Annex

Depositional Zone Regulation Consultation

Technical Information

What seabed standards will apply under DZR?

Farms authorised under DZR will be required to comply with the following environmental standards.

DZR seabed environmental standards		
Where do the standards apply?	Cage edge (i.e. seabed immediately adjacent to the outer edge of the cages)	Depositional zone edge (i.e. seabed at the outer limit of the permitted depositional zone)
What environmental quality is required?	Waste accumulations on the seabed are not such that the seabed environment is at significant risk of becoming anoxic • Where farm wastes tend to accumulate, the most degraded (low diversity) seabed invertebrate community permitted must include two species of sediment re-worker polychaete worms (egg *Capitella species, Malacoceros fuliginosus* or *Ophryotrocha species)* in densities of greater than 1,000 individuals per m^2	No more than very minor effects on the diversity and abundance of seabed invertebrate populations • in soft sediment areas of seabed, the annual mean ecological quality ratio must not be lower than 0.75 using the infaunal quality index method[1]

How large will depositional zones be?

Under DZR, sites will be allocated a depositional zone area of up to 0.5 km^2.

The depositional zone is the maximum area of seabed that can be adversely affected by an individual site as a result of uneaten food and fish wastes settling onto it.

For many farms, particularly those in sheltered waters, the cage-edge standard will dictate the maximum fish biomass that they can farm. This will mean that, in practice, the maximum area of seabed affected will normally be considerably smaller than 0.5 km^2.

The largest depositional zones among existing sites tend to be at sites that are intermediate in terms of the degree of their shelter from, and exposure to, wave action and strong tides.

[1] Although not directly comparable, the seabed standard applied at the moment represents a slight to moderate impact on seabed invertebrate populations.

Our best analysis suggests that the vast majority of existing farms in these intermediate waters have depositional zones of less than around 0.3 km^2. Only three are indicated as having depositional zones significantly larger than this, with only one having a zone of greater than 0.4 km^2.

Standardising the maximum area of depositional zone under DZR to 0.5 km^2 will potentially allow all existing sites to transfer to DZR. It may also mean that, over time, there could be an increase in the number of farms in intermediate waters with depositional zones greater than 0.3 km^2. However, there are a range of other factors that may limit the size of depositional zones allocated farms. These factors include the need to:

- avoid risks to the achievement of river basin management plan objectives. These objectives include objectives for protecting and improving the status of coastal water body ecosystems and for the conservation of important marine habitats and species;

- protect the interests of others who rely on the health of the seabed for their businesses and livelihoods; or

- avoid the creation of large zones through interaction of the zones of neighbouring farms. For example, smaller zones than 0.5 km^2 for individual farms may be necessary where the deposition zones of neighbouring farms would otherwise overlap and result in adverse effects extending over an area of seabed greater than 0.5 km^2.

The development of new sites or the expansion of existing sites will not be permitted if:

- river basin management plan objectives would be compromised as a result of the additional and cumulative impacts on the seabed;

- other's interests would be compromised; or

- the applicant is unable to demonstrate that seabed standards will be met.

What restrictions will apply on fish biomass?

Under DZR, the limit on biomass that can be held at a site will be dictated by the seabed standards. Farmers will be able to increase biomass by up to 10% each fish growth cycle provided the standards continue to be met.

Restrictions on fish biomass under DZR	
First fish growth cycle under DZR	**Subsequent fish growth cycles**
The biomass proposed in the DZR application provided that:	Up to a 10% increase in biomass compared with the peak biomass held during the previous fish growth cycle provided that:

a) the information supplied with the application demonstrates to SEPA's satisfaction that such a biomass will not result in a breach of seabed standards.	a) no seabed standards were breached in the previous cycle; and b) taking account of information provided by SEPA monitoring, there is no indication that the increase is likely to result in a breach of the seabed standards.

What information will farmers have to provide?

Specific information requirements will apply to sites under DZR in relation to the impacts of farm wastes on the seabed[2]. These are outlined below.

Information that farmers will need to provide				
	Applying to develop new sites	Applying to transfer existing sites into DZR[3]	At the start of operating under DZR, and on an on-going basis thereafter	Changing existing location, layout or equipment (inc. at the time of transferring to DZR)
Proposed farm location	Yes			Yes
Proposed farm layout	Yes			Yes
Planned peak biomass during first fish growth cycle under DZR	Yes	Yes		
Fish production plan prior to the start of each year & any subsequent in year changes proposed to the plan[4]			Yes	
Model predictions of the extent and degree of likely deposition on the seabed using: • NewDepomod simulations conforming to model setup and range of discharge scenarios agreed with SEPA	Yes	Yes		Yes

[2] As now, farmers will also be required to apply to SEPA when proposing any changes to sea louse medicine use.
[3] Farms may apply to transfer to DZR at any time. However, any authorisation to do so would not come into effect until the start of the next fish growth cycle.
[4] Annual charges under SEPA's charging system will remain linked to the scale of production.

At least 90 days of current meter data	Yes	Yes	On-going metering recommended for large farms	Yes
Hydrodynamic modelling[5]	Exposed sites, some intermediate sites and other higher risk sites	Exposed sites, some intermediate sites and other higher risk sites		Exposed sites, some intermediate sites and other higher risk sites
The results of surveys of the condition of seabed communities	Yes (baseline conditions)	Yes		Yes, for higher risk sites only

What seabed monitoring will be undertaken?

Under DZR:

- SEPA will monitor the effects of the farm on the condition of the seabed. This will involve carrying out seabed surveys (see below) during each fish growth cycle[6].
- SEPA will inform farmers of the results of its monitoring as soon as they are available. The costs of the monitoring will be recovered via the annual charges levied under SEPA's charging scheme.
- Farmers wishing to develop new sites or change the layout of existing sites will have to provide seabed survey information for the seabed likely to be affected.
- Farmers wishing to transfer existing operational sites into DZR will have to provide seabed survey information on the condition of the seabed during a relevant previous fish growth cycle.
- Farmers operating under DZR will be advised to conduct their own surveys of the condition of the seabed to help them plan and manage production levels at the site.

What will seabed surveys involve?

The precise details of the survey methods, including the number of samples, may vary depending on the type of seabed habitats affected; how well impacts are already understood; and as new, more efficient sampling and analytical techniques are developed.

Typical survey:

[5] "Higher risk sites" include those where fish biomass will exceed around 3,000 tonnes; or the site is close to other farms and hence there is a risk of depositional zones overlapping; or the site has the potential to affect the interests of others whose businesses rely on the condition of the seabed; or the use of the site has the potential to compromise achievement of a river basin management plan objective; or the spatial extent of the site is too large to be adequately modelled with NewDepomod.

[6] As now, farmers will be required to carry out assessments of sea louse medicine residues in sediments in the vicinity of their farms.

- Designed based on modelling and the results of any previous sampling programmes.
- Undertaken at a time during each fish production cycle when impacts on the seabed are likely to be greatest.
- Includes a minimum of 5 sampling stations along each of 3 to 4 transects running from the cage edge and extending beyond the farm's impact on the seabed, or its predicted impact on the seabed in the case of proposed new sites or layout changes.
- Collects information on sediment quality (particle sizes and organic content) and on seabed animal communities. In mixed or hard substrate seabed areas, the surveys will include remote sensing and underwater camera work.
- Involves 2 replicate samples per sampling station.

What happens if seabed standards are breached?

DZR is designed to enable farms to manage stock levels so that breaches of environmental standards do not occur.

If a breach does occur, the consequences will be as follows:

Consequences of a breach of a seabed standard
Production break Farms must break production at the site at the end of the fish growth cycle during which a breach of a seabed standard occurred.
Enforcement action Farm's that have caused breaches of seabed standards may be subject to enforcement action in accordance with our enforcement policy and guidance.
Conditional re-stocking: Farms may only re-stock with another generation of fish once SEPA has confirmed that the seabed has recovered sufficiently. Typical recovery times are expected to be between 6 months and 1 year. However, recovery times depend on a range of factors, including the severity of the breach, and will be longer in some cases.
Restocking levels Depending on the level of recovery, the biomass held in the first fish growth cycle permitted following a breach must not exceed: • the greatest biomass held in a previous fish growth cycle during which seabed standards were not breached; or • if SEPA does not consider recovery to be sufficient to allow re-stocking to the above production levels or if the breach occurred during the first fish growth cycle under DZR, a biomass determined by SEPA as sufficiently low to be unlikely to breach the seabed standards.

How are existing sites likely to perform under DZR?

The cage-edge seabed standard will not change under DZR. Farms that struggle to meet this standard will be required to improve their environmental performance. This is likely to involve making significant changes to stocking levels or to the farm's layout.

In contrast, initial estimates indicate that the vast majority of sites (67 out of 70) that struggle to meet the present limits on the extents of seabed impacts are expected to be able to meet the new, depositional zone standard.