



20/3/2024

Dear Scottish Ministers,

### **EPS Licence Application for ADD Use Clashnessie Bay FS0933**

Please find attached the Loch Duart Ltd (LDL) revised application for a licence to disturb European Protected Species (EPS) as a result of acoustic deterrent device (ADD) use at the LDL operated Clashnessie Bay fish farm (FS0933), Sutherland.

Our previous EPS licence application dated 3<sup>rd</sup> of October 2022 was refused by Scottish Ministers. As part of this resubmission, LDL would like to take this opportunity to address a number of issues raised during the previous application process. Text copied from the document we received (MS-Lot letter dated 24th March 2023) is in blue italics whilst our responses are in standard text. We have also provided responses to comments raised by Marine Scotland Science (Attachment 1) and NatureScot (Attachment 2) during the previous application.

LDL have also conducted additional consultations with MD-LOT representatives, who are also supportive of our resubmission of this application comprising:

- [Redacted], Head of Licencing Marine Scotland and [Redacted] EIA & HRA leader: Teams Meetings 4/4/23
- [Redacted] – Fish Health and Welfare Policy, [Redacted] Marine Conservation (Species), [Redacted] - EIA/HRA, [Redacted] - Renewable Energy Environmental Advice & Marine Mammal Science: Teams Meeting 1/11/23

### **Key concerns from previous application**

#### **Licensable Purpose**

*Evidence insufficient to support licensable purpose for “Preventing serious damage to livestock foodstuffs for livestock, crops, vegetables, fruit, growing timber or any other form of property or to fisheries”.*

#### **Specific evidence of damage inflicted by seals**

Specific evidence to support the licensable purpose of ADD use at the Clashnessie Bay site is provided in Attachment 3, demonstrating both the scale of mortality problems associated with seal predation and how predation activities are additionally damaging to the health and wellbeing of stock. In summary, mortalities attributed to seal predation at the Clashnessie Bay site between 2020 – 2023 show an increasing trend in both mortality number, and the scale of associated cost for services such as net repair at both the site level, and across the business since the removal of ADD systems in 2021. Sub-lethal effects on livestock resulting from seal presence around a farm are also documented with demonstrable declines in farm productivity (e.g. reduced feeding, growth and survival), fish health (e.g. physical damage, disease and parasite risk increased), fish welfare and ultimately, sustainability

through reduced productivity and challenging fish health management. This is unequivocal evidence of the damage inflicted by seal predation and how the use of ADDs can reduce this significantly.

Video evidence of seals breaking through exterior predator nets and additionally through into the inner pen nets at production sites is also provided (Attachment 4). LDL site data shows that prior to the removal of ADDs in 2021, no breaches of nets by seals occurred. Since ADDs were requested to be removed by government ministers in 2021, LDL have since reported 2 net breaches at its sites. It is widely observed that seals are constantly and innovatively finding new ways to attempt to circumvent predator deterrent devices deployed at fish farms. Anecdotal evidence from fish farming in Scotland is thus supported by research suggesting that pinnipeds (and cetaceans) display learning, memory and problem-solving abilities (e.g. Bauer et al. 2020 and references therein). Such activity puts an unacceptable risk on site equipment. Costs of over £170,000 are attributable to repairing seal damaged nets at LDL sites since ADD devices were removed in 2021. This nature of damage also increases the risk of stock escape, and thus additional environmental risk resulting from fish escape at farm sites. Furthermore, seals are also regularly observed to haul out and position themselves on the walkways at sites where farm staff have to carry out farming operations, thus bringing our staff into extremely close proximity to seals and subsequently, unnecessary risk in the workplace.

*“Without more detailed supporting information it is not possible to assess exactly what serious damage has been or will be done nor how the use of ADDs will prevent it.”*

#### Evidence of how ADDs will prevent damage and the effectiveness of acoustic startle systems.

As noted above, information regarding the scale of stock mortalities and subsequent impacts on fish health and welfare is provided in Attachment 3. A benefit of acoustic deterrent systems is that they avoid seals interacting with pens by keeping them at a distance from the cages. The ADD system proposed by this application is an acoustic startle response system, the RT1 Flex, produced by Ace Aquatec. The proposed ADD system plays unique sound patterns with much lower duty cycles than traditional ADD systems.

It was highlighted by the Scottish Ministers response that the paper suggested as evidence for the effectiveness of Ace Aquatec ADD devices (MSc K.Whyte 2015) was not in the public domain. This document can be found online at: [https://www.researchgate.net/publication/284163436\\_Investigations\\_on\\_Seal\\_Depredation\\_at\\_Scottish\\_Fish\\_Farms](https://www.researchgate.net/publication/284163436_Investigations_on_Seal_Depredation_at_Scottish_Fish_Farms) but it is also attached for ease of access (Attachment 5). We would also note that Ace Aquatec has an operational scientific EPS license to further investigate the effectiveness of its devices in reducing seal predation at multiple sites in Shetland. Ace Aquatec’s systems work on the basis of creating a startle reflex in the seal. The use of this reflex has been well publicised and therefore its efficacy and scientific validation as a means to avoid predation has been well documented (see Attachment 6).

#### *No Satisfactory Alternative*

*“The application contains no consideration of any additional methods of seal deterrence or exclusion e.g., frequency of removal of dead stock.”*

A predator (seal) risk assessment has been conducted for the Clashnessie Bay site (Attachment 7). LDL have also considered a range of other complimentary and/or alternative non-lethal seal control options (including those suggested in the Thompson and Coram, 2020 review) and some of which are already utilised at Clashnessie Bay. These are discussed in Table 1 below. This shows the consideration

given to the different control measures, their feasibility for the site, and whether they are currently employed.

Table 3 Currently used, explored and or rejected seal deterrence measures at Loch Duart Ltd.

Method	Review	Status
<b>Attraction avoidance</b>	The removal of morts and moribund fish reduces predator attraction to a site. This is done by using a combination of mort baskets secured to the bottom of each pen unit and divers. This is intended to reduce the investigatory behaviour of seals that may smell or see the morts inside the cage, particularly in the mortality sock.	Currently used at the Clashnessie Bay site - Morts and moribund fish are removed on a daily basis (weather depending) to deter predatory attraction to sites. Mort baskets are secured at the bottom of each pen to collect fish mortalities and are lifted to the water's surface before being emptied and transported off site for appropriate disposal.
<b>Net tensioning</b>	Net tensioning ensures the maximum effective pen volume is always available for stock. Maintaining net tension also provides the first line of defence against predatory seal interactions on a site.	Currently used at the Clashnessie Bay site - Pen nets are adequately tensioned using weights/froyer rings to ensure net tension is maintained.
<b>Double layer pen netting</b>	Used alone, without additional ADD support, net breaches can still occur (see Attachment 4 of video evidence for this).	Currently used at the Clashnessie Bay site - Double layer pen nets are in use on sites and it is the intention to continue to use these in combination with acoustics to avoid investigatory behaviours by seals close to the nets. Double layer netting is used in specific strategic location on nets.
<b>External subsurface predator nets</b>	Additional nets deployed around the circumference of the pen net as an additional barrier to prevent sea interaction.	Deployed on sites when increased predator interest is recognised but seals can also breach and gain access between predator nets and pen nets. (See Attachment 4 of video evidence for this).
<b>Upward extension of nets</b>	Upward extension of nets to prevent breaching of nets from the surface. However, there is no additional benefit to preventing underwater attacks. Such equipment can also potentially require additional infrastructure changes.	Pen nets and top nets are stitched together at Clashnessie Bay site but upward extensions are not in use at present. Such systems are in use on a number of LDL sites but of limited use as this only prevents surface breaching of nets. No additional benefit to prevent underwater attacks and can potentially require additional infrastructure changes.
<b>Pen barrier materials</b>	Tarpaulins may obscure the fish from seeing the predator and therefore becoming stressed. Seals have however quickly learned to overcome these barriers by climbing onto the walkway, and up onto top nets. From here they bounce until a hole is created and they get into the pens. More significant surface nets cannot be deployed to counter this due to weight limits on the cages.	Rejected - Additional barriers are a risk to fish health, due to reducing water flow and oxygen levels in the water. Additional barriers also increase the impact of lice on fish, due to increasing water temperature and low water flow. This puts unnecessary stress on the fish, leading to higher levels of sores, diseases (such as gill disease) and cortisol levels, which can be seen flesh quality after harvest.
<b>HDPE Netting</b>	A range of nets are available to that provide greater strength than traditional nylon netting or qualities that are texturally irritating to seals. These however are not necessarily suitable for all sites and types of cages. Can also be price prohibitive.	Currently used at the Clashnessie Bay site - HDPE nets are in use but have limits to their effectiveness. Would be subject to continued use in combination with acoustics to avoid investigatory behaviours by seals close to the nets.
<b>Pen net mesh size</b>	Dependent on fish size, use of different scales of pen mesh during containment has been seen to influence different types/levels of predator interaction at a site i.e. in larger mesh nets, the	Currently used at the Clashnessie Bay site – nets are sized appropriately (15 – 18mm) for the size of fish in an attempt to deter predator interactions. The strategy has limits to its effectiveness and would be subject to

	fish are potentially more visible to seals resulting in higher levels of attack frequency and damage.	continued use in combination with acoustics to avoid investigatory behaviours by seals close to the nets.
<b>Electric fencing, sub surface (supplied and tested by Ace Aquatec in 2014)</b>	Power and infrastructure issues exist with using this technology. Huge power requirements need diesel generators to be used 24/7 which would elevate the company's CO <sub>2</sub> emissions. Effectiveness not well validated and further research and development required.	Rejected - due to early-stage nature of technology, practicality of deploying on LDL sites, and environmental impact. May also be concerns surrounding H&S for site operatives.
<b>Targeted lethal action</b>		Rejected- Licences no longer granted by Scottish Ministers
<b>Contained Pens</b>	Licenses for this technology have been rejected. Technology is nascent and unproven. Suitability of sites is questionable due to depth. Cost would increase dramatically due to structural changes needed to cages.	Rejected - due to nascent level of technology, permits, and early stage of commercial usage and site applicability.
<b>Predator impersonation</b>	In Scotland, artificial Orca dummy predators were investigated by Mowi over the last ten years as a predator control measure.  ( <a href="https://www.fishfarmingexpert.com/gael-force-loch-erisort-mowi-scotland/shock-and-orca-mowi-uses-fake-whale-to-scare-seals/1368943">https://www.fishfarmingexpert.com/gael-force-loch-erisort-mowi-scotland/shock-and-orca-mowi-uses-fake-whale-to-scare-seals/1368943</a> ) . These were shown to have no impact on seal predation, potentially increasing the risk of orca beaching, and confusing resident populations through using recorded playback of orca calls.	Rejected – unproven as method of deterrence with potential impacts on resident Orca populations.
<b>Lights</b>	Flashing deterrents have been investigated by Ace Aquatec, however their use interferes with the growth of fish, which are highly photosensitive. Acoustics operate above fish hearing (thresholds at 950hz) and therefore provide the only acceptable means to keep seals at a distance where they are not perceived by the fish.	Rejected - due to photosensitivity risks to fish welfare.
<b>Conditioned taste aversion</b>	No proven methodology or products approved for use.	Rejected
<b>Entrapment and relocation of seals</b>	No organised strategy in Scotland.	Rejected

It is evident that while some of these measures can prevent seals from entering pens, or make it more difficult for them to gain access, they do not keep the seals from circling the pen nets and attacking through the nets causing damage and stress to the salmon. Therefore, we do not consider these to be alternatives to acoustic deterrent systems but instead, additional measures for preventing the compromise of the physical and psychological wellbeing of the salmon. Acoustic systems are understood to be capable of keeping seals at a distance from cages – thus avoiding interactions with nets and preventing hounding behaviours that can stress fish.

Within the acoustic deterrent category, LDL have worked with traditional acoustic systems with long duty cycles; we are also testing novel TAST devices (acoustic startle) at some sites and have deployed both Ace Aquatec's acoustic startle systems (RT1s and US3s). These more recent systems such as Ace Aquatec's RT1 Flex system deploy very low average energy sounds, with extremely low duty cycles, and with tailored pitches. The RT1 Flex system, as per this application, has been proven most effective

at the Clashnessie Bay site historically. Evidence that ADDS prevent increased stress and subsequent physical damage to farmed salmon populations is provided in the site-specific data on the mortality rates and feeding rates of the Clashnessie Bay site, prior to and after ADD removal in 2021 (Attachment 3).

### **Favourable conservation status**

*“A single risk assessment should have been carried out to reflect a realistic or worst case scenario.”*

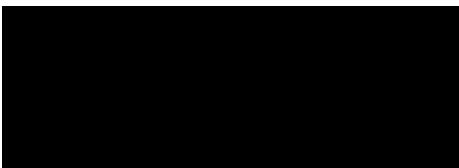
We believe this is a misunderstanding from the original application. There was no intention to deploy both groups of deterrents (RT1 and US3) that were included within the previous applications documentation material simultaneously. In this revised application, only the Ace Aquatec RT1 Flex model is proposed for use. The risk assessments for each group of deterrents as provided by the first application were to provide the option to deploy either set of equipment and therefore a worst case scenario was provided for each group of deterrent. The risk assessment associated with the present application (Attachment 8) is therefore only relative to the use of the RT1 Flex system.

*“...The Scottish Ministers also note that the Application does not include any consideration of cumulative effects.”*

As part of the response to the letters from NatureScot and Marine Scotland Science, a more in-depth description of the justification and methodology of the modelling is included to clarify any misunderstandings and to conduct an assessment of the cumulative effects/risk of using this system at the Clashnessie Bay site (Attachments 1, 2, 8, 9, 10 & 11).

In summary, each month without a determination from government advisors on EPS licensing is resulting in significant fish health and welfare concerns during LDL production, and considerable financial loss to the company. Under such harsh economic impact, LDL would ask that reviews of this submission are accelerated by advisors and ministers to both reduce the impact of predation on our fish (i.e. stress, increased risk of disease and mortality) and economic impacts to the business.

Yours Sincerely



**Environmental Manager, Loch Duart Ltd**

### **References**

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