

Letter of response to Marine Scotland Science Consultation

The following is a response to Marine Scotland Science's (MSS) consultation on Loch Duart Ltd's (LDL) application for a licence to use Acoustic Startle Response (ASR) devices at their site in Clashnessie Bay/Oldany. Text copied from the document we received is Blue and in italics whilst responses are in standard text.

Marine Scotland Science (MSS) have reviewed the request from MS-LOT and provide the following advice.

Marine Mammals

Marine Scotland Licensing Operations Team (MS-LOT) asked Marine Scotland Science (MSS) specific questions in relation to this European Protected Species (EPS) licence application. MSS have reviewed the supporting documentation for the Clashnessie Bay EPS license application and responses are provided below each of the MS-LOT questions.

*Do they follow the guidance provided to applicants?
faq adds and eps including annex 1 and annex 2 - version 5 -october 2021 - final.pdf
(marine.gov.scot)*

MSS have reviewed the EPS Risk Assessment and Calculation Spreadsheet provided by the applicant. MSS advise that the applicant has followed the guidance provided in the Marine Scotland FAQ document.

No response required.

If not, is the applicant using an appropriate method for assessment?

As stated above, MSS advise the applicant has followed the guidance provided to applicants.

No response required.

Has the applicant provided sufficient information to allow an understanding of the impact of the devices? If not, what further information is required?

MSS advise that no, the applicant has not provided sufficient information to allow understanding of the impact of devices. Separate versions of the calculations have been carried out for each model of ADD proposed (i.e., RT1 and US3), when the models will be used simultaneously at the site. MSS recommend that a single revised risk assessment is submitted that considers all devices expected to be used at the site, rather than separate risk assessments for each model of device.

The current re-application is for an RT1 only system and the modelling provided alongside it reflects this.

The applicant states that the ADDs have asynchronous controls to prevent multiple units from sounding simultaneously. MSS advise that it is highly unlikely in reality, with 14 ADDs, that an applicant can ensure there will be no overlap in signals from the different units.

The Site Wide Unified Ramp-down (SURD) control unit that is to be supplied with the ASR equipment provided by ACE Aquatec functions in a queued mode. This queued mode stops simultaneous soundings from all devices attached to it, only allowing one device to fire at a time.

The SURD system data logs can be remotely accessed via an online portal so that historical use patterns can be inspected to ensure that performance levels have been adhered to for both technical and compliance reasons.

We note in the calculation spreadsheet provided by the applicant there is the option to model the impact of the devices firing simultaneously. MSS recommend that a revised risk assessment is undertaken that includes a realistic scenario, along with an example (we suggest over a duration of an hour) of the activation schedule, including information on the duration of signals. MSS recommend that this should include a proportion of the devices firing simultaneously, based on pulse durations and duty cycles of the devices proposed. A more straightforward but highly precautionary option would be to model a 'worst case scenario' whereby all devices fire simultaneously. Information on pulse duration, what constitutes a firing event and planned duty cycles should be provided, along with further information on firing schedule and how the applicant will ensure there is no overlap in signals between devices spaced widely across a site.

The option to model the impact of devices firing simultaneously appears in the spreadsheet to allow for modelling in a scenario without the SURD control system. This application is specifically for use with the SURD system which provides an asynchronous control input, preventing simultaneous firing.

The application only covers one site, but the applicant is also in possession of a licence from NS to deploy and test a TAST device at other sites they operate. They have given reasons for not undertaking a cumulative assessment. Is this justified and if not, what is required?

MSS advise that the reasons given for not undertaking a cumulative impact assessment are not justified. The applicant states in the EPS risk assessment document that that there is no likely interaction between sites (due to no overlap in predicted impact distances), therefore cumulative impact is not considered further. However, as laid out in the Marine Scotland guidance document,

cumulative impact assessments (CIAs) should be carried out for all sites using ADDs in the region (i.e., within the same SCANS block). There is no requirement for the impact distances to overlap to trigger a cumulative assessment. The cumulative assessment is intended to present the number of individuals predicted to be disturbed and / or injured within the same management unit (in this case, a SCANS block) together with other sites in that area. It is not an assessment of the cumulative impact of different sites on individual animals.

MSS advise that a cumulative impact assessment should be carried out to predict the total number of individuals expected to be impacted by ADDs in place at five of the applicants other sites (under Licence Number 210989), along with any other ADDs being used in the same SCANS block. The methodology for cumulative impact assessment laid out in the Marine Scotland guidance document should be followed.

MSS also recommend that the cumulative assessment should include other activities producing underwater noise levels capable of disturbing cetaceans in the area, either from ADD use at other aquaculture sites or from other industries, i.e. all activities capable of causing disturbance or injury. However, as noted in the MS (Marine Scotland) guidance document, currently only impacts from other fish farms using ADDs are required to be considered.

LDL is the operator of the nearest adjacent marine farms to Clashnessie Bay which are located within Eddrachillis Bay, Loch a Chairn Bhain and Loch Laxford. The nearest active farm, Calbha, is 7.9km to the north-east (direct-line distance, not considering intervening landform). An EPS licence issued by NatureScot is in place for deployment and testing of TAST underwater sound-producing units at Calbha, Badcall, Reintraid and Laxford farm sites (License Number 210989). However, this licence expires in July 2024. Given the timescales for anticipated consenting of the EPS application at Clashnessie Bay, the forementioned testing of devices under License Number 210989 is not anticipated to be active when ADD devices at Clashnessie Bay will be operational. Should LDL seek to reapply for a commercial or research EPS licence for ADD use at the farms within Eddrachillis Bay, Loch a Chairn Bhain and Loch Laxford, a cumulative impact assessment will be conducted at that time.

Marine Directorate Licensing Operations Team marine licence database indicates that, at the present time, no other commercial marine licences have been granted for the use of ADDs on fish farms in the SCANS block CS-H (Minch) and that LDL are the only fish farming company currently pursuing a commercial EPS licence for ADD use. Furthermore, it is LDL's understanding that information regarding current (active) EPS licenses' granted for ADD use for research purposes is not publicly available. Hence even if there are other fish farm sites within the SCANS CS-H block that are using ADDs under a licence granted for research purposes, LDL are not privy to that information or the associated data predicting

the number of individual cetaceans predicted to be disturbed and / or injured by those specific devices. As such, we conclude that it is not possible to undertake a cumulative impact assessment as per Marine Scotland Science's response to the original application. However going forward, cumulative effects of the use of ADDs would be considered in any subsequent EPS licence applications in the CS-H (Minch) area, should they arise, and these would include the devices at Clashnessie Bay if the EPS for their use is granted.

Does MSS have any relevant views or information in regard to the evidence provided to address test one – licensable purpose? The applicant has applied for a licence to prevent serious damage to property.

The applicant has applied for an EPS license for the purpose of “preventing serious damage to livestock, foodstuffs for livestock, crops, vegetables, fruit, growing timber to any other form of property, or to fisheries”. The applicant states that damage to fish (both lethal and sublethal impacts) is currently being experienced at the site. The applicant wishes to deploy ADDs to prevent this damage. As such, MSS advise that the application is appropriate for this purpose. However, the evidence provided is only anecdotal, there is no provision of data to support the claims and consequently it is challenging to assess licensable purpose. For example, the applicant states “seal interaction (attacks and sub-lethal impacts) is a known occurrence at the site from fish input”. MSS advise it would be more useful to explicitly state what these sub-lethal impacts are and provide support for them in the form of photographs, videos or data on the detectable impacts (such as stress hormone measurement or descriptions of seal inflicted lesions).

Sub-lethal effects on fish health from seal presence has been highlighted by the applicant as ‘damage’. There remains a lack of evidence on the impacts of predators on fish welfare, but MSS advise following the conclusions and recommendations from the Scottish Animal Welfare Commission (SAWC) to Marine Scotland on this matter (<https://www.gov.scot/publications/scottish-animal-welfare-commission-proximity-of-seals-to-farmed-fish-response-to-marine-scotland/pages/background/>). In summary, this suggests that significant stress is caused to farmed fish contributing to reduced growth, feeding and increased incidence of disease. SAWC also

recommend that “issues related to the impact of seals on the welfare of farmed salmon should be regarded as a legitimate factor when MS-LOT are considering the licensable purpose test for applications for the use of ADDs in these situations....”. As stated previously, MSS advise that additional information and/or data are presented by the applicant in order to effectively assess the “damage” inflicted by seals to fish at the site.

MSS wish to highlight that advice provided here has been generated by advisors working primarily on marine mammals and underwater noise. Farmed fish health and damage to livestock is outwith the usual remit and expertise of the REEA group. Advisors within the MSS Aquaculture and Fish Health Programme, or elsewhere in Marine Scotland, may be better placed to provide more insight into the damage that seals cause to aquaculture.

As part of the submission, LDL have provided details of the previously tested measures to prevent seal attacks but note that they continue to get problems (please see supporting evidence: Attachment 7 Predator (seal) risk assessment and Attachment 3 evidence of seal impact at Clashnessie Bay which shows the impact of seal attacks including mortality data). While we would be keen to quantify the impact of stress induced from seeing seals circling the pens, this is not practical due to the number of variables that would influence the data. Furthermore, the methods required to sample for physiological indicators of stress would be detrimental to the health and welfare of the salmon. Therefore, we believe that relaying behavioural observations (such as reduced feed intake and abnormal shoal behaviour) made by LDL personnel, trained to identify and document poor salmon welfare, along with the evidence provided by LDL on the prevalence and impact of seal attacks, provides a sufficient justification.

In particular, we are seeking views on the efficacy of ADDs. However, MSS provided advice in this regard to the application from Kames Fish Farming and it is assumed that this advice remains the same. Please advise if your wish to amend or add to your previous response.

MSS is not aware of any further evidence published on the efficacy of the model of ADDs proposed to be used in this application (Ace Aquatec RT1 and US3) since we issued our previous advice in relation to the Kames application. Consequently, our advice on the efficacy of ADDs has not changed and we do not need to amend or add to our previous advice.

In order to fully validate the efficacy of the systems in the field, the devices would need to be deployed over a long period of time. In addition, to accurately compare we would need to work with a farm who has full historical dataset. We are keen to gather this information locally, but due to the devices being removed from the water, we are actively pursuing collaborations with farms and academic partners around the world. Site specific quantitative data comparing salmon mortalities in production cycles with and without an ADDs is however included in Attachment 3.

Does MSS have any relevant views or information in regard to the evidence provided to address test two – no satisfactory alternative?

Regarding alternative locations of the farm or alternative dates / timings, MSS have no further comments.

Regarding the use of alternative methods, the applicant describes use of other predation-mitigation measures at the farm including the regular removal of fall / moribund stock, maintaining low stocking densities, and the use of tensioned HDPE pen-nets and top-nets. The applicant claims these measures are not effective without the complementary use of ADDs, i.e. are not a satisfactory alternative to use of ADDs.

MSS advise that, since no evidence of depredation rates with and without ADDs has been provided by the applicant, MSS cannot assess the efficacy of these alternative measures without ADDs. MSS acknowledge that at present it is not possible to gather this evidence, as the use of ADDs requires an EPS licence. We therefore recommend that should a licence be issued, conditions should be put in place to require ADD users to gather data on ADD use and corresponding depredation rates, to better understand the efficacy of these devices going forward (Coram et al. 2022).

As stated previously, Ace Aquatec is actively pursuing the means of validating the efficacy of their devices in the field. Currently there is anecdotal evidence from individual farms. In particular, LDL have provided site-specific evidence showing the impact of seal attacks in the presence and absence of Ace Aquatec's Acoustic Startle response devices (see supporting document Attachment 3). As there has been limited opportunities to deploy ASR devices so far, rigorous data gathering opportunities have been limited. However, as previously mentioned, Ace Aquatec continues to actively pursue opportunities with Academic partners to conduct testing in the field. Part I of the field trial conducted by St Andrews University is in preparation for publication.

A comprehensive evaluation of the full suite of currently available alternatives measures, some of which are currently employed by the applicant, can be found in Thompson et al. (2021). MSS recommend that the applicant provides information on other measures and presents a justification for why these would not be effective alternative to ADDs. Measures that have been shown to be successful at other fish farms in Scotland include Anti-Predator Netting (APN), seal blinds and false bottom cages. MSS note that APN refers to an additional layer of netting to provide physical separation, and not just the use of thicker single netting (e.g., HDPE). The use of APN at fish farms in Scotland has increased from around 20% in 2016 to over 40% in 2020 (Marine Scotland, 2020), and MSS recommend an explanation of why this method has not been implemented is provided by the applicant.

MSS acknowledge that whilst there are other alternative measures available (as outlined above) to deter seals from depredation in addition to those used at Loch Duart sites, the efficacy of many of these are even less well understood than ADDs.

Exploration of alternative methods can be found in the supporting document, Attachment 7 Predator (Seal) risk assessment, Attachment 8 EPS RA RT1, and the applications cover letter.

Although it is for MS-LOT to determine if an applicant has met the requirements of the licensing tests, we would welcome any additional views or information that would assist us. If you consider that the applicant has provided insufficient information in relation to this, do you have a view on what information it would be reasonable to expect the applicant to provide?

MSS advise that the applicant have provided sufficient information to assess the requirements of the licensing test. However, additional information would substantially aid assessment for both this and future applications.

MSS recommend requesting the applicant provides additional information on how they will assess effectiveness of ADDs. The applicant has committed to deactivating devices if no seal interactions are evident or if the devices show reduced efficacy over time. MSS advise that evidence should be collected to inform these decisions. MSS also advise that the applicant should provide information on the specific criteria used to determine when devices would be deactivated.

We note that seal predation and predation-mitigation measures are reviewed on a weekly and monthly basis, any fish mortalities due to predation are recorded daily and there are daily checks of ADD function. We also note that seal activity around the site is recorded on above-water cameras and stress behaviour in livestock is recorded on underwater cameras. MSS recommend the applicant continue to maintain these detailed logs, to evidence any decisions made and to provide information on seal presence and efficacy of the devices over time. Despite these recording schemes, no evidence of lost / damaged fish, seal activity or ADD efficacy has been presented with this application. We note this information is compiled at the end of every farming cycle, and MSS recommend that LOT requests the submission of this information for review.

MSS welcomes the commitment to deactivating the devices should a cetacean be present in the immediate area of the farm, but note that a threshold distance for this is not provided. MSS advise that the applicant provide a threshold distance and also that the applicant records any deactivations due to cetacean presence as part of the recording schemes discussed above.

In summary, MSS advise the following:

- *MSS recommend more evidence is provided to justify why currently used alternative measures and those not trialled by the applicant (including Anti-Predator Netting (APN), seal blinds and false bottom cages) are, or would not be, effective without the use of ADDs;*
- *MSS advise the applicant should provide clarification on how close to the site a cetacean must be for the applicant to deactivate an ADD;*
- *MSS advises the applicant should provide information on what criteria / threshold of efficacy must be demonstrated in order for the devices to be deemed not effective and hence deactivated;*
- *MSS recommend the applicant submit a revised EPS risk assessment that presents the number of individuals expected to be impacted in a 'worst case scenario', along with further information on pulse duration, duty cycles and firing schedules;*
- *MSS recommend the applicant submit a revised EPS risk assessment with a cumulative impact assessment that includes the Clashnessie site, together with any of the applicant's other sites known to be using ADDs (e.g., those using TAST under License Number 210989) and any other sites known to be using ADDs in the region.*
- *MSS advise more evidence is need on the lethal and sub-lethal effects of seals on fish at the site. Specifically, MSS advise supporting data is provided beyond anecdotal statements.*

We wish to thank MSS for their consultation on this issue and for the recommendations they have given.