

## **Carrying Out Sentinel Cage Work**

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### **Background**

Sentinel cages have been developed and used by Marine Scotland – Science for sea lice studies since 2005 for use in the Torridon and Loch Linnhe systems. Sentinel cages have been found to be the most consistently reliable indicators of infestation pressure within the water column and their use, using the Scottish design and methodology, has been utilised by other Atlantic salmon producing countries including Ireland, America and Canada. Marine Scotland – Science published a paper (<http://www.int-res.com/abstracts/aei/v5/n1/p49-59/>) incorporating the background, design, methodology and results of a near 4 year study in Loch Torridon which was published in 2014 – please don't hesitate to contact me with any queries regarding the work.

### **Licencing**

Licencing of sentinel cage sites is undertaken by Marine Scotland in a similar manner to that of a fish farm application. However, the form the licence/licencing procedure takes is dictated by the purpose of the work (e.g. scientific study or long term monitoring) and therefore prior consultation with the Marine Scotland Licencing Operations Team (MSLOT) is strongly advisable on Redacted or MS.MarineLicensing@scotland.gsi.gov.uk.

If MSLOT advise that a licence is required the applicant should identify potential sites and record the exact latitude and longitude of the site to its expected boundaries before filling in an application form (<http://www.scotland.gov.uk/Resource/0044/00440072.pdf>) and enclose copies of all plans, drawings and any other relevant documentation. Ensure you enclose a copy of the relevant Admiralty chart with the location of the study clearly marked and provide any technical information that may be relevant to the navigational safety of the site. If applying for more than one site, applicants must complete a separate application form for each site.

To aid the process applicants should ensure they identify all the relevant stakeholders who may be affected and contact them to notify them of the planned works and would include organisations such as –

Marine Scotland (Licensing, FHI and Compliance)

Crown Estate Commission

SEPA

Maritime and Coastguard Agency

Northern Lighthouse board

SNH

Regional councils

Ministry of Defence

Fish farming companies

Fishery Trusts

Ferry Operators

Local users (Boating clubs/commercial fishermen/adjacent landowners etc)

Once applications are complete there will be a consultation period where an advert outlining the intended works must be published in local newspapers in the region the work is to be carried out. Additionally, copies of all plans/applications must be lodged with local libraries to allow interested parties to inspect the proposed works. After the 1 month consultation period all responses are gathered by Marine Scotland and a decision made and if successful the licence will be issued with any specific restrictions or requirements outlined.

### **Sentinel Cages and Moorings**

Sentinel cages - Sentinel cages are cylindrical in shape, 1.5 m in diameter and 2 m deep with a false bottom to prevent predation from below. Cages are made up of four rings made of polyethylene pipe (38 mm inside diameter × 51 mm outside diameter). The ends of each pipe are connected using 38 mm (outside diameter) aluminium tube, secured with four 8 mm bolts through each end. Cage rings also house trawl wire for weight to ensure the cage sinks when deployed.

Netting – 13 mm knotless mesh supplied by Knox Nets. The tension in the net is maintained by clump weights (7 – 10 Kg) hung from a bridle under the cage.

Moorings – Cages are moored using a three point mooring system. Anchors were supplied by Gael Force and are of the “Bruce” design and weigh either 7.5 Kg or 10.5 Kg depending on the location they are to be deployed.

From each anchor, 16 mm mid link heavy chain (Jackson Wire) was shackled utilising 4.5 tonne compliant shackles (AP Lifting Gear Company) with a further shackle at the other end of the chain linking this to a hard eye spliced into 18 mm Eurosteel rope (Euronete UK) which ran to a 40 inch surface buoy (Gael Force).

**Where possible all certificates of compliance for the above equipment should be kept and copies supplied to aid the licencing procedure.**