



**Collation of data on distribution of species and habitats in the Irish Sea. Stage 1
Priority species and habitats**

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Collation of data on distribution of species and habitats in the Irish Sea. Stage 1 Priority species and habitats

Introduction

The report details progress to date on collating the distribution of species and habitats in the Irish Sea. The work is part of the Irish Sea Pilot. The contract was awarded to the Marine Biological Association on the 24th February 2003. The first deliverables of the contract were due on the 14th March 2003. The agreed deliverables were:

- A copy of Marine Recorder data covering data located on the priority 9 species and 3 habitats.
- List of data sources covered.
- List of searches made and appropriate comments on the data and its source.

Stage 1 of the contract asks for the collation of reports on the distribution of detailed priority species and habitats.

Species covered in Stage 1:

Common Name	Latin Name
The tall sea pen	<i>Funiculina quadrangularis</i>
Honeycomb worm	<i>Sabellaria alveolata</i>
Serpulid tube worm	<i>Serpula vermicularis</i>
European spiny lobster	<i>Palinurus elephas</i>
Ocean quahog	<i>Arctica islandica</i>
Horse mussel	<i>Modiolus modiolus</i>
Native oyster/Flat oyster	<i>Ostrea edulis</i>
Bryozoan	<i>Amathia pruvoti</i>
Colonial sea squirt	<i>Polysyncraton lacazei</i>

Habitats covered in Stage 1:

<i>Zostera noltii</i> beds in littoral muddy sands
<i>Laminaria saccharina</i> , <i>Chorda filum</i> and dense red seaweeds on shallow unstable infralittoral boulders or cobbles
<i>Sabellaria spinulosa</i> encrusted circalittoral rock

In carrying out the work for Stage 1 we have identified sources for Stage 2 species and habitats and will revisit them after the completion of Stage 1.



Methods

Information sources

In accordance with the tender specification the sources of information were as follows:

- 1) JNCC Marine library
- 2) JNCC file information
- 3) National Marine Biological Library.
- 4) Contacts with Chris Lumb.

Information researched

1. JNCC Marine library & JNCC file information

Searches were made in Peterborough on the 5th and 6th March. The MNCR literature database on AREV was accessed. Searches of the literature database were made on:

- surveys with locational positions but no associated data on the MNCR database
- search of all entries by the priority species
- search of all entries by representative species of the habitats listed.

In addition a manual check of the JNCC reports and reprints was carried out which agreed with the results of the MNCR database search.

The majority of reports in the JNCC library have already been entered into the MNCR database. As a clean up exercise the remaining references could be added for all species.

2. File searches were made of a number of JNCC files prepared by Dr Bill Sanderson on species being proposed as rare or scarce designation.

The file search revealed a number of notes on individual species that appear not to have been entered into MNCR. Individual species records were entered as a survey.

3. National Marine Biological Library.

The National Marine Biological Library (NMBL) holds 4350 serial titles, 1060 current serials, 13000 books, 75000 reprints, 1200 conference proceedings, 147 expedition report series, archives and rare material.

Searches were made on sea area and on the species list and habitats as well as representative species of the habitat.

233 initial references were revealed and researched. Additional references cited in the literature were also followed up.

Relevant references were then copied and where possible the details entered into Marine Recorder including the full reference.



4. Contact with Chris Lumb.

Chris Lumb was contacted and suggested a number of additional sources. These are detailed below and will be followed up at Stage 2.

Species	Suggested additional source
<i>Funiculina quadrangularis</i>	SNH records from ROV surveys in Loch Fyne. To be contacted. We have found earlier reference to surveys in Loch Fyne which note the absence of <i>Funiculina</i> .
<i>Sabellaria alveolata</i>	Report by the University of Hull for English Nature. Report to be accessed.
<i>Palinurus elephas</i>	Suggested the Sea Fisheries Committee may have records for the Welsh Coast. To be contacted.
<i>Modiolus modiolus</i>	PhD underway with PEMPL. Chris Lumb is trying to access the data without comprising the research work.

All successful searches were recorded in a database developed in Microsoft Access™ to hold the information and references collected. It was considered that it was best to produce an interim database to catalogue the searches made rather than progress directly to Marine Recorder, which has been used for the final search results.

As much information as possible was obtained and entered to the database from published sources including limited circulation reports.

Results

Introduction

The majority of research literature accessed refers to survey data rather than providing direct access to the raw data. In the time-scale allowed it is not possible to source the original data but it is recommended that an exercise be carried out to ascertain which data sources are most important (and accessible) and to search those out. We are also aware of experts in the various fields and would recommend we contact them to add additional data points.



All relevant datasets have been entered into Marine Recorder. A few assumptions have been made:

- A number of surveys did not contain geographical co-ordinates but did supply detailed maps. Co-ordinates were estimated using charts and GIS. Reference is made to the estimated co-ordinates within the metadata in Marine Recorder.
- 'Survey run by', within Marine Recorder, if unspecified in the paper has been taken as the organization or University department associated with the author.
- 'Surveyor' where unspecified was taken as the author.

The following pages detail the datasets included at Stage 1.

Datasets included in Marine Recorder

The following datasets have been included in Marine Recorder (attached). Only data relevant to the stage 1 species and habitats have been included

TABLE 1 - including comments on each dataset

Dataset	Reference	Comment
The Occurrence of a Subtidal <i>Sabellaria alveolata</i> (L.) reef off Wicklow Head, Irish Sea	Grave, S. & Whitaker, A., (1997). The occurrence of a subtidal <i>Sabellaria alveolata</i> (L.) reef off Wicklow Head, Irish Sea. <i>Irish Naturalists' Journal</i> , 25 , 416-418.	<i>Sabellaria alveolata</i> . Additional species included but none relevant to Irish Sea pilot. Latitude and longitude given.
Growth lines in <i>Modiolus modiolus</i>	Anwar, N. A., Richardson, C. A., Seed, R., (1990). Age determination, growth rate and population structure of the horse mussel <i>Modiolus modiolus</i> . <i>Journal of the Marine Biological Association of the United Kingdom</i> , 70 , 441-457.	<i>Modiolus modiolus</i> obtained from 8 areas around the UK, 4 are relevant to the Irish sea pilot. Map of locations in paper, latitude/longitude estimated.
Observations on the reproduction of <i>Modiolus modiolus</i> in Isle of Man waters.	Jasim, A. K. & Brand, A. R., (1989). Observations on the reproduction of <i>Modiolus modiolus</i> in Isle of Man waters. <i>Journal of the Marine Biological Association of the United Kingdom</i> , 69 , 373-385.	<i>Modiolus modiolus</i> collected from south east of the Isle of Man, authors assuming same distribution as Jones (1951). Latitude/longitude estimated.
<i>Modiolus modiolus</i> (L.) in small Mid-tidal rock pools at Penrhyn Bay, North Wales.	Wilson, D. P., (1977). <i>Modiolus modiolus</i> (L.) in small mid-tidal rock pools at Penrhyn Bay, North Wales. <i>Estuarine and Coastal Marine Science</i> , 5 , 215-222.	Rock pools inhabited by <i>Modiolus modiolus</i> since 1920s. Grid references included in the paper.
Rare marine invertebrates found in the Scottish area.	Rae, B.B., Lamont, J.M., (1963). Rare marine invertebrates in the Scottish area. <i>Scottish Naturalist</i> , 71 , 23-28.	<i>Palinurus elephas</i> recorded from NE Scotland, Shetland and NW Scotland. Area not included in Irish sea pilot but included as metadata.



Dataset	Reference	Comment
Geographical distribution of <i>Sabellaria alveolata</i> in England, Wales and Scotland.	Cunningham, P. N., Hawkins, S. J., Jones, H. D., Burrows, M.T., (1984). The geographical distribution of <i>Sabellaria alveolata</i> (L.) in England, Wales and Scotland, with investigations into the community structure of, and the effects of trampling on <i>Sabellaria alveolata</i> colonies, University of Manchester: ii,39.	<i>Sabellaria alveolata</i> occurrence around England, Scotland and Wales. Grid references are included. Abundances are included, sites where <i>S. alveolata</i> has been recorded as absent have also been entered into Marine Recorder.
Mollusca recorded on a dredging trip - Isle of Man	Kileen, I., (1993). Autumn meeting to the Isle of Man - Mollusca recorded on the dredging trip. <i>Porcupine Newsletter</i> , 5(10) , 252-255.	<i>Modiolus modiolus</i> from around the Isle of Man. Coordinates, details of gear used, depth and substrate included in the report. Latitude/longitude is included in the paper.
Investigations into a <i>Modiolus modiolus</i> community in Strangford Lough (Northern Ireland)	Roberts, C. D., (1975). Investigations into a <i>Modiolus modiolus</i> (L.), (Mollusca: Bivalvia)community in Strangford Lough, N. Ireland. <i>Underwater Association Report</i> 1 , 27-49.	Sublittoral <i>Modiolus modiolus</i> from Strangford Lough. Map of location has been used to estimate the latitude and longitude.
<i>Modiolus modiolus</i> (L.) from the Scottish west coast.	Comely, C. A., (1978). <i>Modiolus modiolus</i> (L.)from the Scottish west coast. I. Biology. <i>Ophelia</i> , 17 , 167-193.	<i>Modiolus modiolus</i> from within the Firth of Clyde. Map of survey area given but no latitude/longitude this has been estimated.



Dataset	Reference	Comment
Survey of the current status of <i>Ostrea edulis</i> in Strangford Lough, Northern Ireland	Kennedy, R. J., Roberts, D., (1999). A survey of the current status of the flat oyster <i>Ostrea edulis</i> in Strangford Lough, Northern Ireland, with a view to the restoration of its oyster beds. <i>Biology and Environment: Proceedings of the Royal Irish Academy</i> , 99B (2) , 79-88.	<i>Ostrea edulis</i> . Map of Strangford Lough with abundance scale (no/m ²) no latitude/longitude given so has this had been estimated.
Analysis of underwater visual data to identify the impact of physical disturbance on horse mussel	Magorrian, B. H., Service, M., (1998). Analysis of underwater visual data to identify the impact of physical disturbance on horse mussel (<i>Modiolus modiolus</i>) beds. <i>Marine Pollution Bulletin</i> , 36 , 354-359.	<i>Modiolus modiolus</i> . No date was mentioned in the text with regard to the undertaking of this survey. Exact location data appears absent thus co-ordinates from a central point within the Lough have been used
Studies on the Crawfish <i>Palinurus elephas</i> in south wales (and cornwall)	Hunter, E., Shackley, S. E., Bennett, D. B., (1996). Recent studies on the crawfish <i>Palinurus elephas</i> in South Wales and Cornwall. <i>Journal of the Marine Biological Association of the United Kingdom</i> , 76 , 963-983.	<i>Palinurus elephas</i> collected from around South Wales. Numbers collected included in paper. Map of area surveyed but no co-ordinates included therefore these have been estimated.
JNCC candidate rare species files, <i>Palinurus elephas</i> records		Reports of <i>Palinurus elephas</i> collated by Dr Bill Sanderson at JNCC. Records include grid reference, date and recorder.



Dataset	Reference	Comment
Survey of the sublittoral algal communities of the Sarn Badrig reef, Mid Wales	Hiscock, S., (1985). A survey of the sublittoral algal communities of the Sarn Badrig reef, mid-Wales. 28pp. Peterborough: NCC	Information on habitat features, substrate and sediment features are included in the report, however the format is different to that used on the MNCR form and has not been included in the survey events.
Marine mollusca of Arran and adjacent seas	Smith, S. M., (1984). Marine Mollusca of Arran and adjacent seas. NCC CST Report 506. Peterborough :NCC.	<i>Modiolus modiolus</i> found around Arran. Species from stage 2 are also included in the species lists but have not been entered at this stage. Latitude/longitude is included within the report, as are descriptions of the stations and maps indicating the stations geographical locations.
Molluscan and polychaeta faunas of selected sites within the Menai marine conservation area	Oliver, P.G., Mackie, A.S.Y., Trew, A., (1986). Report on the molluscan and polychaete faunas of selected sites within the Menai Bridge conservation area. Peterborough: NCC.	A map of sampling locations is given but no latitude/ longitude, species abundance is not included.



Dataset	Reference	Comment
Sublittoral algal populations in Port Erin Bay, Isle of Man	Burrows, E.M, (1958). Sublittoral algal population in Port Erin Bay, Isle of Man. <i>Journal of the Marine Biological Association of the United Kingdom</i> , 37 , 687-703.	No latitude/longitude given within the paper so this has been estimated. Species list of algae, <i>Laminaria saccharina</i> , <i>Chorda filum</i> and red seaweeds have been entered into MR. The abundance measure used is percentage occurrence in samples – percentage cover has been used in MR.
Distribution and ecology of <i>Zostera</i> in County Dublin	Madden, B., Jennings, E., Jeffery, D. W., (1993). Distribution and Ecology of <i>Zostera</i> in County Dublin. <i>Irish Naturalists Journal</i> , 24 , 303-310.	Grid references included for all positions of <i>Zostera noltii</i> beds except 1 (indicated in MR).
Survey of Scottish Sealochs: Loch Fyne	Davies, M., (1989). Surveys of Scottish sealochs: Loch Fyne, Volume 1 – Report. 76pp. Peterborough: NCC.	<i>Modiolus modiolus</i> and <i>Serpula vermicularis</i> found at sites in Loch Fyne. Grid references and surveyors given.



Dataset	Reference	Comment
Bottom fauna of the south Isle of Man	Jones, N. S., (1951). The bottom fauna off the Isle of Man. <i>Journal of Animal Ecology</i> , 20 , 132-144.	<i>Modiolus modiolus</i> from the south of the Isle of Man. Map indicating positions of hauls given but no latitude/longitude included. Therefore grid references have been worked out. Abundance is given as percentage occurrence of species for all hauls in which animals were identified. Only 1 group of hauls (ground) had <i>Modiolus modiolus</i> in all samples this has been entered into MR.
Isle of Man Intertidal survey	Holt, T., (2000). Isle of Man intertidal survey. Monitoring the marine and coastal environment, <i>Irish Sea Forum</i> , 30-34.	No species list is provided so only metadata. The absence of intertidal eel grass, and <i>Sabellaria</i> worm reefs is noted.



Dataset	Reference	Comment
Diving survey of Strangford Lough: The benthic communities and their relation to substrate -	Erwin, D.G., A diving survey of Strangford Lough: the benthic communities and their relation to substrata - a preliminary account. In <i>Proceedings of the 11th European Symposium on Marine Biology, Galway, 5-11 October, 1976. Biology of Benthic Organisms</i> (ed. B.F. Keegan, P.O. Ceidigh & Boaden, P.J.S.), pp 215-224.	<i>Modiolus modiolus</i> in Strangford Lough. Map of locations given but no latitude/longitude this has been estimated.
Modiolus modiolus (L.) - An autecological study	Brown, R.A. & R. Seed, 1976. <i>Modiolus modiolus</i> (L.) - an autoecological study. In <i>Proceedings of the 11th European Symposium on Marine Biology, Galway, 5-11 October, 1976. Biology of Benthic Organisms</i> (ed. B.F. Keegan, P.O. Ceidigh & Boaden, P.J.S.), pp. 93-100.	<i>Modiolus modiolus</i> in Northern Ireland. Most of the work relates to the sublittoral beds in Strangford Lough though more limited data are also available for a much less extensive intertidal population in Belfast Lough. No latitude/longitude included therefore co-ordinates from a central point within the Lough have been used.

Results by Stage 1 priority species and habitats

All species on the list were searched by sea area. Records were not found on all species. Some searches revealed some further routes of investigation.

Table 2:

Latin Name	Sources identified
<i>Funiculina quadrangularis</i>	Only absence records reported. Chris Lumb's suggested lead of Scottish Natural Heritage ROV records to be followed up. <i>Funiculina quadrangularis</i> is not known from the Clyde (Davies, 1989) "In extensive studies of deep mud habitats in the Irish Sea (particularly the Firth of Clyde), <i>Funiculina quadrangularis</i> has not been found (Dr R.J.A. Atkinson, pers. comm.)".
<i>Sabellaria alveolata</i>	Presence/Absence data from Cunningham <i>et al</i> (1984), Grave & Whittaker (1997).
<i>Serpula vermicularis</i>	Loch Creran is the only known location of <i>Serpula vermicularis</i> reefs in Scotland (Moore <i>et al</i> , 1998). Davies (1989) has 3 locations in Loch Fyne where individual specimens occur. Roberts (1975) has a record in Strangford Lough.
<i>Palinurus elephas</i>	Recorded in South Wales (Hunter <i>et al.</i> , 1996; records from Dr Bill Sanderson). Any records with Sea Fisheries Committee to be followed up.
<i>Arctica islandica</i>	One record in Strangford Lough (Roberts 1975). MarLIN has previously accessed <i>Arctica islandica</i> data for the Irish Sea from the CEFAS 4m beam trawl data.
<i>Modiolus modiolus</i>	Records from four locations within Irish Sea Pilot area. Isle of Man (Answar <i>et al</i> 1990; Jasmin & Brand, 1989; Jones, 1951; Kileen, 1995). North Wales (Wilson, 1958), Strangford Lough (Magorrian & Service, 1998; Roberts, 1975; Brown & Seed, 1977; Erwin, 1977) Firth of Clyde (Comely, 1978).
<i>Ostrea edulis</i>	Surprisingly few uncultivated records. Records accessed for Strangford Loch (Kennedy & Roberts, 1999).
<i>Amathia pruvoti</i>	Nothing found on this species.
<i>Polysyncraton lacazei</i>	Two references to work on this species. Specimens collected from the northwest Mediterranean, nothing found on British and Irish distribution of this species.



Habitats covered in Stage 1:

Habitat	Source identified
<i>Zostera noltii</i> beds in littoral muddy sands	Only one source found Madden <i>et al</i> (1993) <i>Zostera notlii</i> from Dublin Bay.
<i>Laminaria saccharina</i> , <i>Chorda filum</i> and dense red seaweeds on shallow unstable infralittoral boulders or cobbles	Isle of man (Burrows 1958) and Mid Wales (Hiscock, 1985). Species list include <i>Laminaria saccharina</i> , <i>Chorda filum</i> and lots of red seaweeds, habitat description includes boulders and cobbles.
<i>Sabellaria spinulosa</i> encrusted cirralittoral rock	No relevant information has been found on this species.

Products

The contract was awarded against the deliverables detailed at the start of the report. In accordance with the contract we enclose:

- A copy of Marine Recorder data covering 23 data sets detailing locational data for the priority 9 species and 3 habitats.
- List of data sources covered – as provided in Table 2.
- List of searches made – this report details the searches made. A full reference list of the NMBL searches is available on request. All successful searches that have been entered into Marine recorder have a reference included.

Next stage

In carrying out the searches we have had reference to the longer list of species and habitats specified in the tender. The searches will be re-analyzed for the longer list and the data entered into Marine Recorder by 15th May.

Conclusions

The majority of records entered have come from historical reports and literature both from the JNCC Library and the NMBL. There are a number of individual reports taken from the JNCC files.

Searches at the NMBL and the JNCC Library allow searching by sea area. The searches undertaken could form the basis for a wider species and habitat list for each geographical unit.

A number of useful sources of data have been revealed and will be followed up in Stage 2 of the project.

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