MONITORING SPATFALL OF PACIFIC OYSTERS IN THE FLEET SSSI

D R SEAWARD

FEBRUARY 1992

JNCC/99WF2 048
MONITORING SPATFALL OF PACIFIC OYSTERS IN THE FLEET SSSI

CONTENTS

1. History of the Fleet oyster farm  
2. Operations  
3. Spawning, settlement and metamorphosis  
4. Monitoring for settlement: initial results  
5. Discussion  
6. Recommendations  

Acknowledgements and References  
List of appendices  
Appendix 1: FSG minutes  
Appendix 2: maps  
Appendix 3: photographs  
Appendix 4: temperatures  
Appendix 5: spat identification  
Appendix 6: brochure  
Appendix 7: JNCC: specification
MONITORING SPATFALL OF PACIFIC OYSTERS IN THE FLEET SSSI

D R SEAWARD

1. HISTORY OF THE FLEET OYSTER FARM

The history of the establishment of the Fleet oyster farm, now known as 'Abbotsbury Oysters', is given in the reports to the Fleet Study Group, abstracted here as Appendix 1.

In brief, a site was chosen by the operator, Mr N Copperthwaite, in partnership with the Strangways Estate, for trials with the Pacific oyster in 1988. Approvals were obtained, and spat laid in March 1989. These grew satisfactorily, so in March 1990 full production commenced with the seeding of one million spat and the construction of a handling and purification plant at Ferrybridge. Sale of oysters started in 1991.

The farm is discussed in relation to the Fleet in the Management Plan (Elton, 1990) and in a wider context in the IOE Review (1991).

2. OPERATIONS

2.1. Definition of areas. The oyster farm consists of the 'growing area' on the Fleet shore of Chesil Beach, 'the banks' intertidal mudflats in Littlesea, and the 'processing shed', office and compound at Ferrybridge, with adjacent 'holding area' on the intertidal shore of East Fleet. These sites are shown on the maps in Appendix 2 and illustrated on the photographs of Appendix 3.

2.2. Growing area. The licenced growing area is 50m wide and extends 1.4km NW from the Portland parish boundary stone, along the Fleet shore of Chesil Beach. Access is by boat or barge. A small hut has been erected on the beach for use as base, shelter and equipment store.
2.3. **Seed oysters.** Spat of the Pacific oyster *Crassostrea gigas* are obtained from Seasalter Shellfish hatchery at Whitstable, for laying in the growing area in late March to April, in time for the spring plankton bloom. Spat are 7mm size, and are put into 5mm mesh oyster bags 1m x ½m, reinforced with a wood frame.

2.4. **Oysters to growing area.** Filled bags are taken to the growing area by boat where they are fixed to steel bar trestles, four to a trestle. Trestles (2m x 1m x 0.65m high) are placed just below low tide level in rows along shore; there are 2 or 3 rows downshore depending on slope and firmness of substrate, the aim being to avoid exposure of the bags to air.

2.5. **Growing area operations.** At intervals, bags are turned, fouling organisms are removed, and oysters are transferred to more and larger-mesh bags as they grow. Total time in the growing area will be about 15 to 18 months, depending upon growth, in turn dependent upon temperature and nutrients. As they approach marketable size, oysters are taken back to Ferrybridge for sorting.

2.6. **Processing shed.** In the processing shed at Ferrybridge are three purification tanks through which can be circulated Fleet water which has been sterilised by ultra-violet radiation, the waste water being discharged back to the Fleet. There are also machines for washing and grading the oysters.

2.7. **Transfer to banks.** At this stage, the oysters are only washed and graded. Those too small to sell are rebagged and returned to the growing area. Marketable oysters are rebagged and transferred to trestles on the banks. Here they are subject to intertidal conditions with some turbulence, which is said to 'toughen the shell and train them to close ready for transporting'.

2.8. **Processing for sale.** When oysters are required for sale, bags are returned from the banks to Ferrybridge, either to trestles on the intertidal holding area adjacent, or into the processing shed for cleaning and purification. The latter involves external cleaning by washing, then immersion for 48 hours in tanks through which Fleet water, sterilised by ultra-violet radiation, is circulated to purge them. Oysters are then graded into four sizes (80 to 110 gms) and despatched to customers.
3. SPawning, SETTLEMENT AND METAMORPHOSIS

3.1. Environmental data. Spawning and successful development to metamorphosis is largely controlled by temperature. Water temperature readings taken by the operator at the growing area are given in Appendix 4. These cover the period 9 May 1990 to 16 February 1991 with some gaps, as spot values. In the following sections, these values have been averaged to arrive at available accumulated 'day-degrees', with no allowance for lower night temperatures, for which there is no information (but see 5.1 below).

3.2. Spawning. Work by Mann indicates that gigas requires about 590 day-degrees above 10.55°C (below which gonad development is not known to occur) to achieve gametogenesis. The data also suggest that there is a minimum absolute temperature to induce spawning and that this temperature is higher than that required to stimulate gametogenesis. Such a hypothesis correlates well with observations by the author that populations of C.gigas introduced into locations in British waters, where temperature rarely exceeds 18°C, often attain maturity but rarely spawn. (Mann, 1979, 103).

Temperature in the Fleet in 1990 (Appendix 4) suggests that sufficient day-degrees accumulated to achieve gametogenesis by mid-August when the water would have been warm enough to induce spawning. Mr Copperthwaite states that oysters in the growing area do become 'ripe', and he considers that spawning does occur, but that larvae do not survive.

3.3. Larval stage. Larvae require about 350 day-degrees growth before settlement, during which they are planktonic filter feeders. During 1990, the figures available indicate that this stage could have been reached by about mid-October, after which it would have been too cold. This extended larval period (perhaps twice the normal length) would increase the risk of predation and reduce the chance of survival to successful settlement.

3.4. Settlement and metamorphosis. Bonar et al (1990, 496) suggest that NH₃ may be an important factor initiating the settlement phase:
'The action of NH₃ on larvae [in the laboratory] may actually reflect the natural situation in the environment...Preliminary laboratory measurements of NH₃ production by larval, juvenile and adult C.gigas suggest that oysters can potentially produce sufficient NH₃ to initiate settlement behavior... We can therefore construct a scenario in which an oyster larva, having acquired behavioral competence, becomes negatively phototactic and/or
positively geotactic and begins a period of characteristic sink-swim behavior... If a larva enters an area of elevated NH$_3$, as for example in a dense community assemblage such as an oyster bar, it begins the stereotyped searching behavior. If the environment is acceptable, the additional cues the larva receives (tactile, physical, chemical, etc.) promote ultimate metamorphosis. If the environment is not acceptable (perhaps decaying animals or vegetation on a muddy bottom), the larva would not receive sufficient additional cues, become habituated to the elevated NH$_3$ after a few minutes, and resume swimming. In this way NH$_3$ would serve as a very general environmental cue which would trigger larval search behavior in potentially inviting habitats.

The preferred substrate is aged adult oyster shell. Following metamorphosis, spat are more resilient and have a relatively good chance of survival to adult.

4. MONITORING FOR SETTLEMENT: INITIAL RESULTS

By February, spat resulting from successful settlement in the Fleet the previous autumn should be about 3mm size.

The following searches were made in February 1992:
(a) 50 oysters in bags at the growing area, 50 in bags at the holding area, and 100 washed, loose oysters in the purification tanks were examined in situ. There was little epifaunal attachment, mainly barnacles and spirorbid worms. Shells in the field were covered with a green algal film. No settled spat were found, except that one gigas shell of 66mm bore an edulis juvenile of 18mm, which is not unusual according to the operator (there is a small 'wild' edulis population in the Fleet, and in December 1990, a 50mm edulis was found attached to a pebble at mid-tide level on Chesil beach in East Fleet).
(b) In the mid- and upper Fleet, shallow water may allow temperatures to become and remain high during autumn, so encouraging more rapid development of larvae to the settling stage. However, suitable substrates are rare except along some stretches of Chesil shore, and in the Herbury embayment where a 17th century reclamation attempt remains in the form of remnants of a stone wall cutting off the inlet, providing abundant flat stone surfaces, some always submerged, together with drifts of old shells, mostly of Cerastoderma glaucum. In February 1992, twenty nine small samples of surface silt and shell debris were taken from here for examination, and at each sample site, nearby stone surfaces were searched in the field. These were all from below water
level on a day of very low water level in the mid-Fleet when most of the 'works wall' was exposed (see photographs). No oyster spat were found on the stones or shell. Silt is an unlikely settlement substrate, but samples were bulked and sieved through 1mm mesh and examined for infauna. Many small animals were found, including the molluscs *Abra tenuis* (2-6mm) at about 100/m² and *Retusa obtusa* (3-5mm) at about 10/m². The latter is a mollusc predator, as is the polyclad flatworm (*probably Notochro plana* sp.) which is frequent. No oyster spat were found.

(c) The oyster farm operator, Mr Copperthwaite, states that he has never seen 'wild' settled *gigas* spat in the Fleet, and he considers that larvae require constant high temperature which is not experiences in the Fleet.

5. DISCUSSION

5.1. Monitoring of temperature and salinity. Although Whittaker (1978) provides graphs of diurnal water temperature variation in the Fleet in 1969, these omit the night hours. However they suggest that in August and September, fluctuation of about 20 to 50°C is experienced, with the average occurring at midday or early afternoon, which is when the data used here were usually taken (Appendix 4). Hence, averaging readings is probably justified (3.1 to 3.3 above). For the future, more regular and frequent readings, and a better idea of diurnal variation under different conditions, will be needed to enable a realistic forecast of spawning and settlement to be made. The salinity data given by Whittaker (1978) shows that the growing area and banks are above 30% during summer and autumn, so that this parameter is unlikely to limit settlement. It would seem paradoxical for MAFF to grant a licence for shellfish farming in such a high status nature conservation site as the Fleet without requiring the operator to be responsible for environmental monitoring.

5.2. Monitoring of settlement. Successful 'wild' settled spat are most likely to be found on cultivated adult oyster shells at the growing area or on the banks; hence these should serve as the most effective spat collector stations. Spat are probably too small to detect easily on the rough frilled adult shells until they are several months old, and there is very little growth in the winter, so that it is best to concentrate monitoring effort during, say, April to September. It is necessary to be able to differentiate *edulis* from *gigas* spat; Appendix 6 shows young specimens of both.
6. RECOMMENDATIONS

6.1. The Fleet oyster farm operator should be encouraged to keep more frequent and regular temperature readings, and to obtain data on diurnal temperature variation.

6.2. The operator should send this and any other environmental data at intervals to JNCC/English Nature/MAFF for storage, processing and forecasting possible spawning and settlement at the Fleet, and for comparison with conditions in shellfish farms elsewhere.

6.3. JNCC/English Nature should commission a contract to monitor *gigas* spatfall in the Fleet, this to be done by monthly collection by the contractor from April to September 1992 inclusive, of a random sample of 100 adult oysters from the bags in the growing area, the sample to be washed and examined for spat under low power binocular microscope.

6.4. Results of the monitoring to be reported to JNCC/English Nature in October 1992, together with recommendations for future monitoring in the Fleet and at other shellfish farms, based upon the experience gained.

6.5. JNCC/English Nature should endeavour to obtain agreement that any licences granted by MAFF for shellfish farming in SSSI's, reserves, etc., are conditional upon the operator being responsible for specified environmental monitoring.

D R Seaward
February 1992

JNCC/99WF2 048
ACKNOWLEDGEMENTS

Thanks are due to the following:

Brian Spencer and Sue Utting of MAFF, Conwy, for plates of settled spat identification, and for much information and advice,

Neville Copperthwaite, the oyster farm operator, and the Strangways Estate, for ready cooperation, information and assistance.

REFERENCES


APPENDICES

Appendix 1. Relevant extracts from Fleet Study Group minutes. Apx. 1.1 to 1.3.

Appendix 2: Maps.
Apx. 2.1. Growing area (SY644776 to SY634786) and banks (approx. SY645779).
Apx. 2.2. Processing shed (SY665763) and holding area (SY665762).

Appendix 3: Photographs.
Apx. 3.1. Growing area from SE end; hut; trestles, bags.
Apx. 3.2. Growing area from NW end; retrieving trestles from deeper water for examination.
Apx. 3.3. Trestles brought up from deeper water.
Apx. 3.4. Banks area; trestles just visible or becoming exposed on falling tide.
Apx. 3.5. Holding area at low water; top right view is from compound with sea wall in foreground.
Apx. 3.6. Rebagged oysters being loaded onto barge for transport to banks.
Apx. 3.7. Compound; boat tractor and trailer; UV equipment; purification tanks.
Apx. 3.8. Purification shed; tanks; washing and grading machines.
Apx. 3.9. Herbury Bay (to right) and works wall (see 4(b)); view NE from SY610810.

Appendix 4: Temperature readings at growing area. Apx. 4.1 and 4.2.

Appendix 5. Oyster spat; gigas at 1 month and edulis at 3 months.

Appendix 6. Abbotsbury Oysters publicity brochure.

Appendix 7. JNCC specification for contract 99WF2 048.
Relevant extracts from Fleet Study Group minutes:

4 December 1987
'Mr N Copperthwaite reported that he had been approached by the Strangways Estate to carry out trials for an oyster fishery in the Fleet. This was to be situated on the Chesil side beyond the bridging camp opposite the Tidmoor Firing Range. The NCC were not happy about the scheme but Mr Copperthwaite had investigated the possible problems thoroughly. The trial would be reconsidered after one year.'

25 March 1988
'Nevil-le Copperthwaite commented briefly on the test site for his oyster fishery in the Fleet (opposite Chickereill). No problems had been encountered to date with the army. A small oil slick had not affected the oysters, neither do other molluscs seem to have been affected. In short, the animals were growing very well.'

8 July 1988
'Mr Copperthwaite reported that the oysters in his trial beds were growing rapidly and showed no disease and a very low mortality rate. The animals would be harvested next year. He had asked Mr Jim White to look at the site.'

18 November 1988
'Unfortunately Mr Copperthwaite was not at the meeting but reports from fishermen suggested that the oyster scheme was going well with good growth observed.'

14 July 1989
'Mr Copperthwaite reported on the progress of the oyster fishery. The first year had shown the viability of oysters, which were of the Pacific type, and that the scheme had now reached the end of its second year. The oysters were placed on racks laid parallel to Chesil Beach at a site west of the Narrows and about one metre offshore; the length of the racks now stretched for about 400m. The young oysters were obtained from Whitstable hatcheries in mid March when about half-an-inch long, by June they reached about 1½ inches in length. The use of the Pacific oyster, rather than the native species, was because growth was faster in the former. Full production was planned for March 1990, when up to one million oysters would be put into the water. The Pacific species would be used for three years, but the native species might be used later. Mr Seaward said that he was still unhappy that native oysters, which breed in the Fleet, were not being used. He also wondered if the vast numbers would affect the settlement of planktonic larvae since they would filter a vast amount of water. In reply, Mr Copperthwaite said that every attempt was being made to monitor the ecological effects of the project. On maturity, the shells would be taken by boat to Ferrybridge where they would be purified and sorted in a yard there.'
Neville also invited any member of the FSG wishing to see the oyster beds for himself, to let him know.

24 November 1989
'Neville Copperthwaite reported that the oyster project in the Fleet was progressing very well. They had a good summer. One important change had occurred - until recently 1000m of shoreline had been used to put the oyster bags down. Now, because the Fleet bed was found to be deeper in places, he was using only half of the original length, the bags being twelve deep in places. Sources of possible pollution and the measures taken to ensure the oysters were clean were then discussed at some length. Neville also reported that the oil spillage that had occurred earlier in the summer had not seemed to have affected the oysters since they had the ability to close their shells and avoid any contamination. The Navy's new refuelling system had resulted in oil spillage in Portland Harbour about eighteen months ago. It would be useful to record the frequency of these happenings. Jim White said he would take this up with the Admiralty. Finally, Neville reported that he was now using the native oyster as well as the Pacific species.'

9 March 1990
Neville Copperthwaite reported that 500,000 oysters had already been seeded this year and that in the next two weeks he would be seeding a similar number. The trials were going well and the purification plant at Ferrybridge was going ahead. Dr Ladle asked Neville if he had been aware of any increase in the fouling of the oyster shells because, apparently a researcher had found that there had been greater fouling changes in the last ten years than in the previous 2,000 years. Neville had not seen or had been notified of any changes.

6 July 1990
'Mr Copperthwaite reported that the scheme was progressing well. He also commented on the apparent replacement of Sargassum over the last two years by "Stringweed" or "Bootlace weed" (Chorda filum). Also sea squirts on the beach shore which were plentiful in 1989 were completely absent this year. Mr Green asked if Neville could formalise his observations so that the information could be given to Dr Ladle.'

9 November 1990
'In the absence of Mr Copperthwaite, Mr Green reported that the oyster project was progressing very well. The MAFF and Environmental Health Authority had been checking the cleanliness of the oysters and of the site. They had found them to be exceptionally clean. The product is to be marketed under the name "Abbotsbury Oysters". Neville is also monitoring the changes to the flora and fauna under the oyster racks.'
8 March 1991
'Mr Copperthwaite reported that Heriot Watt University were carrying out a study of the environmental implications of shellfish farming in Britain for the NCC. They had been to see him and he would ultimately receive a copy of their report which he would pass on to the FSG. He was told that he was the only shellfish farm in Britain that was monitoring temperatures, etc. As soon as the water was about 10°C he would be putting down spat collectors to see if the Pacific oyster was able to reproduce naturally in the wild; he wanted the NCC and the FSG to be involved. Neville also reported that, from casual observations, Sargassum infestation had fallen right away and that it was no longer a problem. Dr Ladle said that these and other monitoring exercises should be put on a proper scientific basis (with a view to the 3rd Symposium); possibly Sarah Welton or Deborah Elton could advise Neville and Dr W Farnham should be contacted. Finally Neville reminded the Group that May 26th 1991 was the First National Oyster Festival and it was to be held in Weymouth.'

5 July 1991
'The NCC report was still awaited. The spat experiments on the Pacific oyster had not yet been done. Previously spat had fallen but they had died. 22°C water temperature for several months was needed for natural propagation, and this was thought unlikely even in the Fleet. It was on this ground that the NCC had objected to the alien Pacific oyster being grown in the Fleet. Neville reported that he was in the 18th month of continuously recording the temperature.'
THE BANKS (see 2.1 & 2.7)

GROWING AREA (see 2.2)
<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Temp (°F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>9</td>
<td>68.0</td>
</tr>
<tr>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100</td>
<td>9</td>
<td>69.0</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>9</td>
<td>70.0</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>9</td>
<td>71.0</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>9</td>
<td>72.0</td>
</tr>
<tr>
<td>13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>9</td>
<td>73.0</td>
</tr>
<tr>
<td>14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>9</td>
<td>74.0</td>
</tr>
<tr>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>9</td>
<td>75.0</td>
</tr>
<tr>
<td>16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>55</td>
<td>9</td>
<td>76.0</td>
</tr>
<tr>
<td>17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>9</td>
<td>77.0</td>
</tr>
<tr>
<td>18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>65</td>
<td>9</td>
<td>78.0</td>
</tr>
<tr>
<td>19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>70</td>
<td>9</td>
<td>79.0</td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:**
- **DATE:** Record for growing season.
- **TIME:** AM or PM.
- **TEMP (°F):** Average temperature for the day.
<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>1st Phase</th>
<th>2nd Phase</th>
<th>3rd Phase</th>
<th>4th Phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/1</td>
<td>00:00</td>
<td>00:00</td>
<td>00:00</td>
<td>00:00</td>
<td>00:00</td>
</tr>
<tr>
<td>1/2</td>
<td>00:01</td>
<td>00:01</td>
<td>00:01</td>
<td>00:01</td>
<td>00:01</td>
</tr>
<tr>
<td>1/3</td>
<td>00:02</td>
<td>00:02</td>
<td>00:02</td>
<td>00:02</td>
<td>00:02</td>
</tr>
<tr>
<td>1/4</td>
<td>00:03</td>
<td>00:03</td>
<td>00:03</td>
<td>00:03</td>
<td>00:03</td>
</tr>
<tr>
<td>1/5</td>
<td>00:04</td>
<td>00:04</td>
<td>00:04</td>
<td>00:04</td>
<td>00:04</td>
</tr>
</tbody>
</table>

APPENDIX 4.2
APPENDIX 5

Crassostrea gigas spat at 1 month old
(under laboratory conditions)

Ostrea edulis spat at 3 months old
(under laboratory conditions)
SUGGESTED RECIPES

1. MOONFLEET MYSTERY
One dozen oysters opened on the deep shell, layered with finely grated cheese, a little freshly ground black pepper and topped with a thin slice of tomato.
Grill in the shell for two to five minutes.

2. OYSTERS WITH STILTON CHEESE
2 oz. Stilton Cheese  
1 tsp. finely chopped Parsley  
4 oz. Mushrooms  
1 1/2 tsp. finely chopped Chives  
1 1/2 tsp. ground Black Pepper  
1 cup dried Bread crumbs  
2 oz. melted Butter

Cream together the cheese, parsley, chives and pepper. The oysters are cooked in their shells and after opening, just loosen off the meat from the bottom cup. Arrange on a grill and spoon the cheese mixture over. Sprinkle with breadcrumbs and grill until brown.
Takes 2 mins.

3. OYSTER GEMINI
12 Oysters  
4 oz. Mushrooms  
1/2 oz. Butter  
4 oz. White Wine  
Small Garlic Clove  
2 Tbsp. Cream  
Tabasco  
Freshly Ground Black Pepper

Open the oysters and place the meat in a bowl. Cut mushrooms fairly small and crush the garlic. Melt butter in a saucepan over a very gentle heat. Add mushrooms and garlic. Saute very gently until mushrooms juices begin to run. Add the oysters and about half their juices from the bowl. Add the wine and seasonings, cooking gently until the oysters have 'rounded up'.
Have the cleaned, warmed shells ready on plates for serving, then carefully stir in the cream before dividing oysters, mushrooms and sauce between them.

STORAGE
Keep your Abbotsbury Oysters fresh by storing in a cool place and eat within 2 or 3 days.

INSTRUCTIONS
Shucking (or preparing) oysters:
You will receive your oysters packed the right way up for opening.

1. Put the oyster on the work top or sink and place your left hand on top of it. Push your oyster knife into the hinge end of the oyster with a side to side action.

2. When the knife has penetrated approx. 1 cm (1/2 inch), cup your left hand and hold the oyster in it. Then twist the knife and the hinge will break. Insert the knife to its full extent to sever the oyster from the top shell. Run the knife underneath the oyster to free it from the flat shell.

N.B. Greater leverage to break the hinge may be obtained by continuing to hold the oyster in a cloth, against the work top when twisting the knife.

Abbotsbury Oysters can be eaten raw or cooked.
To eat raw: open just before serving, serve on the deep half of the shell on a bed of crushed ice with lemon wedges, a touch of cayenne and brown bread and butter. For cooking suggestions see recipes overleaf.
History
Abbotsbury Oysters are grown in the beautiful Fleet Lagoon, which lies between the village of Abbotsbury and the island of Portland.

Farming
The method we use to grow our oysters is quite simple. We place the oysters in mesh bags that protect them from predators such as crabs or starfish. Yes, starfish eat such things! These bags are then placed in the water at a depth of about ten feet. The bags are kept at a constant temperature and are rotated every few days to ensure the oysters receive the nutrients they need. Once the oysters reach market size, they are harvested and purged to prepare them for market.

Ordering
Oysters can be purchased directly from our farm at Ferrybridge, where you can also sample them straight from the water! You can also have a delivery service from us, if necessary, and we offer choice of finishing touch to that present. Major credit cards accepted and delivery to the uk.

Advisory
Abbotsbury Oyster Farm, Ferrybridge, Weymouth, Dorset, DT6 7HA. www.abbotsburyoystersets.com

No further details available please contact the farm.
SPECIFICATION FOR A CONTRACT TO MONITOR SPATFALL OF PACIFIC OYSTERS IN THE FLEET SSSI

MONITORING SPATFALL OF PACIFIC OYSTERS IN THE FLEET SSSI

Background
Following the diminution of problems with growing oysters in areas with organotin contamination from boat antifouling, there has been a consolidation and extension of farmed Pacific oysters, Crassostrea gigas, an introduced non-native. Due to the establishment of breeding populations of other introduced non-native molluscs in British water including Mercenaria mercenaria and Petricola pholadiformis, there is concern that in due course the prevailing warm summers together with possible physiological adaptation will result in Crassostrea breeding too, with probable deleterious consequences for native species and communities. In order to stiffen the case of the Conservation Agencies for the general license to introduce Crassostrea to the wild to be rescinded, it is necessary to collect evidence of successful spatfall. Therefore, the purpose of this project is to contribute to the design and initiation of a generic programme to detect spatfall in sites around Britain.

Objective
To establish a monitoring programme in the Fleet SSSI to detect spatfall from farmed Pacific Oysters by the visual inspection of the farmed oysters and spat collector stations, and by recording water temperatures and salinity.

Programme
To establish good communication with the oyster farm operator, the estate and the local English Nature officer.

To set up visual monitoring and spat collector stations and observe these on at least a monthly basis.

To record the physical structure and operation of the farm photographically, including evidence of spatfall. Full details to be recorded of any spat found (eg location, number, size and substratum) and specimens are to be kept.

To arrange for water temperature and salinity records to be recorded as regularly as possible.

To report on the initial results in February 1992 and make recommendations for the continuation of the monitoring programme in the Fleet and also describe the basic minimum requirements for extending this work to other shellfish farm sites in Britain.

End products and dates
A brief report on the initiation of the monitoring programme together with a photographic record and any specimens obtained to be submitted to JNCC's Nominated Officer by the end of February 1992.

Nominated officer for JNCC
Dr Roger Mitchell

[RM21/11/91 OYSTER.DOC]
How to find Abbotsbury Oysters

Directions
From Abbotsbury take the B3157 road to Weymouth, (approx. 9 miles), via Portesham. After passing through Chickerell and Charlestown take a right and follow the signs to Portland, turn on to the A354 to take you through Wyke Regis. The entrance to Abbotsbury Oysters is on the right hand side, opposite the factory, just before the public house "The Ferrybridge".