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SR638_Seafish Standard Sampling Operating Procedure

Basic Intertidal Habitat Mapping

Mark Gray – August 2010

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Seafish Standard Sampling Operating Procedure

Basic Intertidal Habitat Mapping

Disclaimer:

The procedures outlined in this guidance document are appropriate in most circumstances but caution should be exercised in relation to working on vessels and on the shore particularly as tides can change very quickly. Persons using the procedures outlined in this document should always take appropriate steps to safe guard their own well-being. Seafish does not accept any liability in respect of damage that may occur as a result of utilisation of the screening or survey methodology described in this document.

Carrying out this work will not guarantee that your proposal gets accepted, but it will help to inform and speed up the environmental assessment process. Even after you have completed your work, additional specialist work may still need to be done if some questions remain unanswered.

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Introduction

A lack of information on the precise location of a protected marine habitat or refuge for a protected marine species has caused considerable delays in environmental impact assessments and at worst led to applications to develop shellfish farms being refused or withdrawn as Regulators are unable to decide whether the farm site and/or access arrangements will or will not have a potential impact on a protected wildlife site (Seafish 2006 & 2007).

Environmental information shortfalls may result from: (a) a lack of survey data; (b) poor resolution of survey data; or (c) out-of-date information as the distribution of habitats and species change over time.

The Seafish Standard Operating Procedure Series

The aim of the **Seafish Standard Operating Procedure Series** is to provide shellfish farm developers with guidance on how to collect **basic environmental data** in order to address simple information shortfalls that may exist within a wildlife protected area.

At the heart of series is the promotion of a collaborative approach encouraging shellfish farm developers to develop and maintain a dialog with the Regulator and nature conservation agency involved in the consenting process. It is hoped that this approach will encourage better understanding between all stakeholders of the conservation and operational issues at the site early on in the process.

By following an Standard Operating Procedure (SOP) and carrying out the survey work in collaboration with the Regulators and nature conservation agency, the shellfish farm developer will be able to produce basic environmental information, such as the distribution of habitats, which will help shellfish farm developers determine whether the proposed farm is likely to be compatible with the nature conservation interests of the site and, if so, whether any measures could be required to prevent or reduce damage or disturbance to an acceptable level and enable the sustainable development of the shellfish farm.

The Seafish Standard Operating Procedure Series is being developed to support and assist the environmental assessment and consenting of shellfish farm developments in the UK. Its is hoped that these procedures will save time and resources for all involved and will enable all stakeholders to make well informed assessments and decisions.

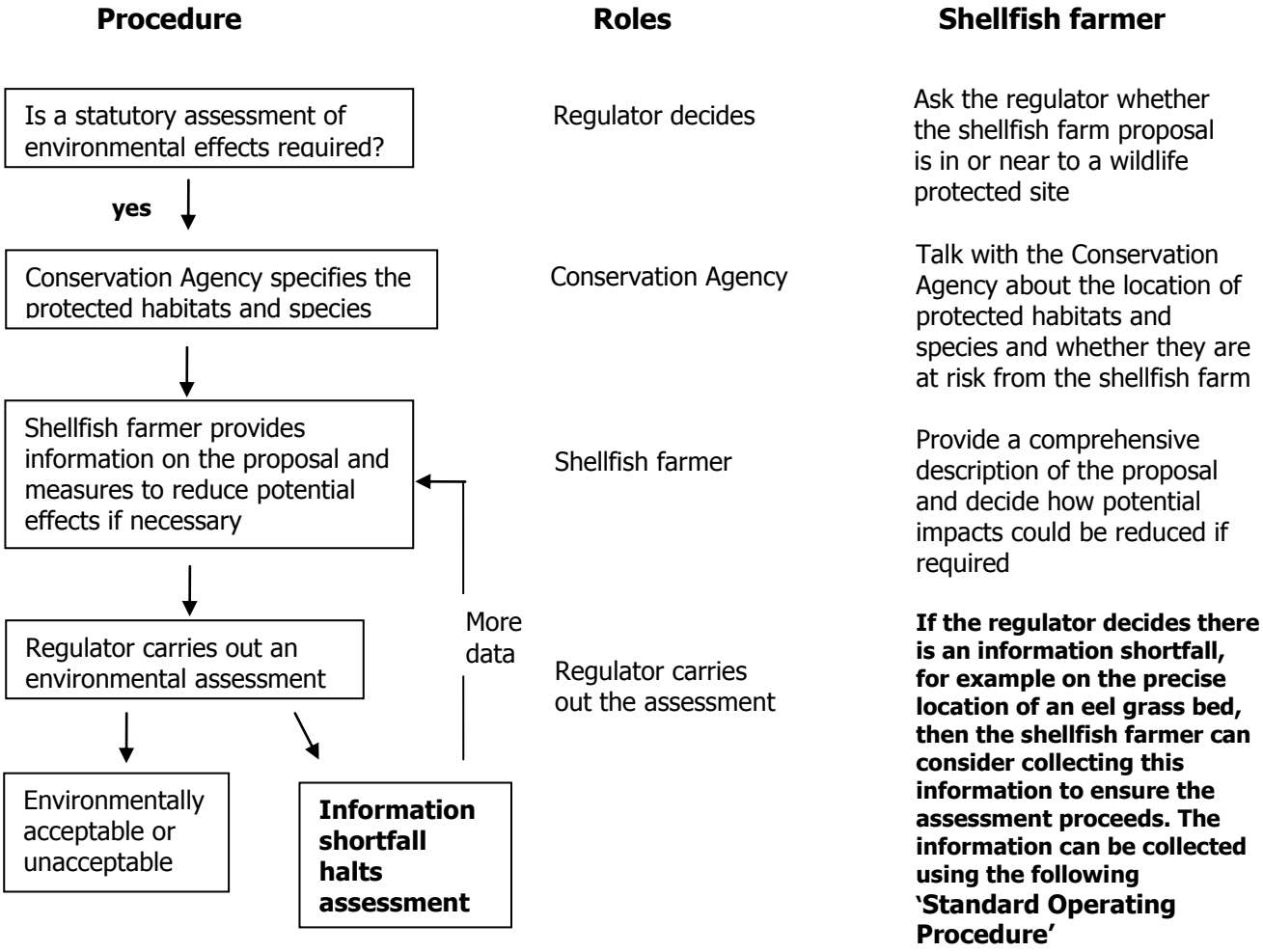
Environmental assessment process

Wildlife in the UK is protected by a wide range of legislation that protects some plants and animals wherever they occur and also creates areas where human activities are carefully managed to protect wildlife, such as Sites of Special Scientific Interest (SSSIs) and Special Areas of Conservation (SACs).

The way in which wildlife is protected depends on the type of designation, but generally speaking the statutory body that authorises the development of a shellfish farm (e.g. a Local Authority or Government department, referred to in this document as the 'Regulator') carries out some form of environmental impact assessment to determine whether a development, such as a shellfish farm, can proceed within or adjacent to a protected wildlife site or not.

The Statutory Nature Conservation Agency (e.g. Natural England) provides advice on the wildlife interests of an area and the environmental impact assessment is based on the information supplied by the shellfish farm developer[1]. Below is a simple flow diagram outlining a general environmental impact assessment procedure and the role and responsibilities of those involved:

General environmental impact assessment procedure



Addressing environmental information shortfalls

In the event of an information shortfall, the shellfish farm developer has three options, namely

(a) Consider a new site, a new cultivation method and/or new access arrangements

(b) Find out whether somebody else holds the required data, for example a company involved in a development nearby or a voluntary environmental organisation that regularly monitors the local wildlife

(c) Collect the data themselves/employ a consultant to collect data

[1] See Seafish Guidance notes on 'Protected Sites', 'Protected Species' and 'How to Prepare for an Environmental Assessment'

This guidance manual enables the shellfish farm developer to collect simple environmental information, i.e. option (c)

The guidance is provided in the form of Standard Operating Procedures (SOP) that will provide step-by-step instructions on how to carryout basic surveys to provide key environmental information.

The SOPs (i.e. survey techniques, data recording and presentation style) have been developed with the UK Nature Conservation Agencies and Regulators (namely Sea Fisheries Committees and Local Authorities).

This will ensure that the environmental information gathered by the industry will be provided in an acceptable format for the purpose of informing environmental impact assessments.

Before any survey work takes place, the shellfish farm developer must agree with the relevant Nature Conservation Agency and Regulator, what environmental data is required and how it is to be both collected and reported as additional site-specific information not covered in the following procedure may be required.

You may be asked by the Regulators to provide information that cannot be collected by the methods presented in the Standard Operating Procedures

It is vital to speak to the Regulators and determine their requirements before you undertake any work

Introduction to Basic Intertidal Habitat Mapping

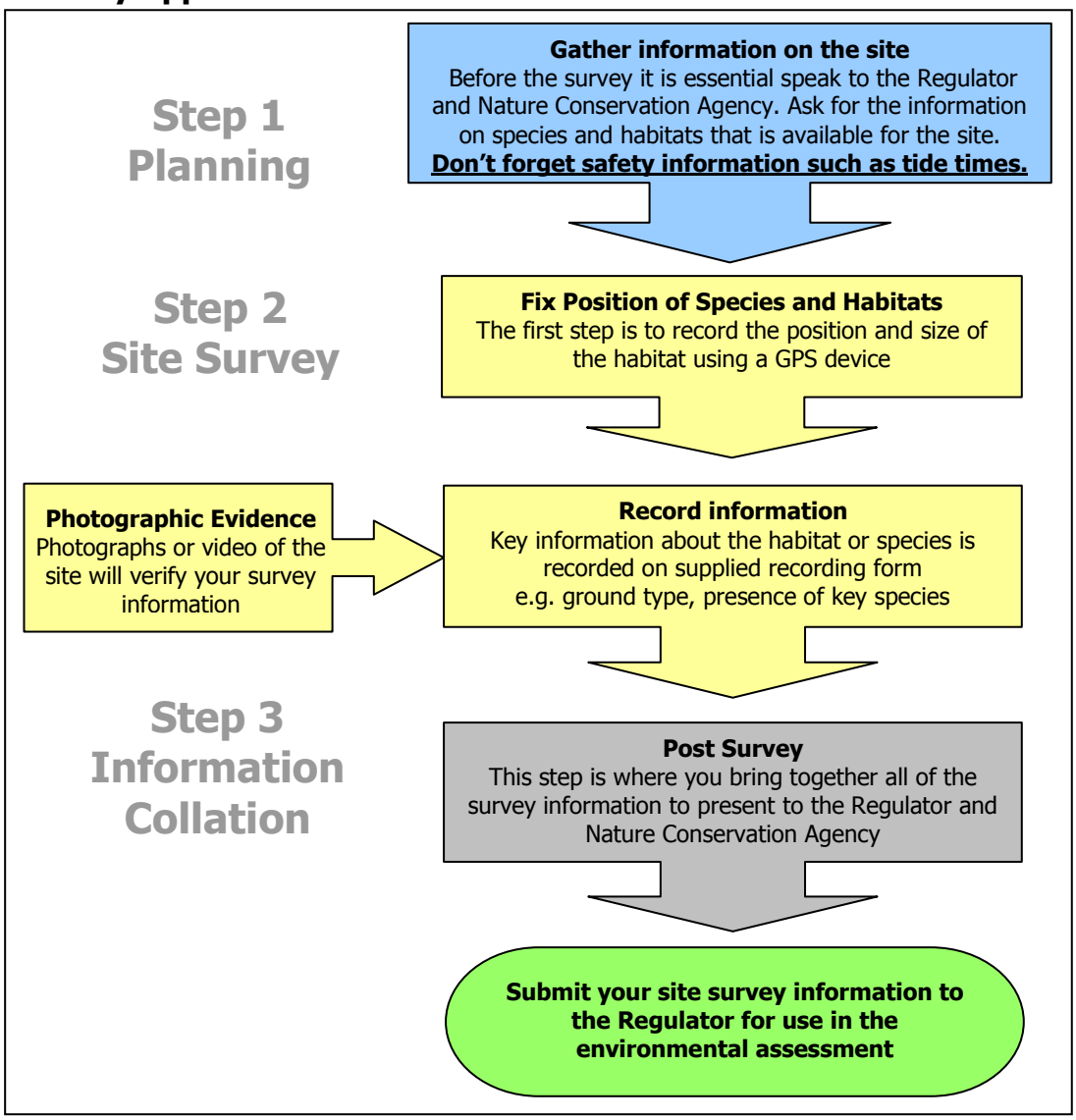
Very often there is a lack of detailed information, needed by Regulators to undertake an environmental assessment, about the **habitats** and **species** found on the shore at the location of a proposed shellfish farm development.

This guidance sheet will take you through the process of carrying out a **basic site survey** using a GPS, a digital stills camera or video recorder and a standard recording form to **record the location, access to and from** and **types of habitat** and **species** found in and around your proposed shellfish farm site.

By accurately recording the GPS coordinates of habitats and by photographing or videoing the site you will be able to provide Regulators with **accurate** and **verifiable** information on the species and habitats, which could help Regulators to make a positive decision on your proposal.

Be sure that you are confident in your abilities before you attempt this work as you can always employ a specialist for a day to carry out the work

The Site Survey Approach



What are habitats?

Habitats are quite simply the parts of the environment where plant and animal species live, in this case the **seabed** or **ground type**, e.g.

- Razor Clams live in a **sand habitat**
- Seaweed is mostly found in **rocky habitats**
- Oysters can be found on **muddy habitats**

A habitat can be thought of as the shore type that a plant or animal species lives in or on

What is the aim of a basic site survey?

The aim of an intertidal site survey is to simply provide information of the **types**, **locations** and **size** of the **habitats** present in and around your proposed site.

To do this you will need to record three key pieces of information:

1. **Type of habitat** (ground)
2. **Location** of the habitat
3. **Location** of important species

This information can be supported and verified by:

4. A **photographic** or **video** record
5. A **sketch map** of the site

Photographic records of each habitat will provide evidence that your records are accurate

Remember that even after you have completed your work, additional work may still need to be done by specialist marine ecologists if some questions remain unanswered.

What equipment will you need?

For carrying out this type of work you will need the following items of equipment. You may already have some of these items and the **Site Survey Forms** are included at the back of this guidance.

- **Site Survey Forms** (included in this guidance), notebook or clipboard and pencils
- Photocopies of **chart** or **OS map** or printout of **aerial photograph** from internet
- **Digital camera**
- **Handheld GPS**
- **Ruler** or **tape measure**
- A **small hand trowel** and a **pocket knife** may also be useful
- Minimum suggested **Safety equipment** includes mobile phone, VHF radio, flares, whistles, personal protective clothing, first aid kit, lifejacket and **tide tables**

(For further guidance on working in the intertidal area contact the Health & Safety Executive)

Step-by-step guide to carrying out a survey

Step 1 – Survey Planning

Planning is an essential part of a survey; time spent in preparation will save you time and effort on the shore

Information Gathering

To guide your survey it is a good idea to obtain **maps** and **charts** of the site and **mark out** the **position** of, and **access routes** to, your proposed shellfish farm development. Admiralty charts and Ordinance Survey maps can show you details of alternative access points and the positions of reefs and similar large habitat features that you may need to gather information on. Another good source of information to help with planning are aerial photographs obtained from mapping websites such as Google Earth. The **Nature Conversation Agency** should also be able to provide or guide you to information on the protected areas.

If possible take an initial series of photographs of the site and the types of habitat found there. These will help both you and the Regulator identify the most important habitats that need to be recorded in the survey.

Equipped with your photos and a chart with clear details of the **position** of and **access routes** to your proposed shellfish farm operation speak to both the **Regulator** carrying out the environmental assessment and the **Nature Conservation Agency,** e.g. Natural England.

Both of these types of organisations will be able to advise you on key habitats or species to look for and provide you with guidance on how to identify them.

Questions to ask:

- **What survey information does the Regulator or nature conservation agency already have of your proposed site?**
  - This could save you a lot of effort if there is already information on your site
- **What areas should your survey cover?**
  - The Regulator will be able to advise you on which areas that need to be surveyed in and around your proposed site ensuring you do not waste time and effort
- **Are there particular habitats or species that you should look out for?**
  - The nature conservation agency will be able to advise you which sensitive habitats or species to be aware of at your **proposed site** or along the **access route**
- **Invite Regulators and nature conservation agency staff to come along on the survey day**
  - Their participation, if staff are available, will provide you with on the spot advice and guidance, and also increase their confidence in the information recorded. Make sure that you give them plenty of warning.

A list of useful information sources can be found at the back of this guidance pack

The Survey Plan

After talking to the Regulator and Nature Conservation Agency you will now have a clear idea of the areas that you need to survey and the important habitats and species to record information on.

Referring to your photocopied maps/charts/aerial photographs and, most likely, your local knowledge, decide the order of areas of the site to visit first over the low water period.

Some general tips

- You do not need to map every inch of a sandy shore if that is the **dominant habitat**; **concentrate** on the **smaller habitat** features and make a note of the dominant habitat
- Concentrate your effort on the areas **inside** and **around** the site of your shellfish farm development – probably between the **mid – low tide level** on the shore

Don't waste effort in areas of no concern

- The **upper shore** will be less important unless you **access** your site by **foot** or **vehicle** then you will probably need to provide information about habitats along the **access routes**
- If you are required to provide information about habitats along the **access routes** plan to take a **series of records** along the route

Ensure that you have up to date weather and tidal information for the site and plan your work around the low water period. Plan to have sufficient time to return to the shore.

Photo © Andy Woolmer Salacia-Marine

Make sure that you have the correct tide times for the survey day

Step 2 – Carrying out the Survey

A **Site Survey Form** has been produced to help you record key information

(The form can be found with completed examples at the back of this guidance)

By following the **Site Survey Form** you will be able to record the information required by Regulators to inform an environmental assessment. **The remainder of this section will take you through filling out the form and recording key information.**

1. Site Description

When you arrive at the site it is a good idea to take some **photos** of the whole area to be surveyed with prominent landmarks in them; this can provide important information later on. Make some notes or a **description of the site** on the **cover sheet**, e.g.

General description of the site (e.g. Is it a rocky shore with patches of sand or a mudflat with boulder areas? What is the dominant habitat?)

The site is a sandy shore with a large stone and boulder mussel scar in the centre of it. There are also some small patches of eelgrass and small boulder areas.

Photographs/Video Taken (Y/N)

2. Recording access route

Information on your access route to and from the shellfish farm site is as important as the actual survey. This information can be used to help you to avoid damage to other sensitive habitats.

Using the **Access Route Recording Table** record the position of each different type of habitat (ground) that you encounter to reach the shore.

Waypoint Name	Latitude	Longitude	Description of Habitat	Photograph/Video Time Taken
Access-1	N 51° 44' 42.0576"	W 004° 22' 38.5968"	Track	11:30
Access-2	N 51° 44' 39.0012"	W 004° 22' 35.4684"	Grass	11:35

Fix Position of habitats

When you arrive at a habitat of interest, record its location using your handheld GPS.

- If the habitat feature is quite small simply store a waypoint in the centre of it
- If it is large, walk around it creating a series of waypoints at regular intervals to describe its shape
- When recording habitats along the **access route** fix the position the different types of ground you travel over to the shore

e.g.

Waypoint Name	Latitude	Longitude
Mussels-1	N 51° 44' 42.0576"	W 004° 22' 38.5968"
Mussels-2	N 51° 44' 39.0012"	W 004° 22' 35.4684"

The GPS should be set to the **WGPS84 datum** and we recommend that you record the coordinates in the **degree and decimal minutes** format e.g.
N 51° 44' 42.0576" W 004° 22' 38.5968"

If you require more details on the use of GPS devices there is a guidance sheet included at the back of this document

Photographic Evidence

Taking **photographs** or **video footage** of each habitat will provide evidence that your records are accurate. Photographs or video may contain very useful additional information for an expert which may assist in the environmental assessment.

It is recommended that you use a camera that records time and date on the photograph or video to help matching them to the record sheets

Photo © Andy Woolmer Salacia-Marine

Your 1st photograph/1st section of video should be of the **GPS screen** showing the correct **time** and location **coordinates** of the habitat – this will provide you with backup information of your waypoint positions and will enable you to identify the sites in the photographs later on.

It is helpful to provide a **verbal description** on the video footage.

Remember to record the times on the **Site Habitat Survey Form** of the photographs e.g.

Photograph/Video Time Taken
12:10 - GPS
12:11
12:15

When you take a photograph of a habitat it is a good idea to include in it a ruler or measuring tape, or alternatively an item of a known size.

This will provide a reference to judge the sizes of habitat details.

In this example the surveyor has used the GPS and a hand rake to provide a scale.

Photo © Andy Woolmer Salacia-Marine

Recording Habitat Information

The **Site Survey Form** has been designed to enable you to record habitat descriptive features in a way that will be useful to the Regulator carrying out the assessment. This section explains how to fill out these boxes.

Habitat Description

- **What is the habitat you are surveying?**

Just like the site description this is a simple non-technical portrayal of the habitat or shore type e.g. a mussel bed on boulders and cobbles.

Habitat Description
Mussel scar made up of boulders and cobbles with shell material in the crevices. Large patches of small mussel.

Height on the shore

- **How high is it above the low water mark?**

You should be able to estimate where the habitat you are recording lies on the shore in relation to the low water mark

Height on the shore
(High/Midshore/Lowshore)

Habitat Types

In order to provide more information on the type of habitat or ground there are a series of features to tick.

This is straightforward as the habitats categories are fairly intuitive; boulders, cobbles, pebbles gravel, sand and mud.

Habitat Type (tick and circle as necessary)	✓
Bedrock	
Boulders (larger than 25 cm)	✓
Cobbles and Pebbles (1.5 – 25 cm)	✓
Gravel **please circle** Shell/Stone/Other	✓
Sand **please circle**: Coarse/Medium/Fine	
Mud	

If gravel present, what is it made of? **Circle** Shell, Stone or if it is made of something else, Other.

If you are on sandy ground, how coarse is it? **Circle** Coarse, Medium or Fine.

Habitat Features

There is a box for recording some extra information about this habitat that can be very important for Regulators or the Nature Conservation Agency.

Your local knowledge will help you to assess such as the level of **wave action**, this part of the site Fully Exposed, Moderately Sheltered or Sheltered? **Circle** as appropriate.

On rocky shores tick the relevant box if there are **rockpools** present or if there are **seaweed** or **animals** attached to the rocks.

Habitat Features (tick and circle as necessary)	✓
Wave Action (Exposed/Moderately Sheltered/Sheltered)	
Rockpools	✓
Seaweed on Rocks	✓
Animals on Rocks	✓
Sand Ripples or Waves	
Burrows/Casts/Tubes	

On sandy shores, record whether the sediment has been formed into **ripples** or **sand waves**? Also record signs of animal **Burrows** or worm **Casts** and **Tubes.**

Custom Habitat Recording

A box is provided to record other species or habitats that you may have been asked to record by the Nature Conservation Agency or Regulators.

Custom Habitat Recording (Record any species or habitat features requested by the Nature Conservation Agency or Regulator)			

Other Species of Interest or Notes

You may wish to make a note of other wildlife or aspects of this location within the site. If so use the note box provided.

Other species of interest or notes?

Small flock of oystercatchers on the lower end of the scar at low water. No seals present but are sometimes seen hauled out on the sand at the south of the site.

Use the back of the form to sketch the particular habitat if you think that will help you describe its shape, size and position on the shore.

Use back of sheet for sketches of habitat or site →

Step 3 – Post Survey Reporting

This step is not as daunting as it sounds!

The aim of this step is to gather all of your site survey information together in a format that can be easily accessed by the Regulator dealing with the environmental assessment.

1. **Copy** out your field record sheets to **new clean record sheets**

2. If possible **rename** or **label** the photographs or videos with the corresponding name of the habitat or GPS waypoint on your record sheet. Digital photographs can be printed out or copied onto a CD.

3. If possible, it is helpful for the Regulator if you can transfer the **waypoints** from the **GPS** to a computer file; there are a number of freely available computer programs to do this (see the 'Useful sources of information' section for examples).

4. Create a **'sketch map'** to provide a schematic of the site

Making a sketch map

The purpose of a sketch map is to provide an **approximate plan** of a site with the **locations** and **areas** of habitats and any key species.

In addition to the record sheets and photographs a sketch map is useful way of displaying your information.

Probably the easiest way of making a map is using an Admiralty chart, OS map or aerial photograph as a starting point, then:

1. **Using your waypoint coordinates mark the location of the habitats recorded**

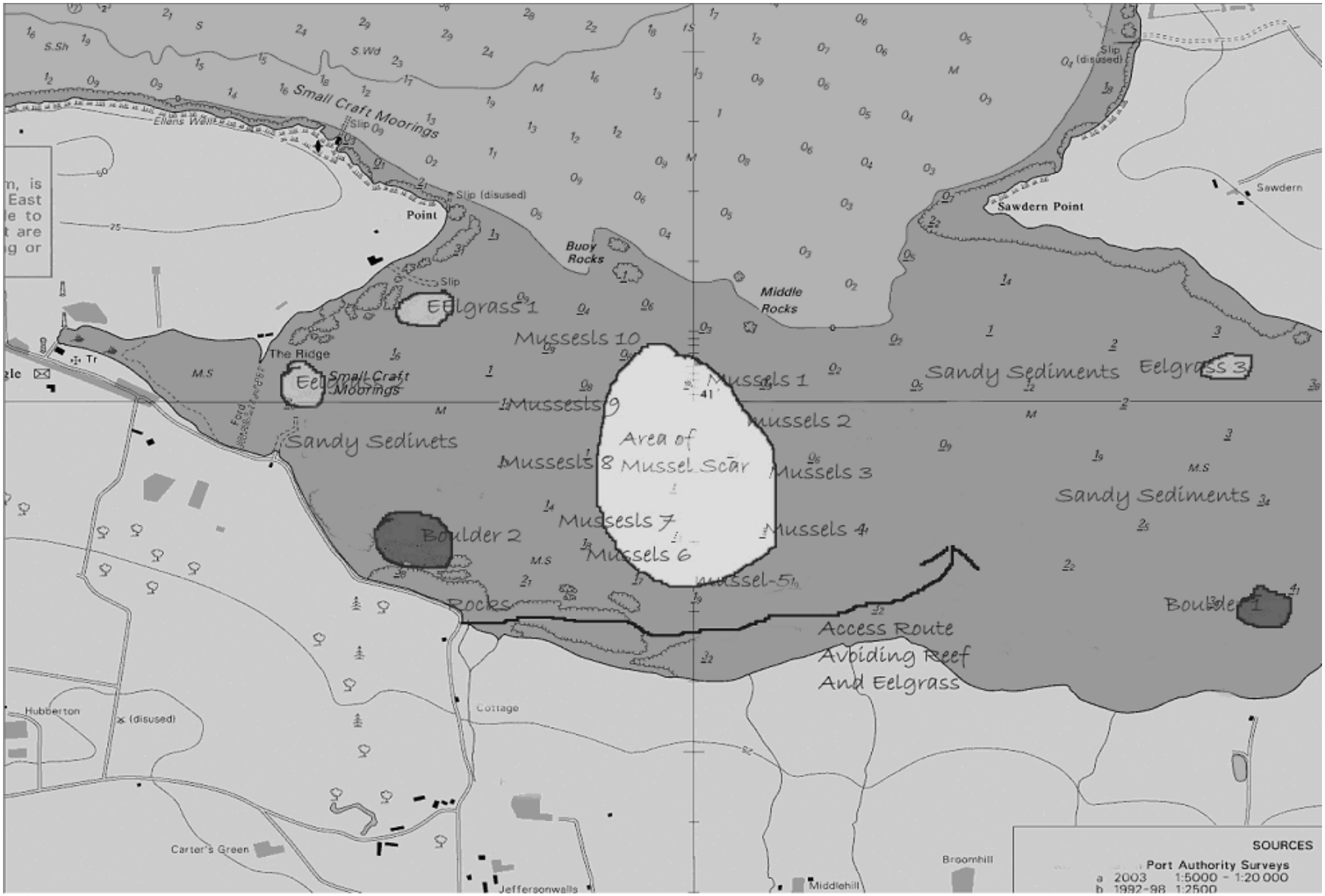
2. **Outline the approximate areas of the habitat features by referring to your waypoints and photographs**

3. **Label the various habitats and various points of interest**

An example sketch map can be found on the next page

Example of a sketch map

Note that map shows the locations and general areas of the habitats you surveyed and your access routes on and off the site



Key contacts:

First points of contact with the different organisations involved in marine wildlife protection are:

Fishery managers:

Cornwall Sea Fisheries Committee
Tel: 01736 369817 www.cornwall.gov.uk/seafisheries

Cumbria Sea Fisheries Committee
Tel: 01946 693047 www.cumbriasfc.org.uk

Devon Sea Fisheries Committee
Tel: 01803 854648 devonseafish@btconnect.com

Eastern Sea Fisheries Committee
Tel: 01553 775321 www.esfjc.co.uk

Isles of Scilly Sea Fisheries Committee
Tel: 01720 423371
www.scilly.gov.uk/environment/fisheries/

Kent and Essex Sea Fisheries Committee
Tel: 01843 585310 www.kentandessex-sfc.co.uk

North Eastern Sea Fisheries Committee
Tel: 01482 393690 www.neseafish.gov.uk

North Western and North Wales Sea Fisheries Committee Tel: 01524 68745 www.nwnwsfc.org

Northumberland Sea Fisheries Committee
Tel: 01670 731399 www.nsfc.org.uk

Southern Sea Fisheries Committee
Tel: 01202 721373 www.southernsfc.org.uk

South Wales Sea Fisheries Committee
Tel: 01792 654466 www.swsfc.org.uk

Sussex Sea Fisheries Committee
Tel: 01273 454407 www.sussex-sfc.gov.uk

DEFRA Tel: 0845 33 55 77 (Helpline)
http://www.defra.gov.uk/marine/fisheries/index.htm

Scottish Executive Tel: 0845 774 1741 (Sea Fisheries Division)
www.scotland.gov.uk/Topics/Fisheries/Sea-Fisheries

Welsh Assembly Government (Dept for Rural Affairs and Heritage) Tel: 0845 010 3300
http://new.wales.gov.uk/topics/environmentcountryside

Department of Agriculture and Rural Development, Northern Ireland Tel: 02890 524 999 (Helpline)
www.dardni.gov.uk/index/fisheries-farming-and-food/fisheries/sea-fisheries.htm

Environment Agency Tel: 08708 506 506 (General Enquiries)
www.environment-agency.gov.uk

Marine & Fisheries Agency Tel: 020 7283 6000 (London)
www.mfa.gov.uk

Nature Conservation Agencies:

Natural England Tel: 0845 600 3078 (Enquiry Service)
www.naturalengland.org.uk

Scottish Natural Heritage Tel: 01463 725000 (HQ Inverness)
www.snh.org.uk

Countryside Council for Wales Tel: 0845 1306 229 (General Enquiries) www.ccw.gov.uk
Environment and Heritage Service, Northern Ireland Tel: 028 9054 0540 (Dept of the Environment) www.ehsni.gov.uk

Joint Nature Conservation Committee Tel: 01733 562 626 (Enquiries) www.jncc.gov.uk

Fishing industry associations:

National Federation of Fishermen's Organisations
Tel: 01904 635430 www.nffo.org.uk

Scottish Fishermen's Federation Tel: 01224 646 944
www.sff.co.uk

Welsh Federation of Fishermen's Associations
Tel: 01437 779 312 www.wffa.org.uk

North Ireland Fishermen's Federation Tel: 02842 771946

Shellfish Association of Great Britain Tel: 0207 283 8305
www.shellfish.org.uk

Association of Scottish Shellfish Growers Ltd
Tel: 01471 844324 www.assg.co.uk

Seafish and the environment

Seafish exists to provide support to the fishing industry. In 2006, we identified that wildlife conservation is a major concern to the industry. We are working to make it easier for the fishing industry to work in harmony with wildlife conservation interests. We have a dedicated Environmental Assessment Support Officer who can provide you with free advice on environmental issues:

Mark Gray, Seafish, Origin Way, Europarc, Grimsby, DN37 9TZ, Tel 01472 252300, Mob 07966 764150 email m_gray@seafish.co.uk Links to useful information sources can be found on the Seafish website, www.seafish.org

Useful sources of information

Survey methods:
http://www.jncc.gov.uk/page-2430
This is a link to the JNCC Marine Monitoring Handbook which contains a wealth of detailed information on survey and sampling methods.

http://www.seasearch.org.uk/
This site has guidance for divers undertaking surveys but has good general information on survey approaches.

http://www.marlin.ac.uk/shore_thing/resources.html
This site has shore survey methods for use by schools and other voluntary groups and may have some good advice.

'Handbook for Marine Intertidal Phase 1 Biotope Mapping Survey'
CCW have produced a handbook outlining methods of undertaking habitat and biotope surveys. This may be available on request from CCW offices (see Key contacts).

Aerial Survey Photograph Websites:
http://www.flashearth.com/
http://maps.google.co.uk/
http://maps.live.com/

More information on using GPS:
http://www8.garmin.com/aboutGPS/manual.html

Software to download waypoints from GPS:
http://www.easygps.com/default.asp
http://www.tapr.org/~kh2z/Waypoint/
http://earth.google.com/

Marine wildlife and communities:
http://www.marlin.ac.uk/sah/

Health and Safety:
http://www.hse.gov.uk/pubns/estuary.htm
Guidance to safe working practices when working on intertidal shores

http://www.pol.ac.uk/ntslf/tidalp.html
7 day tide predictions are available from this site

Links to further useful information sources can be found from the Seafish website
www.seafish.co.uk

Intertidal Habitat Survey Cover Sheet

Fill this sheet out and include it with your survey forms, photographic evidence and GPS data when submitting to Regulator

Name	
Address	
Telephone Number	
Mobile Number	
Email address	

Site Name	
Date of Survey	

General description of the site (e.g. is it a rocky shore with patches of sand or a mudflat with boulder areas? What is the dominant habitat?)

Photographs/Video Taken (Y/N)

Access Route Recording Table

Fill this sheet out if access to your shellfish farm site is by a method other than boat i.e. by vehicle or by foot

When recording habitats along the **access route** record the position of each different type of habitat (ground) that you encounter to reach the shore

Waypoint Name	Latitude	Longitude	Description of Habitat	Photograph Time Taken

Habitat Description	Habitat Type (tick and circle as necessary)	✓	Habitat Features (tick and circle as necessary)	✓
	Bedrock		Wave Action (Exposed/Moderately Sheltered/Sheltered)	
	Boulders (larger than 25 cm)		Rockpools	
	Cobbles and Pebbles (1.5 – 25 cm)		Sand Ripples or Waves	
	Gravel **please circle** Shell/Stone/Other		Seaweed on Rocks	
	Sand **please circle**: Coarse/Medium/Fine		Animals on Rocks	
	Mud		Mounds/Casts/Tubes	
	Custom Habitat Recording (Record any species or habitat features requested by the conservation agency or fishery manager)			
Height on the shore				
(High/Midshore/Lowshore)				

Waypoint	Latitude	Longitude	Photograph/Video Time Taken	Other species of interest or notes?

Habitat Description	Habitat Type (tick and circle as necessary)	✓	Habitat Features (tick and circle as necessary)	✓
	Bedrock		Wave Action (Exposed/Moderately Sheltered/Sheltered)	
	Boulders (larger than 25 cm)		Rockpools	
	Cobbles and Pebbles (1.5 – 25 cm)		Sand Ripples or Waves	
	Gravel **please circle** Shell/Stone/Other		Seaweed on Rocks	
	Sand **please circle**: Coarse/Medium/Fine		Animals on Rocks	
	Mud		Mounds/Casts/Tubes	
	Custom Habitat Recording (Record any species or habitat features requested by the conservation agency or fishery manager)			
Height on the shore				
(High/Midshore/Lowshore)				

Waypoint	Latitude	Longitude	Photograph/Video Time Taken	Other species of interest or notes?

Use back of sheet for sketches of habitat or site →

Intertidal Habitat Survey Cover Sheet - *Example*

Fill this sheet out and include it with your survey forms, photographic evidence and GPS data when submitting to Regulator

Name	A. Fisher
Address	A. Fisher 1 Seaside Road Estuary Town ET11AA
Telephone Number	01234 567891
Mobile Number	012345678910
Email address	Afisher@anisp.com

Site Name	Sandy Bay
Date of Survey	20 September 2007

General description of the site (e.g. is it a rocky shore with patches of sand or a mudflat with boulder areas? What is the dominant habitat?)

The site is a sandy shore with a large stone and boulder mussel scar in the centre of it. There are also some small patches of eelgrass and small boulder areas.

Photographs/Video Taken (Y/N)

Access Route Recording Form - *Example*

Fill this sheet out if access to your shellfish farm site is method other than boat, i.e. by vehicle or by foot

When recording habitats along the **access route** record the position of each different type of habitat (ground) that you encounter to reach the shore

Waypoint Name	Latitude	Longitude	Description of Habitat	Photograph Time Taken
Access-1	N 51° 44' 42.0576"	W 004° 22' 38.5968"	Track	11:30
Access-2	N 51° 44' 39.0012"	W 004° 22' 35.4684"	Grass	11:35
Access-3	N 51° 44' 35.4156"	W 004° 22' 33.9492"	Salt marsh	11:38
Access-4	N 51° 44' 31.4088"	W 004° 22' 34.5432"	Muddy Sand	11:50
Access-5	N 51° 44' 29.4612"	W 004° 22' 37.7616"	Sand	11:56

Site Survey Form - *Example*

Habitat Description	Habitat Type (tick and circle as necessary)	✓	Habitat Features (tick and circle as necessary)	✓
Mussel scar made up of boulders and cobbles with shell material in the crevices. Large patches of small mussel.	Bedrock		Wave Action (Exposed/Moderately Sheltered/Sheltered)	
	Boulders (larger than 25 cm)	✓	Rockpools	
	Cobbles and Pebbles (1.5 – 25 cm)	✓	Sand Ripples or Waves	
	Gravel **please circle** Shell/Stone/Other	✓	Seaweed on Rocks	✓
	Sand **please circle**: Coarse/Medium/Fine		Animals on Rocks	✓
	Mud		Mounds/Casts/Tubes	
	Custom Habitat Recording (Record any species or habitat features requested by the conservation agency or fishery manager)			
Height on the shore				
(High/Midshore/Lowshore)				

Waypoint	Latitude	Longitude	Photograph/Video Time Taken	Other species of interest or notes?
Mussels-1	N 51° 44' 42.0576"	W 004° 22' 38.596"	12:10 GPS	Evidence of bait collection on the mussel bed
Mussels-2	N 51° 44' 39.0012"	W 004° 22' 35.464"	12:11	
Mussels-3	N 51° 44' 35.4156"	W 004° 22' 33.949"	12:13	
Mussels-4	N 51° 44' 31.4088"	W 004° 22' 34.543"	12:14	
Mussels-5	N 51° 44' 29.4612"	W 004° 22' 37.761"		
Mussels-6	N 51° 44' 30.516"	W 004° 22' 43.003"		
Mussels-7	N 51° 44' 33.7308"	W 004° 22' 46.556"		
Mussels-8	N 51° 44' 38.0004"	W 004° 22' 48.158"		

Habitat Description	Habitat Type (tick and circle as necessary)	✓	Habitat Features (tick and circle as necessary)	✓
Area of sandy sediment with eelgrass. Patches of eelgrass are on small mounds surrounded by bare sand. The mounds are about 2 metres across	Bedrock		Wave Action (Fully Exposed /Moderately Sheltered/Sheltered)	
	Boulders (larger than 25 cm)		Rockpools	
	Cobbles and Pebbles (1.5 – 25 cm)		Sand Ripples or Waves	✓
	Gravel **please circle** Shell/Stone/Other		Seaweed on Rocks	
	Sand **please circle**: Coarse/Medium/Fine	✓	Animals on Rocks	
	Mud		Mounds/Casts/Tubes	✓
	Custom Habitat Recording (Record any species or habitat features requested by the conservation agency or fishery manager)			
Height on the shore				
(High/Midshore/Lowshore)				

Waypoint	Latitude	Longitude	Photograph/Video Time Taken	Other species of interest or notes?
Eelgrass-1	N 51° 44' 34.8396"	W 004° 22' 52.674"	12:45 - GPS	The eelgrass patches were all small less than 2 metres square. There were cockles present in the sediment around the patches but no other species were seen. These patches are outside of the area that I am interested in for my shellfish farm.
Eelgrass-2	N 51° 44' 29.1984"	W 004° 22' 50.620"	12:46	
Eelgrass-3	N 51° 44' 39.0516"	W 004° 22' 26.248"	12:50 -GPS	
			12:50	
			13:09 - GPS	
			13:10	

Standard Operating Procedure Guidance - How to use a GPS Device for site surveys

What is GPS?

GPS stands for **G**lobal **P**ositioning **S**ystem and is a satellite-based positioning and navigation system owned and operated by US Department of Defence. GPS can give a position accurate to within approximately 10 m using a single handheld receiver. This makes it very useful for surveying a site.

How will a GPS help me survey a site?

A GPS device will enable you to:

- Plot the positions of habitats (e.g. locations of sand and rock)
- Determine the size of habitats (e.g. reefs)
- Create accurate sketch maps of the site

How GPS works:
A GPS device calculates your position by measuring the distance between you and three or more GPS satellites.

Because the GPS microwave signal travels at a known speed the GPS device can calculate the distance from each satellite by measuring the time delay between transmission from the satellite and its reception. By calculating the position of at least three satellites the GPS device can determine your position

Position Formats and Map Datum

You will probably be used to using Admiralty chats. These charts use the most common coordinate system: **latitude and longitude**.

The map datum is the reference point that the coordinate system refers to. The most widely used datum is **WGS84** and most modern Admiralty charts use it although it is always wise to check in the text box on the chart.

Your GPS set should be set to WGS84

Example of **latitude longitude** coordinates of the same location:

Decimal Degrees:
N 51.744390 W 4.376380W
Degrees and Decimal Minutes:
N 51° 44.66340' W 4° 22.58280'
Degrees, Minutes and Seconds:
N 51° 44' 39,804" W 4° 22' 34.368"

All are equally valid but it is important that you stick to the same format – we recommend **degrees** and **decimal minutes**

Waypoints

A GPS set can store positions as **Waypoints**. This is usually a simple click of the button on your GPS device; you may need to refer to your user manual for instructions.

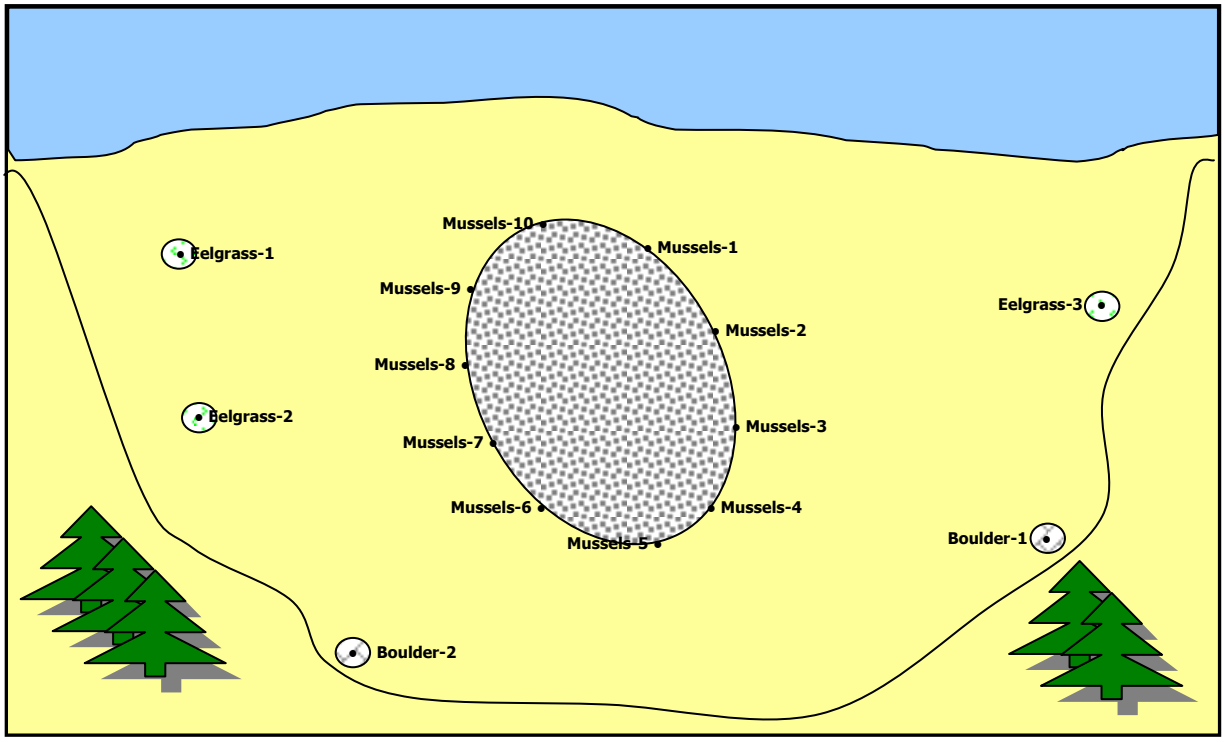
When storing waypoints it is a good idea to give them consistent names e.g. rock-1, sand-3 or photo-4 etc.

Mapping with waypoints

By using a series of waypoints you can easily plot the area of a large habitat feature such as a mussel bed or sandbank. Simply move around the outside of the habitat feature recording waypoints at regular intervals (remember to name them consistently). This type of information is very useful to the Regulator and Nature Conservation Agency who can plot the waypoints on their Geographical Information System.

Example: Mapping Habitat Features

In this example a mussel bed and other habitat features that have been mapped in a bay.



The surveyor walked the around the edge of the mussel bed and recorded a series of waypoints. The waypoints were all named in a sequential manner – Mussels 1 to 10. The surveyor then recorded single waypoints for small habitat features such as boulders and patches of eelgrass.
The surveyor recorded the coordinates of each waypoint in latitude and longitude format on a recording form to ensure no information was lost:

Waypoint	Latitude	Longitude
Mussels-1	N 51° 44' 42.0576"	W 004° 22' 38.5968"
Mussels-2	N 51° 44' 39.0012"	W 004° 22' 35.4684"
Mussels-3	N 51° 44' 35.4156"	W 004° 22' 33.9492"
Mussels-4	N 51° 44' 31.4088"	W 004° 22' 34.5432"
Mussels-5	N 51° 44' 29.4612"	W 004° 22' 37.7616"
Mussels-6	N 51° 44' 30.516"	W 004° 22' 43.0032"
Mussels-7	N 51° 44' 33.7308"	W 004° 22' 46.5564"
Mussels-8	N 51° 44' 38.0004"	W 004° 22' 48.1584"
Mussels-9	N 51° 44' 41.0568"	W 004° 22' 47.6472"
Mussels-10	N 51° 44' 43.4292"	W 004° 22' 44.6016"
Eelgrass-1	N 51° 44' 34.8396"	W 004° 22' 54.6744"
Eelgrass-2	N 51° 44' 29.1984"	W 004° 22' 50.6208"
Eelgrass-3	N 51° 44' 39.0516"	W 004° 22' 26.2488"
Boulder-1	N 51° 44' 27.456"	W 004° 22' 33.7872"
Boulder-2	N 51° 44' 26.0376"	W 004° 22' 44.1084"

Sea Fish Industry Authority

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supporting the seafood industry for a sustainable, profitable future