SEPA
Scottish Environment Protection Agency
Buidheann Dìon Àrainneachd na h-Alba

Finfish Aquaculture Sector

Baseline survey design

Version 2 May 2022

1. Process requirements for baseline survey

As part of the pre-application process, the operator must submit a baseline survey plan to SEPA. Baseline surveys must:

- characterise the seabed in and around a farm's predicted area of impact;
- identify any protected habitats or species within that area;
- provide an assessment of the existing environmental status of the seabed, including existing impacts;
- address any potential risks identified in the wider area.

1.1. Identification of survey area

1.1.1. The minimum baseline survey area must be identified by extending the allowable mixing zone along its major and minor axes by 50 meters in all directions, or to a distance of 150 meters from the pen edge – whichever is greater; and enclosing this extended area. An example is given in Figure 1 below:

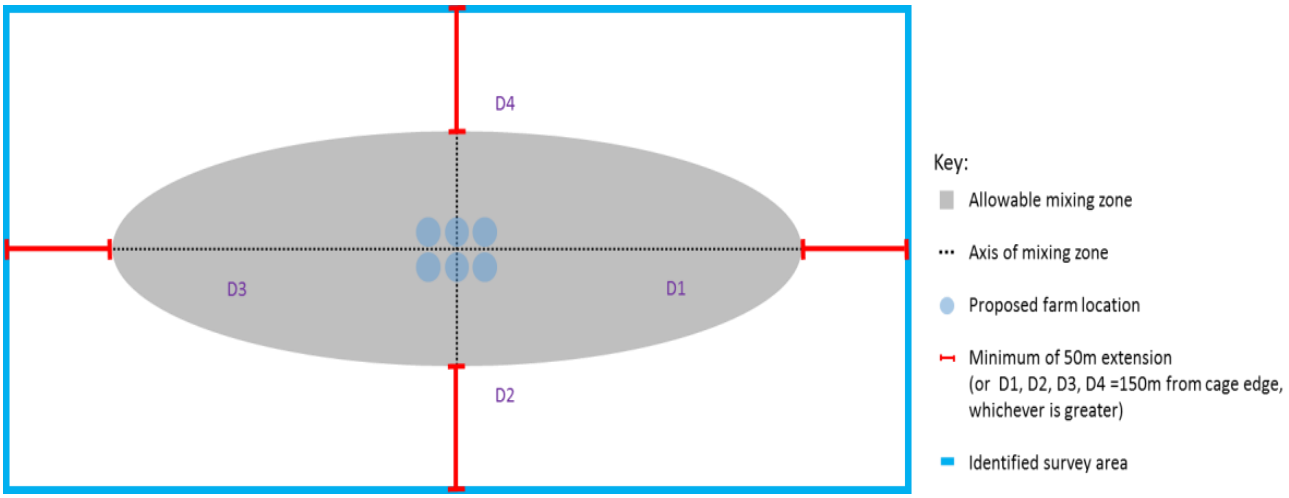


Figure 1. Survey area identification

1.2. Seabed Assessment

1.2.1. Within the identified survey area, an initial visual assessment of the seabed must be performed prior to any detailed baseline survey design taking place.

1.2.2. The extent of this assessment must be sufficient to identify the broad habitat types found within the survey area, and the boundaries between those habitats.

1.2.3. All data collected during seabed assessment must be submitted to SEPA in the form of a baseline survey report. All data collected must be made available to SEPA on request.

For further guidance on how to perform baseline survey seabed assessment, refer to Annex A.

1.3. Survey design

1.3.1. Sampling effort must be sufficient to provide an assessment of the status of each habitat type. By using a targeted approach, required sampling effort will be less where the seabed is homogenous than in a heterogeneous environment.

1.3.2. Within each soft sediment habitat identified during seabed assessment, a sufficient number of sampling stations must be randomly distributed within that area. In order to allow for reasonable characterisation, a minimum of five sampling stations must be located in each habitat.

NOTE 1: Under certain circumstances (e.g. conditions of greater variability) SEPA reserves the right to require a greater minimum number of sampling stations.

NOTE 2: Where PMFs have been identified during seabed assessment further consultation with SEPA will be required in order to determine an appropriate monitoring approach.

1.3.3. To determine the location of sampling stations within a habitat, a semi-probabilistic sampling approach must be applied:

- Sampling grids will be placed over each individual habitat.
- Grid spacing for a habitat will be proportional to the habitat's size.
- Sample stations for each habitat must be randomly distributed within each grid.

An example is given in Figure 2 below:

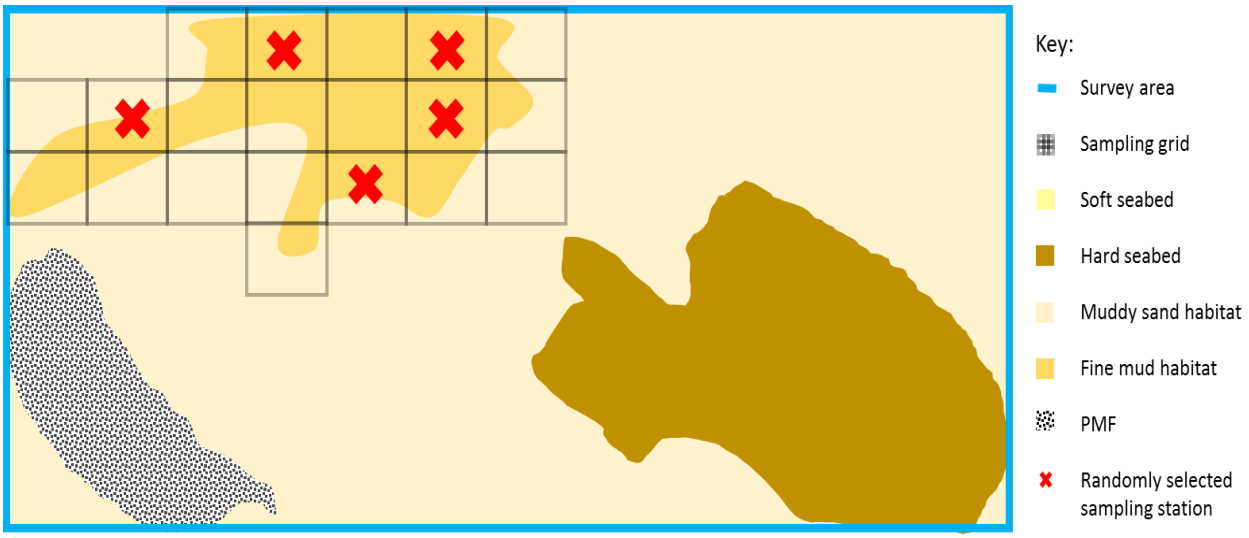


Figure 2. Semi-probabilistic sampling approach with randomised sampling stations.

1.4. Sampling requirements

1.4.1. At each soft sediment sampling station, grab samples must be collected for the following parameters:

- Benthic Invertebrates
- Particle Size Analysis (PSA)
- Total Organic Carbon (TOC)

NOTE: It is imperative that areas where PMFs have been found are not subject to invasive sampling techniques.

1.4.2. Where there is previous use of in-feed medicine within the waterbody or wider area within which the proposed farm is to be sited, then chemical residue samples must also be collected and analysed.

1.4.3. SEPA reserves the right to require that samples are collected for additional analyses depending on the risks identified during the pre-application process.

1.4.4. Where seabed assessment has identified areas that cannot be grab sampled (i.e. hard substrate habitats and/or some types of PMF) then these areas must be subject to a more detailed visual survey of sufficient quality to allow descriptions of the biotopes.

1.5. Wider area risk assessment

1.5.1. Where local bathymetry and/or model outputs identify potential sinks or hotspots of deposition then additional sampling may be required outside of the identified survey area.

1.6. Modifications to existing sites

1.6.1. In order for SEPA to assess whether environmental capacity exists to accommodate a proposed expansion or modification to a MPFF, operators must carry out a baseline survey - the design of which will be determined by existing habitat data for the new allowable mixing zone.

1.6.2. At least one environmental monitoring survey must have been carried out prior to applying for any type of modification to an existing site.

1.7. Identification of survey area

See section 1.1 above.

1.8. Seabed assessment

See section 1.2 above.

1.9. Survey design

The survey design must be sampled as in section 1.3 above, minus the overlapping extent of the existing MPFF.

1.10. Sampling requirements

See section 1.4 above

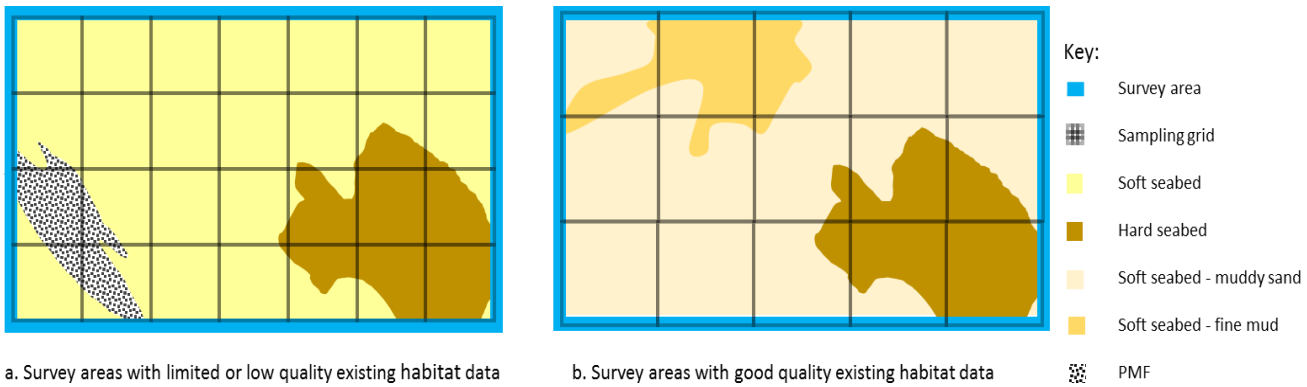
Annex A: Additional guidance Baseline survey seabed assessment

The following guidance may be applied to aid the planning and performing of seabed assessments for baseline survey. It should be read in conjunction with the contents of section 1.2 above.

A.1 A sampling grid should be applied across the survey area to allow the extent of the required assessment to be determined appropriately.

A.2 Existing habitat data, where available, may be used to help determine the spacing of the grid applied:

- Where existing habitat data is lacking, or it indicates the presence of PMFs within the survey area, then footage will be required in order to produce a detailed map of the survey area. Specific sections within the survey area may need to be surveyed in more detail (see Figure A1a)
- Where sufficient existing habitat data is already available in order to produce a map of the survey area the amount of footage required from the visual survey may be reduced proportionally - providing that the survey confirms that any existing data is correct and also covers enough ground to pick up the presence of any previously unidentified PMFs (see Figure A1B)



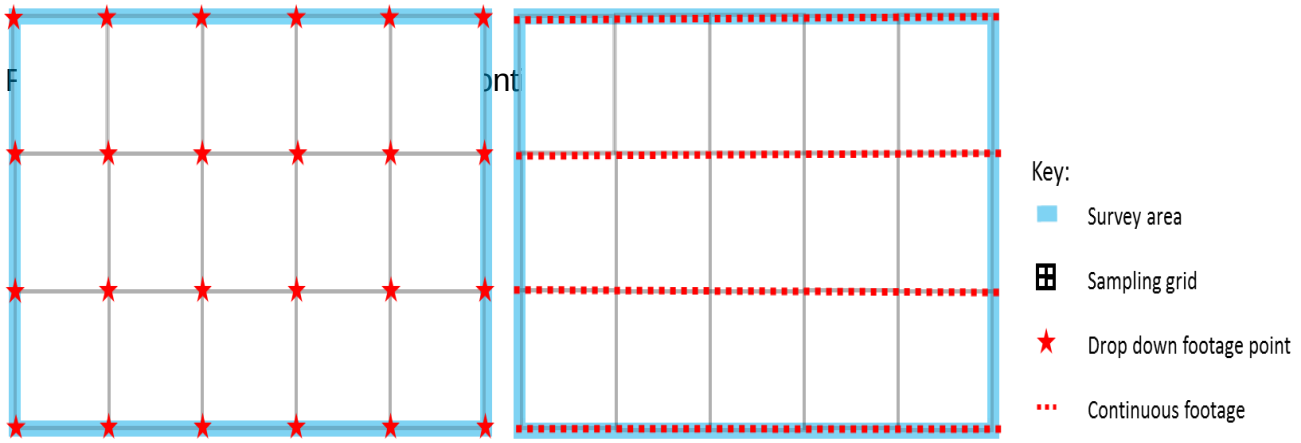
a. Survey areas with limited or low quality existing habitat data

b. Survey areas with good quality existing habitat data

Figures A1a and A1b. Examples of seabed assessment approaches

A.3 Collection of visual survey data may be achieved using one of the following approaches:

- Drop down video at gridline intersections (See figure A2).
- Continuous footage collected along lengthwise gridlines e.g. by towed camera or remotely operated underwater vehicle (ROV) (see Figure A2).



Glossary

For the purpose of this document, and unless the context requires otherwise, the following definitions shall apply:

allowable mixing zone – the maximum allowable area of impact from a fish farm, calculated by applying a 100 metre radius around each pen. Its shape will be based upon the farm's modelled impact area.

baseline survey – a survey with emphasis on characterisation and description of conditions in the survey area, which forms the basis for future monitoring and/or follow-up surveys.

biotope – a habitat and its characteristic assemblage of plant and/or animal species.

epifauna – animals living on the surface of the seabed, or attached to submerged objects, aquatic animals or plants.

habitat – an area of uniform environmental conditions.

hard substrate – substrate consisting of bedrock, larger rocks/stones or fixed marine constructions such as wharfs, quays and pipelines.

marine pen fish farm (MPFF) – a fish farm based upon a system of pens, constructed as floating collars with net bags suspended in the water column beneath. Farmed fish are held in the net bags, and waste and effluent flow from the pen(s) into the water environment under the influence of local currents.

operator – an individual or company responsible for the operation of an existing or proposed marine pen fish farm that will be subject to operator monitoring activities.

NOTE: With respect to the Water Environment (Controlled Activities) (Scotland) Regulations 2011 (CAR), the operator is the 'Authorised Person' defined and identified as such in the CAR authorisation.

priority marine features (PMFs) – habitats and species that are considered marine nature conservation priorities in Scottish waters. A list may be obtained from NatureScot.

remotely operated underwater vehicle (ROV) – remote-controlled underwater vehicle with video camera and often the possibility for mounting additional equipment (e.g. sonar, manipulator arm, etc.).

sample – a volume of water or sediment collected from a sampling station and identified for the assessment or measurement of specific determinand(s).

sampling station – a precise location within the water environment from which a sample is collected. It may be discrete or form part of a transect.

site – the location of an existing marine pen fish farm, or the proposed potential location of a new marine pen fish farm.

transect - a line across the water environment along which multiple observations are made or multiple samples are collected.

References

a. BS EN ISO 5667-19:2004 - Water quality - Sampling. Part 19: Guidance on sampling in marine sediments, ISBN 0 580 43945 3.
b. BS EN ISO 19493:2007 - Water quality. Guidance on marine biological surveys of hard-substrate communities, ISBN 978 0 580 54108 7.
c. Common Implementation Strategy for the Water Framework Directive (2000/60/EC), Guidance Document No: 25 - Guidance on chemical monitoring of sediment and biota under the Water Framework Directive.

For information on accessing this document in an alternative format or language please contact SEPA by emailing to equalities@sepa.org.uk

If you are a user of British Sign Language (BSL) the Contact Scotland BSL service gives you access to an online interpreter enabling you to communicate with us using sign language.

http://contactscotland-bsl.org/

www.sepa.org.uk