costs to be partially funded. The ongoing requirement to undertake Appropriate Assessment of production activities, to determine the effect on the conservation objectives of EMSs, means that the mSFCs may incur considerable associated costs. Equally, in setting permit conditions for production activities within an EMS, resources will be needed to monitor and control such operations. A proportion of the fee for the proposed fishery permit scheme may be required to offset the mSFCs costs associated with allowing access to and monitoring compliance with EMS conditions. To make such fees commercially sustainable, the allocation of permits may have to be restricted and fees balanced with the sustainable stock levels.

Note 7.
Climate Change Planning

Provision should be made for a fundamental review of the implications of climate change on shellfish resources and management. The impact of coastal defence strategies, water quality changes and species shift should be considered.

The implications for shellfish production due to climate change are considered to be significant both in terms of positive and negative aspects. The need for improved coastal defences, to accommodate rising seawater levels and potential storm surges may open up new intertidal areas for production through managed retreat. Equally, hard coastal defences, built to prevent inundation of coastal areas, may result in the loss of intertidal areas currently important for cultivation. The quality of coastal waters may also be adversely affected due to increased storm water overflows and hence lowering of shellfish harvesting water classifications. In all areas, the opportunity for enhanced recruitment of non-native species exists due to temperature rises while species migration to cooler/deeper waters is also a possibility with recruitment failure of traditional stocks in established areas. While only limited indications of changes are currently evident, the timeframe of likely events indicates that forward planning should provide scope for the identification of effective management options.

Note 8.
Marine Energy Production

Provision should be made for the integration of the operations of the marine energy production sector with sustainable shellfish resource use. The design and location of inshore wind, wave and tidal farms together with management and access to sites should be considered.

The expansion of wind and wave/tidal electricity generation in inshore waters has the potential to impact on shellfish production. The reliance on natural recruitment areas and migration of economically important shellfish species gives the production industry a vested interest in the location of service structures. This applies to both the physical disturbance of the seabed areas and in potential exclusion zones for fishing activities associated with the operation of such farms. Potential problems could be overcome if they are addressed at an early stage. Consequently, the activities of the shellfish production industry and the natural resources upon which it relies need to be considered at the planning stage.

## 10. Appendix (continued)

Note 9.
Recognition of Natural Resources Requirements

Provision should be made for the activities of the shellfish production industry to be recognised in the equitable allocation of coastal resources through Integrated Coastal Zone Management (ICZM) and Marine Spatial Planning (MSP). The process of ICZM should be initiated with the implementation of the WFD and the designation of economically important species. Subsequent provisions under MSP measures should include the requirement for dedicated shellfish production areas and Marine Protected Areas (MPAs) for shellfish resources.

The concept of Integrated Coastal Zone Management (ICZM) is not new, although the practical implementation on anything more than an experimental scale has not been contemplated in the UK. Increasing pressure on coastal resources from a wide range of activities has seen the concept gaining support as one method of ensuring equitable allocation of resources amongst stakeholder groups. Similarly, the concept of Marine Spatial Planning (MSP) has gathered significance in relation to the truly marine, and typically offshore component of the coastal zone. While practical implementation of such concepts is considered to be some time away, there is scope for the requirements of the shellfish production industry to be considered at the outset.

The practical application of the processes of ICZM will begin to be encountered with the implementation of the Water Framework Directive, which makes provision for the designation of areas within the 1nm zone for 'economically significant aquatic species'. The shellfish production industry should have the opportunity to designate both the species and production areas that sustain the capture fisheries, and also the areas of importance for the cultivation sector. In both instances, the requirement for recruitment areas and seed resources should be recognised within the designations. In the wider context of MSP, the need for protection of recruitment areas and nursery grounds for shellfish stocks further offshore, identifies the scope for Fisheries Marine Protected Areas (MPAs) to be established to safeguard the conservation status of stocks.

## Cross-sectoral initiatives

*RECOMMENDATIONS (for industry, inshore managers, key stakeholders)*

*Note 10.*
*Water Framework Directive*

The commercial shellfish production industry should be aware of the implications of the introduction of the Water Framework Directive (WFD). Fisheries operators within transitional waters should ensure activities are compatible with the Directive's objectives and seek designated status for exploited stocks. Cultivation operations should seek improved measures of water quality management with safeguards as robust as those previously implemented under the Shellfish Waters Directive. Considerations for the mSFCs should include integration of the Directive with measures for management of shellfish production and the impact on activities outside transitional waters. In addition, public health departments and agencies responsible for water quality standards should seek to integrate pollution monitoring and public health control.

The implementation of the Water Framework Directive (WFD) presents the industry, local shellfish managers and public health departments with the opportunity to promote their sectors' interests.

The commercial fisheries sector needs to ensure that activities are consistent with the Directive's aim of maintaining 'ecological status', or 'pristine condition' in waters highly modified by man. The Directive covers transitional waters out to 1nm and so all sectors (hand gathering, mobile and static gears) will be affected. The definitions of what constitutes 'ecological status' or for waters classified as highly modified by man "pristine condition", have yet to be fully determined and reference points set. However, there is an assumption that in the main, static gear fisheries will be largely unaffected. One instance where activities may be called into question would be estuarine shrimp nets if they take a bycatch of juvenile finfish especially in nursery areas. The mobile gear sector needs to be aware that some fisheries are likely to be examined to determine their suitability within transitional waters. Dredging or trawling in areas where damage is done to seabed features or a bycatch of juvenile fish is taken, are likely to require amendment or be curtailed. In comparison, a traditional oyster fishery, where the waters have been managed for a single purpose over an extended time period, the activity of dredging for oysters and the associated provisions for stock management seem unlikely to be constrained.

The ability to designate areas for 'economically significant aquatic species' presents the commercial fisheries and cultivation sectors with the opportunity to have their activities and the resources upon which they depend officially recognised. Hand gathering, static and mobile gear operators should seek to ensure that appropriate stocks and operational areas are documented through the inshore managers' permit schemes. Importantly, the WFD will replace the provisions of the Shellfish Waters Directive (79/923 EC) for shellfish water designations, so the significance for the industry's long-term future needs to be appreciated. The shellfish waters designations provided reference points for the industry to ensure basic water quality provisions for bivalve molluscs were maintained, and served to ensure the activities of the industry were recognised under statute. Equally robust provisions must be brought forward to protect the sectors interests under the WFD. Also, 'economically significant aquatic species' should include all other commercial molluscs and crustacean stocks and associated fisheries within transitional waters, and so provisions should be made for appropriate area designations with standards set for water quality and 'ecological status'.

For the cultivation sector, the most significant impact is likely to be pollution management and control. The emphasis of the Directive is to implement river basin management including transitional waters out to 1nm. Pollution monitoring and control is a key objective particularly in relation to diffuse sources of pollution. Sources such as agricultural run-off and storm water overflows have often resulted in the lowering of shellfish harvesting areas classifications, but without remedial or compensatory measures being able to be taken. Any action taken to identify and closely manage such pollution sources, together with more responsive reporting systems to identify when pollution events have occurred, should greatly assist the production industry.

*The shellfish production sector should be proactive in the WFD implementation process.*

The impact of the WFD on fisheries management has yet to be identified. However, inshore managers will need to take account of the Directive when considering management measures within 1nm. The management of harvesting and cultivation operations under permit schemes would place the emphasis on the managers to monitor and control activities. The potential for certain fishing activities to be constrained within the 1nm zone could result in the transfer of effort to areas further offshore. Such implications need to be considered at the outset for stock management purposes, especially where stocks straddle the boundary between transitional waters and waters further offshore. The potential for the development of under-utilised stocks (see Note 29) needs to be recognised in the process of designating 'economically significant aquatic species' and the inshore managers should take account of this when seeking designations.

## 10. Appendix (continued)

*Inshore managers and associated agencies should engage with the implementation process for the WFD at the earliest opportunity.*

The WFD presents the opportunity for further integration of pollution monitoring and public health control. The notification of pollution events and the timescale of impact on shellfish stocks have a direct link to the need for public health monitoring and possible control of harvesting operations. The emphasis on monitoring and control of sources of diffuse pollution within the WFD allows for improved reporting of pollution incidents and consideration of potential impacts. There is scope for greater integration between the monitoring of pollution events and the dissemination of information to the production industry to advise the process of ensuring end product standards, and ultimately public health control conditions, are met. Involvement of the mSFC district Shellfish Producers' Board (see Note 14) should ensure the commercial sector is fully involved with the development and operation of control measures.

*Note 11.*
*European Marine Sites (EMSs)*

The establishment of EMSs places legal obligations on those responsible for the management of activities and on commercial operators. The key obligation for shellfish producers should be to ensure that activities do not compromise the designated conservation objectives. Those responsible for permitting activities should determine clear management objectives, assess appropriate operations, establish monitoring, and control production activities where necessary.

The implementation of the EU Habitats and Birds Directives through the network of Natura 2000 sites has seen the designation of EMSs (Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) for birds) within inshore waters, and the potential for further designations offshore. The conservation objectives, on which the site designations are made, have to be taken account of when undertaking any activities within the areas. This is a legal obligation for all operators and where activities may have an impact on the conservation objectives of a site, an Appropriate Assessment may be required to determine the suitability of the operation. The commercial shellfish production industry needs to be advised of the location and extent of such sites, together with details of the conservation objectives and precluded methods of production. Commercial operators should seek to ensure that accurate details of both historic and current activities are available to help support continued production within EMSs. A Memorandum of Understanding (MoU) for Appropriate Assessments in marine sites was proposed between the Shellfish Association of Great Britain and English Nature. Discussions on this MoU continue now with Natural England after taking on the role of statutory advisor to government on nature conservation issues.

The management of fisheries by agencies within inshore waters and the formation of mSFCs with a remit for management of all commercial shellfish production activities through permit schemes, places EMS obligations on such bodies. Guidance from central government on the balance to be achieved at national level between the implementation of EMSs and the operation of public fisheries will dictate overall management considerations. However, as the competent authority controlling all shellfish production activities within a district, the mSFC would be required to take account of the conservation objectives through permit conditions. The balance to be achieved between shellfish stock management and the conservation objectives for an EMS will require the setting of overall management objectives. These should establish the significance of the EMSs' overall impact in relation to the total scale of the shellfish resource.

To undertake Appropriate Assessment of potentially damaging activities within an EMS, inshore managers will need access to sufficient resources. The provision of advice and guidance from the proposed National Shellfish Resource Group (NRSG see Note 2) would make this a less onerous task. However, provision would have to be made within mSFC and agency staff resources for technical expertise to cover aspects relating to environmental management. Problems of financing the Appropriate Assessment process could be addressed through the issuing of restricted permits with a fee proportionate to the additional management cost. The division of such costs for large-scale fisheries or hand-gathering operations may not be disproportionate to the overall value of the resource. However, where individual cultivation activities are concerned, the full cost of any Appropriate Assessment could easily exceed the short to medium term returns from such activities. Equally, where new or small-scale sustainable fisheries are planned, the cost of assessment might outweigh the anticipated return for individual operators. Such issues will have to be considered when levying costs for nature conservation through fisheries management provisions. The need for alternative funding will need to be recognised.

While Appropriate Assessments may not be required in all EMSs, there will be the additional burden of monitoring and control of activities within EMSs under permit conditions. The boundaries of each EMS will need to be well defined within permit conditions if activities are considered damaging to features. In relation to mobile gear capture and potentially hand-gathering operations, the monitoring and control of illegal activities could present significant resource implications. It is important that such costs are not passed on to the legitimate permit operators.

*Note 12.*
*Industry Investment*

Public and private investment is required for various aspects of the shellfish production industry to develop efficient and sustainable businesses. National measures will be introduced through the European Fisheries Fund (EFF) with central government advised of industry needs. Specific sectoral requirements for investment can be identified for the cultivation and fisheries sectors on a local, regional and national basis. Regional investment should be supported through the Regional Development Agencies (RDAs) and structured towards efficiency improvements and business development within both primary production and downstream areas. Priorities for investment should be identified at the district level through the mSFCs with all investment measures for local, regional and national programmes based on sustainable use of identified natural resources. The mSFCs should provide a link for industry to local government business support units and national schemes for training and business benchmarking.

To be competitive within national and international markets, shellfish businesses must operate in a sustainable and efficient way. The socio-economic contribution to the local, regional and national economy ensures that the overall importance of the sector is recognised, with EU funding measures in place to provide support. The European Fisheries Fund (EFF) seeks to modernise the industry through targeted measures encouraging sustainable resource use, while improving business efficiency and production values. Within the UK, the EFF structural measures are broken down by regional needs and applied through sectoral programmes. It is important that the industry both advises government of its needs when the programmes are being formulated and is in a position to subsequently draw down funds. Failure at either of these stages places UK businesses at a competitive disadvantage to other Member States that frequently are engaged in the same market place.

## 10. Appendix (continued)

Provision for investment by the Regional Development Agencies (RDAs) is required to target production efficiencies of individual operators and to assist business development. Opportunities for increased employment in the production sector are limited due to finite natural resources and technical innovation that can reduce labour requirements. However, training in technical and business skills is important. Down stream investment in processing and distribution facilities should increase the overall value of the sector, eg through adding value locally rather than exporting the vast amounts of fresh product as occurs currently. Investment in infrastructure such as landing facilities and distribution networks, together with regional and national marketing schemes, is required to promote efficiency at the regional level and develop market opportunity.

Inshore managers will be in a good position to advise government (with respect to the requirement for EFF structural measures) and RDAs (in terms of the district perspective of production opportunities). It is extremely important that provisions for funding are closely associated with the true production opportunities, based on available natural resources and recognised through the shellfish production management process. Equally the mSFCs should be in an extremely good position to provide a link to local government business support units and training programmes to ensure individual businesses gain development assistance.

In relation to overall investment, each production sector has specific requirements based on the nature of the industry and the fisheries prosecuted. For the static gear sector, targeting EFF in support of sustainable fishing practices should provide the opportunity for investment in the development of technical innovations to improve the selectivity of fishing techniques. Measures to improve the value of landings and to support management programmes should offer scope to integrate marketing and management measures in order to improve the quality of landed products.

Regional investment in the static gear sector is required to improve production efficiency and reduce wastage with opportunities to support technical innovation in transport and storage of live products. Diversification and utilisation of stocks that are currently exploited inefficiently should also attract investment. The need for support of downstream industry particularly the processing sector in order to capitalise on investments in the production sector is particularly relevant in this respect. The processing and marketing requirements of species that are currently exploited inefficiently should be seen as a priority. The financial risk associated with the processing and production sectors developing such alternative opportunities, needs to be recognised within the structuring of the funding measures for such developments.

The use of EFF to support development within the mobile gear sector should focus on the need for sustainable production. The sector has sought opportunities to exploit under-utilised species but has been constrained by environmental and nature conservation considerations when establishing new fisheries and techniques. In an attempt to remain commercially viable, effort has been expanded into areas not previously fished and gear developed accordingly, to cope with harsher conditions. Both forms of development have been subject to environmental scrutiny and control, so if opportunities are to be prosecuted on a sustainable basis then appropriate fisheries management systems need to be in place at the outset. The EFF should target both management issues and gear development in order to promote sustainable production techniques. Equally, raising the value of landings should be viewed as an appropriate use of development support to offset the operating costs of the sector and reduce the underlying pressure on stocks. In the long term, adding value in the UK to landings rather than sending them for export would bring in additional revenue.

Investment at a regional level should seek to complement the use of structural funds. Production efficiency for the mobile sector is largely based around the status of existing stocks and directly linked to the time needed to be spent fishi ng.The major cost for the sector is fuel, so reducing time spent at sea is key to gaining an economic landing. This could be improved in the medium to long term by enhanced stock levels. Fisheries management initiatives, either for existing stocks or development of sustainable production techniques for under-utilised stocks, should attract regional investment. Support for restructuring, either in terms of low impact gear development and usage or for transfer of effort to under-utilised stocks and changes in fishing techniques, should be supported through tailored financial investment. Equally the demand for and value of landings from the sector could be improved by regional investment in infrastructure and downstream industry activities, as already outlined for the static gear sector.

Targeting EFF measures in support of sustainable shellfish cultivation provides the opportunity for investment in technical innovation measures to allow access to new production areas. Such innovations should include the sustainable utilisation of deeper water sites further from shore through gear development, and the minimisation of visual impact or environmental disturbance in near-shore sites. Also, measures to improve the value of production and in support of management should provide scope for the scaling up of production outputs to achieve greater economies of scale. Specific management initiatives to reduce the adverse impacts of pollution events and ensure production from Class A harvesting areas should offer scope for enhanced product values.

Targeted regional investment is required to improve efficiency of production from cultivation with opportunities to support technical innovation and market development. Efficiency improvements should be instigated through assistance for established businesses to develop through expansion, and hence reap the benefits of economies of scale. To assist with technical innovation, tailored financial assistance is required but recognising the time period between investment in stock and equipment and the placing on the market of the finished product. Elements of financial and operational risk should be recognised specifically in the support measures.

Support for infrastructure investment and particularly down stream industry investment (in the form of distribution and processing) is needed for shellfish produced by the cultivation sector to reach new markets. Such support should encompass the need for product development and quality/cost considerations. The formation of joint business ventures for distribution and marketing should be encouraged through financial assistance.

At the district level, investment in the shellfish production sectors and associated industries needs to be structured around the sustainable use and management of resources. This is extremely important. The inshore managers should be central to the identification of development opportunities and the appropriate investment required within their districts, based on sustainable management policies being in place.

## 10. Appendix (continued)

*Note 13.*
*Accredited Fisheries and Shellfish Products*

Market development is key to raising the value of the industry and accreditation schemes should assist this process. Opportunities for distinct local fisheries and some cultivated products within local and regional markets should utilise regional food groups. Within regional and national markets, accredited fisheries and shellfish products will be required. Accreditation of harvesting practices presents an intermediate stage with mSFCs and fisheries agencies needing to achieve accredited management of stocks if full benefits are to be gained. Management of shellfish stocks out to 12nm, backed up by reliable scientific data on stocks on which to base management decisions will be fundamental.

The value of shellfish landings could be enhanced if they were associated with sustainability and environmental credentials. The influence of accredited food products on the market is becoming significant. Opportunities to supply shellfish to major outlets are becoming constrained by lack of documented production criteria.

The industry has two main levels at which it could seek to accredit its products. Local markets can be developed under the umbrella of regional food group initiatives requiring little more than recognition that the products come from within the region. While this may be of interest to small-scale fisheries and cultivation operations, it provides little leverage in terms of access to markets at the national and international levels. To satisfy these markets, the standards of an international or nationally recognised accreditation scheme have to be met.

To date, the Marine Stewardship Council (MSC) is the only third-party, independent, internationally-recognised accreditation scheme that complies with FAO guidelines. The MSC operates a scheme that involves accreditation of all stages of the production process including the issue of sustainable stock management. There are other accreditation schemes and the industry will need to balance the perceived benefits of the various schemes against the costs of meeting the respective accreditation criteria. One alternative scheme, based on 'best practice' harvesting techniques, can be undertaken through the Seafish and BSI Responsible Fishing Scheme. This sets standards for the capture sector and provides a recognised assurance to the supply chain. For cultivation activities, organic standards have been considered by some to be the most appropriate way to attain accreditation.

The potential for hand harvesting operations to seek accredited fishery status should be good in many locations as the management under mSFC permit schemes, combined with responsible harvesting techniques, should result in stable and sustainable fisheries. Likewise, the static gear sector is well placed to develop markets based on fishing techniques with limited environmental impacts but a primary requirement is for the stocks to be managed sustainably. The mobile gear sector could benefit in terms of access to markets through implementing product assurance schemes. However, there is a primary requirement at all levels that the fishing operations are environmentally sustainable and the mobile gear sector has a limited track record of environmentally benign operations. The immediate challenge for the industry should be to develop environmentally sensitive fishing techniques for appropriate locations in order to become involved in the assurance process.

While accreditation of harvesting operations can be undertaken through responsible fishing schemes, for fishery products to be accredited they must come from stocks that can be certified as being managed sustainably. Currently, no stocks are under sufficiently rigorous management measures to satisfy the requirements for accreditation. However, inshore managers should be able to implement well defined management controls under permit conditions.

The long established nature of some native oyster fisheries places these in a position where they could be considered for accreditation both on environmental and sustainability grounds. The working of some beds over many decades has resulted in the habitat formed co-existing with fishery operations. The native oyster is also a Biodiversity Action Plan species and is the subject of management measures to both re-establish it within traditional areas and enhance production.

Market demand for recognised systems of accreditation is increasing and all levels of the shellfish production sector should recognise this. Such processes need to include the fundamental assurances of sustainable use of natural resources and environmental responsibility, and hence management systems will need to be accredited together with the harvesting techniques. It is proposed that the NSRG should act as an independent body to assess management protocols and as a benchmarking/reference body for any commercial accreditation scheme (see Note 2).

*Note 14.*
*Shellfish Producers' Board*

The closer integration of shellfish production with market opportunities should be facilitated through the inshore management process. District Shellfish Producers' Boards should be established with all production sectors represented. Regulation of production through management control should balance the interests of the producers with those for stock sustainability. To improve the flow of market and management information at district and national levels, an Internet-based system detailing shellfish supply, demand and stock management status should be established.

The integration of market opportunity with sustainable production management needs a strong link between routine stock management decisions and commercial interests. The mSFCs' control of harvesting activities through permit conditions requires a formal linkage to be established between producers and managers. This linkage should include the activities and stocks beyond 6nm, bringing in respective inshore managers. Equally, implications for management of stocks between mSFC districts should be encompassed.

Introducing a system of district Shellfish Producers' Boards would provide all sectors of the industry with the opportunity to discuss production issues and market requirements with the shellfish resource managers. Flexibility within the district management functions (such as seasonal or restricted opening of fisheries to encompass market opportunity or stock quality considerations) should encourage optimal use of shellfish resources whilst maintaining stock stability. Membership of the Producers' Board should be voluntary with honorary official positions and administration costs met from the mSFCs budgets. Each industry sector (including hand gathering, static and mobile gear together with cultivation interests) would organise appropriate representation. Those within the processing and downstream industry sectors should also be part of the discussion process.

The need to integrate supply and demand to optimise market opportunities requires a national information system based on local inputs. Establishing an Internet-based system to display district management and production information would be helpful for producers and those seeking shellfish supplies. Such a system would also allow a national perspective on management measures that were in force within each district. At a local level, it could indicate revision of permit conditions and thus serve as a useful management tool. Data on district stock assessments and landings could also be incorporated. The system could also be an extremely important tool for notification of pollution or biotoxin events, and speed up the flow of information to the industry.

## 10. Appendix (continued)

*Note 15.*
*Marine Spatial Planning (MSP)*

All sectors of the shellfish production industry should identify their activities within any local or regional MSP initiatives to ensure their resource needs are recognised. Key areas of economic activity should be delimited by management measures. Production locations should be based on industry records with associated facilities, such as storage or conditioning and relaying beds noted. The influence of climate change on current activities should be taken into account and considerations for future change in activities identified. The infrastructure and access needs of the industry should also be identified particularly with respect to ICZM and the onshore requirements for industry development.

Shellfisheries management should be incorporated into the framework of MSP to allow the adoption of an ecosystem-based approach. MSP (through development of regional sea and sub-regional plans) should provide a basis on which particularly important areas for shellfisheries can be identified and potential conflicts between shellfisheries and other sectors can be addressed. The mSFCs should be statutory consultees in the development of Marine Spatial Plans, which should be subject to SEA; mSFCs should have a significant role in the development of Marine Spatial Plans (and associated SEAs), providing information on current fishing activities, any effects of these activities on the environment, possible mitigation measures for these effects, as well as effects of other activities on shellfisheries (both new and developing).

The concept of MSP is not new to the production industry with long established agreements between static and mobile gear interests regarding allocated areas. Also, cultivation operations have exacting requirements for natural resource that require dedicated locations. With increasing pressures on all natural resources, shellfish operators need to identify their specific resource requirements. While the key areas of economic activity will be delimited through the management measures of the inshore managers, the production industry needs to determine its detailed resource needs. Such cataloguing will require records from industry of sustainable use of resources within specific locations. As well as characterising shellfish stocks and harvesting areas, associated natural resources such as recruitment areas and migration routes etc., will need to be identified. The NSRG, assisted by the industry and inshore managers, should be best placed to do this. Within the concept of MSP, there is the potential for Marine Protected Areas to be designated. Such designations could be extremely beneficial to the industry with respect to recruitment and nursery areas for some shellfish species. Any MSP system must take account of environmental stability and climate change in particular. In this respect, industry operators would be best placed to identify any alterations in shellfish distribution or occurrence, and as such should be able to update the MSP process.

ICZM and local planning measures will need to focus on the need for access to intertidal areas, particularly for the hand gathering and cultivation sectors, and the need for industry developments onshore to correspond to the inshore production potential. It is extremely important that such considerations are not overlooked in any MSP process and in this respect, the district mSFCs and fisheries agencies should be best placed to establish and present the needs of industry.

## Sectoral development strategies

The strategies for hand-harvesting, static gear, mobile gear, non-targeted production and the cultivation sectors are considered. Key species within each sector have specific development requirements. In addition, species with clear enhancement opportunities are also identified for strategic intervention.

## Hand harvesting sector

### KEY RECOMMENDATIONS (for government/agencies)

Note 16.
Commercial Hand Harvesting Management

Provision should be made to establish all commercial hand harvesting operations under inshore management control. Permit schemes should be introduced as the basis for sustainable stock management for such fisheries with the potential to limit access within districts where appropriate. Limits for personal use should be established for all non-commercial activities based on district requirements for stock management. Where appropriate within EMS areas, only dedicated operators should be permitted and reflect resource management needs. Clear stock assessment and monitoring objectives should be established for the hand gathering fisheries and be implemented by the inshore managers. The NSRG should provide specific guidance, and especially for operations in EMSs and environmentally sensitive areas.

The importance of the hand-gathering sector, in terms of the revenue that is generated and the significance of the stocks upon which it depends, requires improved management control, taking into account associated environmental considerations. This should be achieved by the district mSFCs introducing permit controls for all stocks that are subject to commercial hand gathering. In terms of personal use, hand-gathering limits should be set for each species to ensure the operations do not become commercial. There will need to be legislative provision to ensure that the mSFCs can control and enforce such constraints on public access gathering for personal use.

Management of the commercial sector through permit conditions should take account of the need to restrict effort where necessary, both in terms of stock management and where environmental damage may be caused by uncontrolled activity. In the context of EMSs and the exploitation of shellfish stocks, additional permit controls or special permits may be warranted to meet conservation objectives. If there is a need for Appropriate Assessments and associated management, this will lead to increased costs which will need to be reflected in permit conditions. The numbers of permits issued, as well as the associated management costs, should be balanced with the harvesting operation needing to be sustainable and economically viable.

## 10. Appendix (continued)

### Note 17.
### Hand Harvesting - Public Health Control

Provision should be made for all shellfish stocks harvested by hand and the production areas to be designated as suitable for commercial harvesting. The identification, monitoring and control of such stocks should be undertaken by the inshore managers. Enhanced water quality monitoring through the WFD should be integrated with food safety and public health provisions.

The commercial hand gathering of shellfish should be provided with safeguards as to the classification of production areas and the traceability of harvested stock within the seafood supply chain. To facilitate this, inshore managers should have responsibility to designate commercial hand gathering stocks and areas, with monitoring and control through permit conditions. The integration of water quality monitoring and pollution control for public health reasons should be assisted through the WFD implementation. Improved pollution monitoring and reporting should allow public health controls to be implemented through the inshore managers permit conditions. Prevention of gathering, as well as traceability of permit holders and landings would be more readily achieved.

### Note 18.
### Commercial Hand Harvesting

Provision should be made for commercial hand harvesting of shellfish to be the subject of legislation equivalent to 'Buyers and Sellers'. Through the link to harvesting permit controls, established by the inshore managers, improved monitoring of stock exploitation and public health controls should be achieved.

The current legislation for the registration of Buyers and Sellers of fish does not cover the production of shellfish from hand gathering operations. In the majority of cases the sale of such shellfish will be to merchants or the processing sector and buyers are already likely to be registered. The possibility of hand gathered shellfish being sold only to registered buyers offers the potential for improvement in both stock management and public health controls. The registered buyers should only make purchases from holders of hand harvesting permits and records kept by the buyers would prove useful to verify levels of landings from any particular stock or area. Buyers would also need assurance that product had come from designated areas subject to public health controls and verification of permit conditions could assist this. Equally, the linking of hand gathering permit records with those from registered buyers presents opportunities for improved public health control through traceability of stock to production area and permit holder. This would allow rapid intervention following any pollution or biotoxin events.

Note 19.
Shellfish Intended for Bait

Provision should be made for all commercial gathering of shellfish for bait to be brought under permit control of inshore managers. To improve monitoring of stocks and ensure access control, catch and effort should be reported and environmental sustainability assessments undertaken. Limits for personal use should be established for non-commercial activities.

The collection of soft shell green crab for use as bait by anglers is a widespread activity both on a hobby basis and as a commercial venture. The collection process in intertidal areas can involve laying tiles or pipes to provide refuges for the crabs post moult, when they are particularly vulnerable to predation. Such activities are often commercial as authorities may levy fees to control the numbers of refuges set. Currently, no stock monitoring is undertaken and there is limited ability to control access in most areas but there is scope to bring such commercial operations under the control of inshore managers. Provision under permit conditions for reporting of catch and effort should allow an assessment of environmental sustainability. In addition, within EMSs the control of access and effort through permit conditions will assist the maintenance of conservation objectives. Limits for personal use should be established at the local level for non-commercial collection. Legislative provision should be established to allow inshore managers to control and enforce such conditions.

Note 20.
Control of Landward Access

Provision should be made for the inshore managers to designate fishery access points. This should be encompassed within permit conditions and would require additional legislative provision.

The control of hand gathering activities on intertidal foreshores often produces logistical difficulties for monitoring and enforcement. While the harvesting operations can be controlled through permit conditions, the landing of catches and access points to the fishery are more difficult to monitor. The management of the harvesting operations also carries with it a general environmental responsibility and this could relate to features on the landward side of the fishery. This is particularly relevant to the designation of some EMSs. For hand gathering operations, there is a requirement to be able to enforce both the designation of access and landing points, and the establishment of environmental safeguards.

10. Appendix (continued)

## Hand harvesting sector

*RECOMMENDATIONS (for industry, inshore managers, key stakeholders)*

*Note 21.*
*Sustainable Harvesting Activities*

To establish production standards for industry, codes of practice should be developed for mollusc and crustacean harvesting operations. Such responsible harvesting activities should be recognised through permit conditions implemented by the inshore managers.

To assist the hand gathering sector to implement responsible harvesting operations, a code of practice should be established for all activities. In many districts, the proximity of EMSs to hand gathering areas means that the industry will need to operate under strict guidelines to ensure that the site conservation objectives are met. The need for good environmental management of the intertidal sites prosecuted for shellfish will be emphasised further by the implementation of the WFD. The industry is best placed to draw up a code of practice that recognises the production requirements of the sector whilst identifying steps to minimise any environmental impact of operations. The management of such operations through permit schemes would make it appropriate to include the harvesting code of practice as part of the permit conditions. The range of species produced through hand gathering operations will require separate codes for mollusc and crustacean harvesting. The potential for hand harvesting operations to seek accredited fishery status would be good in many areas as the management of stocks under permit, combined with responsible harvesting techniques, should result in stable and sustainable fisheries.

## Static gear sector

KEY RECOMMENDATIONS (for government/agencies)

Note 22.
UK Shellfish Licence Scheme

Provision should be made for existing legislation to be revised in order to improve stock management monitoring and control. UK vessels should hold an existing Shellfish Licence to qualify for the respective district fisheries permit scheme allowing continued national control over access to key crustacean species, and for national management measures to be introduced. Requirements for reporting effort, catch, landings and areas fished should be co-ordinated by inshore managers for inshore waters, with district mSFC and fisheries agencies permit schemes prevailing.

The UK Shellfish Licence scheme was implemented to cap access to major crustacean stocks by UK vessels within British fishery limits. The current scheme sets reporting conditions for effort and landings of lobster, various crabs and crawfish. It is important that the Shellfish Licence scheme remains in place to ensure that no increase in access to such stocks occurs as all are considered near to or fully exploited. To integrate the requirements of the UK Shellfish Licence scheme into the district mSFC reporting controls through permit schemes, some minor amendments to legislative provisions should be made. The ability of the Shellfish Licence scheme to cover all UK vessels entitled to operate within British fishery limits means that where national measures for stock management or control are required they could be implemented through the Licence. One example of this may be the need to ban the landing of berried animals within England. To maintain the existing safeguards with respect to access to key species, qualification for a district fisheries permit for such stocks will require all vessels to already hold a UK Shellfish Licence. Within the mSFCs districts, however, specific fisheries permit conditions would need to prevail over the general conditions laid down in the UK Shellfish Licence scheme. This approach should allow the mSFCs and fisheries agencies to co-ordinate the reporting and stock assessment requirements within the districts and throughout inshore waters.

Note 23.
Permit Scheme for Static Gear Fisheries

Provision should be made for permit reporting schemes to be implemented for static gear fisheries in inshore waters by the inshore managers. These should include stocks not already subject to reporting under Shellfish Licence conditions. Only UK registered fishing vessels should qualify for permits within mSFC districts, with allocation based on SEA compliance for the activity and location. Inshore managers' permit conditions should be established for inshore waters, based on management objectives for stock assessment and monitoring with reporting of effort, catch, bycatch, areas fished and landings. Consideration should be given for environmental safeguards through SEA compliance and the protection of EMSs. The potential exists for permit withdrawal penalties to be introduced for non-compliance. Within the mSFC districts, additional permit schemes for the management of all non-TAC species should be based on sustainable stock management measures including effort control, technical measures and catch limits. Such permit schemes should encompass the need to match stock management objectives with market demand. Foreign vessels with historic access rights to inshore waters should be allocated permits for appropriate species with reporting requirements for catch, bycatch, effort and areas fished. Such measures are required for stock assessment and conservation together with the protection of the natural environment and EMSs.

The mSFCs monitoring of fishing activity through fishery permit conditions requires that access is allocated to appropriate vessels. To ensure that only commercial activities are encompassed, eligibility for a permit should be restricted to UK registered fishing vessels. Such permits would only cover species not already encompassed under the Shellfish Licence scheme (and already eligible for permits) and would exclude management objectives for Nephrops which are managed at the EU level through TAC conditions.

## 10. Appendix (continued)

The issuing of fishing permits, with reporting conditions for individual areas or stocks and for the various static gear techniques, should recognise the need for an environmental impact assessment. For all permits, there would be a requirement for compliance in terms of a Strategic Environmental Assessment (SEA) of the fishing technique in relation to the operational area. The development of such assessments should be undertaken by the mSFCs in conjunction with the NSRG and once such techniques have been established, they should be easily applied to all fishing operations. The reporting conditions attached to permits should also identify the areas fished as well as effort and landings made, in order that monitoring and control of activities impacting on EMSs or other environmentally sensitive areas could be undertaken. (Note: Currently, vessel size restrictions are used under SFC byelaw to prevent access to certain areas/stocks. Such restrictions could be more flexibly implemented using permit conditions.)

Controlling fishing activity and monitoring stocks through permit conditions also has potential advantages in terms of enforcement procedures. If permit conditions were found to be broken, penalties could be implemented through withdrawal of the permit for various periods. This removes the need to create a criminal offence at the outset and should allow proportionate penalties to be administered. Such types of initiatives were identified as more appropriate penalties for the fishing industry within the Net Benefits Report (Cabinet Office, 2004) there would be a requirement for permit withdrawal to be possible between mSFCs districts to ensure that offenders from outside any individual district could be sanctioned.

The setting of permit fees should be based on the management costs of the fishery and divided between all permit holders. However, consideration will need to be given to the proportionate effort exerted by individuals in relation to the quantity of gear deployed, and consequently banded fees may be appropriate.

The flexibility of permit control of fishing activities provides the opportunity for decisions on stock management to take account of market conditions. Applying the same conditions on a non-discriminatory basis to all permit holders for a single stock or fishery provides the opportunity for rational management based on market demand. The views of the permit holders, as to when and what levels of exploitation they would like to achieve, should be part of the management process and recognised through district Shellfish Producers' Boards.

The monitoring and assessment of stocks through permit conditions within inshore waters where historic rights of access exist for foreign vessel would require that such activities are included if management objectives are to be met. Agreement would need to be sought at EU level to allow permit conditions for reporting of catch, effort and areas fished and based on access to defined species. The permit should still be based on a SEA for the technique deployed and the areas worked. The justification for such a system applying to all vessels with access rights is that it is non-discriminatory between Member States and the measures are implemented for stock conservation and management purposes. Also, environmental protection and the safeguarding of EMSs and their conservation objectives are fundamental to the proposals being proposed.

## Static gear sector

*RECOMMENDATIONS (for industry, inshore managers, key stakeholders)*

*Note 24.*
*Improved Management Control of Fisheries*

To optimise sustainable economic yields from the static gear fisheries, there are a range of management measures that should be implemented at the district mSFC level. Restriction of access to key species should be enforced through the Shellfish Licence scheme with all shellfish stocks subject to reporting under permit. Capping of effort for key stocks should be implemented through restricted permit conditions for gear type and deployment, with prescribed landing conditions identified, including minimum size, body parts and soft shell ban, landing for bait etc.

The static gear fisheries have some specific requirements for optimising the sustainable use of shellfish stocks, and these include the need for effort control. Management through fishery permit conditions, implemented by inshore managers, provides the scope and opportunities to address this. Controlling access to stocks could be implemented through restriction of permit numbers. In the case of UK Shellfish Licence holders the designated stocks are currently only open to them, while for these and other stocks the granting of a permit could be subject to qualifying conditions. If access is not constrained, some stocks will require effort to be capped as part of the permit conditions, with all permit holders treated proportionately. Capping of effort could be applied through restricted gear deployment and technical measures or through closed seasons and areas etc but the latter presents difficulties in relation to the transfer of effort. There is potential for prescribed landing conditions to be set by the district mSFCs in order to improve the status of stocks. Measures possible under permit conditions include minimum landing sizes above EU requirements, a ban on soft shell animals or body parts, no landing for bait, lobster V-notch provisions, etc.

*Note 25.*
*Market Development and Management*

The static gear sector is dependent on a range of key shellfish products in order to ensure economic viability. The quality and sustainability of landings need to be improved for some species if the sector is to remain competitive.

The static gear sector is dependent on a range of species that are extremely important economically on both a national and regional basis. However, for some of these stocks there are market and management issues that need to be addressed if the full economic potential is to be achieved and stocks managed on a sustainable basis.

## 10. Appendix (continued)

The brown crab fishery is of national importance with landings exceeding the value of the majority of finfish species. However, on a regional basis issues with the quality of landings and volumes have served to constrain the market value. Also, the market requirement traditionally for live product has seen a shift towards ready prepared and processed products with specific raw material specifications. Measures to manage landings and for product development are needed to overcome these specific issues related to quality of landings.

Similarly, the exploitation of spider crabs on a regional basis are failing to match seasonal product quality with market demand, and the need for processing of the landed material. The velvet crab fishery also has regional significance, but issues involving appropriate transport and storage facilities have limited the ability to supply existing continental markets.

In terms of mollusc stocks, significant regional fisheries for whelks have tended to be short lived due to over exploitation of stocks within discrete areas. The resource is extremely valuable in the international market and provisions are needed to ensure management measures are in place to prevent the recruitment over-fishing that is currently experienced. While the landing of octopus in the UK is limited, the occurrence of animals as a bycatch of static gear fisheries is evidence of their regional availability. Currently, the resource is wasted through a lack of regional demand to match the quantities landed, despite an expanding ethnic market in the UK, and established continental markets for fresh and preserved products.

The static gear sector requires both management and market-based initiatives to optimise the economic value of the natural resources available. The development of market opportunities will require a range of bodies to undertake initiatives, all with the over-riding requirement of stock sustainability. However, development of such species should provide the opportunity for effort to be transferred from stocks currently considered to be fully or over exploited.

## Mobile gear sector

### KEY RECOMMENDATIONS (for government/agencies)

Note 26.
Permit Scheme for Targeted Mobile Gear Shellfisheries

Provision should be made for permit reporting schemes to be implemented for mobile gear fisheries in inshore waters by the inshore managers. These should cover stocks not already subject to reporting under Scallop Vessel Licence (>10m) conditions. Only UK registered fishing vessels should qualify for permits within mSFC districts, with allocation based on SEA compliance for the activity and location. The permit conditions should be established for inshore waters, based on management objectives for stock assessment and monitoring, with reporting of effort, catch, bycatch[1], areas fished and landings. Consideration should be given for environmental safeguards through SEA compliance and the protection of EMSs. The potential exists for permit withdrawal penalties to be introduced for non-compliance. Within the mSFC districts, additional permit schemes for the management of all non-TAC species should be based on sustainable stock management measures including effort control, technical measures and catch limits.

[1] Bycatch (non-target species of whole shellfish or parts thereof, eg crab claws, that are landed) as opposed to discards (non-target shellfish in the catch that is returned to the sea). NB. Shellfish discards are likely to survive on return to the sea.

Such permit schemes should encompass the need to match stock management objectives with market demand. Accessing shellfish seed resources should be undertaken in inshore waters through permit conditions. Foreign vessels with historic access rights to inshore waters should be allocated permits for appropriate species with reporting requirements for catch, bycatch, effort and areas fished. Such measures are required for stock assessment and conservation together with the protection of the natural environment and EMSs.

The general conditions applying to the operation of a fishery permit reporting scheme have been described for the static gear fisheries (Note 23). There should be similar conditions for the mobile gear sector. Requirements should be for uptake by UK registered fishing vessels, permit reporting for all fisheries prosecuted, SEA compliance for all techniques and the exclusion of TAC species from additional management. The major difference between the operation of a permit system for the mobile and static gear sectors is that UK Shellfish Licence implications (for the static gear sector Note 22) are substituted by UK Scallop Licence conditions for vessels over 10m.

Vessels (>10m) with a Scallop Licence, and operating within British fishery limits, would be required to report catch, bycatch, effort and location for all species in order to generate data for stock management. Reporting would also be required in relation to SEA compliance and the protection of EMSs. Holders of UK Scallop Licences should be eligible for mSFCs district permits for scallops and while within such areas, the district permit conditions would prevail. These may need to contain provisions to limit vessel size or gear deployment within certain areas, particularly environmentally sensitive sites.

Access to shellfish seed resources is also potentially an important element of the management of mobile gear activities and shellfish stocks. Using mSFC district permit conditions to manage such stocks should be undertaken in conjunction with the NSRG to ensure that appropriate and sustainable management techniques are employed for optimal use of the seed resources.

Reporting by foreign vessels with historic access rights in inshore waters is considered to be justified on the same basis as for static gear activities (Note 23).

Note 27.
Environmental Assessment and Conservation Management

Provision should be made for the environmental impact from mobile gear activities to be minimised. Implementing a system of Strategic Environmental Assessments (SEAs) for all commercial mobile gear operations could be undertaken by the NSRG, identifying suitable habitat types and techniques of exploitation. Management advice should be available for inshore managers in order to establish best practice for bycatch reduction and to minimise the environmental impacts of mobile gears.

The mobile gear sector is under pressure not only in relation to the stocks that are targeted but also in terms of impacts on the general environment. Strategic Environmental Assessment (SEA) is required both for the techniques and the habitat types where fisheries operate. Some mobile gears also have the potential to take significant bycatch of both shellfish and finfish species, so impacts on other commercial stocks need to be considered.

The provision of SEA for mobile gears would only be part of the management process as best practice standards need to be established. Technical or management measures need to be introduced to mitigate impacts and the typing of habitats is required to identify suitable operational areas. This is particularly relevant to the operation of mobile gears within EMSs where specific conservation objectives are identified to protect features of the sites. The implementation of the Water Framework Directive will also raise issues on the use of mobile gears within transitional waters (<1nm), and any threat to maintaining 'ecological status'. The outcomes of such considerations have a direct impact on the management of shellfish stocks and will need to be recognised within mSFC permit schemes.

The NSRG could develop protocols and undertake assessments for the major gear types and be in a position to advise the inshore managers so that they could establish best practice for fisheries and environmental management. This should lead to a reduction in bycatch of both finfish and shellfish and minimise the environmental impact of mobile gears and techniques.

## Mobile gear sector

*RECOMMENDATIONS (for industry, inshore managers, key stakeholders)*

*Note 28.*
*Sustainable Fishing Practice*

Best practice fishing techniques need to be developed for the mobile gear sector to minimise environmental impacts of their operations within inshore waters. Inshore managers' management objectives for sustainable fishery exploitation should be established on the basis of SEA and the availability of suitable habitat types. Any interactions with static gear operations should be identified together with that for nature or environmental conservation interests. Compensation measures for gear types and operations should be identified within the conditions of fishery permit schemes.

The potential impact of mobile gears on the environment should be the subject of SEA (Note 27). The application of such assessments by inshore managers in relation to management of stocks and fishing opportunities will form the basis for establishing best practice for managing stocks and minimising environmental disturbance.

Inshore managers will need to consider a range of issues when establishing management objectives for the mobile gear sector. These should include interactions with static gear operations and the overlap of habitats and stocks, including seasonal distributions. The presence of sensitive habitats, in relation to physical gear disturbance and the location of EMSs and their conservation objectives, will also need to be taken into account. Formulating management measures based on best practice and implementing these through fishery permit conditions, should seek to allow the mobile gear sector to maximise fishing opportunities while minimising environmental impact and bycatch. The mobile gear sector will need to consider their own compensation measures in terms of working practices and/or gear developments to minimise their impact on the environment and/or non-target stocks. It is

likely that the sector will increasingly be faced with establishing a track record of sustainable use of natural resources if it is to continue to have widespread access to inshore shellfish stocks. The implementation of the Water Framework Directive will also seek to ensure that the sector's operations in transitional waters (<1nm) will maintain the ecological status of both the stocks and the wider environment.

*Note 29.*
*Access to Under-utilised Shellfish Stocks*

Opportunities for the sustainable exploitation of shellfish stocks that are currently under-utilised should be improved through the development of appropriate management and fishery measures. Stocks that are suitable for exploitation should be identified with clear management objectives set and limited fishery access ensured through permit conditions. Such stocks should be outside any locations that have been identified as environmentally sensitive but with environmental monitoring provisions in place as part of the management objectives. Best practice fishery management should be established based on guidance from the NSRG with both gear development and sustainable fishery techniques used to revise SEA provisions.

Currently there is a degree of difficulty in developing mobile gear fisheries for under-utilised stocks or expanding existing fisheries in areas subject to nature conservation designations or sensitive habitat features. The issues are most evident in areas close to shore and in estuaries and will need to be considered further with the implementation of the Water Framework Directive. Improved management measures, to allow controlled access to such stocks, and environmentally sensitive production techniques need to be developed.

If inshore managers managed stocks under permit conditions, this would provide the opportunity for targeted activities to be controlled and developed in recognition of the habitat features of the areas concerned. Central to the development of such fisheries should be the ability to limit access through restricting permit numbers. This should recognise the need for the fishery to be exploited on a commercial basis and hence permit costs should reflect the limited entry and any restricted fishing practices. In addition, it should be a prerequisite that the stocks identified are not in areas where habitat types are sensitive to the level of disturbance likely to be exerted by the mobile gear and indicated by SEA. In seeking to rationally exploit shellfish stocks in such areas, inshore managers should establish clear management objectives before commercial fishing activities are undertaken. The impact of limited commercial fishing activity on the habitat should be the focus of dedicated environmental monitoring with controls put in place to ensure that any potential effects are short term and recovery is evident. Where appropriate, such controlled fisheries should be used to undertake gear development to minimise the environmental impact and revise SEA considerations.

Such tightly controlled commercial operations should provide the opportunity to establish both best practice for fisheries management and the development of sustainable production techniques. This should facilitate the expansion of such fisheries within sites identified as low impact habitat types and allow the NSRG to revise the SEA for relevant techniques and areas. Such an approach allows commercial activities to take place in a controlled manner with the potential for any findings to be applied to other fishery areas.

## 10. Appendix (continued)

*Note 30.*
*Access to Shellfish Seed Stocks*

The utilisation of shellfish seed resources should be significantly improved through identifying the extent of appropriate stocks within inshore waters and developing sustainable management measures. The location of suitable stocks, in relation to seasonal availability and interactions with other fisheries and environmental considerations, should be established within inshore waters. Exploratory fisheries should be the subject of clear management objectives with limited access through inshore managers' permit conditions, with environmental monitoring and controls in place at the outset. Best practice needs to be established for management of such fisheries and the optimal use of seed resources determined for appropriate stocks. Such guidance should be developed by the NSRG.

Currently, the mussel seed resource is the prime subject of commercial exploitation using mobile gear with stock then relayed for cultivation. Seed is relatively widespread in terms of habitat types and distribution but stocks are often ephemeral in near shore waters and can be subject to significant predation pressure in both intertidal and subtidal locations.

The utilisation of shellfish seed resources within inshore waters by inshore managers under fishery permit schemes, should allow the stocks to be managed sustainably. Although the mussel seed resource is widespread, it is subject to a range of environmental pressures that influence its potential availability for fishery exploitation. These pressures include the seasonal nature of settlement, tidal and storm disturbance and the stability of natural beds, the interaction of established beds used as nursery feeding areas for finfish, and environmental considerations of avian predation on stocks and the impact of marine predators. Such factors make the assessment of the availability of stocks extremely difficult, both in terms of temporal and spatial considerations. However, stocks suitable for exploitation should be able to be identified by inshore managers based on environmental guidance provided by the NSRG. To sustainably exploit ephemeral stocks, management systems need to be developed and be in place, ready for rapid implementation.

For all stocks, the fisheries should be conducted under close management with restricted access through permit conditions. The mSFCs should establish clear management objectives for any exploratory fisheries, with provision for environmental monitoring and appropriate controls. Only through the development of such techniques can best practice for fishery management be established to allow optimal utilisation of resources, whilst minimising any environmental impacts.

*Note 31.*
*Market Development and Management*

The mobile gear sector is dependent on a range of shellfish products to ensure economic viability. The quality and sustainability of landings of key species need to be improved if the sector is to remain competitive.

The mobile gear sector is dependent on a range of species that are extremely important economically both on a national and regional basis. However, for some of these stocks, there are market and management issues that need to be addressed if the full economic potential is to be achieved on a long term sustainable basis.

The native oyster supports dredge fisheries that are important regionally and that have traditional markets due to their long established nature. Competition has come from cultivated native and Pacific oysters produced within the UK and on the continent. The availability of other oyster products and a decline, for a variety of reasons, in the quality and quantity of native oysters from the wild fisheries has seen the traditional markets reduced. To redress this balance, there is a need to consider management measures to assist the stabilisation of the stocks' market value and reduce fishing pressure. Both seasonal quality and the consistency of landings can adversely affect the markets. Fishery permit schemes should be used to regulate production. In addition, relaying in appropriate areas can assist the fattening of stock, and there is scope to do this through identifying such areas managed under permit conditions.

The cockle has also been a traditional fishery product within the UK with high levels of landings achieved. However, landings are strongly dependent on good annual recruitment that can be cyclical, based on a range of environmental parameters. Consequently in some years the stock available for fisheries production can be limited and the value of the fishery constrained. There is the potential for the cockle to be sold as a live product rather than processed immediately upon landing. The increased value that is attainable with a live product requires market development opportunities to be investigated.

Fisheries for a range of clam species are prosecuted in a similar manner to those for the cockle but generally at very restricted levels due to both market and production constraints. For the market potential to be realised, environmental constraints associated with production techniques need to be resolved. Once a level of sustainable production capacity can be identified, this resource should be promoted within existing markets for the species.

Similarly, significant quantities of squid are landed by the mobile gear sector largely as a seasonal bycatch. The landings are often piecemeal and sold on the open market in the fresh state. While valuable, they fail to achieve their full potential. Markets for processed product can be found on the continent and within the UK which means that potential exists for further development of these landings. The queen scallop is another species where market opportunities suffer through the seasonality of supply. While the regional landings can be significant, the volumes produced can suffer from poor handling and distribution. However, the queen scallop is highly suitable for primary processing and markets are well established in the UK and abroad.

The brown shrimp and to a lesser extent the pink shrimp have limited local fisheries with processed shrimp products gaining regional distinction. The brown shrimp also has an established export market to the continent. The local and small-scale nature of the shrimp fisheries with traditional market outlets means that the resource is often under-valued. If regional and export market opportunities are to be fully realised, the extent of the stocks within the mSFC districts need to be established.

The mobile gear sector requires both management and market-based initiatives to optimise the economic value of the natural resources available. The development of market opportunities will require a range of bodies to undertake these initiatives. However, all must be based on the need to ensure sustainable exploitation of the stocks.

## Non-targeted production sector

### KEY RECOMMENDATIONS (for government/agencies)

Note 32.
Control of Unlicensed/Non-Permitted Activities

Provision should be made to ensure that commercial harvesting activities that ignore the management controls of inshore managers can be subject to appropriate enforcement action. Measures should be available to prosecute unlicensed fishing vessel owners and operators without permits, including hand gathering and divers. If enforcement measures were available under legislation equivalent to 'Buyers and Sellers' (see Note 18), this would help to maintain public health controls and traceability of stock back to harvesting location. Fisheries management provisions should include appropriate powers to monitor and enforce compliance both within inshore waters and onshore, and the ability for shellfish to be confiscated and returned to the sea.

The implementation of dedicated management systems, to achieve sustainable exploitation of shellfish resources and to minimise the environmental impact of industry activities, will be compromised if unauthorised commercial operations occur.

The activities of unlicensed fishing vessels and commercial operators without the necessary permits to prosecute shellfish stocks should be able to be controlled. Such intervention is required to ensure all commercial landings are taken account of for effective stock management and conservation, and to ensure that only environmentally sustainable techniques are employed. The enforcement of commercial operating conditions should also protect the position of the legitimate industry in terms of harvesting operations, market stability, and public health control.

There is a need to distinguish between commercial activities and those undertaken for personal use, and the inshore managers should have the powers to set and enforce limits for personal use for all species. Enforcement of unlicensed commercial activities should be available through legislation equivalent to that in 'Buyers and Sellers' legislation and extended to all commercial activities, including hand gathering and diving. Any legitimate buyer would be required to ensure that the shellfish came from a fishery permit holder and hence traceability, for public health purposes, should be assured. Definitions of what constitutes a sale will need to be unambiguous and inshore managers will need to have appropriate powers to prosecute unlicensed/non-permitted commercial activity, including the potential to confiscate and relay stock.

Note 33.
Reporting of Shellfish Bycatch from all Fisheries

Provision should be made for the reporting of shellfish bycatch from targeted and non-targeted fishing activities to ensure accurate stock assessments can be made. Within inshore waters, all UK registered fishing vessels should have a reporting requirement either through logbook or permit scheme conditions. Equally, agreement should be sought at EU level to ensure reporting conditions are equivalent for foreign vessels, with access rights, on the basis of stock conservation and environmental management.

Accurate landings data are essential as part of the stock assessment process. Therefore, all shellfish catch levels should be recorded. Non-targeted species within the catch of some shellfish vessels has the potential to be unreported and hence not taken account of within stock assessment or conservation measures. One example of such a bycatch would be crab caught in mobile gear fisheries for scallops. Equally, beam trawl activities that are targeting flatfish can take a bycatch of crustacea which is recognised through a landing allowance, currently set at 75kg of crab claws. Bycatch animals can be unmarketable, due to the damage caused in non-targeted gear, so large quantities of whole animals may be discarded at sea or body parts removed. The impact of such activities largely goes unrecorded either on a temporal or spatial basis and these occurrences cannot be factored into stock management decisions.

To address this, all UK registered fishing vessels operating within inshore waters need to record shellfish bycatch levels. For shellfish vessels operating under a fishery permit scheme, this should be a standard reporting condition. For finfish operations and vessels of all sizes, this would be a logbook requirement. To enable such information to be utilised within the stock management process, the location of shellfish bycatch should also be reported. It is equally important that the seasonal nature of bycatch levels within certain locations and fisheries can be taken account of within the management process if sustainable and optimal resource use is to be achieved. Where foreign vessels have access rights within inshore waters, agreement needs to be sought at the EU level to allow similar reporting procedures. These should be justified on the basis of stock conservation and sustainable management of the fisheries, and as such should be supported by the Commission.

## Non-targeted production sector

*RECOMMENDATIONS (for industry, inshore managers, key stakeholders)*

*Note 34.*
*Management of Fishery Bycatch Issues*

A key management objective to optimise sustainable use of resources should be to integrate finfish and shellfish stock management measures together with gear type interactions within shellfisheries. The interactions of shellfish and finfish activities, with respect to bycatch of shellfish within inshore waters, needs to be established to inform the management process. Initiatives aimed at optimal use of resources should establish acceptable bycatch levels for all fisheries and develop best practice to minimise bycatch. Appropriate management measures should be introduced through shellfish permit conditions or byelaw restrictions for finfish activities. The identification of bycatch issues should assist the stock assessment and conservation process, enable area/seasonal management for conservation purposes and identify under-utilised fishing opportunities or stocks that could be targeted sustainably.

The interaction between finfish and shellfish operations can lead to a bycatch of shellfish occurring. To address such issues within the fisheries management process, inshore managers should establish operational areas for the respective fishing activities. This should be undertaken on a seasonal basis to indicate any potential stock movements and link the habitat types to the fishing activities. Where overlap between fishing activities occurs, either on a temporal or spatial basis, measures should be introduced to minimise the occurrence of bycatch situations and optimise the use of the shellfish resource. To achieve the latter, the management process should establish acceptable levels of shellfish bycatch for each fishery (and possibly more stringent than those agreed at EU level). Recognition of this should be included within fishery permit conditions for shellfisheries; management measures for finfish operations would need to be introduced through byelaw. Inshore managers, together with the NSRG should seek to establish best practise to reduce shellfish bycatch, i.e. through gear modifications. Emphasis should be on management measures for spatial and temporal separation of shellfish stocks and fishing activity, and modification of fishing techniques where appropriate.

The role of the catching sector in the process of optimal use of resources should be highlighted, as their input will be fundamental for both stock assessment and conservation measures. The reporting of bycatch levels, regardless of landings and based on areas fished, should allow stock conservation management to be implemented at the earliest opportunity, and should indicate potential under-utilised fishing opportunities or stocks. The Shellfish Producers' Boards should be instrumental in identifying cross-sectoral issues and seeking management measures to reduce discard activities.

*Note 35.*
*Monitoring of Unlicensed Activities*

The interests of legitimate industry operators need to be safeguarded in the face of competition from unlicensed activities. The reporting, enforcement and prosecution of illegal activities should assist environmental and stock conservation management objectives and is required for the overall management system to be credible and effective.

The geographic scale of operational areas for inshore managers should be based on natural shellfish resources and associated local fishery activities, rather than on artificial administrative boundaries. A potential benefit of local fisheries management is to engender a feeling of ownership and involvement in the management process by those prosecuting the fisheries. Monitoring and enforcement by inshore managers (especially those with access to finite resources) will only be effectively achieved through the consent of legitimate industry operators. A close working relationship needs to be established between the fishery managers and the industry. This should in part be encouraged through the formation of district Shellfish Producers' Boards.

Those businesses legitimately operating under fishery permit conditions (and any potential associated fees) have a vested interest in ensuring that unlicensed activities are controlled. The reporting of illegal activities should support the stock conservation and management objectives under which permits should be issued. Also, it should assist in securing the district's environmental management objectives. It is essential that if the overall management objectives of the inshore managers are to be achieved, then unlicensed activities should be identified based on liaison with industry, with provision for enforcement and prosecution where appropriate.

## Cultivation sector

### KEY RECOMMENDATIONS (for government/agencies)

Note 36.
Management Framework

Provision should be made for shellfish cultivation activities to be under the control of inshore managers through permit schemes. This should allow greater integration with shellfisheries within districts and improve on the planning of the use of resources. The use of permit conditions should enhance the monitoring and reporting of production with consideration given to the location of activities and the requirements for environmental and EMS controls.

The cultivation of shellfish has taken place in English waters for over a century. Controlling the locations for semi-intensive production has been left primarily with the seabed owners, while more extensive operations have been under Several Fishery Orders (SFOs). The development of extensive cultivation techniques for relaying of stock has also been under 'hybrid' fishery orders (Several Fishery Order granted within a Regulated Fishery Order (RFO) area by the holder of the RFO). The monitoring and control of the movement of stock to prevent the spread of disease has been implemented at EU level for registered shellfish farm sites. These include all semi-intensive production facilities within the UK. However, there is no definitive requirement for 'hybrid' order or RFO areas to be individually registered.

To improve the monitoring and control of shellfish cultivation activities, inshore managers should have management responsibility for all activities within their districts. This should allow integration of cultivation activities particularly at the extensive level, with the management of shellfisheries and shellfish seed resources. The requirement for cultivation activities to be approved within EMSs in relation to the conservation objectives, and the ability for wider environmental considerations to be taken into account when locating cultivation activities, should also form part of the inshore managers' responsibilities. Such a system should enhance the monitoring and reporting of shellfish production allowing clear distinction between fisheries and cultivation. Overall, such a system of management should improve planning of the use of natural resources within inshore waters.

## 10. Appendix (continued)

The SFC's management of district fisheries through permit schemes should serve as a model for the development of cultivation activities with businesses having an option for individual sites to be allocated under permit conditions. (Note: this would not preclude a business applying for a Several Order as the other option.) A potential benefit is that current difficulties associated with 'hybrid' orders, where the granting of such orders can pose management and enforcement difficulties for the wider fisheries, would be overcome. Another disadvantage of the current system is that it would become even more complicated in the future if crustacean species were cultivated or enhanced under 'hybrid' orders.

The physical location of intertidal cultivation sites should be the subject of central government planning guidance for local government planning authorities. The deployment of fixed structures and associated onshore facilities by the cultivation industry are operations that have the potential for visual impact within near shore areas and as such should be subject to planning guidance. There is also a fundamental need for security of tenure to be part of the permit conditions. The site needs to be available for periods that allow commercial investment and returns to be made. The control of access to natural seed resources through inshore management fishery permit conditions (see Note 26), in conjunction with extensive cultivation permit conditions should also ensure integration of such activities within and between districts. To improve the overall reporting of cultivated production for all scales of operations, these latter points should be a specific permit condition.

The requirement for provisions of disease control, especially where large quantities of shellfish are subject to relaying, identifies the need for each cultivation permit that is issued to be classified as a registered farm site. Such provisions should also allow areas for stock enhancement to be designated and provide the opportunity for such areas to be clearly identified and monitored.

The operation of cultivation sites under permit scheme conditions requires that in addition to security of tenure, provisions are made to control and prosecute illegal activities by third parties. In addition, the security of the site designation itself should be protected through legislation and this in part should be recognised within the Water Framework Directive (see Note 3). In the context of Integrated Coastal Zone Management, the removal of a cultivation site (established under permit conditions) in favour of another development activity that is in opposition to the considerations of the inshore manager, should be the subject of Public Inquiry.

### Note 37.
### Development of Cultivation Sites

To alleviate concerns relating to any real or perceived environmental impacts of shellfish cultivation activities, effective management measures are needed to enable the location and/or expansion of sites. Within environmentally sensitive areas, cultivation operations should be subject to SEA/EIA with respect to both the technique and location and any environmental interactions should be assessed. Operational protocols, based on best practice, should be established and take into account the appropriate conditions for cultivation, any mitigation measures to reduce potential impacts, and specific considerations for operations within EMSs. Inshore managers should be provided with technical and management advice from the NSRG.

The location of existing commercial cultivation activities within environmentally sensitive areas including EMSs and the need for provisions for such operations to expand, together with provision for new commercial ventures to be established in such areas, will require that any environmental impacts are minimised. Successful commercial

operations require specific site conditions. To balance this with any impact that cultivation activities could have on the environment, cultivation techniques should be subject to SEA. Such technical appraisals should be combined with an assessment of the specific location, and any environmental interactions that are identified. Operational procedures, based on best practice, need to be developed in relation to the environmental characters of each site, and mitigation measures established to reduce impact where appropriate.

For inshore managers to manage the development of commercial cultivation operations through permit scheme conditions, the NSRG will need to provide guidance on best practice and undertake SEAs of cultivation techniques. Where cultivation activities could impact on EMSs or environmentally sensitive areas, there is a specific need to implement monitoring programmes and to identify mitigation measures to reduce impact.

Note 38.
Access to Wild Seed Resources

Provision should be made for the sustainable and optimal utilisation of ephemeral seed mussel resources within inshore waters. The distribution and stability of seed resources within inshore waters should be established together with the wider environmental consequences of exploitation. Best practice for management measures should be established for both removal and relaying of seed to achieve optimum use of these resources.

For the development of extensive cultivation through better access to wild seed resources, and principally to mussel seed resources (see Note 30), appropriate control measures will need to be in place to protect both the stocks and the wider environment. The distribution of seed resources within inshore waters is knowledge held largely by the commercial sector. Some stocks are already exploited on a piecemeal basis as opportunities arise, although it is difficult to estimate the extent of production in relation to the total seed resources available. It is a fundamental requirement that the extent of such a natural resource is estimated before rational exploitation can be considered. The type of seed stock also needs to be defined. Good use has been made of ephemeral stocks that are typically lost to storm or tidal conditions and often rapidly depleted by avian and marine predators in the intertidal areas. Stocks in subtidal areas may have slow growing individuals due to overcrowding and tidal conditions but these individuals show good production potential when relayed in appropriate conditions. The consequences of exploiting such different types of stocks need to be established if optimal use of the resource is to be achieved. The relative impact on the environment of exploitation is likely to differ considerably between stocks so other factors, such as use of the seed or beds as a food resource for birds or as nursery areas for finfish populations, should be considered.

To address the issues described above, techniques employed for the commercial exploitation of seed should be the subject of SEA. For those activities within EMSs, dedicated protocols should be established in conjunction with best practice techniques, to ensure that the wider environmental considerations are recognised. For inshore managers to be able to manage the sustainable exploitation and relaying of shellfish seed stocks under fishery permit conditions, the NSRG will need to assure that best practice protocols are in place taking into account environmental considerations. The management of seed removal and relaying operations will require close monitoring as will the yields achieved from the cultivation process. To achieve best practice and optimal use of seed resources, the NSRG will need to be involved in this overall process.

## 10. Appendix (continued)

Note 39.
Shellfish Cultivation Sites Outside Transitional Waters

Provision should be made for the recognition of shellfish cultivation activities within inshore waters outside of 1nm. Movement of production to such areas requires designation of sites and the replacement of safeguards that have been achieved through the Shellfish Waters Directive, together with the recognition that classification of harvesting areas (under the Food Hygiene (England) Regulations 2006) may no longer apply.

Cultivation activities outside transitional waters (>1nm) were identified and made provision for within the WFD (see Note 3) and requires that a form of recognition of such sites be developed. The expansion of extensive shellfish cultivation and the potential for the development of technology for deeper water production, together with constraints on operations within the 1nm zone indicate the likely requirements for such sites in the future.

Designation as registered shellfish farm sites should occur for the purposes of disease monitoring and for reporting production. Equally, the management of such cultivation activities by the inshore managers should be undertaken through permit scheme conditions. However, with the implementation of the Water Framework Directive the ability to designate shellfish waters under the Shellfish Waters Directive (79/923 EC) will cease with the repeal of the Directive in 2013. Also, the requirement for the classification of harvesting areas under the Food Hygiene (England) Regulations 2006 (previously enacted under Directive 91/492 EC until January 2006) will only apply where the sites concerned are significantly impacted by anthropogenic inputs. Production from deeper water sites may be considered more appropriately under the requirements of the Fishery Products Directive (91/493 EC). Consequently, the recognition of sites and the classification of products for placing on the market will need to be undertaken, together with effective monitoring and control systems being in place to ensure long-term water quality standards are maintained.

## Cultivation sector

*RECOMMENDATIONS (for industry, inshore managers, key stakeholders)*

*Note 40.*
*Improved Management Control and Resource Use*

The management of all shellfish cultivation activities through permit schemes, operated by the inshore managers, should ensure optimal use of resources and enable development of the sector. The availability of cultivation sites should be subject to planning guidance for intertidal areas with all cultivation techniques and locations considered on the basis of SEA. In the context of EMSs, Appropriate Assessments should be undertaken where necessary. Overall management objectives should be established by the inshore managers with monitoring and control measures implemented through permit conditions.

Inshore managers should undertake management of all cultivation activities within their districts through permit scheme conditions. Such provision should allow optimal use of resources, with cultivation activities able to be developed and integrated into the overall fisheries management regime. The availability and extent of cultivation production sites should be determined by the mSFCs and fisheries agencies with the National Shellfish Resource Group (NSRG) providing guidance on environmental considerations and the need to ensure optimal and sustainable use of resources. The location of sites in intertidal areas should be the subject of planning policy

guidance (see Note 36). Inshore managers should establish clear management objectives and controls for the sector. Cultivation activities should be based on best practice techniques and subject to SEA with guidance from the NSRG. Sustainable exploitation of seed resources should be determined by inshore managers on the basis of either local utilisation or their movement to other districts or areas.

Cultivation activities within EMSs should also be subject to Appropriate Assessment where necessary. Within EMSs or environmentally sensitive areas, provisions should also be made for monitoring of any impacts. Development of activities should be undertaken to minimise environmental disturbance (see Note 37). Where operators disregard permit conditions, provisions must be made for penalties to be implemented by inshore managers possibly through conditions of permit withdrawal. Fundamental to the operation and effectiveness of such a permit system is the requirement for reporting conditions to be established for harvesting operations and for the movement of stock.

*Note 41.*
*Market and Product Development*

The cultivation industry should seek to develop production opportunities based on specific marketable products in the face of competition from both fisheries and imports. The ability to manipulate the production process coupled with improved management measures should ensure that the sector can exploit the available market opportunities.

The cultivation sector is in a position where its products are both distinct and also directly competitive with wild fisheries production. One product in the former category is the Pacific oyster because natural recruitment does not currently occur on a scale capable of sustaining fishery production. In contrast, the native oyster can come from traditional fisheries or from cultivation and in some respects the products are directly competitive. The major advantage held by cultivated production is that to varying degrees the product quality and specification can be controlled and selected. Disadvantages are the investment required in equipment and stock, and the time and maintenance required to achieve a marketable sized product. The cultivation sector needs to develop a range of shellfish products to expand market opportunities.

The mainstay of the cultivation industry in volume terms is the mussel. Production is through both intensive suspended rope operations and extensive activities using the relaying of wild seed on the seabed. The products can be similar in terms of physical characteristics of size, meat yield and lack of shell fouling given suitable environmental conditions. Relatively small scale, but regionally and locally important markets exist for such production. However, the overall national mussel market for fresh cultivated production is faced with competition from both processed products, typically in the form of ready to cook shell-on vacuum packed dishes, and imported products either as fresh, frozen or processed. Development of local and regional markets for fresh mussels should focus on the quality of the products and local production credentials. These may be assisted through regional food group assurance schemes (see Note 42). To target the wider national and export markets or develop processed products, the sector requires volume production of consistent quality in order to achieve economies of scale and regular supply. These should be key development targets for the mussel cultivation industry. A range of initiatives will be required to achieve these targets, from primary production and environmental management, through to assistance with measures for downstream product development.

## 10. Appendix (continued)

Pacific oysters are produced through intensive methods on intertidal rack and tray systems. Production faces competition from a range of sources and increasingly from imported products. The impact of global warming is already being seen with imports of Pacific oysters from the continent beginning to be sourced from wild fisheries. Quality issues predominate with oysters from the fishery production often having poor meat yields and appearance. However, unit price is lower than cultivated production and markets are consequently being undercut. The English cultivated oyster sector also faces issues related to seasonal demand and hence price variability. To remain competitive with volume imports, quality issues and niche market opportunities will be fundamental to further development. The traditional cultivation of Pacific oysters in the UK seems likely to also be challenged by other domestic sources of supply. Natural recruitment of the oysters in southern England is evident and the impact of global warming seems likely to result in 'wild' stocks becoming established. As with current imports from the continent, the quality of such production is likely to be variable but quantity could become significant. Given this scenario, there should be scope to develop processed products as the unit cost of production of the raw material will be lower than for cultivated outputs. One potential negative factor associated with wild recruitment (which will equally affect cultivated stocks) is that the animals will assume spawning patterns that will make them less suitable for sale at certain times of the year. The Pacific oyster was initially introduced into UK cultivation to overcome such problems that are associated with the native oyster. Technically it is feasible to produce reproductively sterile seed under hatchery conditions, so production from cultivation may still achieve a competitive advantage over 'wild' Pacific oyster stocks.

For native oysters produced through either semi-intensive cultivation systems or extensively with part grown stock being relayed on the seabed, the main competition comes from domestic fishery production. The seasonality of supply, due to spawning conditions and price fluctuations associated with fishery outputs, present major challenges. Cultivated production should seek to retain the high quality niche market opportunities through product quality and consistency of supply and using seasonal availability as a marketing tool.

*Note 42.*
*Market Assurance*

The development of market opportunities for cultivated shellfish products should be enhanced through market assurance schemes at local, regional and national levels. The ability for the sector to achieve this should be supported through the sustainable management objectives of inshore managers.

The general significance of market assurance schemes for the shellfish production industry has been described earlier (Note 13). The shellfish cultivation sector is well placed to use such mechanisms to develop markets, based on cultivation techniques with limited environmental impacts and often 'local' production credentials.

Where cultivated outputs are at a relatively small scale, markets are typically at the local or regional level with the costs for distribution minimised. Such activities should capitalise on regional food group initiatives through the development of 'farm assured' schemes. Placing products on local markets, while requiring all public health end product standards to be met, still allows for variable production characteristics (in terms of individual size, meat weight yield and appearance) to be accommodated. Such distinguishing features are often part of the 'local product' appeal.

In contrast, where scale of operations exceed the capacity for local sales, there is a requirement to move into far more competitive regional or national markets. The increased costs associated with this require economies of scale, For individual producers this should effectively be achieved through the establishment of joint business ventures in the form of commercial producer and marketing groups. However, production and marketing at the regional and national level requires that production and quality standards be implemented to ensure consistency of supply.

The requirement for accreditation of production at all levels of cultivated output has been considered by the industry. Some sectors see advantages in seeking certification under organic production standards but this has not been universally supported. The view is that it does not adequately recognise the sectors "green" environmental credentials. Equally, with the wide range of production techniques (from extensive relaying operations using wild stock through to more intensive operations utilising hatchery produced seed), there are broader considerations for what constitutes accredited cultivated output. Nonetheless, the demand at the national level for accredited seafood products indicates that if the cultivation sector is to maintain and develop market share, it will need to embrace the requirement for accreditation. As a first step, there should be potential for the accreditation of the sustainable production of the native oyster as it is a Biodiversity Action Plan (BAP) species with management and production controls already established at the national level.

## Priority species – strategic intervention

### KEY RECOMMENDATIONS (for government/agencies)

Note 43.
Native Oyster

When evaluating any marine development proposals within inshore waters, provision should be made for the native oyster to be considered as a priority species based on its conservation status and commercial importance.

The exploitation of the native oyster has a long history within the UK with techniques for its cultivation developing as the wild stocks declined. The importance of the species, both in terms of fisheries and cultivation outputs and as an indicator of the health of the marine and estuarine ecosystems, has warranted its designation as a UK Biodiversity Action Plan (BAP) species. Such a designation allows priority conservation measures to be formulated and introduced with a clear conservation management strategy developed, and enhancement programmes initiated. The ultimate goal is to ensure the survival and stability of wild stocks in extensive locations throughout the UK.

The native oyster can be regarded as an indicator of sustainable marine and brackish water ecosystems and there is scope for the Water Framework Directive (WFD) to play a key role in the overall maintenance of populations. The WFD calls for the maintenance of good 'ecological status' for transitional waters out to 1nm, or to establish 'pristine conditions' in such waters highly modified by man. The criteria or the reference points for such designations have yet to be fully established. Given the historical widespread distribution of the species and the desire to stabilise and re-establish populations within such waters, the native oyster should act as a potential indicator species to assess the Directive's impact.

The management of native oyster stocks must include preventing the spread of a specific disease organism, *Bonamia ostreae*. The oyster is the only native species with a recognised disease-control risk for which measures have been implemented at the EU level. The control and prevention of the spread of the disease is of paramount importance as it has the potential to damage conservation and commercial goals for the species.

The long established nature of oyster fisheries and cultivation activities has led to recognised commercial working practices that are necessary to maintain and facilitate recruitment to natural oyster beds. Measures such as the disturbance of grounds to remove predators and detritus and prevent the build up of anoxic sediments, together with the laying of suitable cultch materials (such as shells) to encourage settlement of seed have to be routinely undertaken. Such requirements for physical disturbance and management intervention to optimise conditions for the native oyster should be recognised within any conservation schemes if they are to be effective.

Note 44.
Mussel

Provision should be made to recognise the important commercial status of the mussel (for both fisheries and cultivated production) together with the potential for enhancement of this resource. Production facilities (for seed or marketable stock) should be considered within the planning process for the location of marine energy farms.

The mussel is of strategic importance to the shellfish production industry, both the fisheries and cultivation sectors. It is also unique in that it is the only commercial species found throughout inshore waters from estuaries to the edge of the continental shelf and capable of occupying multiple habitat types.

Within the near shore environment, mussel stocks are subject to multiple pressures including those from commercial interests and nature conservation interests. There is a requirement for both fisheries and cultivation operations to have access to stocks and in the context of cultivation the supply of suitable seed stocks is currently finite even if issues of access can be addressed.

The production of mussels has considerable potential for development in deeper inshore waters both for seed stock and marketable products. Mussels are able to colonise a wide range of substrates or structures suspended in the water column and this provides considerable scope for cultivation on structures in deeper water. Due to the greater wave exposure experienced outside the shelter of land, such structures will need to be sub-surface. Any such operation in inshore areas would require both physical and legislative safeguards and protection but the potential for such cultivation activities exists. Although the unit cost of production are likely to be greater than extensive techniques in near shore areas, various benefits are evident. The ability to collect large quantities of mussel seed in relatively confined areas with minimal environmental impact is one leading solution to overcome the current situation of a finite supply. Equally, cultivation in such areas avoids conflicts with nature conservation interests, and in particular avian predation and disturbance. Such production would assist the overall development of the cultivation sector but should not replace existing intertidal operations.

Various options exist to establish production in deeper water areas with the shellfish cultivation industry capable of using purpose-built equipment. However, the maintenance of such operations would require legal protection and pose threats to navigation. Greater potential could exist for operations to be integrated with the proposed development of marine energy production. The construction of wind and wave farms in coastal waters provides purpose-built structures and areas protected from vessel incursions. Various trade-offs could be established. Seed mussels settling on the structures could be removed for cultivation thus preventing the build up of biofouling and the need for antifouling coatings. Equally, the loss of access to the natural resources in the vicinity of energy farms for the fishing industry could be compensated for by collection and cultivation equipment being located in such areas.

Note 45.
Native Lobster

Provision should be made for the commercial importance of the native lobster to the fishing industry to be recognised and supported through the development of stock enhancement. Within future plans for coastal defence or engineering works, the cost effective instatement of habitat type suitable for lobster stocks should be considered.

The native lobster is the most valuable shellfish species in terms of unit value and availability. Fishery stocks are typically fully exploited within inshore waters and measures are in place to control recruitment over-fishing. The importance and economic value of the species has seen investment in hatchery operations for juvenile production to replenish or enhance natural stocks. The habitat selection criteria for such juveniles, appears highly specific, i.e. rocky substrates that have specific refuges. The availability of suitable habitat seems to be the ultimate limiting factor for the enhancement of stocks, with migration of seeded juveniles from areas if suitable refuges are not available. The loss of specific habitat types in inshore waters is likely to have impacted on the ultimate capacity for stock levels, and in some instances enhancement has been attempted through deploying small scale artificial reefs.

The opportunity exists for enhancing lobster stocks through providing suitable habitats within inshore waters. This would not be a cost effective option if conducted in isolation. However, the construction of service structures for coastal defence schemes and energy farms provides the opportunity for joint initiatives that would have benefits for environmental compensation and fisheries management. Cost effective engineering solutions for such constructions do exist and with the increased need for these structures in coastal waters, the relative impact on local lobster stocks could be significant. Such measures should provide opportunities for both natural recruitment and potential enhancement through restocking with hatchery-produced juveniles.

The management of shellfish resources by inshore managers through fishery permit schemes should provide for the sustainable exploitation of such stocks. The potential for migration of stocks to occur (either of seeded juveniles out of areas or wild stock into new habitat areas) makes such management more appropriate than property rights assigned through a Several Fishery Order.

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