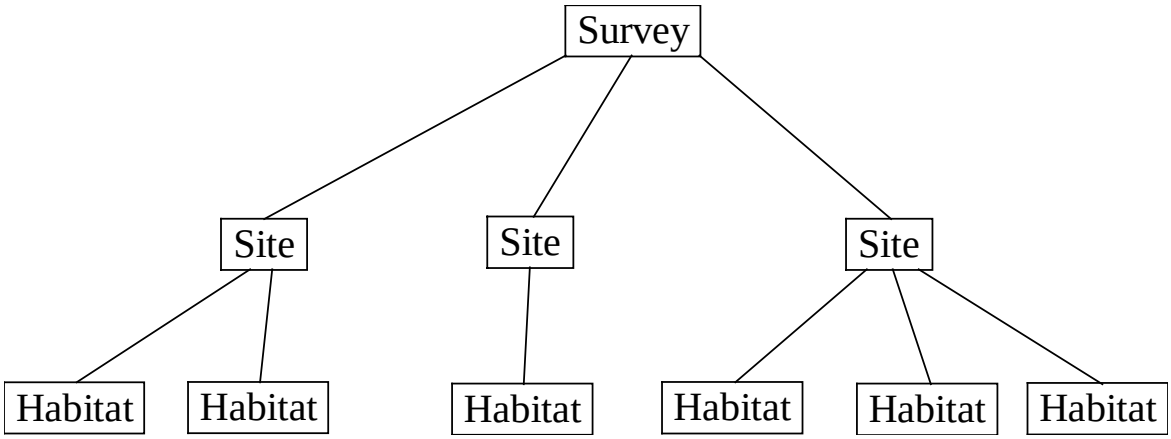
Guidance notes for completion of field recording forms

Introduction

The field recording forms and the MNCR database have a compatible structure, such that data are collected and stored at three levels, namely survey, site and habitat levels with the following inter-relationship:



A series of forms is available which enable recording of data to three levels of detail:

- **Mapping** and **inventory** surveys, in which biotopes within given areas of shore or seabed are matched to the MNCR classification, but no habitat or species data are collected (this type of survey may include a rapid 'on site' survey and/or use of aerial photographs).
- Surveys of **intermediate** detail, in which habitat details and only the most conspicuous species are recorded, and which may be undertaken by less experienced recorders or include the coarser detail of video surveys.
- **Detailed** surveys of each habitat with full species lists (e.g. MNCR Phase 2 surveys including infaunal sediment surveys).

Refer to the table below to **ensure the correct forms are used**. The **intermediate** habitat forms contain a sub-set of categories given on the forms for **detailed** surveys.

Field survey recording forms to be used for different types of survey

			Forms to use					
			SURVEY	**SITE**	**HABITAT**			
Level of detail	**Methods**	Littoral / sublittoral	Survey	Site	Littoral habitat (intermediate)	Littoral habitat (detailed)	Sublittoral habitat (intermediate)	Sublittoral habitat (detailed)
Map or list types	Aerial photography / inventory surveys	L	●	●				
Habitat and main species	Rapid shore surveys	L	●	●	●			
	Video	S	●	●			●	
	Seasearch	S	●	●			●	
Habitat and all conspicuous species	MNCR recording & infaunal sampling (cores)	L	●	●		●		
	MNCR recording & core sampling	S	●	●				●
	Remote sampling with replicate samples (grabs etc.)	S	●	●			●	

Survey form

This form is for the recording of information relevant to the survey as a whole. It includes information (e.g. surveyors, dates and positions) which, when entered to the database, act as a checking mechanism during data entry of site and habitat records.

RECORD NUMBERS

Survey number - Survey numbers are allocated by the MNCR at Peterborough (contact the MNCR Database Manager).

GENERAL DETAILS

Project / contract title. Enter here the title of the major project (e.g. MNCR surveys of isolated saline waters in Scotland) or contract (e.g. UMBSM surveys of Scottish sealochs) to which this survey contributes.

Organisation / contractor. Enter the organisation or contractor (e.g. MNCR, Devon Wildlife Trust, University Marine Biological Station, Millport) responsible for undertaking the survey.

Survey title. Enter a short title (which is used frequently in database searches) to summarise the year undertaken, organisation, general location and type of survey (e.g. 1989 UMBSM Uist sealochs sublittoral survey; 1993 BioMar Berwickshire RoxAnn & video survey; 1992 FSCRC Solway littoral cockle dredge monitoring study).

Reference. Give the reference(s) to the report or paper relevant to this survey. For new surveys a reference is usually not available until after the field data is entered to the database.

SURVEYORS - List all the surveyors used during the survey (first and surnames) and give their initials (the latter are used for rapid entry of surveyors on site and habitat forms).

DATES OF SURVEY - Enter the first and last day of the survey.

LOCATION - Give two corners of a box (either top left and bottom right or top right and bottom left), using either 6-figure OS grid references or Latitude and Longitude, that will encompass all sites surveyed during the survey (positions entered for each site are checked by the database to ensure they fall within this given box).

TYPES OF SURVEY UNDERTAKEN - Tick all the relevant boxes.

SURVEY AREAS - List the area or areas covered by the survey. These should be specified at the start of the survey to ensure names used are consistent with the site naming guidance given later under 'site form'.

DISTRICTS - Give relevant districts only for surveys in Scotland.

COUNTIES / REGIONS - List the relevant counties (England and Wales) or regions (Scotland).

MNCR COASTAL SECTOR - Tick the relevant one. As these are no longer given on site forms, where the survey covers more than one coastal sector, state which sites are in each.

COUNTRY AGENCY REGION / TEAM - Tick the relevant one. Where the survey covers more than one region or team, state which sites are in each.

SYNOPSIS OF REPORT / SUMMARY OF SURVEY - Give a brief text description, outlining relevant details relating to the aims of the survey, methodology (particularly where this differs to standard MNCR methods), level of coverage, areas omitted, etc.

DATA VALIDATION - This section must be completed as samples and data are worked up and entered to the MNCR database. Refer to separate guidance on each stage indicated here. The survey leader / reporter is responsible for ensuring quality control and that the completed survey form is sent to the Head of the MNCR as a record that data validation has been completed to a satisfactory standard.

Site form

This form is for recording features of the site as a whole, including its physical characteristics, site designations, a conservation assessment, known uses and impacts and a site description. A site will encompass one or more STATIONS or HABITATS with a **habitat form** completed for each. For mapping/inventory surveys, only very brief details of each habitat are recorded on the site form and habitat forms are not completed.

A 'site' should be treated as a discrete area of shore or seabed (for instance a rocky shore between sandy bays, a channel between two islands) which can be surveyed during a single visit, although second visits may be required for complex areas. For some extensive sediment flats, whole lagoon sites or for mapping surveys with discrete lengths of coast of similar character, the site may be several kilometres in extent but for detailed recording of rocky habitats the site will be the broad transect down the rock slope or a spot location on a level seabed. Repeat surveys at different times of the year or different years are best considered as different 'surveys' and hence would require separate site records.

RECORD NUMBERS

Survey number - Survey numbers are allocated by the MNCR at Peterborough (Contact the Database Manager) and can be entered after the survey if unknown at the time of survey.

Site number - This is the report site number assigned at the end of a survey before data entry to the database. Allocation of this number allows renumbering of sites into a more sensible geographical order if required.

Field site number - Assigned each day during a survey.

Number of habitat records - Number of habitat records completed for this site (note all habitats present may not have a completed habitat form).

LOCATION - The combination of site name, survey area, district and county/region, should provide a reasonable indication, without reference to a map, of where the site is located. FOLLOW THE GUIDANCE BELOW - these names are used in reports and to label photographs and must be clear and informative.

Site name - Use a nearby distinctive feature named on the Admiralty chart or Ordnance Survey map (1:10,000 or 1:25,000 series). The name should be informative and precise but not verbose:

e.g. SW of Black Head

Off Slippery Head

Channel between Red Island and North Rocks

Names such as 'Loch Torridon' and '600 m from slip' are too vague or at the wrong scale.

Use capitals for proper place names only (i.e. names used on charts and OS maps) and abbreviate all cardinal points (without full stops) unless they are part of the place name.

Survey area - These should be defined by the survey leader at the start of the survey, for each discrete body of water or stretch of coast (e.g. Loch Sween, Lundy Island, River Stour). Where there is no obvious name it is best to link the site name to the nearest town, so that a combination of town and county gives some idea of where 'SW of Black Rock' actually is, e.g. 'SW of Black Rock, Workington, Cumbria'.

District (Scotland) - Applicable only to Scotland (sub-divisions of the Scottish Regions).

County/Region - Give the county (or Region/Island Council in Scotland).

POSITION (Grid references or latitude/longitude) - The position of the centre of the site must be given either as an OS grid reference or Latitude and Longitude. For sites where the area surveyed covers an extensive area (e.g. extensive sediment shores or drift dives) then the limits of the site can be entered as well.

Generally OS grid references should be used for shore sites where the site position is derived from OS maps, and the Latitude/Longitude given where positions are derived from Admiralty charts or from Decca or GPS (Global Positioning System). State from which method the position was derived, including the datum for Decca and GPS (usually WGS72 and WGS84 respectively).

Grid References - Give a six figure grid reference (e.g. SX 934 192).

Latitude/Longitude - Give degrees and minutes at least, with decimal fractions of minutes (e.g. 54º31.50'N 4º35.15'W) if possible. Positions entered as degrees, minutes and seconds (e.g. 54º31'30''N 4º35'10''W) are also acceptable.

SURVEY DETAILS

The form allows details for two visits per site to be entered, as for instance when further sampling is required on a second visit or two pairs of surveyors record from the same sublittoral rock site at different depth zones.

Surveyors - Give full surnames and all initials of persons undertaking the survey (not just initials).

Date/Time/Duration - Give the date of the survey in the form indicated, time on the 24-hour clock at the beginning of the survey and duration of the survey (hours/minutes). The correct formats for date, time and duration respectively, are 27.4.89, 13:45 and 00:22.

Underwater visibility (m) (sublittoral surveys by SCUBA diving only) - An estimate of the horizontal underwater visibility.

Height / depth of survey (m)

Tidal correction (m) - Enter the correction used to convert height or depth limits surveyed relative to sea level to those relative to chart datum. The correction should be calculated from Admiralty tidal predictions for the nearest port or secondary port.

Measured from sea level / Corrected to Chart Datum - Enter the upper and lower height or depth limits covered during the survey of the site. Depths below sea level or chart datum should be preceded by a -, heights by a +.

TYPE OF SURVEY - Tick either littoral or sublittoral (or both) and the types of survey undertaken. Recording relates to surveying of epibiota on rocky substrata and on the surface of sediments or the recording of large widely-spaced infaunal species found by digging into the sediment. Ensure the correct core size and the sieve mesh size used for sediment sampling are given; note the number of cores taken on the habitat form.

PHOTOGRAPHY - This section is included to assist in keeping track of the photography carried out in the field and later correlation of photographs with particular sites and photographers (it is often useful to add a note of the subject matter, e.g. '*Metridium*' or 'kelp forest', as well).

Number taken - Record the number taken (approximately if necessary) of each type. This should be adjusted if necessary when photographs for the survey are labelled (some may be discarded if poor quality).

PHYSIOGRAPHIC FEATURES - The physiographic feature in which the site is located. There are two main divisions (open and enclosed coast), each of which is further divided. Record the appropriate sub-division, ticking the main category only (i.e. do not tick 'island/rock' for something within a larger marine inlet).

Open coast - Any part of the coast, including offshore rocks and islands, which is not within a marine inlet or lagoon.

Linear coast - Areas of open coast including large islands which do not comply with categories below.

Islands / rocks - Features separated from the coast of the mainland or large islands.

Offshore seabed - Seabed beyond 3 miles (~ 5 km) from the shore.

Semi-enclosed coast - An area of coast bounded by headlands which provide some shelter from along-shore winds but which is predominantly open to onshore winds (compare 'embayments').

Strait / Sound - Channels between the mainland and an island, or between two islands which are open at both ends to the open coast (it does not refer to similar features or narrows within marine inlets).

Barrier beach - Coastal features caused by long-shore drift which create sheltered areas (of sediment) behind them.

Enclosed coast - Marine inlets and lagoons which are fully enclosed from the open sea except at the entrance. They include sealochs, voes, estuaries, rias and harbours.

Embayment - An enclosed area of coast in which the entrance provides shelter from onshore winds for the major part of the coast inside, but which is not a sealoch, ria, voe, estuary or lagoon.

Sealoch - Glacially formed inlets (fjords, fjards) of western Scotland and Ireland; typically elongate and deepened by glacial action with little freshwater influence. Often with narrows and sills dividing the loch into a series of basins.

Ria / voe - Drowned river valleys of south-west Britain (ria) and Shetland (voes). Often with a greater presence of rock and more marine in character than estuaries.

Estuary - Downstream part of a river where it widens to enter the sea; often with significant freshwater influence and predominantly comprising sediment habitats.

Isolated saline water (lagoon) - Enclosed bodies of water, separated from the sea by shingle, sand or sometimes rock and with a restricted exchange of water with the sea, yielding varying salinity regimes.

For the following categories of **salinity**, **wave exposure** and **tidal streams**, record the predominant category affecting the site as a whole. Note this may differ between littoral, infralittoral and circalittoral zones in the same location. When there is local variation within the site (major zone) note this on the individual habitat forms.

SALINITY - Salinity, particularly in estuaries and lagoons, may be difficult to assess on site, but a review of the literature prior to the survey may assist in categorising each site. The species present on site may also indicate the overall salinity regime to which the site is subject.

The categories are defined as follows (the points of separation approximate to critical tolerance limits for marine species):

Fully marine	30-40 ‰
Variable	18-40 ‰
Reduced	18-30 ‰
Low	<18 ‰

Give the actual salinity (or salinity range) if measured on site.

WAVE EXPOSURE - These categories take account of the aspect of the coast (related to direction of prevailing or strong winds), the fetch (distance to nearest land), the degree of open water offshore and the depth of water adjacent to the coast. Estimation of wave exposure will require inspection of charts and maps. In some cases (e.g. Scapa Flow in Orkney) the wave exposure on the shore is greater than in the sublittoral due to enhanced sea chop from persistent strong winds. The wave exposure can often be arrived at by using the guidelines on the form, but fuller descriptions are given below:

Extremely exposed - This category is for the few open coastlines which face into prevailing wind and receive oceanic swell without any offshore breaks (such as islands or shallows) for several thousand kilometres and where deep water is close to the shore (50 m depth contour within about 300 m, e.g. Rockall).

Very exposed - These are open coasts which face into prevailing winds and receive oceanic swell without any offshore breaks (such as islands or shallows) for several hundred kilometres but where deep water is not close (>300 m) to the shore. They can be adjacent to extremely exposed sites but face away from prevailing winds (here swell and wave action will refract towards these shores) or where, although facing away from prevailing winds, strong winds and swell often occur (for instance, the east coast of Fair Isle).

Exposed - At these sites, prevailing wind is onshore although there is a degree of shelter because of extensive shallow areas offshore, offshore obstructions, a restricted (<90º) window to open water. These sites will not generally be exposed to strong or regular swell. This can also include open coasts facing away from prevailing winds but where strong winds with a long fetch are frequent.

Moderately exposed - These sites generally include open coasts facing away from prevailing winds and without a long fetch but where strong winds can be frequent.

Sheltered - At these sites, there is a restricted fetch and/or open water window. Coasts can face prevailing winds but with a short fetch (say <20 km) or extensive shallow areas offshore or may face away from prevailing winds.

Very sheltered - These sites are unlikely to have a fetch greater than 20 km (the exception being through a narrow [<30º] open water window), they face away from prevailing winds or have obstructions, such as reefs, offshore.

Extremely sheltered - These sites are fully enclosed with fetch no greater than about 3 km.

Ultra sheltered - Sites with fetch of a few tens or at most 100s of metres.

TIDAL STREAMS (maximum at surface) - This is maximum tidal stream strength which affects the actual area surveyed. **Note for shores and inshore areas this may differ considerably from the tidal streams present offshore.** In some narrows and sounds the top of the shore may only be covered at slack water, but the lower shore is subject to fast running water. Where tidal streams are significantly different for individual habitats (either enhanced or reduced) compared with the overall strength at the site this should be noted under 'Modifiers' on the individual habitat record form. The categories are broad

and in the circalittoral zone finer divisions, particularly of 'moderately strong' above and below 2 knots, may be significant in structuring community composition.

The categories are defined as follows:

Very strong	>6 knots	(>3 m/sec.)
Strong	3-6 knots	(1.5-3 m/sec.)
Moderately strong	1-3 knots	(0.5-1.5 m/sec.)
Weak	<1 knot	(<0.5 m/sec.)
Very weak	negligible	

The velocity may be shown on Admiralty charts (either shown directly or as a diamond keyed elsewhere on the chart) or in coastal pilots. However, it is uncommon to have such a direct record for the site being surveyed and you may have to extrapolate considerably.

GEOLOGY - Tick at least the major headings (Hard, Moderately hard, Friable, Soft or Very soft) and the secondary headings if possible. Refer to a geological map for the area being surveyed but exercise care in relying on the map, particularly for sublittoral habitats.

STRATIFICATION (sublittoral sites only) - A thermocline is a sharp temperature change across a depth profile and will usually be felt by the surveyor descending through the water column. If a thermocline is suspected, temperature above and below can be noted. A halocline will be indicated by a 'hazy' or shimmering appearance in the water.

LITTORAL WIDTH (littoral sites only) - Distance from High Water Spring Tides to Low Water Spring Tides. Give an estimate of the maximum extent of this for the part of the shore you are working on and for a line at right angles to the top of the shore.

LITTORAL ASPECT (littoral sites only) - The direction(s) to which the shore faces open water (may be important in relation to prevailing winds and to desiccation effects due to the sun).

CONSERVATION ASSESSMENT - The categories here are in 'Mitchell, R. (1987). *Conservation of marine benthic biocenoses in the North Sea and the Baltic.* Strasbourg: Council of Europe' or in the MNCR site assessment protocol. Some of these criteria require experience of similar situations and you should only complete them if you feel confident to do so. Assessment of individual habitats should be noted on the relevant habitat form.

SITE DESIGNATIONS - This information should be obtained before a survey and noted when the site lies within the designated site (include proposed designations if known).

USES AND IMPACTS - These are generally self explanatory. You should tick an activity if you know it occurs even if you do not see the activity while you were at the site. Some impacts will be direct and localised and should only be recorded if on the site. Others may be more diffuse (such as sewage discharge) and should be recorded if it is likely to occur at the site surveyed.

BIOTOPES PRESENT - List the habitats and communities (= biotopes) present at the site, numbering them from the highest or shallowest habitat surveyed to the lowest or deepest. Indicate which have records completed on habitat forms; when full habitat records are not made, complete the details for classification code and notes. Give the source (i.e. version of MNCR classification) of the classification code used.

Sub-habitats - At some sites, such as rocky shores, habitats may be further split (e.g. rock pools, overhangs) beyond the main records made in each zone. Link the two records with

an arrow from the sub-habitat to the main habitat. The two records can then be linked in the database for some types of analysis.

Mapping/inventory surveys (full details of procedures are given in the marine phase 1 handbook) - When aerial photographs are being ground-truthed, give brief details of each biotope within the defined polygons of the photograph, noting the percentage cover of each biotope (which must add up to 100% for each polygon) and clearly demarcating the biotopes within one polygon from those in the next polygon.

SITE DESCRIPTION - This is a 'sketch in words' to describe the main characteristics of the site including the type of site, its general physical location, any particular reason for selecting the site and the spatial relationship of the biotopes present. Also include any features which are particularly unusual or of high conservation value. An example is given below:

> "A steeply sloping sheltered bedrock shore at the entrance to a large sealoch. Zonation on the shore was distinct with typical zones of yellow and grey lichens, black lichens, *Pelvetia canaliculata, Fucus spiralis, Fucus vesiculosus* and *Fucus serratus*. The site was representative of shores in the area and had unusually dense numbers of the nudibranch *Onchidoris bilamellata*. The site was about 150 m south of a large fish farm."

LOCATION AND SKETCH / PROFILE / PLAN OF SITE - Show the location of the site by sticking on a photocopy of a map or chart and an additional sketch map if necessary. Show the spatial relationship of the different biotopes surveyed in a profile, 3-D drawing or a plan (particularly appropriate for sediment habitats) of the site. Mark clearly the habitats surveyed with height or depth boundaries and where possible indicate the main species present (in words or pictorially). 3-D sketches are particularly useful (but work according to your artistic ability). For mapping/inventory surveys more detailed maps may be made separately and kept with the site form.

Habitat forms

The front page of these forms is for a description of the main characteristics, physical and biological, of each separate habitat investigated. Species present are noted on the remaining pages. The **intermediate** forms allow for up to three habitat records to be made per form.

Because the **littoral** and **sublittoral** versions and the **intermediate** and **detailed** versions are all similar in format and content, details for all versions are given together here. Some categories may not therefore appear on particular forms.

At the top of each set of boxes the type of information required is shown:

✓	=	tick one only
✓✓	=	tick as many as apply
1-5	=	score as appropriate
%	=	give estimated percentage of the total encountered
Abund.	=	give abundance of taxon on the MNCR SACFOR abundance scale (Superabundant, Abundant, Common, Frequent, Occasional, Rare)

GENERAL DETAILS

Survey no., Site no., Field site no. - As on the associated site form.

Site name - As on the associated site form.

Habitat number - A sequential number allocated to each habitat within the site. Habitat numbers should run from the highest or shallowest habitat (= 1) to the lowest or deepest.

Position within site - For most sites, this section will not have to be completed as the position on the site form will be sufficiently accurate. However, it should be completed where the site covers a large area, such as an extensive sediment flat and the location of the habitat or station is significantly different to the central site location on the site form.

Number of cores - Give the number of infaunal core samples taken.

Sieved volume - Note the volume in litres of sediment left after sieving (to assist later in drawing up contracts for sample sorting).

Replicate number - For remotely collected grab and dredge samples several replicates may be taken. For each the sieved volume, sample numbers and position should be noted, although they each have the same habitat number.

Sample volume - For remotely collected grab and dredge samples note the volume in litres of sediment collected (i.e. before sieving).

Infaunal sample number - Note the number code put on any label/Dymo tape with the sample. The following convention is recommended: Survey no. or a letter code for survey/Field Site no./Habitat no., e.g. 346.14.2 or MB14.2 where MB indicates survey area (in this case Morecambe Bay).

Granulometry sample number - Note the number code put on any label/Dymo tape with the sample. Use the SAME NUMBER as the infaunal sample + GS, e.g. 346.14.2GS.

SURVEYORS - Enter names of the survey staff (which may be a subset of those surveying the whole site).

HEIGHT/DEPTH LIMITS - Enter the upper and lower height or depth limits relative to sea level and relative to chart datum after correction.

HEIGHT BAND/DEPTH BAND - The appropriate height or depth band should be indicated (essential for sediment shores and all sublittoral habitats).

ZONE - These are primarily related to rocky habitats or those where algae grow (*e.g.* stable shallow sublittoral sediments).

Separate habitat records should be made for each zone. Avoid making records which span zones, especially where they cross the main zones, such as between Infralittoral and Circalittoral or Littoral fringe and Eulittoral. Additionally, records may be made for sub-habitats within a zone if appropriate (e.g. rockpools in the mid eulittoral) but note here the zone applicable.

The zones are defined below:

Supralittoral - colonised by yellow and grey lichens, above the *Littorina* populations but generally below flowering plants.

Upper littoral fringe - this is the splash zone above High Water of Spring Tides with a dense band of the black lichen by *Verrucaria maura*. *Littorina saxatilis* and *Littorina neritoides* often present. May include salt marsh species on shale/pebbles in shelter.

Lower littoral fringe - the *Pelvetia* (in shelter) or *Porphyra* (exposed) belt. With patchy *Verrucaria maura, Verrucaria mucosa* and *Lichina pygmaea* present above the main barnacle population. May also include salt marsh species on shale/pebbles in shelter.

Upper eulittoral - barnacles and limpets present in quantity or with dense *Fucus spiralis* in sheltered locations.

Mid eulittoral - barnacle-limpet dominated, sometimes mussels or dominated by *Fucus vesiculosus* and *Ascophyllum nodosum* in sheltered locations. *Mastocarpus stellatus* and *Palmaria palmata* patchy in lower part. Usually quite a wide belt.

Lower eulittoral - *Fucus serratus, Mastocarpus stellatus, Himanthalia elongata* or *Palmaria palmata* variously dominant; barnacles sparse.

Sublittoral fringe - dominated by *Alaria esculenta* (very exposed), *Laminaria digitata* (exposed to sheltered) or *Laminaria saccharina* (very sheltered) with encrusting coralline algae; barnacles sparse.

Upper infralittoral - dense forest of kelp.

Lower infralittoral - sparse kelp park, dominated by foliose algae except where grazed. May lack kelp.

Upper circalittoral - dominated by animals, lacking kelp but with sparse foliose algae except where grazed.

Lower circalittoral - dominated by animals with no foliose algae but encrusting coralline algae.

EXTENT OF RECORD - Tick zone/height or depth band except where the record is from a restricted feature (such as a rockpool, isolated patch of sediment or rock outcrop) or where several habitats have been recorded together (e.g. where a rapid record is made of a whole shore).

SURVEY QUALITY - Indicate the quality of records obtained from both fauna and flora.

Thorough - suggests that all conspicuous species have been recorded.

Adequate - indicates that a high proportion of conspicuous species were recorded (a few more would be found given extra time) or that you feel your expertise is such that some species may have been overlooked but you were able to record thoroughly within the habitat.

Inadequate - implies that insufficient time was spent recording the habitat or that your expertise in fauna or flora was poor.

Do not over-estimate your abilities; inadequately recorded records should be labelled as such and can be screened out of analytical procedures if necessary.

SUBSTRATUM - Give the percentage of each different substratum present in the habitat as whole (i.e. from where this particular record is made). For sediments estimate the proportion of each grain size category (which should be backed up by a sample taken for granulometric analysis). The total should add up to 100%.

Where species are recorded as epibiota on fucoid fronds or kelp stipes do not record the fucoid or kelp as part of the substratum - the habitat is rock.

INCLINATION - This category gives an indication of the variation in inclination of the substrata within the record. Record the relative quantity of each category as a proportion of 100%.

FEATURES - Record the particular features of the habitat as a tick (rockpool, ripples, etc.) or on a 1-5 scale as indicated. Where categories are scored, an indication of the extremes of the scale are given below and recorders should interpolate between these for each record.

The categories given here indicate the range of features which should be used to aid description of the habitat, and which in some cases may be better described in words than as a 1-5 score.

FEATURES -ROCK

Surface relief - overall relief of the habitat from **very even** (unbroken bedrock with uniform inclination) to **very rugged** (highly broken slope with wide range of surfaces, possibly with gullies or rockpools breaking up the overall inclination considerably).

Texture - an indication of the smoothness of the rock type from **very smooth** (a hard and well worn rock such as granite or well rounded cobbles) to **highly pitted** (a highly pitted or bored rock such as some limestone, or very fragmentary and jagged rock such as shale).

Stability - an indication of the stability of the rock, and related to wave action, from **very stable** (bedrock; boulders which are never moved by wave action) to **highly mobile** (frequently turned pebbles, cobble or even boulders, where colonisation is considerably affected because of such movement).

Scour - an indication of scour by sand (not abrasion from mobility of rocks - see above), from **none** (no scour present) to **highly scoured** (very highly scoured by sand - rocks likely to be smooth and without colonisation).

Silt - the amount of silt settled on the rocks, from **none** (very clean rock surfaces) to **highly silted** (thick layer of silt on all surfaces). Where sand deposits on rocks from wave action note under the tick-boxes of this section.

Fissures - the amount of fissures (over 10 mm wide) present, from **none** to **very many** (accounts for high proportion of habitat).

Crevices - the amount of crevices (less than 10 mm wide) present, from **none** to **very many** (accounts for high proportion of habitat).

Rockpools - the amount of rockpool present, from **none** to **very many** (accounts for high proportion of habitat).

Boulder, cobble, pebble shape - from **highly rounded** (very rounded boulders, cobbles or pebbles) to **very angular** (highly angular boulders, cobbles or pebbles, e.g. slates).

FEATURES - SEDIMENT

Surface relief - overall relief of the habitat, from **very even** (surface completely uniform) to **highly uneven** (surface perhaps with numerous mounds or drainage channels).

Firmness - an indication of the degree of softness or compactness of the sediment, on the scale (with littoral and sublittoral guides): 1 **very firm** (no indentation when walked on; difficult to dig with fingers), 2 (make a slight indentation; fingers only in), 3 (sink ankle deep; hand in), 4 (sink knee deep; can penetrate up to elbow) to 5 **very soft** (sink thigh deep; whole arm in).

Stability - from **highly stable** (movement of sediment very unlikely) to **highly mobile** (sediment constantly being moved).

Sorting - an indication of the uniformity of the particle size, from **very well sorted** (sediment composed of a single grain size) to **very poorly sorted** (sediment with wide range of grain sizes).

Black layer - an indication of the depth of the anoxic layer, on the scale: 1 = not visible, 2>20 cm below surface, 3=5-20 cm below surface, 4=1-5 cm below surface, 5=<1 cm below surface.

MODIFIERS - Tick if any of these are affecting the habitat. This category indicates in particular if conditions for this habitat record are different to the overall conditions as noted on the Site form (e.g. salinity, wave exposure or tidal streams):

Freshwater runoff - where small streams run over the shore or a freshwater surface layer develops and may affect the species present.

Wave exposure - wave surged - surge gullies in the sublittoral fringe often lack *Alaria esculenta* or kelps. Lower shore habitats on steep and vertical rocky shores are often subject to increased wave action compared to the upper shore.

- sheltered - localised protection from the predominant wave action.

Tidal stream - accelerated - from that indicated on the Site Record. Occasionally rock outcrops or wrecks which protrude into the water column experience stronger currents than the surrounding seabed.

- decelerated - habitats, particularly in the littoral zone and kelp forest probably experience markedly reduced tidal streams compared with that offshore (which is the likely source of tidal stream data from charts and coastal pilots) or on the lower shore of sealoch narrows. If a habitat is specifically subject to slower tidal streams by way of shelter from headlands, gullies etc. note it here.

Grazing - where grazing has eliminated the algae used to characterise the zone, e.g. where *Echinus* completely grazes the foliose algae below kelp forests on North Sea coasts.

Shading - shaded surfaces on the shore or in the shallow sublittoral.

Pollution - where pollution has or may have a significant modifying effect on the habitat.

ASSESSMENT - Give your on-site assessment of the quality of the habitat. This assessment will rely upon the personal experience of the recorder both within the region being surveyed and of the biotope in question. **Inexperienced recorders may feel unable to**

complete this section. The assessment should act as a guide to the survey reporter of the conservation value of the biotope, although a wide variety of other data will also be taken into account in any final evaluation.

Representativeness - The degree to which the biotope at the site is representative, both physically and biologically, of the biotope in the region (MNCR sector) as a whole, on the scale:

5 Highly typical - conforms very closely to the defined biotope (in its most natural state) in habitat characteristics and contains a high proportion of species typical of or highly preferential to the habitat.

4 Typical - conforms closely to the defined biotope in habitat characteristics and contains most species typical of the habitat.

3 Transitional representative of the region but intermediate between one biotope and another

2 Atypical - differs slightly in habitat and species characteristics to the defined biotope, but not considered transitional to another biotope.

1 Highly atypical - markedly different in either habitat or species characteristics to the defined biotope, but not considered a separate biotope. May contain different dominant species or rare/scare species in very high densities.

Naturalness - The degree to which the habitat is affected by man, either through change in the substrata, pollution or disturbance or the introduction of non-native species which affect the natural community composition. Scale:

5 Highly natural - Substrata wholly natural, likely to be virtually free from pollution or disturbance and no non-native species present.

4 Natural - Substrata wholly natural, no evidence of pollution or disturbance (whilst recognising diffuse pollutants and activities such as fishing/potting may have some effect), only one or two non-native species present at most which do not appear to have an effect on community structure.

3 Semi-natural - Substrata not fully natural or pollution / disturbance possible (no obvious effects) or a few non-native species present.

2 Unnatural - Substrata mostly artificial, or some evidence of pollution or disturbance or high proportion of non-native species.

1 Highly unnatural - Substrata artificial, or habitat heavily polluted or disturbed or non-native species present which have a significant effect on community structure.

Extent - The extent by area of the habitat, based on actual evidence in the field or reasonable judgement from information on charts or maps. Scale:

5 Very extensive	>10,001 m^2
4 Extensive	1001-10,000 m^2
3 Moderately extensive	101-1000 m^2
2 Limited	11-100 m^2
1 Very limited	0-10 m^2

Species richness - An indication of the number of different species present compared with the average **for that community in the region** (i.e. an exposed sandy beach which would not normally have a rich biota because of the mobile nature of the

sediment should not be compared with more stable shores which are usually much richer). Score as follows:

5 Very high

4 High

3 Moderate

2 Low

1 Very low

Abundance/biomass - relates to the biomass or quantity of fauna and flora present. Score as follows:

5 Very high

4 High

3 Moderate

2 Low

1 Very low

MAIN COVER OR CHARACTERISING SPECIES / TAXA - List the species or higher taxa which best characterised that particular habitat, and note their abundance (abundances are not entered to the database but are important in later interpretation of the record). Do not list species simply because they were very common, but only if they are good indicators of the habitat type. Taxa given here (except higher taxa specified individually in the species list) must not be omitted from the main species checklist.

BIOTOPE NAME - This should be a succinct (<60 character) description of the biotope including the key features of the substrata, the biological zone or height/depth band and the type of community. Modifiers (e.g. tidal stream strengths) should be included in the biotope name if they distinguish this biotope from another.

e.g. Overhanging, infralittoral bedrock

Boulders and cobbles on mud at 11-17 m

Lower eulittoral *Sabellaria* reefs

Tide-swept cobbles and pebbles at 24-28 m

BIOTOPE DESCRIPTION - This is a 'sketch in words' to describe the main characteristics of the biotope and can include features not included in the checklist, or mentioned in the biotope name. An example is given below:

"A gently sloping plain of sandy mud with patches of empty shells, supporting a diverse community of epifaunal and burrowing species, with *Pecten maximus* and *Virgularia mirabilis* particularly conspicuous."

In your description try to give a clear pen picture of the habitat and the spatial arrangement of the main cover taxa or predominant infaunal groups. Also note any rare or unusual features or species or if the biotope is in any way atypical.

MNCR CLASSIFICATION CODE - your on-site match of the record to the MNCR classification of biotopes (ensure the version of the classification is noted on the site form).

When assigning field records to a particular biotope the following annotations can be used against the biotope code:

?	Unsure if record fits defined biotope
T	Record transitional between two biotopes (both codes receive a T)
P	Only part of record refers to biotope (i.e. record includes several biotopes) - this is used primarily when matching old data not collected to current MNCR methodology.
I	Incomplete record lacking full species list
?T	Combination of ? and T above
?P	Combination of ? and P above

Use of these 'flags' is important in data handling to separate adequately correlated records from those for which some uncertainty remains.

SPECIES LIST - note ALL the conspicuous species present within the habitat for which this record applies, including any additional species not listed in the checklist. Recording should continue until very few new species are being recorded with additional survey effort. Mark the abundance in the box according to the MNCR Abundance scales, but note when a specimen or photograph was taken of the species, or the identification is uncertain (with a '?') to the left of the species code. A specimen MUST be kept when identification is uncertain, the species appears to be out of its recorded distributional range or the species is particularly uncommon and its identification might be questioned by others.

David Connor

Head, Marine Nature Conservation Review

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