

FOI Backgrounder - ADDs, Seals, Cetaceans & Salmon Farms (June 2020)



In April, May and June 2020, Scottish Natural Heritage (SNH) [disclosed documents to Scottish Salmon Watch via Freedom of Information](#) (SIR158549/A3220427).

Documents disclosed by SNH via FOI:

[Download SNH FOI reply ADD 2020 #1](#)
[Download SNH FOI reply ADD 2020 #2](#)
[Download SNH FOI reply ADD 2020 #3](#)
[Download SNH FOI reply ADD 2020 #4](#)
[Download SNH FOI reply ADD 2020 #5](#)
[Download SNH FOI reply ADD 2020 #6a](#)
[Download SNH FOI reply ADD 2020 #6b](#)
[Download SNH FOI reply ADD 2020 #6c](#)
[Download SNH FOI reply ADD 2020 #6d](#)
[Download SNH FOI reply ADD 2020 #7](#)
[Download SNH FOI reply ADD 2020 #8](#)
[Download SNH FOI reply ADD 2020 #9](#)
[Download SNH FOI reply ADD 2020 #10](#)
[Download SNH FOI reply ADD 2020 #11](#)
[Download SNH FOI reply ADD 2020 #12](#)

Please note from [SNH's covering letter dated 29 April 2020](#):

We have also withheld some information relating to ongoing consultations where we have not yet formulated our final response. Whilst there is a public interest having access to information about the potential impacts of ADDs on cetaceans and seals, in these instances, the public interest does not outweigh the potential to cause substantial harm by releasing information before we have agreed our response internally. We are therefore withholding the information under EIRs Regulation 10(4)(d) (Material in the course of completion etc). You are welcome to request this information again in two months' time.

Here's Scottish Salmon Watch's FOI request dated 28 February 2020 to SNH (a similar FOI request was sent to JNCC):

Please provide information on Acoustic Deterrent Devices (ADDs), seals, cetaceans and salmon farms since 1 January 2019.

Please include emails, letters, Government briefings, internal discussions, correspondence with salmon farmers and other parties such as manufacturers of ADDs and SARF, scientific papers, reports and other information in relation to Acoustic Deterrent Devices (ADDs), seals, cetaceans and salmon farms.

Please include any data on the use and prevalence of ADDs on salmon farms.

Data on the use of ADDs was previously published in 2018 and in 2017:

<https://donstaniford.typepad.com/files/pr-adds-deafening-impact-on-cetaceans-18-april-2018-1.pdf>

<https://donstaniford.typepad.com/files/pr-cetaceans-sound-alarm-over-noisy-salmon-farms-7-may-2017.pdf>

An update was published in September 2018 via <https://donstaniford.typepad.com/files/pr-sounding-off---adds-evade-marine-noise-registry-10-sept-2018.pdf>

Summary (in chronological order - information sourced from SNH's FOI disclosure):

In February 2020, [Scottish Sea Farms admitted that it was running down nylon net stock before investing in polyethylene nets](#). "As net design improves and SSF's nylon net stock reduces then the use of polyethylene nets is anticipated to reduce seal predation and therefore the use of ADDs," [stated an 'ADD Deployment Plan' from Scottish Sea Farms dated 19 February 2020](#).

In February 2020, [an email \(the names are redacted\) referred to a chat re. ADD conditions which "concluded that Portree Outer \[The Scottish Salmon Company\] and Sconser Quarry \[Mowi\] fish farm had undischarged planning conditions re. ADD deployment plans"](#).

From: [REDACTED]
To: [REDACTED]
Cc: [REDACTED]
Subject: RE: Portree fish farm - 16/03352/FUL - Update following meeting of 7 June 2019 and OSC underwater noise monitoring - 30 August 2019
Date: 07 February 2020 13:11:42

[REDACTED]
Just had a quick chat to [REDACTED] re. ADD conditions. We concluded that Portree Outer and Sconser Quarry FF had undischarged planning conditions re. ADD deployment plans. Therefore neither farm will currently be using ADDs, though both are installed/in production. He's going to contact [REDACTED] and [REDACTED] but we're going to have a catch up on these cases before he does so. I think it's fairly straightforward – we asked to see Portree Outers ADD data but they haven't supplied it and we asked for a revised MOWI Sound of Raasay combined ADD plan but haven't seen that either. Let me know if there are any wider issues/updates that we need to discuss.

In February 2020, [SNH and Marine Scotland proposed to meet for a "discussion on ADDs"](#). "I'm also keen to get some indication of next steps and timescales on the ADD work," [said SNH's Cathy Tibbrook in an email to Marine Scotland dated 4 February 2020](#).

"I work as part of the Aquaculture Team in Marine Scotland, advising on planning policy," [explained a redacted email referring to a meeting on 6 February 2020](#). "I understand that are aware of a review being undertaken by [redacted name] in the Marine Planning and Policy directorate of Marine Scotland which has been investigating the legal framework of Acoustic

Deterrent Devices (ADDs) used in the aquaculture industry. [Redacted name] and myself in the aquaculture team had a meeting with [redacted name] last week to discuss her paper on this issue, particularly any further role which local authorities can play in the process."

In February 2020, [Scottish Sea Farms admitted that "it is highly likely that we won't have to use ADDs at all at this farm" \(Lismore North\)](#). "In terms of ADD use, we are proposing to use the Airmar devices at Lismore North and these do not have the 'patrol' mode function," [wrote the Development Manager at Scottish Sea Farms in an email to SNH dated 18 February 2020](#). "We are hoping to trial the OTAQ seal fence system at two sites in the Sound of Mull which have this feature but would like to see how well these work before expanding their use to other locations. It is highly likely that we won't have to use ADDs at all at this farm given that ADDs haven't been used for 5 years and that we would be upgrading the cage nets to the stronger polyethylene nets which have significantly reduced seal predation at locations which have experienced issues in the past".

In January 2020, [SNH raised concerns about the use of ADDs at Lismore North Fish Farm operated by Scottish Sea Farms within a Special Area of Conservation](#). "In our view, this proposal is likely to have a significant effect on the harbour seal interest of site by disturbance of seals whilst they are in the water (via ADD use) and then they are hauled out on Dubh Sgeir particularly during sensitive periods such as pupping (June - July) and moulting (August)," [wrote SNH in a letter to Argyll & Bute Council dated 16 January 2020](#).

In January 2020, [SNH raised concerns over ADD use at BDNC salmon farm \[Bay of the Dead Heads in Shuna Sound\] with Mowi](#).

From: [Redacted]@mowi.com
Sent: 24 January 2020 17:10
To: [Redacted]
Subject: BDNC_ADD use
Hello [Redacted] just to acknowledge I have received your letter concerning ADD use at BDNC (dated 15 January) today. I note the contents and will discuss and review with colleagues and will come back to you in due course. I agree that a subsequent meeting on the issues raised would be beneficial.
Best regards
[Redacted]
[Redacted]
Mowi Scotland Limited
Mobile: [Redacted]
DDI: +44 1397 [Redacted]
[Redacted]@mowi.com

In January 2020, [SNH advised re. Mowi's salmon farm proposal at Carradale in Kilbrannan Sound](#) that "the use of acoustic deterrent devices (ADDs) can in some instances be capable of causing disturbance to cetaceans". Here's [an extract from an email from SNH's Liam Wright to SNH colleague Stan Phillips on 13 January 2020](#):

Cetaceans

All species of cetacean qualify as European Protected Species (EPS) and are therefore considered sensitive species as identified in section 4.3 of the template. The use of acoustic deterrent devices (ADDs) can in some instances be capable of causing disturbance to cetaceans. As such this proposal could result in an impact which may have an effect on the receptors or issues identified in sections 4.1 to 4.4.

We would suggest that best practice measures should be adopted to ensure that the risk of any impacts on cetaceans as a result of the use of ADDs will be minimised. In order to do so we would recommend that the applicant develops and adheres to an ADD deployment plan which sets out appropriate measures to be followed to ensure any potential impacts on cetaceans will be minimised.

In November 2019, [SNH raised concerns about the use of ADDs at the controversial salmon farm proposal at Flodiggary with the Director of Planning & Development at Highland Council.](#)

The proposal lies within Inner Hebrides and the Minches Special Area of Conservation (SAC) designated for its harbour porpoise. The site's status means that the requirements of the Conservation (Natural Habitats, &c.) Regulations 1994 as amended (the "Habitats Regulations") or, for reserved matters the Conservation of Habitats and Species Regulations 2010 as amended apply. Consequently, The Highland Council is required to consider the effect of the proposal on the SAC before it can be consented (commonly known as Habitats Regulations Appraisal). The SNH website has a summary of the legislative requirements (<http://www.snh.gov.uk/docs/A423286.pdf>).

In our view, this proposal is likely to have a significant effect on harbour porpoise within Inner Hebrides and the Minches SAC because Acoustic Deterrent Devices (ADDs) are included as part of the range of predator control measures. These may disturb harbour porpoise.

In October 2019, [GenusWave lobbied SNH and Marine Scotland with an update on their technology which they claimed would lead to a "reduced level of noise pollution".](#)

Conventional acoustic deterrent devices (ADDs) are widely used to keep seals away from fish farms and fisheries. These devices aim to deter animals by emitting sound at high source levels and duty cycles, i.e. the time and duration during which sound is emitted. The long-term success of these devices is often limited since habituation, the decrease in responsiveness to the signal, can be a significant problem. ADDs have been highlighted as a potential concern as some devices cause long-term habitat exclusion in non-target species and may have the potential to cause threshold shifts in hearing in target and non-target species.

An alternative can be found by inducing a startle reflex response, which causes flight and avoidance behaviour without habituation in the majority of seals. This approach only requires brief, isolated sound pulses to be emitted at very low duty cycles. Making this effective for specific species can be achieved by choosing a frequency band where the hearing sensitivity in the target-species (e.g. seals) is higher than in non-target species (e.g. porpoise & dolphins). This method has been shown to be successful in deterring seals from fish farms while not affecting the distribution of harbour porpoise in two different study areas on the West coast of Scotland. In a long-term test, a startle-reflex based system caused a ~91-97% reduction in seal predation losses over the course of one year while emitting sound less than 1% of the time. Therefore, additional benefits of this approach include a reduced level of noise pollution in areas, such as the West coast of Scotland, where there are fish farms using ADDs to deter seals. Ongoing research efforts focus on making this method available to the aquaculture market and to widen the method to other applications and species, such as the mitigation of marine mammal collision risk around marine renewable energy installations and mitigating the risk of hearing damage around marine construction sites (e.g. pile-driving).

In September 2019, [SNH criticised Mowi for failing to address the issue of ADDs](#). "Main thing is it doesn't address our points re. 'Standard mode activated at one site at any given time' or 'ADD use across all of Sound of Raasay fish farms to decline over time' so we need more than just this plan with the name at the top changed," [wrote SNH's Alex Turner in an email to SNH colleagues Liam Wright and Caroline Carter dated 24 September 2019](#). "Might be worth stressing that point? I also think some of the notes on the RH side of the document are confusing (see my notes on the attached version - they look like speech bubbles). Also, I still don't like sections 5 & 6 - Liam, you will remind me (probably correctly) that this can be addressed at the annual review meeting - but it's still not well thought through in my opinion."

[In July 2017, [SNH's Alex Turner wrote to Mowi \(then named Marine Harvest\)](#): "If existing ADD noise is already displacing cetaceans then any additional noise from Sconser Quarry would exacerbate the problem," [said the email dated 24 July 2017 \(obtained via FOI from Highland Council\)](#). "Marine Harvest need to demonstrate that the existing sites have been managed sensitively in the past and/or provide undertakings that they will be in the future. Confirm what ADD model has been used in the past (US3 or TR1) and what model will be used in the next cycle."]

In September 2019, [SNH advised Argyll & Bute Council](#) (in relation to [Mowi's mortality-laden Carradale salmon farm in Kilbrannan Sound](#)) that "the continuous activation of ADDs (as set out in the current deployment plan) is not considered to be good practice and we would recommend the ADD deployment plan should be amended to take this into account". "We would suggest that patrol mode should be activated in response to initial predation and thereafter could remain active for a specified number of days (e.g. in box 3)," [wrote SNH's Liam Wright in an email dated 12 September 2019](#). "If Patrol Mode is effective in deterring

seals this may be sufficient. If not, and predation continues, then use of Standard mode could be included as a later option (e.g. in box 4)."

In September 2019, SNH admitted that a salmon farm proposal by Grieg Seafood for Loch Dunvegan on the Isle of Skye would not have any significant effects. "They [Grieg Seafood] have committed not to use ADDs," [wrote SNH in a letter to Highland Council dated 6 September 2019](#). "They state that this equipment has been successfully used in Shetland with no predation by seals, no need for ADDs and no seals shot".

In September 2019, [SNH admitted to being "sceptical"](#) about the proposed use of OTAQ ADDs at Flodigarry on the Isle of Skye (a [controversial 'organic' salmon farm which Highland Council refused in January 2020](#)). "Would be good to see more on the C-PODS," [said SNH's Skye & Lochalsh's Operations Officer in Portree in an email dated 6 September 2019](#) in relation to a proposed salmon farm at Flodigarry. "Nice idea but have to say we're sceptical at the moment".

"We are also aware that cetacean detections can be masked by the ADD noise output, particularly with CPOD devices, and so we would like to see detail of the system," [commented SNH in relation to OTAQ's Sealfence ADD and the proposed salmon farm at Flodigarry](#). "Given the potential cumulative ADD noise from your multiple farms it would be good practice to produce a cumulative plan for all of the consented farms".

In September 2019, SNH alluded to differences with Marine Scotland's position on ADDs. "We may be working towards a common position with Marine Scotland but are we at odds in the meantime?" [asked SNH's Nick Halfhide, Director of Sustainable Growth, in an internal email on 3 September 2019](#) re. ADD use on Canna ([where Mowi want to set up a salmon farm in "probably the worst location" according to the National Trust for Scotland](#)).

In September 2019, [referred to a review of the ADD regulatory regime by Marine Scotland with "an internal paper for Ministers by the Autumn"](#). "Marine Scotland officials are reviewing the ADD regulatory regime, and will be producing an internal paper for Ministers by the Autumn," [wrote SNH's Cathy Tilbrook, Head of Sustainable Coasts & Seas, in internal email dated 2 September 2019](#). "We have provided information to assist in this review, including suggestions relating to marine EPS licensing. We have not yet seen the draft paper. In the meantime, we continue to provide advice on ADD deployment (within the Inner Hebrides & Minches SAC and in some cases outwith the site) in line with our current draft policy, which requires recording and active management and reporting of ADD usage through an Environmental Management Plan."

In September 2019, [SNH suggested to Mowi the "removal of ADD use"](#) at one salmon farm (Sconser Quarry) and said they were "keen for you [Mowi] to demonstrate how you would envisage total ADD use across all of your Sound of Raasay fish farms to decline over time".

From: [REDACTED]
To: [REDACTED] mowi.com
Cc: [REDACTED] highland.gov.uk; [REDACTED] mowi.com; [REDACTED] mowi.com
Bcc: [REDACTED]
Subject: RE: Sconser Quarry ADD Deployment Guidance - Discharge of Condition 3 of Planning - SNH comments - 2 September 2019
Date: 02 September 2019 12:23:00
Attachments: [image001.jpg](#)

Dear [REDACTED]

Thanks for your revised ADD deployment plan for Sconser Quarry. Sorry for the delay in getting back to you. We have considered your proposals for that site but also the wider issues regarding implementation of a similar approach across all your Sound of Raasay farms.

Your current proposals appear to involve continuous activation of the OTAQ SealFence ADD in Patrol mode. That is contrary to our guidance that ADDs should not be used continuously. The ADD research that you refer to is encouraging but was of limited duration and is not in the public domain. That, combined with the sensitivity of these constrained SAC waters, means that we do not consider it to be appropriate to depart from our published guidance.

We recommend that your flow chart should be updated to avoid continuous activation of ADDs. Patrol mode could be activated in response to initial predation and remain active for xx days (e.g. in box 3). OTAQ appear confident about the success of Patrol mode in deterring seals, so that may be sufficient. If not, and predation continues, then use of Standard mode could be included as a later option (e.g. in box 4). However Standard mode is likely to be audible by cetaceans at greater distances and we would be more concerned about cumulative impacts for that mode. If you were able to make commitments that Standard mode would only be activated at one farm at any given time that would help address concerns relating to possible cumulative impacts. We are also keen for you to demonstrate how you would envisage total ADD use across all of your Sound of Raasay fish farms to decline over time (for example the removal of ADD use at the Sconser site may be something you could commit to in the medium term?).

In August 2019, [SNH's Director Support Manager asked colleagues](#): "How is our relationship with Mowi? Has it been impacted by this case?" ([the controversial Canna salmon farm](#)). "This shouldn't affect our relationship at all," [replied SNH's Cathy Tilbrook, Head of Sustainable Coasts & Seas in an email of 2 September 2019](#). "The advice we provided was not unusual for EIA screening/scoping and would not have ruffled any feathers at Mowi. We continue to liaise closely with the company as the application processes."

In August 2019, [SNH wrote to Highland Council suggesting that Mowi had been "misadvised by OTAQ"](#) ([OTAQ is an ADD manufacturer whose largest shareholder is Euroblue Investments - a company named in the Offshore Leaks Database](#)). "We think OSC [Ocean Science Consulting] research is fine as far as it goes but was limited duration and lack of publication will limit wider applicability," [wrote SNH's Operations Officer for Skye & Lochalsh in an email dated 30 August 2019 to Highland Council](#) in relation to ADDs at The Scottish Salmon Company's Portree salmon farm. "For Sconser Quarry we will go back to MOWI to say that the current proposals (constant use of Patrol mode and possibly extensive use of Standard mode) are not acceptable especially in terms of cumulative impacts. It looks as if they have been misadvised by OTAQ".

In August 2019, [SNH wrote to The Scottish Salmon Company "disappointed that OTAQ \[a manufacturer of ADDs\] are not prepared to publish the report"](#) (on underwater noise

monitoring of the OTAQ SealFence at Portree salmon farm). "As this is a sensitive location, and the ADD system has been operating for this trial period, we request sight of the information that the Scottish Salmon Company and OTAQ collect under section 3.3 of the ADD plan," [wrote SNH's Operations Officer for Skye & Lochalsh in an email dated 30 August 2019](#). "Much will rest on the annual review meetings and we are keen to see the information that has been collected since the system was first deployed in March".

In August 2019, [SNH raised concerns at the "continuous" use of ADDs by Mowi](#) at their salmon farms at Sconser Quarry and Scalpay on the Isle of Skye. "There will need to be at least another round of dialogue with MOWI re. their proposals for Sconser Quarry and Scalpay," [wrote SNH's Operations Officer for Skye & Lochalsh in an email dated 27 August 2019 to Highland Council](#). "They are proposing continuous use of patrol mode for all of the sites. That would deviate from our guidance and we would only be prepared to revisit our guidance if the Portree study was published (and possibly more data). As discussed, I think we're also looking for more certainty with the alternatives at the end of the flow chart. We still need to go back to MOWI".

In August 2019, [Mowi wrote to Argyll & Bute Council "as a matter of urgency" asking to use ADDs at their Carradale salmon farm in Kilbrannan Sound "as soon as practically possible"](#). "Please find attached a draft ADD Deployment Guidance flowchart which would be used to control and manage the use of the OTAQ SealFence system proposed for use at Carradale," [wrote Mowi in an email dated 20 August 2019](#). "The flowchart also defines responsibilities and reporting requirements. The modular system can be operated at a source output of 170db in patrol mode and 189db in standard mode."

In August 2019, [JNCC published a report: "Evidence base for application of Acoustic Deterrent Devices \(ADDs\) for marine mammal mitigation in coastal waters"](#).

4 UK Legislation and Guidance

Overview

Marine mammals are protected in the UK under a series of regulations. Some of these apply to noise and the potential for hearing damage or disturbance. The majority of acoustic devices available emit loud sounds and therefore could carry a risk of an adverse impact on these species. The risk of injury from ADD deployment is likely to be very low (see section 1.3) and would only occur if animals stayed in the vicinity of an operating device for prolonged periods of time. ADDs, if effective, will disturb marine mammals, and the question of whether this could be considered an offence in relation to environmental legislation will depend primarily on how these devices are used, how often, for how long and where they are deployed.

In July 2019, [SNH wrote to Argyll & Bute Council](#) raising concerns about the use of ADDs by The Scottish Salmon Company in Loch Na Keal on the Isle of Mull. Here's an [extract from SNH's letter dated 24 July 2019](#):

In our view, this proposal is likely to have a significant effect on harbour porpoise within Inner Hebrides and the Minches SAC because the predator control plan includes the use of acoustic deterrent devices (ADDs). Consequently, Argyll and Bute Council is required to carry out an appropriate assessment in view of the site's conservation objectives for its qualifying interest. To help you do this, we advise that in our view, on the basis of the information provided and the appraisal carried out to date, it will not adversely affect the integrity of the site. The advice from our appraisal is as follows:

- The hearing range of harbour porpoise includes the sound frequencies emitted by the proposed ADD model. As a result we consider that the use of ADDs may result in disturbance/habitat exclusion^[1].
- In our view the ADD deployment plan identifies an appropriate decision making process to guide the activation/deactivation of ADD's and this will ensure that the long term and continuous use of ADD's at this location will be avoided.
- Conservation Objective 2b states that the distribution of harbour porpoise throughout the site is maintained by avoiding significant disturbance. Significant disturbance in this context is where changes to the distribution of harbour porpoise occur on a continuing or sustained basis. We consider that in this location any short term temporary disturbance or displacement as a result of the deployment of ADD in line with the ADD deployment plan will not result in significant disturbance.

We would like to highlight the importance of ensuring that the measures outlined in the ADD deployment plan (including the type and number of devices and the requirement for monitoring and reporting) are set as a requirement of any planning consent, should Argyll and Bute Council be minded to approve this application.

We consider that the ongoing review of ADD use is an essential component of the deployment plan and as such we would like to highlight that an appropriate review process should be part of any consent granted. By ensuring a review process is in place Argyll and Bute Council, as the Competent Authority, in consultation with SNH, will maintain a mechanism to require future changes to the plan should they be deemed necessary.

In July 2019, the [team at St. Andrews University behind GenusWave](#) admitted in an email that "a range of manufacturers with devices on fish farms have made unsubstantiated claims with regard to being 'cetacean/dolphin/porpoise friendly' or posing 'no risk to hearing damage'". "To our knowledge, none of these claims are actually backed up by any publication in the scientific literature, even though the University of St. Andrews is sometimes falsely quoted to back up these claims," [stated the email dated 15 July 2019](#) (believed to be directed to SNH's Skye & Lochalsh office and copied to Highland Council).

Finally, regarding your concerns relating to the prototype nature of the device used in the studies. Genuswave Ltd. (genuswave.com) is the only company that has fully implement the results from these two peer-reviewed papers in the scientific literature in a commercial product. This is technologically challenging which is why the process has taken time. The duty cycles and source levels you are rightly referring to can be adjusted based on regulatory guidance. The general concern you may be hinting at is certainly justified though. A range of manufacturers with devices on fish farms have made unsubstantiated claims with regard to being 'cetacean/dolphin/porpoise friendly' or posing 'no risk of hearing damage'. To our knowledge, none of these claims are actually backed up by any publications in the scientific literature, even though the University of St Andrews is sometimes falsely quoted to back up these claims.

Best,

██████ & ██████

Dr ██████ ██████

Honorary Lecturer & Research Fellow

Scottish Oceans Institute

Sea Mammal Research Unit

University of St Andrews

KY16 8LB, St Andrews

Scotland/UK

Here's the [research team behind GenusWave](#):

APPLICATIONS BENEFITS SCIENCE TECHNOLOGY ABOUT U.S. IMPORTS

Research

University of St Andrews



Vincent Janik

Vincent Janik is a professor of biology at the University of St Andrews in Scotland. He has more than 20 years of experience in marine science and leads a research group on marine bioacoustics. Before coming to St Andrews, he worked as a researcher at the Woods Hole Oceanographic Institution. His research is focused on marine mammal acoustics and underwater noise.



Thomas Götz

Dr Thomas Götz is an Honorary Lecturer and Research Fellow at the University of St Andrews (Scottish Oceans Institute, SMRU) working in the field of marine bio-acoustics, sensory ecology & physiology, applied ecology and acoustic deterrence. Thomas scientific research encompasses studies on the effects of noise on marine mammals, the physiological mechanisms underlying 'aversiveness' of sound, the relevance of the startle reflex for the elicitation of flight responses, navigation in seals and echolocation behaviour in dolphins. He designed and completed the first studies on the acoustic startle response in marine mammals demonstrating that the reflex is present in these animals and generally associated with flight and avoidance responses. The applied strand of his work provided the foundation for the development of the targeted acoustic startle technology. Current work involves research on new applications and engineering support for prototype development.

In June 2019, [SNH red-flagged the use of ADDs at The Scottish Salmon Company's salmon farm at Ushenish in South Uist](#). "The typical frequencies of ADDs are within the hearing range of harbour porpoise," [wrote SNH in a letter to the Planning Officer at Comhairle nan Eilean Siar dated 24 June 2019](#). "A significant body of evidence exists to suggest that in some cases ADDs can result in the disturbance and displacement of harbour porpoise. The evidence of impacts on cetaceans from ADDs currently in use is varied and is dependent on many variables (e.g. noise characteristics of device, how the device is used, the topography, animal behaviour and importance of the area/habitat where the ADD is being used. We advise that a 3km indicative disturbance distance is used when assessing application. This distance is based on evidence in scientific literature and on our internal modelling exercise, and should be used to assess the indicative spatial extent of disturbance. The proposed site lies 1.3km from the boundary of the SAC".

In June 2019, a '[Habitats Regulation Appraisal Report](#)' by [Arcus Consultancy Services on behalf of The Scottish Salmon Company's extension of Geasgill salmon farm in Loch Na Keal on the Isle of Mull](#) stated: "Multiple stakeholder advice considers the use of Acoustic

Deterrent Devices (ADDs) in finfish aquaculture to be the primary activity likely to affect harbour porpoise" and "it is recognised that active ADDs may result in potential disturbance and habitat exclusion on cetacean".

4.1.3 Underwater Noise

Multiple stakeholder advice⁴ in relation to general impacts of aquaculture considers that the use of ADDs is the main interaction between aquaculture development and cetaceans. It is recognised that active ADDs may result in potential disturbance and habitat exclusion of cetacean, and in particular harbour porpoise, in the area of ADD use and where cetaceans are present within the detectable range.

In June 2019, [SNH's Skye & Lochalsh office in Portree wrote to Grieg Seafood raising concerns 'Salmonsafe' ADDs from GenusWave](#). "The results of the trials are promising, especially in relation to effects on porpoise, but need to be treated with a degree of caution because they appear to utilize prototype devices with differing source levels, and operational deployment may not be the same as the trial deployments," said [an email dated 10 June 2019](#). "We are not aware of any farms where these devices are currently in operation."

In June 2019, [The Scottish Salmon Company wrote to SNH](#) asking for "further information on the reasoning behind the 3km indicative distance for the Inner Hebrides and Minches SAC" in relation to the Ushenish salmon farm in South Uist. In an [email dated 20 May 2019](#), SNH had emailed The Scottish Salmon Company: "The proposed site is within 3km of the Inner Hebrides and the Minches SAC designated for harbour porpoise. An ADD deployment plan would be required for this proposed site; this would need to include the requirements to consider best net technology prior to ADD use".

In May 2019, [SNH raised concerns about the significant effect of ADDs at The Scottish Salmon Company's salmon farm in Loch Shieldaig](#). "The standard US3 emits sound in the 10-20KHz frequency range which is within the sensitive hearing range for harbour porpoise (i.e. not target specifically at seals)," [wrote SNH in a letter to Highland Council dated 14 May 2019](#). "We don't think that the ER shows evidence to suggest that sound emitted by the ADDs will not travel in to the SAC boundary."

In May 2019, [Grieg Seafood wrote to SNH looking into the possibility of installing a new "less harmful" ADD system](#). "The system is a targeted acoustic startle technology (TAST) manufactured in conjunction with the University of Andrews and considered to be less harmful to the surrounding environment than other devices currently on the market," [wrote Grieg Seafood in an email dated 8 May 2019](#).

"Our preference for this site would be to maintain the presumption against the use of ADDs," [continued SNH's email to Grieg Seafood](#). "We would ask you to demonstrate that you have tried alternatives and explain why ADDs are needed. The 2016 scientific paper you referenced, highlight 'puzzling' observations that seal surfacings occurred within 100 m of the transducers and suggested that this behaviour was more common amongst pups during the adult moulting period, coinciding with pups exploring their environment. We have some concerns that the use of the 'Salmonsafe' ADDs may result in behavioural changes which in turn may have knock-on effects for long-term survival of pups. Given the proximity of the seal SAC, we would want that issue to be investigated scientifically before we would be in a position to support ADD use at this site. It may be that GenusWave have further information on this aspect or further targeted research may be needed."

In April 2019, [Mowi reviewed their ADD Deployment Guidance](#). "The revision is based on the recommended best practice of OTAQ," [said Mowi's \[redacted\] Environmental Analyst in an email to SNH dated 23 April 2019](#). "OTAQ recommended that Patrol Mode is used continuously to mitigate against potential seal attacks. The continuous use of the lower decibel range of Patrol Mode (125 dB to 170 dB) is suggested to be more effective than the intermittent use of other operational modes which utilise higher decibels. OTAQ are currently validating a model investigating the impact of SealFence operational modes on cetaceans and pinnipeds. The model output will provide evidence to determine if this is an effective method of seal deterrence and best practice. The results are planned to be presented by OTAQ to SNH in due course".

In April 2019, [Shieltaig Community Council strongly objected to an application by The Scottish Salmon Company in Loch Shieltaig citing concerns re. ADDs](#).

(2) Effect of Acoustic Deterrent Devices (ADDs) on the Habitat.

The Non-Technical Planning Statement states at paragraph 6.6 that *"The detection range of a bespoke Acoustic Deterrent Device system for the Proposed Development, is limited to areas out with the cSAC [The Inner Hebrides and Minch Special Area of Conservation]."* Further, Table 5.5 of the Environmental Impact Report (Interaction with Predators), SSC states that there are no outstanding issues to be addressed with regards to ADD deployment and the proximity of the cSAC.

SSC has submitted no evidence to support these claims.

The Inner Hebrides and Minch Special Area of Conservation is designated under the EC Habitats Directive as a special conservation area for the harbour porpoise *"For which this is considered to be one of the best areas in the United Kingdom"*. Appendix A, Figure A4 (Natural Heritage Designations) shows a map of the Special Conservation Area which stops at the entrance to Loch Torridon, approximately 500 metres from the Proposed Site. Appendix N (ADD Usage and Deployment Plan) recognises that the ADDs can have a negative effect on cetaceans. This issue is recognised in the Scoping Opinions by Scottish Natural Heritage (SNH), SEPA and the Highland Council (Table 5.5 of the Environmental Impact Assessment Report).

SSC has responded by stating that it keeps records of its ADD activations and mitigates the effect of its ADDs by keeping a wildlife log and manually switching off the system if its employees sight any cetaceans.

We do not believe this is an effective mitigation because:

- The site is not permanently manned meaning for the majority of the time no one is actually around to spot cetaceans and turn off any devices. Even if employees are at the site, it is absurd to suggest they will be looking around for cetaceans whilst working. By way of example, members of the Community visited the site by boat at 10.30am on 30th April. The ADDs could be heard operating, even from above the water, and there was no one present on site to turn them off. It is fair to assume they had been operating like this since the previous day and overnight, if not over several days or weeks.
- Even if staff were present, paragraph 3.2 (of the Appendix N) states that disabling will not occur if seal mortalities are being recorded. As the ADDs are only deployed if seal mortalities are recorded, presumably this means they are therefore never turned off, even if a cetacean is spotted.
- A new scientific paper published by The Scottish Marine Institute in October 2018 ("Mapping widespread and increasing underwater noise pollution from acoustic deterrent devices") demonstrates that Acoustic Deterrent Devices (ADDs) ***"are a significant and chronic source of underwater noise on the Scottish west coast with potential adverse impacts"***. The study's data shows that ADD detections have been made both immediately outside Loch Torridon and inside the cSAC. Indeed, the paper states that ADDs can be detected ***"at a considerable distance from active fish farms"*** (20km+). Scottish Natural Heritage confirmed in 2017 that "There is scientific evidence, both empirical and modelled, which shows that ADDs can cause disturbance and displacement of cetaceans" (including the harbour porpoise). Scottish Natural Heritage further concluded that this problem is "particularly relevant in restricted environments (e.g. straits or narrows) where cumulative ADD use can present a barrier to passage by cetaceans". Loch Torridon is a restricted environment and as the Proposed Site is 500 metres from the narrow entrance to the Loch, SSC's ADD usage may act as a barrier to passage of cetaceans into and out of the loch (see Appendix A).
- Finally, although the Marine Noise Registry does not currently contain detailed information on ADD use in fish farms, the SSC disclosed in 2017 that it used two ADDs at the Neighbouring Site broadcasting at 12kHz and not the low range frequency (1-2kHz) which is less harmful to cetaceans and for which its units are enabled. It should be noted that SSC states in Appendix N that they currently deploy 10 devices and that four more will be deployed at the Proposed Site; and

The Community Council does not agree with the conclusion of Scottish Salmon Company that *"impacts that may affect the integrity of the cSAC were all considered to not be significant, and were thus scoped out of the requirement for further assessment."*

This statement is yet another example of how SSC claims to have addressed the potential negative consequences of the Proposed Development, but on closer examination these claims are specious.

In February 2019, [SNH questioned "inconsistency" in Mowi's application for a new salmon farm at the Isle of Scalpay](#). "Some farms are able to operate without ADDs with the newer stronger nets," [wrote SNH's Dr. Caroline Carter in an email dated 12 February 2019](#) in reply

to Mowi's claim that "removing the option to use ADDs puts potential pressure on the welfare of farmed fish and the protection of seals".

"Conclusive evidence is not what is required," [wrote SNH's Caroline Carter in an email dated 12 February 2019](#) in reply to Mowi's claim that there was "little scientific evidence which provides conclusive data on the impact of ADDs". "There is enough scientific evidence in existence to highlight the potential, and as far as I'm aware under Natura that's sufficient," [continued SNH's Dr. Caroline Carter in an internal email to SNH's Kirsty North](#).

In January 2019, [a 'Predator Control Plan' for The Scottish Salmon Company's Geasgill salmon farm in Loch na Keal](#) admitted that "it is not common practice for SSC to use anti-predators nets".

**The Scottish
Salmon Company**



Predator Control Plan

Geasgill, Loch na Keal

5. Acoustic Deterrent Devices

If necessary at the site, Acoustic Deterrent Devices (ADDs) will be fitted. The ADD will be situated on the cages. The ADDs will be the OTAQ SealFENCE, a triggered system used to deter a seal attack. The device will be implemented when site staff note high risk seal activity within the vicinity of the site. A log will be kept of the incidence of attack, and timings and duration of the ADD activation, to be assessed by SSC Managers annually to determine usage.

6. Anti-predator nets

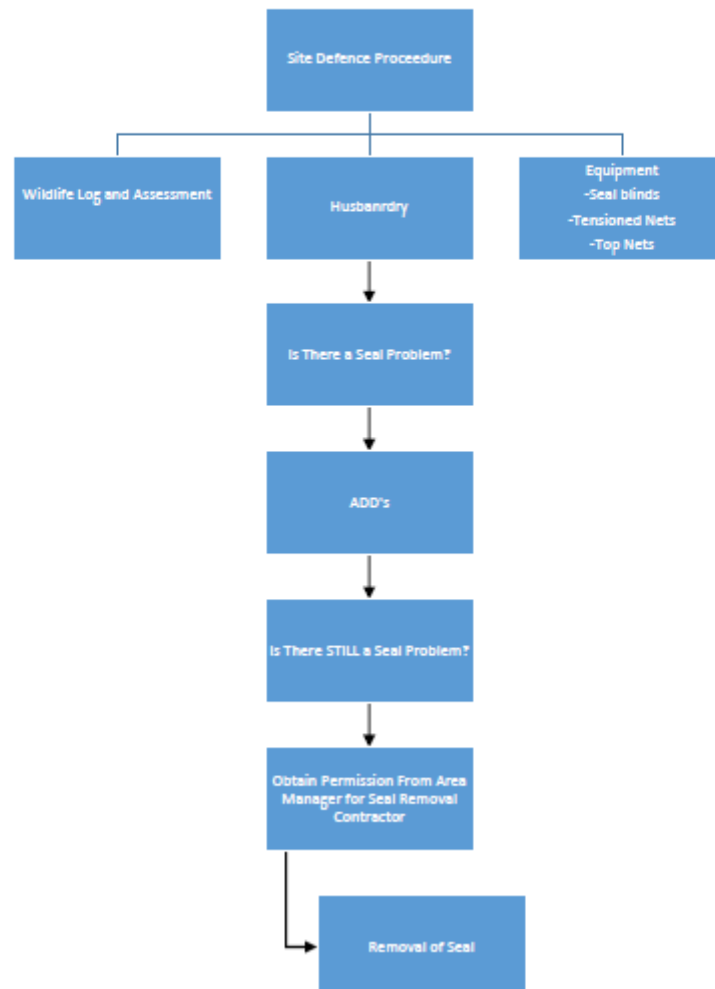
It is not common practice for SSC to use anti-predator nets, as there is a high risk of entanglement to diving birds and mammals. However, SSC may consider using these nets in certain circumstances – the Site Manager will consult with the Regional Manager prior to deploying these nets.

7. Dispatch of Seals

If all other methods of deterrents prove ineffective, as a last resort if necessary, persistent problem seals will be shot. Area Managers must approve the requirement to remove problem seal before this action can be taken. SSC will contract a licensed marksman to remove the rogue seal. Records will be kept of seal removal contracts, including the number and type of seals removed from the site and the company will ensure compliance with current legislation. SSC will follow guidelines of Scottish Government, to meet obligations and responsibilities as detailed in the Marine (Scotland) Act, issued in February 2010.



Flow Chart of Anti Predator Device Assessment



In January 2019, [SNH criticised Mowi's policy of using ADDs rather than predator nets](#). "The company's policy is to use ADDs rather than predator nets, and they cite potential entanglement as the reason for not deploying predator nets," [wrote SNH's Dr. Caroline Carter to SNH colleagues in an email dated 29 January 2019](#) in relation to Mowi's new Isle of Scalpay salmon farm. "Thus is a new farm application, and therefore we should ask them to first consider operating the site without using ADDs at all (as per our draft guidance). There are nets available now that are thought to prevent seal predation without needing other measures. For example Seal Pro netting <https://www.garwarefibres.com/product/sapphire-sealpro/> this has/is being proposed by other companies. If they are procuring new kit for this site, then that's the perfect time to look at other options. Appendix 5.5a details the company's commitment to achieving ASC certification, and within this, there is a limit to the number of days the ADD system is in operation to less than or equal to 40% of the time the site is stocked. This could be a significant amount of time, and so my feeling is that we should be aiming for a lower proportion than this".

In January 2019, [Scottish Sea Farms referred to SNH's "holding objection" to an application in the Sound of Mull](#) (a salmon farm which was [cited in the death of a humpback whale in 2014](#)).

From: [REDACTED]@scottishseafarms.com>
Sent: 25 January 2019 17:19
To: Davies, Sandra; planning.oland@argyll-bute.gov.uk
Cc: Colin MacFarlane; Andrew Campbell
Subject: Fishnish A planning application (18/02024/MFF) - Submission of revised information on ADD use
Attachments: Appendix E - Revised Sound of Mull ADD Deployment Plan - Jan 2019 v7.pdf; Supporting Information Document - Fishnish A (Revised).pdf

Dear Sandra

Please find attached a revised ADD Deployment Plan for the Sound of Mull and updated Supporting Information Document (Section on Inner Hebrides and Minches SAC) which have been amended in response to the SNH holding objection to this application, and following further discussion with SNH on the use of ADDs.

Please let me know if you require any further information.

Kind regards

[REDACTED]

[REDACTED] | Scottish Sea Farms Limited
South Shian, Connel, Argyll, PA37 1SB
Tel +44 (0)1631 [REDACTED] Mobile [REDACTED]



Scottish Sea Farms [committed in their 'Sound of Mull ADD Deployment Plan'](#) (January 2019) to "completely phase out the use of ADDs in the Sound of Mull" beyond 2021 "once all farm have been upgraded to polyethylene nets with improved net tensioning". Scottish Sea Farms pledged their "intention to remove ADDs from all farms in 2021 once cage nets are fully upgraded".

ADD use beyond 2021

SSF acknowledge that the Sound of Mull lies within the Inner Hebrides and Minches SAC designated for its harbour porpoise population and that it is considered a sensitive location in terms of potential indirect and unintentional disturbance of porpoise and other cetaceans from underwater sound generated by ADDs. Once all farms have upgraded to polyethylene nets with improved net tensioning and we can demonstrate that these improvements can limit seal predation to an acceptable level, it is our intention to completely phase out the use of ADDs in the Sound of Mull.

Conclusion

The Sound of Mull and the Fishnish area in particular, have supported significant records of harbour porpoise activity in recent years, despite existing ADD use in this area. SSF do however accept that the Sound of Mull is a sensitive location in terms of potential indirect and unintentional disturbance of porpoise and other cetaceans. We have therefore identified significant changes in ADD use at all Sound of Mull sites which will reduce the risk of significant disturbance. These include:

- Investment in stronger cage nets and associated net tensioning which should reduce the need to use ADDs;
- Replacing continuous ADD use at sites with limited ADD use where tensioned netting has not been fully effective against seal predation and seal related fish mortality is demonstrated;
- Limiting the amount of time ADDs can remain on;
- Limiting simultaneous use of ADDs to a maximum of two sites;
- Intention to remove ADDs from all farms in 2021 once cage nets are fully upgraded.

In January 2019, the Scottish Government invited a public tender to a £100,000 research project - "[Improve understanding of use, impact and efficacy of ADDs in aquaculture](#)" (CR/2018/08) - to be completed by June 2020.



INVITATION TO TENDER FOR:

Improve understanding of the use, impact and efficacy of Acoustic Deterrent Devices (ADDs) in aquaculture

TENDER REFERENCE – CR/2018/08

A '[Specification of Requirements](#)' included:

SPECIFICATION OF REQUIREMENTS

Improve understanding of the use, impact and efficacy of Acoustic Deterrent Devices (ADDs) in aquaculture

Introduction

1. This specification sets out the terms of reference for the research project "Improve understanding of the use, impact and efficacy of Acoustic Deterrent Devices (ADDs) in aquaculture". The project will assist in gathering evidence on the effectiveness of ADDs in reducing seal depredation and the extent of their use at fish farms in Scotland.

2. Acoustic Deterrent Devices (ADDs) are one of a number of management measures used by the aquaculture industry to reduce seal depredation at fish farms, but in recent years there has been increasing concern about the potential for impacts on cetaceans. Despite the long-term use of ADDs in aquaculture there is 1) a poor understanding of the practical effectiveness of current and new ADDs in terms of deterring seals and reducing predation events at Scottish aquaculture sites, and 2) limited empirical data on the disturbance and displacement of cetaceans as a result of ADD use at Scottish aquaculture sites. These were raised as significant knowledge gaps in a Scottish Government review of ADDs in Scotland¹, therefore the aim of this project is to address some of the recommendations made by Coram et al (2014) in an effort to further develop our understanding of the issue.

3. To address some of these issues requires a greater understanding of the extent of ADD use at aquaculture sites in Scotland. Currently there is limited information on their use (for example, the number, type of device(s) used and mode of operation) which may vary considerably between aquaculture sites. Increasing our understanding of where and how ADDs are used at fish farms will not only enable better mapping of devices, but will also help to inform investigations into the effectiveness of ADDs in reducing seal depredation and the potential for impacts on cetaceans.

4. Assessing the potential for impacts on cetaceans from ADDs, and their effectiveness in reducing seal depredation, can be difficult. They will vary widely based on a number of factors, including sound characteristics of the devices, how they are used (e.g., duration, source level, frequency, duty cycle), the environment in which they are used, as well as species behaviour. Our understanding of the effectiveness of ADDs on seal depredation events in the long-term and the variables that may influence this effectiveness is still limited. Similarly, while a number of studies have been undertaken over the years which have demonstrated that certain devices have the potential to affect some cetacean species (particularly harbour porpoise), there is still a poor understanding of the occurrence of behavioural responses around ADDs *in situ* at fish farms in Scotland and the consequences of any disturbance or displacement of cetaceans.

¹ <http://www.gov.scot/Publications/2014/10/8271/0>

5. Consequently, there is a need to improve our understanding of the use, impact and efficacy of ADDs in aquaculture in order to balance the sustainability of our growing aquaculture industry whilst protecting biodiversity and the environment.

The Study

Aims

6. The aim of this research project is to improve our understanding of the use, impact and efficacy of ADDs in aquaculture. Specifically the study will aim to:

- Undertake a comprehensive assessment of the status and use of ADDs at Scottish aquaculture sites.
- Using an analysis of existing data sources and information gathering techniques, assess the relative effectiveness of ADDs in reducing seal depredation.
- Consider and explore the feasibility of alternative non-lethal approaches for reducing seal depredation.
- Deliver a set of recommendations for future *in situ* field studies to fill key data gaps.

Objectives

7. The research objectives for this project are as follows:

- Undertake a comprehensive assessment of ADD use at fish farms around the Scottish coast. This should include an assessment of the types of devices used by each fish farm (where applicable), their location and the extent of their usage. This information should be presented in a live database that can be updated with new data.
- Using existing information sources and dialogue with industry, undertake an assessment of the effectiveness of ADDs as a tool in reducing seal depredation. This should take account of signal characteristics and/or modes of operation and variables that may contribute to seal depredation events and apparent ADD effectiveness, as well as a consideration of the geographical variability in the use of ADDs and associated results.
- Develop science-based industry guidance on the use of ADDs in aquaculture (to minimise the risks of disturbance to cetaceans) building on Scottish Natural Heritages (SNH) guidance (available on request from SNH²) and in close co-operation with the aquaculture industry.

² E-mail: caroline.carter@nature.scot

- Drawing on recommendations from Coram et al (2014) and advice from the Special Committee on Seals (SCOS) (in draft) review the feasibility of alternative non-lethal approaches for reducing seal depredation at fish farms in Scotland.
- Deliver a set of recommendations for future *in situ* field studies to 1) investigate the occurrence of behavioural responses of cetaceans in response to ADDs, and 2) the efficacy of ADDs in reducing seal depredation.

Methods

8. The successful contractor should develop the proposal in line with the aims and objectives of the project and wider policy requirements. However, as a minimum it is anticipated that the approach would consist of the following research tasks:

- Working in close cooperation with the aquaculture industry (and other relevant organisations), undertake a comprehensive assessment of the extent of ADD use in Scotland. This should involve the collection of data on ADD usage at aquaculture sites in Scotland (for example, covering types and numbers of devices, modes of operation, location, etc.) to help quantify and map the scale and range of use, which will be collated into an appropriate database. To ensure that the data is up to date and reflects current ADD usage, there will be a requirement for the contractor to develop protocols for its continuous use that can be easily followed beyond the life of this contract.
- Using existing data sources (held by Government, academia and industry), and working in close partnership with the aquaculture industry, gain a greater understanding of the effectiveness of ADDs in reducing seal depredation at fish farm sites. We anticipate this involving 1) analysis of existing data sets and 2) structured dialogue with aquaculture bodies to understand drivers and ADD effectiveness in different locations and circumstances. Particular consideration should be given to the signal characteristics and/or modes of operation of ADDs and potential role of other variables (e.g. time of year, weather, operation of fish farms) that may influence seal depredation events and apparent ADD effectiveness. Contact with the Seal and Salmon Working Group (SASWG) which represents industry, academia and Government is essential.
- Explore opportunities to engage with the industry and other relevant organisations in relation to the aims of the project. To facilitate this, the contractor will be expected to have a project plan in place to ensure continuous dialogue and engagement with the industry.
- Building on SNH guidance "*Proposed use of acoustic deterrent deterrents (ADDs) at fish farms affecting the Inner Hebrides and the Minches cSAC*," drawing on the findings from the above outcomes and working closely with Marine Scotland, SNH and the aquaculture industry, develop science-based industry guidance on the most effective use of ADDs to reduce seal depredation while minimising potential disturbance/displacement of cetaceans. Developing a framework for the assessment of cumulative impacts of ADD will be important.

- Drawing on recommendations and findings of the report “*Evaluating and Assessing the Relative Effectiveness of Acoustic Deterrent Devices and other Non-Lethal Measures on Marine Mammals*” (Coram et al, 2014) and advice from the Special Committee On Seals (SCOS) (*in preparation*), review and consider the feasibility of alternative approaches for reducing seal depredation at fish farms and provide details on where these approaches are being used, how effective they are, financial and logistical feasibility, and any potential constraints associated with their use. Particular focus on nets and associated configurations is encouraged. The outcome of this review should be a set of recommendations on effective solutions with particular consideration of their deployment at Scottish aquaculture sites.
- Deliver a set of detailed recommendations for future *in situ* field studies to 1) investigate the occurrence of behavioural responses of cetaceans in response to ADDs, and 2) the efficacy of ADDs in reducing seal depredation. These recommendations should have regard for current research ongoing, and provide a clear justification, regarding what work, if any, should be commissioned, and provide costings for these elements. As part of this, the contractor should explore the feasibility of field studies and consider a selection of sites for any proposed field trials, including consultations with relevant organisations.
- Close liaison with experts in this research area and the aquaculture industry to ensure that the aims of the project are being met.

The contractor is encouraged to expand and develop their ideas based on the information presented here to fulfil the project requirements in the optimum manner.

Research Outputs

9. Within the first week of the contract the successful contractor will provide a 50 word abstract describing the project for publishing on the Scottish Government website.
10. The successful contractor will provide the Scottish Government with the following outputs:
 - Progress reports to be sent to Marine Scotland and Scottish Natural Heritage at a frequency to be agreed. This report should contain information on progress, outputs and deliverables.
 - An open access database that includes information on current ADD used (numbers and devices) within the Scottish aquaculture sector. This should be considered a live database and one that can be updated on a regular basis to reflect current ADD use.
 - Findings on the efficacy of ADD use with respect to seal depredation.
 - Science-based industry guidance on the use of ADDs in aquaculture to minimise the risks of disturbance to cetaceans which will build on the internal SNH guidance on ADD use at fish farms.

- A draft final report for the period of the contract. The content of the report should be agreed with the Scottish Government but it is anticipated that it will include the policy and scientific background, methodologies employed, results, conclusions and recommendations in relation to the aims and objectives of the project. This draft report should be submitted no less than six weeks before the end of the contract and should contain an Executive Summary (no more than two sides) in a format compatible with Microsoft Word. Potential contractors should indicate in their tender who will have the main responsibility for writing the report.
- A research summary which will be published by Scottish Ministers. This should be a 2-4 page summary of the main findings of the research and should be produced separately from the final report. This summary should not be simply a bulleted version of the points in the main report, but should be a wider look at what the findings mean in a wider policy context and may be edited by the Scottish Government.
- An oral presentation of their research findings to the Scottish Government and a range of stakeholders.

Timing and Cost

11. It is envisaged that the study will begin in February 2019 and will be completed by June 2020.

12. The estimated budget for this work is £80k to £100k.

Project Management

13. A steering group will be established to manage the project. The steering group will meet with the contractor after the contract has been let and at six monthly intervals until the project is successfully completed. The contractor should therefore allow for four meetings in total.

Please note that the 2014 report referenced in Note 1 is available [online here](#)



PUBLICATION - RESEARCH AND ANALYSIS

Evaluating and Assessing the Relative Effectiveness of Acoustic Deterrent Devices and other Non-Lethal Measures on Marine Mammals

Published: 28 Oct 2014

Part of: [Marine and fisheries](#)

ISBN: 9781784128739

Marine Scotland commissioned a research project aimed at gathering literature and data into the effectiveness of non-lethal measures of deterring marine mammals from a range of activities (e.g. fish farms, renewable developments etc.). This review attempt



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145 page PDF

2.8 MB

ACCESSIBILITY: This document may not be fully accessible.

A [FOI request by Scottish Salmon Watch in May 2018](#) asked: "If GenusWave is guilty of making false representation regarding SNH support, please provide details". [A FOI reply by SNH in July 2018 \(SIR150721/A2655569\)](#) admitted:

We can confirm that the statement referring to SNH was inaccurate and misleading and have asked that it be removed from the GenusWave website. The statement was posted in error while the site was in development and has now been deleted.

In March 2018, an SNH guidance document - "[Proposed use of acoustic deterrents \(ADDs\) at fish farms affecting the Inner Hebrides and the Minches SAC](#)" raised serious concerns over noise disturbance by salmon farms. "ADDs in Scotland have been detected above background at significant distances from source, in the order of 15km (but could be much further depending on the environmental conditions," [stated the SNH report](#). "It is clear that ADD signals from fin fish farms are a pervasive anthropogenic noise source in the marine environment. In our view, we do not consider the continuous use of ADDs as acceptable (by continuous we mean indiscriminate use i.e. being turned on and left on regardless of risk/threat".

ADD use at fin fish farms outside the SAC

37. New applications or amendments to existing consents for ADD use up to 3km outside of the SAC boundary should be treated in the same manner as those within the SAC, based on the modelled indicative disturbance radius discussed earlier. In any location beyond that, the use of ADDs must still be weighed against the range of possible effects on the natural heritage including cumulative ones, and should incorporate consideration of all other alternative anti-predation strategies. ADDs that operate in the hearing range of cetaceans could cause disturbance. Outside the SAC we advise that fin fish farms adhere to good practice guidelines for ADD deployment, which are currently the focus of our work with industry.

General principles

38. In the meantime, we advise for sites both within and outside the SAC:
- a. The location is considered as above in relation to cumulative impacts
 - b. The applicant should, in the first instance, consider if it is possible for the site to be operated without the use of ADDs.
 - c. There should not be continuous use of ADDs; these should be triggered in response to a predation threat.
 - d. An ADD Deployment Plan should be supplied as detailed in point 21.

CMEU contacts

The CMEU leads, and first points of contact, for provision of advice on aquaculture are:

- Liam Wright (liam.wright@nature.scot / 0131 316 2695),
- Suzanne Henderson (suzanne.henderson@nature.scot / 01463 725238), and
- Laura Steel (laura.steel@nature.scot / 01463 725236).

For aspects specifically relating to underwater noise, as outlined in this guidance, the contact is:

- Caroline Carter (caroline.carter@nature.scot / 01738 458562).

In July 2017, [SNH wrote to Marine Scotland stating that "there is sufficient evidence, both empirical and modelled, to show that ADDs can cause disturbance and displacement of cetaceans"](#).



Scottish Natural Heritage
Dualchas Nàdair na h-Alba

All of nature for all of Scotland
Nàdar air fad airson Alba air fad

██████████

Marine Scotland – Marine Planning and Policy
Scottish Government
Area 1A South
Victoria Quay
Edinburgh
EH6 6QQ

Date: 28 July 2017

Dear ██████████

IMPACT OF ACOUSTIC DETERRENT DEVICE (ADD) USE ON CETACEANS

In an email to SNH, dated 8 March 2017, you asked that, "SNH submit formal statutory advice to Scottish Ministers on the impact of ADD use on cetaceans. This advice should be based on sound scientific evidence concerning the actual impacts of different ADDs on cetaceans." In more recent correspondence (1 June 2017), you clarified that this advice should "focus on the scientific evidence regarding potential impacts of ADDs on cetaceans" rather than discussing possible subsequent regulatory or management approaches.

Our advice is provided as requested and summarised below. In our view:

1. There is sufficient evidence, both empirical and modelled, to show that ADDs can cause disturbance and displacement of cetaceans.
2. There is sound, scientific evidence to expect that hearing damage, stress and masking may also occur but these are difficult to demonstrate empirically and would require further assessment.

In summary, ADDs used in aquaculture are of the frequency range and level that has been shown to disturb and displace cetacean species in various scientific studies. SNH advises that the potential for these impacts is real and therefore the requirements for protection conferred upon these species through the Habitats Regulations need to be considered.

In November 2016, [SNH met with Marine Scotland to discuss the issue of ADDs use on salmon farms](#). SNH's Dr. Caroline Carter presented "maps illustrating the range of audibility of ADDs in NW Scotland, and increasing persistent detection over last decade" and "areas within cSAC [candidate Special Areas of Conservation] which recent studies have identified as being ensonified".

In the [meeting on 8 November 2016](#), SNH and Marine Scotland clashed on the need for EPS ([European Protected Species](#)) licensing with SNH suggesting that the use of ADDs by salmon farms constituted reckless and deliberate disturbance and was therefore a breach of EU law.

EPS Legislation and MS Marine EPS Guidance

- CT suggested it would help to re-visit the decision-making flowchart in the MS Marine EPS guidance and offered SNH's view on the likely responses to each question in turn:
 - Q1 Are EPS likely to be present? => Yes.
 - Q2 Are you planning an activity which could potentially cause injury or disturbance to marine EPS? => Yes (noting that the guidance itself indicates this, for ADDs).
 - Q3 Can the impact be fully or partially mitigated? => potentially, there being various options here (eg see Annex 2). However, any such mitigation needs to be enforceable (eg via planning conditions) to ensure delivery.
 - Q4. Will an offence be committed despite mitigation plans? Yes, in some cases – leading to requirement for EPS licence
- Q4 prompted [redacted] to outline recent legal advice received by MS on the definition of 'reckless'. The advice received was not definitive but, in case law, implied 'culpable indifference and blameless disregard'. Examples of recklessness in a driving context were also given. It was MS's opinion, on the basis of this advice that ADD use *by the aquaculture sector*, is not 'reckless', the intention of ADD use being different for aquaculture to that for other industries where ADDs may be applied to 'deliberately' scare / disturb EPS (cetaceans).
- MS considered that, unless there was an identified negative effect of ADDs used in aquaculture upon EPS species, and that operators had been made aware of the negative consequences of their actions, potentially via guidance which informed operators that what they were doing could disturb cetaceans, and provided them with routes by which they might avoid this, it would be difficult to infer recklessness.
- Further to this, [redacted] argued that since ADD use for aquaculture was (in MS opinion) not, by this token, reckless and not therefore a criminal offence, there was no basis for introducing an EPS licensing regime. Rather, regulators should promote good practice to help achieve safeguard of EPS.
- SNH questioned this interpretation, indicating that the objective of the EPS legislation was to minimise or avoid disturbance and harm to protected species and, given our understanding of the potential risks to cetaceans from exposure to certain levels of underwater noise, that a reasonable interpretation of the legislation and accompanying guidance would conclude that disturbance through ADD use (irrespective of the sector employing it) falls within its scope. SNH further queried the interpretation of 'reckless / deliberate' for use of ADDs, where there has been widespread discussion with industry on potential risks to EPS, such that an operator would be 'aware of the likelihood that disturbance would result from his actions...'.
 - **Action 1. MS ([redacted] or [redacted]).** To provide SNH with a copy of the legal question raised by MS and the advice received from lawyers on defining reckless behaviour and written confirmation of how MS interpret that advice (as set out in the meeting). Also in relation to Reg 39 (2) issue raised later.
 - **Action 2. SNH (CT).** To investigate the potential for SNH to obtain a separate legal opinion on defining 'reckless / deliberate behaviour' (in the context of the EPS) and perhaps also in relation to Reg 39 (2), noting that SNH lawyers may not wish to offer advice on the same question asked by MS.
- [redacted] & [redacted] indicated that legal advice received on the definition of 'reckless' within the MS Marine EPS Guidance would, need to be fully considered.

SNH's Dr Cathy Tilbrook [cited the "growing use of ADDs" and "increasing evidence of their potential to cause disturbance and a growing aquaculture industry"](#). SNH's Sustainable Coasts and Seas 'Team Manager' stated as an objective: "Reducing or preventing the risk of legal challenge/infracton of Marine Scotland".

- CT (and others) outlined three objectives:
 - Securing a mechanism for monitoring and managing the use of ADDs, so as to safeguard EPS (and especially HP within the cSAC) in the face of growing use of ADDs, increasing scientific evidence of their potential to cause disturbance and a growing aquaculture industry;
 - Reducing or preventing the risk of legal challenge / infracton of MS, in relation to non-delivery of its statutory functions, under the Habitats Regulations (insofar as they apply to EPS) and noting high levels of public/ NGO scrutiny on such issues;

Finally:

- SNH emphasised the opinion that ADD use by the aquaculture industry, and the associated EPS licensing issues, is an issue of growing concern, that needs to be addressed to ensure safeguard of HP and compliance with European legislation.

"Does Marine Scotland conclude that an ADD left on continuously throughout the production cycle, with no mitigation, and given common understanding of potential risk to cetaceans, is not a reckless action which could result in the disturbance of cetaceans?" [asked SNH of Marine Scotland at the 8 November 2016 meeting](#).

Annex 1. Actions / questions for Marine Scotland in relation to ADD use by the aquaculture sector.

1. MS to provide SNH with a copy of the legal question posed and the advice received from lawyers on defining reckless behaviour (and on Reg 39 (2)) and provide written confirmation of how MS interpret that advice (Actions 1 and 6).
2. The aquaculture industry widely acknowledges that ADDs can impact cetaceans. Our understanding is that the legal advice received by MS regarding the definition of reckless is 'culpable indifference and blameless disregard'. Does MS conclude that an ADD left on continuously throughout the production cycle, with no mitigation, and given common understanding of potential risk to cetaceans, is not a reckless action which could result in the disturbance of cetaceans? If so then what is the justification for this conclusion?
3. MS to clarify which parts of the Marine EPS guidance they intend to update e.g. the definition of reckless and/ or description of Reg 39(2); and set out timescales / process for this revision (Action 3).
4. In areas of higher cumulative pressure it seems logical that there is an increased risk to cetacean species. In some areas this could theoretically result in their exclusion from significant areas for significant periods of time. Do MS agree this is a reasonable conclusion and if so what are the implications in relation to Regulation 39 (and within the HP cSAC, the ability to achieve Conservation Objectives on avoiding significant disturbance and maintaining access to all parts of the cSAC)?
5. Does MS consider that the concerns raised by SNH regarding ADD use for aquaculture inside and outwith the cSAC, require to be addressed? If not, what is the basis for that decision? If so, does this justify changes to current regulatory practices and do the options in annex 2 merit further consideration? Can MS clarify their timescale for providing a clear and formal policy statement that sets out the government position (Action 5 and 8)

Potential mitigation conditions (currently under discussion with industry):

- No continuous use of ADDs at any site.
- Use of automatic triggered devices (with some guidance on frequency / duration of triggering)
- Use of low frequency devices
- Reporting requirements (to be agreed)
- Use of strategic area-wide approach to ADD deployment?
- Seasonal restrictions on ADD use?
- Consideration of cumulative impacts and possible further restriction / no ADD use in areas of highest risk (NB Further work and discussion is required to clarify the location of such areas and the basis for their identification).

Please note that less than 18 months later in March 2018, [David Ainsley's filed a legal complaint with the European Commission](#) (as [submitted as written evidence in 2018 to the Scottish Parliament's salmon farming inquiry](#)) - including:

- 1. Is the disturbance of cetaceans by salmon farm Acoustic Deterrent Devices (ADDs) an offence under the Conservation (Natural Habitats, &c.) Amendment (Scotland) Regulations 2007, Habitats Regulation 39(2)¹⁷**
- 2. Is the disturbance of cetaceans by salmon farm ADDs an offence unless a European Protected Species (EPS) license is held?**
- 3. Is it an offence to disturb EPS with ADD(s) if a farm has a planning consent including ADD(s) as part of their predator control plan but no EPS licence?**
- 4. Should Art. 6(3) appropriate assessments have been carried out on the effect of ADDs on cetaceans on:**
 - (i) The Port na Cro Planning Application within the Inner Hebrides and Minches cSAC?**
 - (ii) All new consents within the Inner Hebrides and Minches cSAC?**
 - (iii) All existing consents within the Inner Hebrides and Minches cSAC?**
 - (iv) Should such Art. 6(3) appropriate assessments consider the cumulative effect of ADDs on cetaceans within the SAC?**

And:

The head of Policy and Advice of Scottish Natural Heritage advised Marine Scotland (MS) on 28/7/17:

- 1. "There is sufficient evidence, both empirical and modelled, to show that ADDs can cause disturbance and displacement of cetaceans.*
- 2. There is sound, scientific evidence to expect that hearing damage, stress and masking may also occur but these are difficult to demonstrate empirically and would require further assessment."*

This SNH report is important and annexed to this complaint (annex 1). It summarises pertinent science and concludes:

"In summary, ADDs used in aquaculture are of the frequency range and level that has been shown to disturb and displace cetaceans in various scientific studies. SNH advises that the potential for these impacts is real and therefore the requirements for protection conferred upon these species through the Habitats Regulations need to be considered"

We discuss the science in section 2.3: one of the studies involved an aerial survey by Brandt et al (2012)⁴ using a single ADD. They recorded a *“significant decrease in porpoise density from 2.4 before to 0.3 porpoises per square kilometre during ADD operation within the 990 km² survey area”*, i.e. a single ADD excluded 87.5% of porpoises from a 990 km² area. The same survey recorded 96% exclusion of porpoises at stations 7.5 km from the ADD.⁵ There was no evidence that disturbance did not happen at greater distances.

The SNH commissioned report Lepper et al 2014⁶ states *“the risk that ADDs at Scottish aquaculture sites is causing permanent hearing damage to marine mammals cannot be discounted”*. Echo-locating cetaceans rely on their sensitive hearing to forage and hearing injury could result in early death.

The 28/7/17 report from the head of Policy and Advice of Scottish Natural Heritage to Marine Scotland (MS) (annex 1) represents a welcome change of attitude by SNH. We hope that this report will be translated into action to correctly interpret European and Scottish law.

The reply from MS to the report from SNH (31/10/17 annex 1) ignores advice from their statutory conservation adviser that there is sufficient evidence for disturbance,

And:

(2) The failure to enforce EPS licensing requirements

Under Regulation 44 of the Habitats Regulations, disturbance to cetaceans, which are European Protected Species (EPS), can only take place if a EPS licence is granted.⁸

SNH’s ‘Marine mammals and licencing’ paper offers further guidance, stating that, *‘if injury or disturbance [to cetaceans] were likely... to result from the activity a EPS licence would be required in order for that activity to be carried out legally.’*

No fish farms in Scotland hold EPS licenses.⁹ The 118 which use ADDs may have Planning consents which include ADDs.

It is ironic that a scientific study on ADDs requires an EPS licence¹⁰ however salmon farm ADDs disturb cetaceans over large areas without EPS licenses.

And:

We submit that peer-reviewed science *does* show an identified negative impact (ADDs disturb cetaceans). The term “deliberate or reckless disturbance” in Hab.Reg. 39(2) is described by MS themselves³⁰ as a *“catch-all disturbance offence”* which a reasonable person would understand to mean that “deliberate or reckless” is intended to be interpreted in the widest possible sense.

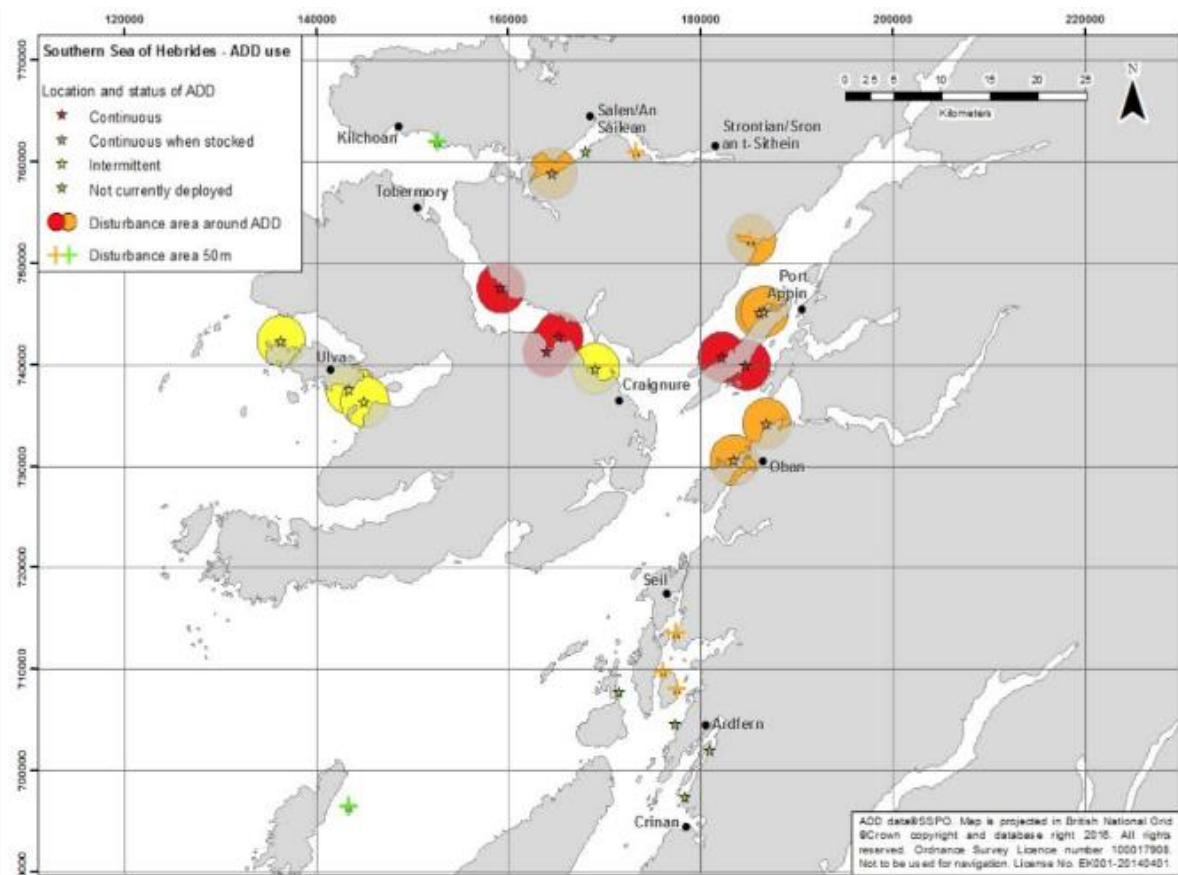


Fig 1. SNH map showing zones of disturbance of 2.5 km for Airmar ADDs and 50m for Terecos ADDs

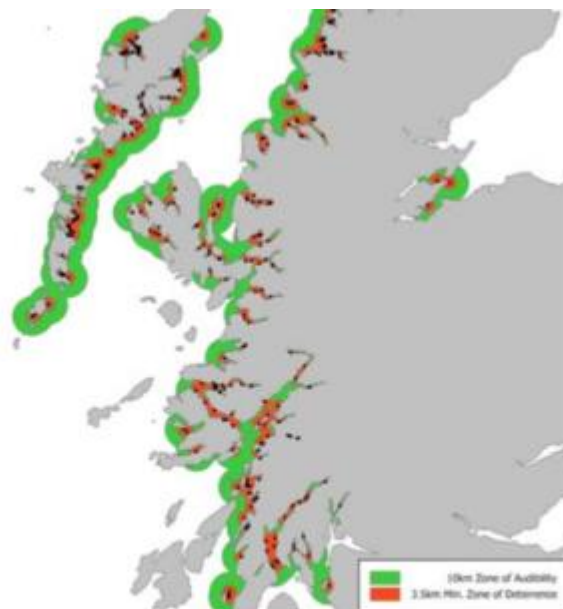


Fig 3. Map from Corram et al., (2014) Report to Marine Scotland showing zone of deterrence at 3.5km and zone of audibility at 10km.