MEDIA ADVISORY

Scottish Salmon Watch, 11 June 2018

Sounding Off About Scotland's Noisy Salmon Farms - Turn Off Acoustic Deterrent Devices to Protect Cetaceans

Campaigners are calling for a ban on the use of Acoustic Deterrent Devices (ADDs) - used on Scottish salmon farms to scare away seals - due to their impact on cetaceans including harbour porpoises and minke whales. A new report authored by the Scottish Association of Marine Science (SAMS) examining 'low frequency' ADDs is due be published via the Scottish Aquaculture Research Forum (SARF) later this month, perhaps even this week.

In response to complaints that ADDs used on salmon farms are 'recklessly disturbing' cetaceans and breaching the EC Habitats Directive, a "new generation" of low-frequency 'cetacean friendly' models have been assessed by a SARF project which was funded in 2016. The report - Low-frequency Acoustic Deterrent Devices and Porpoises (LEAP): Assessing potential impact of low-frequency Acoustic Deterrent Devices (ADDs) on cetaceans in Scottish coastal waters will be published "soon, possibly as early as mid- to late June" **[1]**.

In a report on the environmental impacts of salmon farming published in March 2018 the Environment, Climate Change and Land Reform Committee recommended that "fish farms cannot use ADDs". In April 2018, the Hebridean Whale & Dolphin Trust's written submission to the Scottish Parliament's salmon farming inquiry cited new research on the impact of ADDs on minke whales even at low frequencies **[2]**.

"Turning down the volume of ADDs will not solve the problem," said David Ainsley, a whale watching tourist operator. "Lower frequency ADDs may be less disturbing for porpoise but worse for dolphins and minke whales. The use of ADDs by salmon farms constitutes 'reckless disturbance' and is an offence under Scottish law and the EU Habitats Directive. As with the shooting of seals there must be a zero tolerance to ADDs."

"All current ADDs including the so-called 'cetacean friendly' models emit very loud noises well above the reported thresholds for disturbance and hearing damage to cetaceans," continued Ainsley who filed a complaint with the European Commission in April 2018. "This is why no ADDs can comply with the requirements of the law protecting cetaceans from disturbance and injury. Because ADDs are not very effective, seal shooting will continue until farms stop using ADDs and instead fit double-skinned anti-predator nets, as used in British Columbia where licenses are no longer being issued for ADDs."

ADDs were banned in British Columbia nearly twenty years ago with scientific research detailing significant impacts on cetaceans. "We're heard your concerns that the actions taken

by salmon farmers to keep predators away from the fish pens can be harmful to wildlife," stated the BC Salmon Farmers Association in 2015. "All of our farms companies have voluntarily banned the use of firearms on their farms. Also, salmon farmers stopped using Acoustic Deterrent Devices before they were eventually banned in 2000."

The SARF report - Low-frequency Acoustic Deterrent Devices and Porpoises (LEAP): Assessing potential impact of low-frequency Acoustic Deterrent Devices (ADDs) on cetaceans in Scottish coastal waters - is authored by scientists working at the Scottish Association of Marine Science (SAMS) in Oban. Lead researcher Dr. Stephen Benjamins of SAMS told Scottish Salmon Watch (21 May 2018): "The report you are referring to is presently in the final stages of peer review. I would imagine the final version will be published by SARF soon, possibly as early as mid- to late June."

"The project has been quite delayed, but we are now at the final stages of peer review/Board approval," said SARF's secretary Richard Slaski in an email to Scottish Salmon Watch (22 May 2018). "Our best estimate is that it should be ready for publication on the SARF website by the end of the third week of June".

Scottish Natural Heritage stated on 20 April 2018 in reply to a Freedom of Information (FOI) request:

> We hold a draft copy of a research report, SARF 112. "Influences Of Lower-Frequency Acoustic Deterrent Devices (ADDs) On Cetaceans In Scottish Coastal Waters", which is being delivered by the Scottish Association for Marine Science (SAMS). However, this report has not been published yet and is currently going through a formal peer review process prior to publication. Until the review is completed we are not able to release this research report. Scientific journals only publish papers after completion of the peer review process.
>
> We are therefore withholding the draft report under EIRS Regulation 10(4)(d) (Material which is still in the course of completion, unfinished documents or incomplete data). In this case we have concluded that it is not in the public interest to release a draft research report that is still undergoing peer review, and could be subject to change during that process.
>
> We anticipate that the research will be published in June this year, and will then be made publicly available on the SARF website, http://www.sarf.org.uk/.

"This [SARF] project aimed to establish the effects of the use of lower frequency acoustic signals delivered by a new generation of 'cetacean friendly' ADD devices on harbour porpoises in the context of Scottish coastal waters aquaculture sites," writes Dr. Denise Risch of SAMS on her web-page.

"Marketing for these devices typically labels them as 'cetacean friendly' or 'environmentally friendly'," stated the SARF project proposal dated April 2016. "While the theory behind these claims appears logical, there has been little field based assessment of their effects on cetaceans and validation of the claims made". SARF explained:

Most such devices currently used in Scotland emit, or are operated using a range of frequencies typically upwards from approximately 6kHz. As demonstrated in SARF044, and subsequent research[1] , cetaceans may be just as sensitive to the noise emitted as seals, or even more so. In consequence, their use may have an incidental effect of disturbing these species and excluding them from the ensonified areas.

Harbour porpoise and other cetaceans have strict protection under national and international legislation and are listed in the European Habitats Directive as European Protected Species (EPS). Under the Habitats Regulations (via which the Habitats Directive is implemented in Scotland), deliberate or reckless disturbance of any EPS is a criminal offence, unless permitted through provision of an EPS licence. UK administrations are also currently considering the possible designation of SACs for Harbour Porpoise in UK coastal waters. Any such designations, if implemented, would likely place additional responsibilities upon developers and regulators to ensure that activities consented in designated areas do so only if it can be shown that the activities concerned have no adverse effect upon the Harbour Porpoise population concerned. This could, potentially, limit future use of ADDs capable of disturbing porpoises, in such areas.

'Scotland's 10 Year Farmed Fish Health Framework' (FFHF) published on 23 May 2018 included:

- Develop standards for the use of Acoustic Deterrent Devices (ADDs) or alternatives on marine salmon farms.

"We have offered SNH input into the planned working groups deriving from the FFHF and this is one area we would particularly hope to influence," said SNH's Cathy Tilbrook in an email to Scottish Salmon Watch (29 May 2018).

In April 2018, Cathy Tilbrook gave oral evidence to the Scottish Parliament's salmon farming inquiry admitting that SNH did not know if salmon farming was impacting on the marine environment.

Read via Daily Mail: "We've no idea if we're curbing damage of fish farms, admit watchdogs"

On the issue of ADDs, SNH's Cathy Tilbrook testified to the Rural Economy & Connectivity Committee (18 April 2018) that "we have not yet got the answers":

> **The Convener:** Does Cathy Tilbrook want to comment on that? It seems to tie into SNH. A fair summary would be to say that the ECCLR Committee report was forthright. Has SNH been mindful of the report when considering fish farm applications?
>
> **Cathy Tilbrook:** The report picks up on a lot of things that we have already raised in the advice
>
> that we provide on fish farm applications. The report is a good summary of the key issues with which we are currently grappling. Mark Harvey is right to say that we have not yet got the answers to all those issues, particularly in relation to wild salmonids and acoustic deterrent devices. We found the report to be a very helpful summary of issues that we would like to be bottomed out with good solutions.

"The answer is breathtakingly simple," said Don Staniford, Director of Scottish Salmon Watch. "Ban all ADD's on salmon farms. This chimes with the requirements of the Aquaculture Stewardship Council's salmon standard, public commitments made by Marine Harvest, the recommendation of the Scottish Parliament's ECCLRC, Scotland's legal obligations via European law and the ban in British Columbia. Scientific research is screaming out - noisy ADDs used continuously by salmon farms are causing hearing damage to cetaceans even at low frequencies. The message to the Scottish Parliament and Scottish Government is loud and clear - don't just turn down the volume, turn the noise pollution off completely. As far as cetaceans are concerned, salmon farms should be seen and not heard!"

In May 2018, via oral evidence to the Scottish Parliament's salmon farming inquiry, Scotland's largest salmon farming company pledged that all Marine Harvest sites would be accredited by the Aquaculture Stewardship Council's salmon standard which prohibits the use of ADDs by 2020 (only one salmon farm in Loch Leven is currently ASC accredited out of 36 sites) **[3]**.

In January 2017, the Joint Nature Conservation Committee (JNCC) in Aberdeen wrote to SNH in an attempt to input data from ADD use on salmon farms into the UK Marine Noise Registry (a commitment made in the UK Marine Strategy). "As yet we have been unable to collect data associated with ADD use at fish farms," explained JNCC in an email **[4]**. Scottish Salmon Watch has filed a FOI request for any data now collected.

Despite growing scientific evidence that ADDs are causing 'reckless disturbance' of cetaceans, the Scottish Government gave a ringing endorsement on BBC's Sunday Politics Scotland show in March 2018:

"The position which we all wish to see is every method used to scare seals away from cages and as the Minister responsible I am very pleased that technology now including the use of sonar devices means that it is now proving possible to do this in increasing occasions," said the Cabinet Secretary for Rural Economy & Connectivity (Fergus Ewing).

BBC News reported (25 March 2018):

> Cabinet Secretary for the Rural Economy Fergus Ewing told the BBC's **Sunday Politics Scotland** programme he hopes the killing of seals may become unnecessary in the near future.
>
> He said: "We are working with the sector towards a situation where licences for the control of seals would no longer be necessary and are doing everything possible we can to ensure that the best environmental practice is followed and that we can use modern technological devices to scare the seals away from cages."

During oral evidence before the Environment, Climate Change & Land Reform Committee (ECCLRC) in February 2018, Mark Harvey of Highland Council claimed to be "trying to control ADD use":

Mark Harvey:

I just add that the issue of ADDs was rather thrust on us in the past couple of years. My general area of work is Skye, and the waters surrounding Skye are now a candidate SAC for harbour porpoise, so it immediately became a much more important material consideration for us.

Our response to that is to put a condition on any permission that is granted to require the operator to retain a log of ADD use. More importantly, as a result of discussion with SNH, which may need to look retrospectively at the existing use of ADDs on farms and potentially take action by requiring adjustments to the way in which they are used, we have been considering whether particular equipment can be tuned—obviously, we are talking about sound frequencies underwater—to affect seals but not harbour porpoise and other cetaceans, for which there is a similar problem. At the planning application stage and subsequently through the compliance with the condition, we are trying to control ADD use. Obviously, the existence of an SAC makes it a pressing issue for us.

Documents obtained via FOI from Highland Council in March 2018 claim that Marine Harvest Scotland (MHS) is "moving in the right direction" in terms of "unregulated ADD noise" (according to emails from SNH in 2017) **[5]**.

"The proposed ADD at Sconser Quarry is the low frequency TR1 so one of the less disturbing devices for harbour porpoise," reported SNH"s Alex Turner to Highland Council in July 2017. "The challenging issue relates to assessing existing unregulated ADD noise from the 3 x existing sites which use the more disturbing US3 devices. MHS are moving in the right direction on that too (better guidance and training for Farm Managers) but clearly that's much more difficult to address in planning terms."

A 'Predator Mitigation Plan' (August 2017) for Marine Harvest's new Isle of Rum salmon farm - approved by Highland Council in January 2018 - included:

The waters around the Small Isles, such as the Isle of Rum, are known to be visited by a number of different cetacean species. Under the Regulation 39(2) of the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended), it is an offence to deliberately or recklessly disturb any dolphin, porpoise or whale (cetacean). Furthermore, the farm is located within the Inner Hebrides and Minches candidate Special Area of Conservation (cSAC) for the protection of harbour porpoise. Scottish Natural Heritage have advised that the use of ADDs has the potential to lead to disturbance/habitat exclusion of harbour porpoise and the continuous noise emission from ADDs is not best practice. In the absence of further information, assessment and certainty, the decision has been made not to install ADDs at the proposed site as precautionary mitigation.

In a letter to Highland Council in August 2017, Grieg Seafood admitted: "ADDs have the potential to impact on the Harbour Porpoises covered by the Inner Hebrides and the Minches SAC and may result in disturbance/habitat exclusion".

In an email regarding ADD use at the Scottish Salmon Company's salmon farm in Portree Outer (obtained via FOI from Highland Council), SNH advised in January 2017: "The proposed system does not appear to meet our aim of minimising additional noise inputs into the cSAC. Rather than following the principle of being targeted to sound when seals are present, it appears that this device would sound intermittently most of the time".

Documents obtained via FOI last year from the Scottish Government revealed that 164 salmon farms use ADDs with 112 salmon farms where ADDs are listed as "Always On" **[6]**.

Information disclosed by SNH in 2017 detailed companies and regions which use and do not use ADDs:

Region	Company	ADD
Shetland	Cooke	Don't use
Shetland	Hjatland	Don't use
South West	Hjatland	Don't use
Outer Hebrides	Scottish Salmon Co	Ace aquatec US3
South West	Scottish Salmon Co	Ace aquatec US3
West Scotland	Scottish Salmon Co	Airmar, OTAQ Sealfance, Ace aquatec US3
South West	Scottish Salmon Co	Airmar, Ace aquatec
South West	Marine Harvest	Mon aqua, Terecos
Outer Hebrides	Marine Harvest	Don't use
West Scotland	Marine Harvest	Terecos, Airmar, Mohn aqua
Orkney and the North Coast	Scottish Sea Farms	Airmar, Ace aquatec
Shetland	Scottish Sea Farms	Mohn AquaMAG, Ace aquatec US3
West Scotland	Scottish Sea Farms	Mohn aqua, Airmar
West Scotland	Loch Duart	Airmar, Mohnaqua, Ace aquatec
Shetland	Balta	Ace aquatec, Lofitech
South West	Dawnfresh	Mon Aqua

In May 2017, The Sunday Herald revealed:

> WHALES, dolphins and porpoises off the west coast of Scotland are being put at risk by noise alarms used by fish farms to scare off seals, scientists are warning. Underwater acoustic deterrent devices (ADDs) deployed by more than 130 fish farms can be heard at least 30 kilometres away.
>
> As a result, lochs, bays and large areas of sea in Scotland are now polluted by noise, threatening the health of cetaceans. The marine mammals depend on sound to navigate the seas. Loud underwater noises can cause permanent hearing loss, stress and disorientation resulting in whales and dolphins beaching and dying.
>
> Now new evidence presented at a scientific conference in Denmark last week suggests that the noise from fish farms could harm cetaceans. A study by researchers from the Scottish Association for Marine Science and the UK Government's Joint Nature Conservation Committee revealed that ADDs caused "large-scale underwater noise pollution".

This research was presented at Ocean Noise in May 2017.

The scientific paper - "Large-scale underwater noise pollution from Acoustic Deterrent Devices (ADDs) on the West Coast of Scotland" - is still awaiting publication in a peer-reviewed journal.

SNH is also strangely silent on the impact of ADDs from salmon farms. Documents obtained from SNH via FOI in April 2018 **[4]** reveal that:

- Following media coverage in The Sunday Herald in May 2017 and an EC complaint filed by the Global Alliance Against Industrial Aquaculture (GAAIA), Cathy Tilbrook, Coastal & Marine Ecosystems Unit Manager, wrote to SNH colleagues:

From: Cathy Tilbrook
Sent: 10 May 2017 10:21
To: Caroline Carter; Karen Hall; Fiona Manson; George Lees; Suzanne Henderson; Liam Wright; David Maclennan; John Uttley; Laura Steel; Jane Dodd
Cc: Katie Gillham; Andrew Bachell; Alison Bell; Ian Jardine; Dominic Shann; Rhoda Davidson; John Baxter; Erica Knott
Subject: Complaint re. ADD use in Scotland

Hi all

Many of you will be aware of a recent FoI request we have been responding to from [redacted] relating to the use of acoustic deterrents in aquaculture. This was followed by a Sunday Herald article last weekend on 'ADDs putting the health of cetaceans at risk'. The article focuses on recent research on the increasing extent of underwater noise from ADDs on the west coast of Scotland and states that GAAIA will file a formal complaint to the EC on failure to protect cetaceans from 'deliberate and reckless disturbance' from ADDs. The piece includes an SNH quote from Caroline (see below) and comments from Whale & Dolphin Conservation, SAMS and SSPO.

We have now received the formal complaint letter against the Scottish and UK Governments, submitted to the EC on 7 May (attached). On the basis of alleged breaches in EU law, [redacted] call for an immediate ban at all salmon farms in Scotland, although this is later qualified to suggest that all farms using ADDs should apply for a licence containing detailed evidence that there are no satisfactory alternatives to use of ADDs. The Marine Scotland seal licensing return spreadsheets are heavily used in the complaint letter to contend that ADDs are used on the vast majority of farms, in some cases continually. The complaint also quotes from a SMRU 2013 report to MS that refers to uncertainty about whether the use of ADDs should be construed as 'deliberate or reckless disturbance of cetaceans' and that this would not be clarified until the current interpretation is challenged in court.

In response to the complaint, we will now discuss next steps with Marine Scotland and seek to conclude our earlier discussions on the need for EPS licensing for ADD use in aquaculture. We are already in close liaison with SSPO and individual operators within the Inner Hebrides and Minches cSAC about developing best practice use of ADDs to minimise risk to cetaceans. Indications from SSPO are that the recent media coverage should not affect industry willingness to continue this work. We will develop some further lines to take on this issue, to help staff deal with any follow-up queries, but in the meantime, the quote below provides the headline messages that we want to get across.

Dr Caroline Carter (SNH marine mammal advisor) said: This is an interesting study which highlights an increase over time in the area where seal scarers can be detected above background noise levels. We would note that a noise signal that is detectable above background levels does not necessarily equate to an impact. However, available evidence shows that certain types of acoustic deterrents can disturb cetaceans and therefore we are actively working on this issue. We are already in discussion with the aquaculture industry to develop smarter use of acoustic deterrents to reduce the risk of unintended impacts on cetaceans. We are also supporting further research which will help inform our advice on this topic.

- In October 2017, SNH briefed the salmon farming industry on new research on far-field and near-field impacts of ADDs used by salmon farms and proposed a meeting in January 2018.

From: Caroline Carter
Sent: 26 October 2017 17:07
To: [redacted]@scottishsalmon.co.uk; [redacted]
Cc: Cathy Tilbrook
Subject: [redacted] PhD Studentships on ADDs and Aquaculture

Dear [redacted]

As promised I am writing to update you on the two ADD/harbour porpoise PhDs a[redacted]Both Students have just started (this month) and have had their initial supervisory meetings. At the moment they are very much finding their feet and are starting their literature review on the topic.

[redacted] project is looking at the far field signal of ADDs throughout the west coast. How exactly this will be done is still being developed but it will more than likely use HWDT acoustic data to develop underwater noise maps, [redacted]

The second student, [redacted] project will focus on near-field interactions between fish farms and harbour porpoise, i.e. fine-scale activity and behaviour of harbour porpoises around fish farms. Probably using acoustic click detectors to monitor activity; looking for patterns in activity and investigating the reasons for any pattern found.

Both of these projects should add useful information on the subject. I can keep you updated with how these projects are developing, but am also keen to facilitate a meeting at an early stage. I was wondering therefore whether we would be able to organise a meeting in January? The [redacted] folk are content to travel over to Perth from Oban and I can arrange a meeting room here if that suits. Please let me know if this is something you would be interested in, and if you have any suggested dates and we can take it from there.

Any questions – please shout.

The SAMS web-site lists a new project - "Modelling underwater noise from acoustic deterrent devices to determine the extent of exposure and implications for the conservation of marine mammals" - by Charlotte Findlay funded by the European Social Fund via the University of Highlands & Islands.

SAMS

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Charlotte Findlay

PhD student

I am a marine ecologist interested in understanding the impacts of man-made noise in the marine environment, and how this affects marine species at both individual and population levels.

My work focuses on the risks posed by Acoustic Deterrent Device noise to marine mammals on the west coast of Scotland.

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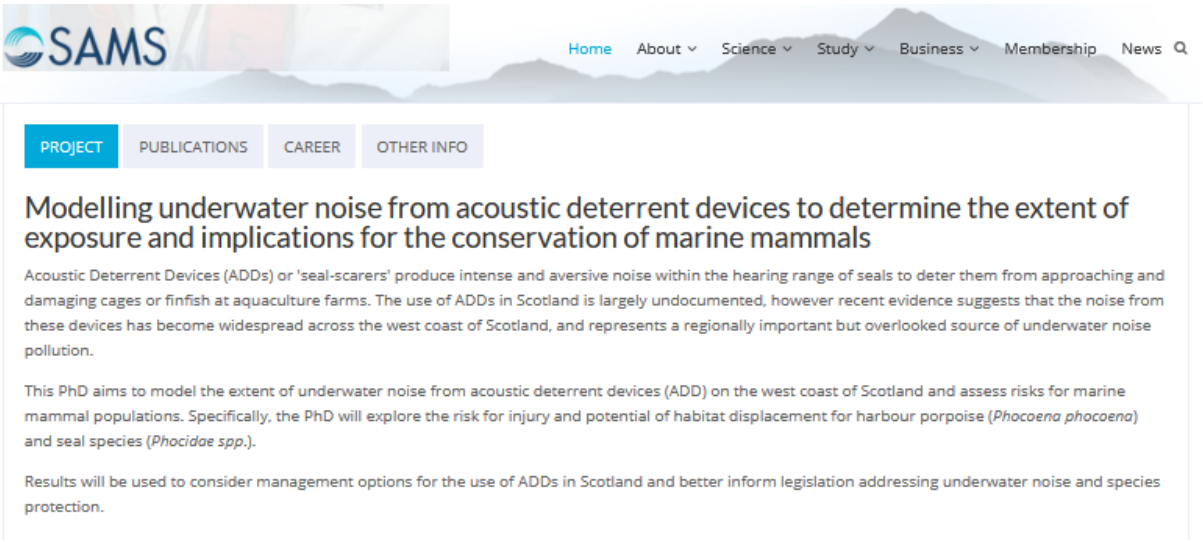


- In December 2017, Marine Scotland wrote to SNH regarding a meeting with ADD manufacturer Ace Aquatec which the Dundee-based company claimed is "cetacean friendly" and "was developed to avoid the sensitive hearing range of cetaceans". "He's obviously looking to get the device past various regulatory hurdles," said the redacted email.

- In January 2018, the following abstract was presented at the UK and Ireland Regional Student Chapter (UKIRSC) of the Society for Marine Mammalogy at the University of St Andrews:

The purpose of porpoises around Scottish fish farms

Texa Sim

SAMS, University of Highlands and Islands

The harbour porpoise (*Phocoena phocoena*) has a widespread coastal distribution throughout the northern hemisphere, where there is potential for interaction with anthropogenic activities. In Scotland the species may interact with an expanding Atlantic salmon (*Salmo salar*) aquaculture industry. Scottish salmon farms are mainly situated on the west coast, northern and western islands which also have some of the highest harbour porpoise densities in Europe. Possible impacts to the species have been brought further into focus through the recently proposed Inner Hebrides and Minches Candidate Special Area of Conservation (cSAC). This protected area will cover 13,539km² of porpoise habitat and has significant overlap with existing salmon farm sites.

The impacts of salmon farms on the harbour porpoise are not well understood, and study efforts mainly focus on the effect of Acoustic Deterrent Devices (ADDs) deployed to prevent seal depredation. These may induce habitat displacement in harbour porpoises, or conversely cause habituation where individuals have been exposed to long-term use. However, the extent of these impacts on porpoises in Scotland is presently unclear. The significance of other factors, such as wild fish aggregations, has also received limited attention to date.

To address these knowledge gaps, the present study will use Passive Acoustic Monitoring (PAM) to identify whether harbour porpoise occur near Scottish salmon farms, and if so, establish temporal variation in usage patterns. Additional PAM will investigate evidence of behaviours such as foraging. Potential attractants such as wild fish aggregations will also be assessed using a combination of video and acoustic techniques. Finally, the effects of ADDs on porpoise occurrence and behaviour will be assessed, providing further understanding of the West of Scotland population. The study will ultimately present multiple small-scale, site-specific examinations on the relevance of salmon aquaculture to harbour porpoises in Scotland, with an aim to inform activity management within the cSAC.

The SAMS web-site lists Texa Sim as funded by the Marine Alliance for Science and Technology for Scotland for a PhD "studying the occurrence of harbour porpoises around Scottish sea farms, with a focus on acoustic techniques to answer questions about their behaviour".

In November 2017, Ace Aquatec met with Fergus Ewing, Cabinet Secretary for Rural Economy & Connectivity. Fish Farming Expert reported in November 2017: "Ace Aquatec, which supplies seal scarers, biomass cameras and electric fish stunners to the salmon industry, has been shortlisted for a prestigious Queen's Award for Enterprise" (in April 2018 it was announced that Ace Aquatec had won - read in The Courier via "Queen's Award joy for city marine welfare firm").

In April 2018, Fergus Ewing was again deaf to the concerns of ADDs and was busy at the Seafood Expo Show in Brussels promoting ADDs manufactured by Ace Aquatec. The Courier reported (25 April 2018):

THE COURIER.CO.UK

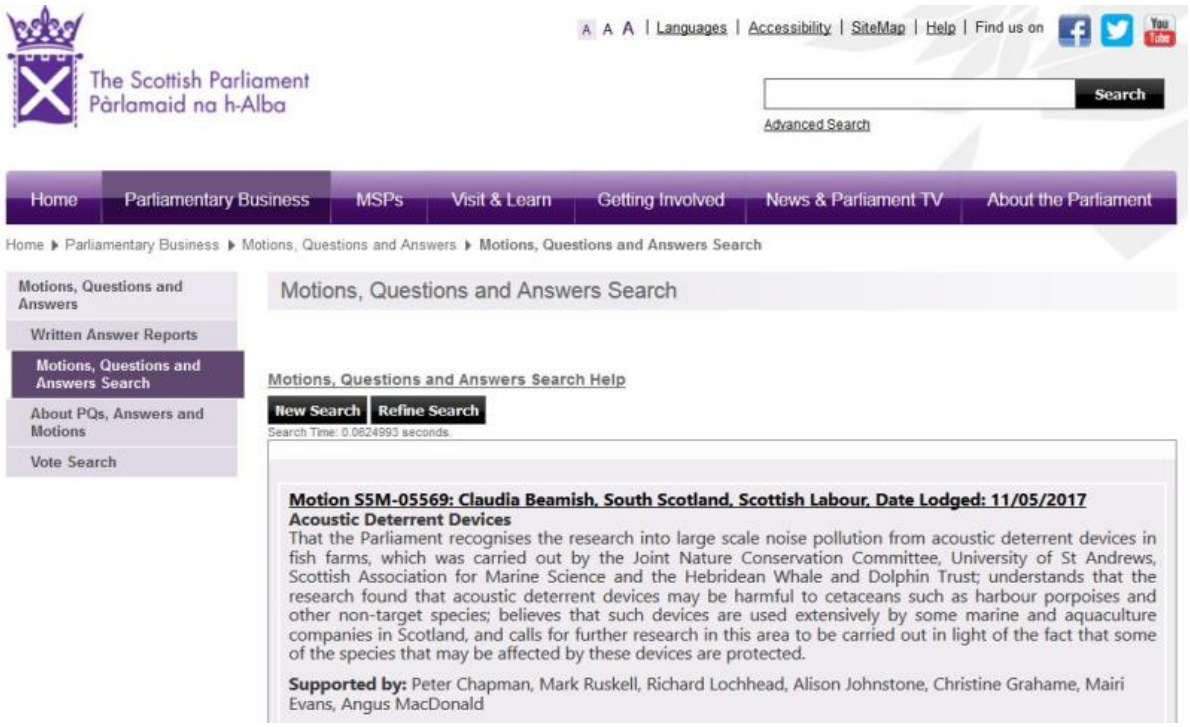
Tayside and Fife seafood firms hope to catch new customers at industry's largest expo

Mike Forbes from Ace Aquatec added: "We're always looking to spot the next big unsolved problem, and with industry events like these it's just as important to exercise our listening skills as our sales pitch."

The delegation was joined by Fergus Ewing, the cabinet secretary for the rural economy, who noted Scottish seafood exports were worth £944m in 2017.

He said: "In spite of the uncertainty being caused by Brexit, our message in Brussels this week is that Scotland is very much still open for business."

In May 2017 two Scottish Parliamentary motions tackled the issue of ADDs used on salmon farms - one filed by Claudia Beamish MSP:



And a second filed by Maurice Golden MSP:

Motion S5M-05663: Maurice Golden, West Scotland, Scottish Conservative and Unionist Party, Date Lodged: 17/05/2017
Hide Full Motion <<

That the Parliament recognises the importance of aquaculture to the Scottish economy and supports measures to safely expand the industry; recognises the need for fish farms to deter predators; notes the potential adverse commercial impact on exports of lethal measures; calls for research to be conducted on the potential for noise pollution from acoustic deterrence devices (ADDs) to inadvertently affect marine wildlife, especially along the west coast of Scotland, and for research on alternatives to both lethal and ADD measures, and further calls for that research to inform both a review of licensing requirements for ADD use in areas of special conservation and in the issuing of a best practice guide on ADD use by Scottish Natural Heritage.

In 2014, a humpback whale was entangled in a salmon farm operated by Scottish Sea Farms in the Sound of Mull. "The post mortem findings are consistent with a peri-weaning, maternally-attached animal which underwent an acute death," reported Scotland's Rural College. "The observed pathology and stranding history would be consistent with the whale becoming trapped beneath a salmon pen and subsequently drowning" (read more via 'Salmon Farming Kills Whales').

Read more via:

The National: "Warning salmon farm devices could hit wildlife tourism" (9 May 2018)
Press Release: "Deafening Impact of Salmon Farms on Cetaceans" (18 April 2018)
Scottish Parliament Motions on Acoustic Deterrent Devices (22 May 2017)
Press Release: "Cetaceans Sound Alarm On Salmon Farms - new research sparks EC complaint & call to ban Acoustic Deterrent Devices" (7 May 2017)
Sunday Herald: "Health of whales, dolphins and porpoises put at risk by underwater alarms" (7 May 2017)

Contact:

Don Staniford (07771 541826): dstaniford@gaaia.org

Notes to Editors:

[1]

From: Richard Slaski [mailto:r.slaski@sarf.org.uk]
Sent: 22 May 2018 10:48
To: 'Don Staniford'
Cc: 'Sandra Gray'
Subject: RE: SARF 112: "Influence of low frequency ADDs on cetaceans in Scottish coastal waters"

Hi Don,

The project has been quite delayed, but we are now at the final stages of peer review / Board approval. Our best estimate is that it should be ready for publication on the SARF website by the end of the third week of June.

Richard

Richard Slaski
Secretariat
Scottish Aquaculture Research Forum (SARF)
PO Box 7223 Pitlochry PH16 9AF
Tel: 01738 479486
Company Registered in Scotland - SC267177
Charity Registered in Scotland - SC035745
EU State Aid Registration No: X939 2009
Website: www.sarf.org.uk

From: Don Staniford <salmonfarmingkills@gmail.com>
Sent: 21 May 2018 21:32
To: r.slaski@sarf.org.uk
Subject: SARF 112: "Influence of low frequency ADDs on cetaceans in Scottish coastal waters"

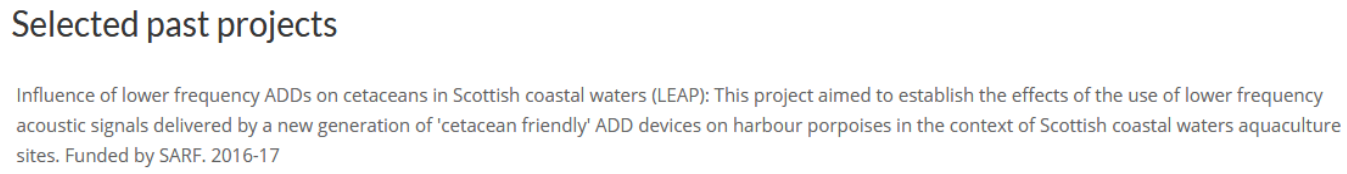
Richard,

Re. http://www.sarf.org.uk/cms-assets/documents/235749-572237.call-for-proposals-sarf112---influence

Do you have an update on the project?

Do you know when the final report will be published?

Dr Denise Risch of SAMS describes it as a 'past project' on her web-page:
https://www.sams.ac.uk/people/researchers/risch-dr-denise/



Best fishes,

Don

Don Staniford

Director, Scottish Salmon Watch: https://scottishsalmonwatch.org/

Director, Global Alliance Against Industrial Aquaculture (GAAIA):
http://www.salmonfarmingkills.com

Read my blog via http://donstaniford.typepad.com/my-blog

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From: Steven Benjamins [mailto:Steven.Benjamins@sams.ac.uk]
Sent: 21 May 2018 17:57
To: Don Staniford
Subject: Re: SARF report?

Hello Mr. Staniford,
Thank you for your interest in our work. The report you are referring to is presently in the

final stages of peer review. I would imagine the final version will be published by SARF soon, possibly as early as mid- to late June.
Regards,
Steven

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From: Don Staniford <salmonfarmingkills@gmail.com>
Sent: 18 May 2018 10:07:42
To: Steven Benjamins
Subject: SARF report?

Dr Benjamins,

Please do you have a copy of the SARF reported cited on your web-page?
https://www.sams.ac.uk/people/researchers/benjamins-dr-steven/

Current projects
Low-frequency Acoustic Deterrent Devices and Porpoises (LEAP): Assessing potential impact of low-frequency Acoustic Deterrent Devices (ADDs) on cetaceans in Scottish coastal waters (project lead). Funded by Scottish Aquaculture Research Forum. 2016-17

Best fishes,

Don

Don Staniford

Director, Scottish Salmon Watch: https://scottishsalmonwatch.org/

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Read my blog via http://donstaniford.typepad.com/my-blog

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The SARF 'Call for Proposal' for "Influence of low frequency ADDs on cetaceans in Scottish coastal waters" dated April 2016 detailed:

CALL FOR PROPOSALS

RESEARCH REQUIREMENT

PROJECT	SARF112	**Influence of low frequency ADDs on cetaceans in Scottish coastal waters**

Context:

Various approaches are employed in Scotland to prevent or minimise seal depredation of salmon from fish cages. While practices such as removal of fish morts and appropriate tensioning of cage nets are encouraged, Acoustic Deterrent Devices (ADDs) are still commonly used in many locations to deter seals from approaching fish farms.

Most such devices currently used in Scotland emit, or are operated using a range of frequencies typically upwards from approximately 6kHz. As demonstrated in SARF044, and subsequent research[1] , cetaceans may be just as sensitive to the noise emitted as seals, or even more so. In consequence, their use may have an incidental effect of disturbing these species and excluding them from the ensonified areas.

Harbour porpoise and other cetaceans have strict protection under national and international legislation and are listed in the European Habitats Directive as European Protected Species (EPS). Under the Habitats Regulations (via which the Habitats Directive is implemented in Scotland), deliberate or reckless disturbance of any EPS is a criminal offence, unless permitted through provision of an EPS licence. UK administrations are also currently considering the possible designation of SACs for Harbour Porpoise in UK coastal waters. Any such designations, if implemented, would likely place additional responsibilities upon developers and regulators to ensure that activities consented in designated areas do so only if it can be shown that the activities concerned have no adverse effect upon the Harbour Porpoise population concerned. This could, potentially, limit future use of ADDs capable of disturbing porpoises, in such areas.

Background:

In recent years a new generation of ADDs has started coming to market, emitting lower frequency signals than most currently employed ADDs, to which seals are understood to be sensitive but some cetaceans, such as harbour porpoise and bottlenose dolphin, less so. Examples include Ace Aquatec US3, etc. Marketing for these devices typically labels them as 'cetacean friendly' or

[1] Coram, A., Gordon, J., Thompson, D. and Northridge, S (2014). Evaluating and assessing the relative effectiveness of non-lethal measures, including Acoustic Deterrent Devices, on marine mammals. Scottish Government. (http://www.gov.scot/Resource/0046/00461726.pdf)

'environmentally friendly'. While the theory behind these claims appears logical, there has been little field based assessment of their effects on cetaceans and validation of the claims made. Given their potential benefits to the aquaculture sector in terms of enabling acoustic deterrence of seals in areas where this might otherwise be prevented or limited (due to potential disturbance or injury to porpoises and dolphins), there is clear value in undertaking empirical, third party research to test this theory and provide industry regulators and advisers with independent assurance regarding the use of such devices.

Outline Research Requirement:

The purpose of this research will be to design and implement a field based study (or studies) to establish the effects and influence, if any, of the use of the lower frequency acoustic signals typically delivered by such devices on specific cetaceans in Scottish coastal waters. Given their relative abundance, in comparison to other cetaceans in Scottish waters, studies should focus on harbour porpoise, though observations relating or relevant to other 'Scottish' species, such as bottlenose dolphins, if feasible, will be welcomed. The acoustic signals considered should be typical, in terms of frequency spectrum, duration, signal pattern, duty cycle and source level, of those employed by 'cetacean friendly' devices currently being marketed or promoted in Scotland. The 'effects' considered should be those relevant to European Protected Species legislation, namely potential for injury and, primarily, disturbance.

Impact:

Use by industry of 'traditional' ADDs in Scotland, to deter seal depredation, is not always considered appropriate by SNH, or in certain circumstances, legal, in areas considered sensitive to cetaceans due to risk of injury or disturbance to cetaceans, primarily harbour porpoise. Recent publication of EPS guidance by MS, informed by recent research on ADD impacts on cetaceans[2], indicate that ADD use could constitute disturbance to cetaceans and so, even where permitted, this may still be conditional upon securing an EPS licence and implementation of a range of mitigation. Cumulative use of ADDs, alongside other noise impacts, is of particular concern as industry continues to grow. Should Harbour Porpoise SACs be designated, as is currently being considered by Scottish Government, restrictions on use of such devices may become stricter still. Newer, 'lower frequency' ADDs offer a potential mechanism for allowing greater developer use of acoustic deterrence in such locations, but any such relaxation on use has to be informed by independent field based studies that can provide Regulators and Advisors with assurances regarding the response of such species to such devices and the signals they emit.

Objectives:

The setting of clearly defined and measurable project objectives is a matter for applicants. However indicative objectives include:

- Collation of data from ADD manufacturers on characteristics of acoustic signals (frequency spectra, source level, duty cycles etc), employed by 'lower frequency' devices currently promoted or available in Scotland

[2] Ibid.

- Assessment of theoretical sensitivity and response of harbour porpoise[3] to acoustic signals of the frequencies and character featured by these new devices
- Design and implementation of a field based programme to ascertain harbour porpoise response to acoustic signals of the frequencies and character featured by these devices considering, specifically, evidence of disturbance or displacement
- Review and summary of findings regarding harbour porpoise response to acoustic signals tested and provision of recommendations regarding optimal use of 'lower frequency' ADDs for minimising or avoiding harbour porpoise disturbance, while maintaining effective seal deterrence.

Approach:

Applicants are invited to suggest their preferred approach to the project, but should note that SARF do not envisage the utilisation of actual ADDs themselves in the course of this study but, rather, approaches which re-create the acoustic signals generated by such devices and enable playback via an underwater speaker. This should allow testing of signals representative of a range of devices to be considered and help to maintain the impartiality of the research.

Project Management: There will be a SARF Steering Group assigned to this project. (Applicants should factor the cost of attending steering group meetings, probably in Edinburgh, into their applications.)
Deliverables: A Draft and then Final Report

Anticipated Duration:	12-18 months
Maximum Cost:	No maximum specified
Proposed Start Date:	Spring 2016
Commissioning Mode:	Open Competition
Deadline for Applications:	17:00 Friday 8th April 2016
Application Forms:	Application forms together with SARF's standard terms and conditions of contract are available at: http://www.sarf.org.uk/downloads.html
Contact:	Richard Slaski – email: r.slaski@sarf.org.uk Tel: 01387 740098

[3] As above, studies should focus on harbour porpoise though findings relating or relevant to other 'Scottish' species, such as bottlenose dolphins, if feasible, will be welcomed. It is expected that the field programme design will be centred around harbour porpoise.

A SARF report - "Assessment of the impacts and utility of acoustic deterrent devices" - published in 2010 included:

Main findings here were that:

- **Porpoises avoid areas where ADDs are active.**
- **Porpoises return to areas almost immediately after ADDs are switched off.**
- **Porpoises are not totally excluded from areas where ADDs are being used.**
- **Porpoises were detected (feeding) even at about 200m from an Airmar ADD source.**
- **Porpoises, dolphins and seals are most sensitive to the 10 kHz peak in the Airmar ADD signal.**
- **ADD signals are not uniform.**

Main findings were that:

- **Acoustic signals from ADDs can be detected at more than 14km from the sound source.**
- **Acoustic propagation losses are site specific and quite variable**
- **Porpoises appeared to avoid one area where ADDs had recently been installed.**

And:

These questions are important to fish farm managers and regulators because under the Nature Conservation (Scotland) Act of 2004, and under the the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended in Scotland), ADDs may be deemed to represent a deliberate or reckless disturbance of cetaceans and could constitute an offence.

[2] "The claim is based on research into the effects of ADDs in keeping minke whales – a key draw for cruise services – away from offshore wind developments," reported The National (9 May 2018). "Published in November by the Carbon Trust, the paper found the species swims away from the gadgets even after they have been deactivated."

HWDT's written submission to the Scottish Parliament's salmon farming inquiry in April 2018 included:

ADDs are powerful acoustic devices that emit loud acoustic signals and are used widely by the aquaculture industry in Scottish waters in an attempt to prevent seal depredation. Crucially the effectiveness of such devices for deterring seals from fish farms has not been consistently demonstrated, with seals frequently seen around facilities using these devices and no convincing peer-reviewed evidence available to show they are effective in reducing seal depredation; in some cases they may even attract seals (Götz and Janik 2013). Observations of seals frequenting farms with active ADDs lead Lepper et al. (2014) to suggest that these animals, which might be highly motivated by feeding opportunities, could expose themselves to levels of sound that could cause long-term damage to their hearing.

The sound output frequencies (2 – 40 kHz) for ADD devices currently used throughout Scotland are within the auditory range of non-target marine animals including cetaceans (Lepper et al. 2014). Cetaceans depend on sound for foraging, communication, navigation and detecting predators or threats and as a result have excellent underwater hearing. Consequently, even though cetaceans do not pose a threat to aquaculture facilities, they are impacted by disturbance and habitat exclusion from ADDs. ADDs have been shown to affect a range of species that can be found in close proximity to aquaculture facilities in Scotland including harbour porpoises (*Phocoena phocoena* - Johnston 2002; Olesiuk et al. 2002; Booth 2010; Northridge et al. 2010; Brandt et al. 2013; Lepper et al. 2014; Dähne et al. 2017; Mikkelsen et al. 2017), killer whales (*Orcinus orca* - Morton and Symonds 2002) and minke whales (*Balaenoptera acutorostrata* - McGarry et al. 2017). In particular, we would like to draw the committee's attention to the recently published report by McGarry et al. (2017) on minke whale responses to Lofitech ADDs. In the scoping reports for many salmon farm facilities minke whales are often considered to show a limited response to ADDs because it is argued that their hearing sensitivity to high frequencies is lower than that of dolphins and porpoises. However, the recent report by McGarry et al. (2017) clearly demonstrates that minke whales do show a pronounced avoidance to ADDs at considerable ranges.

All cetacean species are protected under both EU (Habitats Directive) and national (Nature Conservation (Scotland) Act) legislation and a range of international agreements to which the UK is signatory (ASCOBANS, OSPAR). Underwater noise is a recognised form of pollution that needs to be addressed, including through the EU Marine Strategy Framework Directive. Under the Nature Conservation (Scotland) Act, it is an offence to deliberately or recklessly disturb or harass any species of cetacean. ADDs are known to disturb cetaceans and this has been confirmed by many scientific studies, yet many aquaculture facilities are situated in critical areas of habitat such as within the candidate Special Area of Conservation (cSAC) for harbour porpoise (Evans and Prior 2012; Dolman et al. 2013) and a proposed nature conservation Marine Protected Area (ncMPA) for minke whales (Paxton et al. 2014).

HWDT can demonstrate from its acoustic monitoring data that the use of ADDs has increased significantly in recent years. More sites are using them and more devices are being deployed at each site. This trend is predicted to accelerate as industry production increases in line with Scotland's National Marine Plan. HWDT supports the ECCLR committee's view that the industry should not be permitted to use ADDs as per the Aquaculture Stewardship Council guidelines.

As highlighted in the ECCLR report, there is not a consistent approach to the monitoring and management of ADD use. Current records of the operating times, locations and duty cycles of ADDs are not adequate, nor are the data collected on seals that have been shot under licence. Government and regulatory bodies continue to allow ADDs and shooting as predator deterrents, yet neither has proven effective at mitigating depredation. More emphasis should be placed on developing effective predation mitigation measures and incentives introduced to develop innovative and effective, non-invasive methods to exclude seals.

Read the report by the Carbon Trust's report - "Understanding the Effectiveness of Acoustic Deterrent Devices (ADDs) on Minke Whale (*Balaenoptera acutorostrata*), a Low Frequency Cetacean" - by McGarry et al (2017) online here

RPS

Carbon Trust

Offshore Renewables Joint Industry Programme (ORJIP) Project 4, Phase 2

Understanding the Effectiveness of Acoustic Deterrent Devices on Minke Whale (*Balaenoptera acutorostrata*), a low frequency cetacean.

Date: *06 November 2017*

Revision: *Final version*

Suggested citation:

McGarry, T., Boisseau, O., Stephenson, S., Compton, R. (2017) Understanding the Effectiveness of Acoustic Deterrent Devices (ADDs) on Minke Whale (*Balaenoptera acutorostrata*), a Low Frequency Cetacean. ORJIP Project 4, Phase 2. RPS Report EOR0692. Prepared on behalf of The Carbon Trust. November 2017.

RPS marine conservation research.org CARBON TRUST

Tourist operator David Ainsley's written submission to the Scottish Parliament's salmon farming inquiry in April 2018 included:

The use of ADDs

The salmon industry is unlawfully disturbing and excluding porpoise, whales and dolphins from inshore waters by using Acoustic Deterrent Devices (ADDs). This drives these iconic animals away from feeding grounds in inshore waters, affecting their life expectancy and damaging wildlife tourism in the Inner Hebrides and Minches cSAC (designated for porpoises). Because ADDs are not the most effective way of keeping seals and farmed salmon separated, the industry also shoots some seals, further damaging wildlife tourism.

With regard to the use of Acoustic Deterrent Devices (ADDs) on farms we submit that:

1. It is an offence under Scottish Law (Habitats regulation 39(2)) to "*deliberately or recklessly disturb, harass or injure any porpoise, dolphin or whale*". There are legal precedents, including a jet skier who was prosecuted in Banff court for disturbance.

2. A FOI reply from Marine Scotland (MS)[8] reveals that of 172 Scottish fish farms listed, 121 use ADDs. Airmar ADDs are used at 62 farms, Ace Aquateq ADDs at 17 farms and Terecos are used at 39 farms. Only 6 farms use a single ADD, whilst 84 farms (nearly 70%) use 4 ADDs or more. Up to 20 Airmar ADDs are being used per farm. These ADD models

output from 179 to 196dB re1µ(rms)[9]. Hearing damage to porpoise occurs at 165dB re1µ(rms)[10], 96% habitat exclusion at 113dB re1µ(rms)[11] and disturbance at 100db re1µ(rms) [12]. Most of the farms using ADDs are within or affecting the Inner Hebrides and Minches cSAC, designated for porpoise.

3. There is a wealth of science which shows that ADDs disturb, exclude and can cause hearing damage to porpoise and other cetaceans. One study found that 87.5% of porpoise were excluded from a 990 square kilometre area by a single ADD[13]. ADDs are used to protect porpoise from hearing damage from pile driving, by excluding them from wind farm construction sites.

   The science is summarised in our complaint to the EC and in the report (both attached to this email) from the head of Policy and Advice of Scottish Natural Heritage, where she advised Marine Scotland (MS) on 28/7/17:
   - *"There is sufficient evidence, both empirical and modelled, to show that ADDs can cause disturbance and displacement of cetaceans.*
   - *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."*
   - It 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".***

And:

6. The Aquaculture Stewardship Council requires that certified farms cannot use ADDs or kill marine mammals. In Norway, a total of 115 salmon farms are certified, including 49 Marine Harvest farms. In Scotland only 2 are certified. Can the inquiry determine why Scottish farms do not comply with the same environmental standards as Norwegian farms? We welcome the recommendation of the ECCLR committee that Scottish farms should be certified[21].

And:

Summary

We urge Scottish Ministers to uphold their duties under domestic and European law, by preventing the use of ADDs and requiring that fish farms in Scottish waters adopt technical measures that stop the killing, injury or disturbance to marine mammals.

David Ainsley's written submission also attaches a complaint to the European Commission which includes:

EUROPEAN COMMISSION

Complaint – Infringement of EU law

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)[1]?**

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?**

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"

And:

Hjaltland Seafarms Ltd use **no** ADDs on their 25 farms and Cooke Aquaculture only use ADDs on 3 of their 22 farms. Fifty-one farms do not use ADDs, 8 of which do so to comply with the Wholefoods accreditation scheme, demonstrating that farms can operate without ADDs . There are alternatives to ADDs which do not harm cetaceans.

The RSPCA "Freedom Foods" (FF) accreditation requires that accredited farms operate ADDs continuously. The biggest individual seal shooting companies in 2015, Marine Harvest and Scottish Seafarms were both RSPCA – FF accredited salmon farms. In 2014 almost 70% of seals reported as shot were at FF accredited sites[23] which must use ADDs. SNH cites as justification for not objecting to the use of ADDs on Planning consents that they will not be used continuously. The farms which are supposed to use ADDs intermittently and are FF accredited must be breaking one or other condition.

The Aquaculture Stewardship Council requires that certified farms worldwide comply with strict requirements for responsible farming. Certified farms cannot use ADDs or kill marine mammals. In Norway, a total of 115 salmon farms are certified, including 49 Marine Harvest farms whereas in Scotland only 2 are certified, one of which is in freshwater where there are no seals. We welcome the recommendation of the ECCLR committee that Scottish farms should be certified[24].

And:

The minutes of the SNH / MS discussion on ADDs and EPS 8/10/16[29] are very pertinent to this complaint, and raise concerns that MS intend to reduce the protection EU law affords to cetaceans. We summarise key points: -

- SNH asks MS *"for a clear and formal policy statement that sets out the government position, especially where this seems to diverge from published guidelines"*
- MS seeks to define 'reckless' in a way that ADD use by the aquaculture industry would not be an offence under Hab. Reg. 39(2). However, their legal advice is that it would be difficult to infer recklessness "unless there was an identified negative impact of ADDs used in aquaculture upon EPS species."
- SNH question MS interpretation, the purpose of EPS legislation is to avoid disturbance and harm to EPS species. Disturbance through ADD use (irrespective of the sector employing it) falls within this scope.
- SNH propose a compromise EPS process which would allow disturbance by ADDs in all but the most sensitive areas. We maintain that this would not comply with EU or Scottish law.
- According to MS "The Marine EPS Guidance would need to be updated, in relation to its description of Reg. 39(2)". We take this as an indication that MS are reluctant to comply with their statutory duty to enforce Hab. Reg. 39(2)
- It was emphasised that planning legislation cannot be used to address and manage impacts covered by other regulatory regimes (such as EPS legislation)

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 themselves[30] 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.

And:

> We maintain that fish farm companies using ADDs consciously accept the foreseeable results of using ADDs: that cetaceans will be disturbed. Accordingly, the use of ADDs where there are cetaceans constitutes deliberate disturbance.

The Scottish Parliament's Environment, Climate Change & Land Reform Committee report on the environmental impacts of salmon farming (March 2018) included:

Use of Acoustic Deterrent Devices (ADDs) - evidence of effectiveness

235. Acoustic Deterrent Devices (ADDs) are used on Scottish fish farms as a non-lethal method to reduce the risk of seal depredation by producing loud, aversive underwater sounds. However, the report states that "Despite their widespread use in Scottish aquaculture, the long-term effectiveness of ADDs as a seal deterrent remains unproven."

Current use of ADDs

236. The Committee is aware of reports of large numbers of fish farms operating ADDs continuously. The Committee asked the SSPO how many farms are operating ADDs on a continuous basis. In a further written response the SSPO said no system continuously emits a noise. All have different cycles of sound propagation, with periods where no noise is produced. The SSPO did not provide detail on numbers but said they understood 50-60% of ADDs/farms that currently use ADDs use them in a manner where they are turned on continuously. They said industry is keen to support continuous improvement in design and adaptation of anti-predator systems, including research to better quantify if our use of ADDs is having any actual effect on non-target species. They stated "Our current experiences of interaction with wildlife around fish farming areas points to this not being a problem." The Committee understands there is no consistency of approach in the use of ADDs with fish farms relying on differing manufacturers guidelines.

Impact of ADDs on marine wildlife

237. The report says "…the absence of a consistent ADD monitoring scheme and/or licensing process currently poses a significant challenge to the assessment of the scale of ADD-related noise pollution and consequently its impact on marine species. ….. ADDs are currently not being recorded consistently in any national marine noise register." SNH confirmed the report reflects their concerns about the potential impacts of ADD use on marine wildlife (especially European Protected Species),

including disturbance/displacement; auditory injury and long-term impacts such as increased stress levels. They state there is evidence of an increase in the extent of marine acoustic pollution in areas of Scottish waters that are important to cetaceans. These concerns are reflected across evidence including the submission from the Hebridean Whale and Dolphin Trust who raised concerns about the siting of fish farms in critical areas of habitat for cetaceans.

238. SE LINK referred to a growing body of evidence on the impact of ADDs on harbour porpoises saying the devices induce stress, cause hearing damage and cause displacement—they change the behaviour of harbour porpoises by preventing them from going to certain areas. SE LINK stated although ADDs are not proven to be effective on seals, they have a significant impact on cetaceans. The Scottish Salmon think tank suggested there should be a moratorium on deployment of ADDs while research on the deleterious impacts on seals and cetaceans is investigated.

Regulation, monitoring and management of ADDs

239. Argyll and Bute Council discussed the regulatory process for ADDs: "ADD use is considered by planning authorities when determining a planning application for a new or expanded farm. ADDs are normally proposed as part of a number of anti-predator control measures and used only if other measures such as tensioned netting are not effective. The acceptability of ADD use is assessed based on the sensitivity of the location, the type and frequency of the ADD and how it will be operated. SNH provide advice as a statutory consultee and normally if planning permission is approved for a development, it is subject to a planning condition that ensures that ADD use cannot take place unless the details of ADD use have been agreed by the Planning Authority in consultation with SNH and thereafter the development maintained as such unless any variation is agreed in advance by the Planning Authority. While ADD use is considered in individual applications there is currently no formal monitoring requirement directly linked to existing regulatory consents."

240. Highland Council confirmed they look to control ADD use at the planning application stage and subsequently through the compliance with the condition placed on planning consents to require the operator to retain a log of ADD use. They are also looking retrospectively at the existing use of ADDs on farms and the need to take action by requiring adjustments to the way in which they are used including adjusting frequencies to affect seals but not harbour porpoise and other cetaceans.

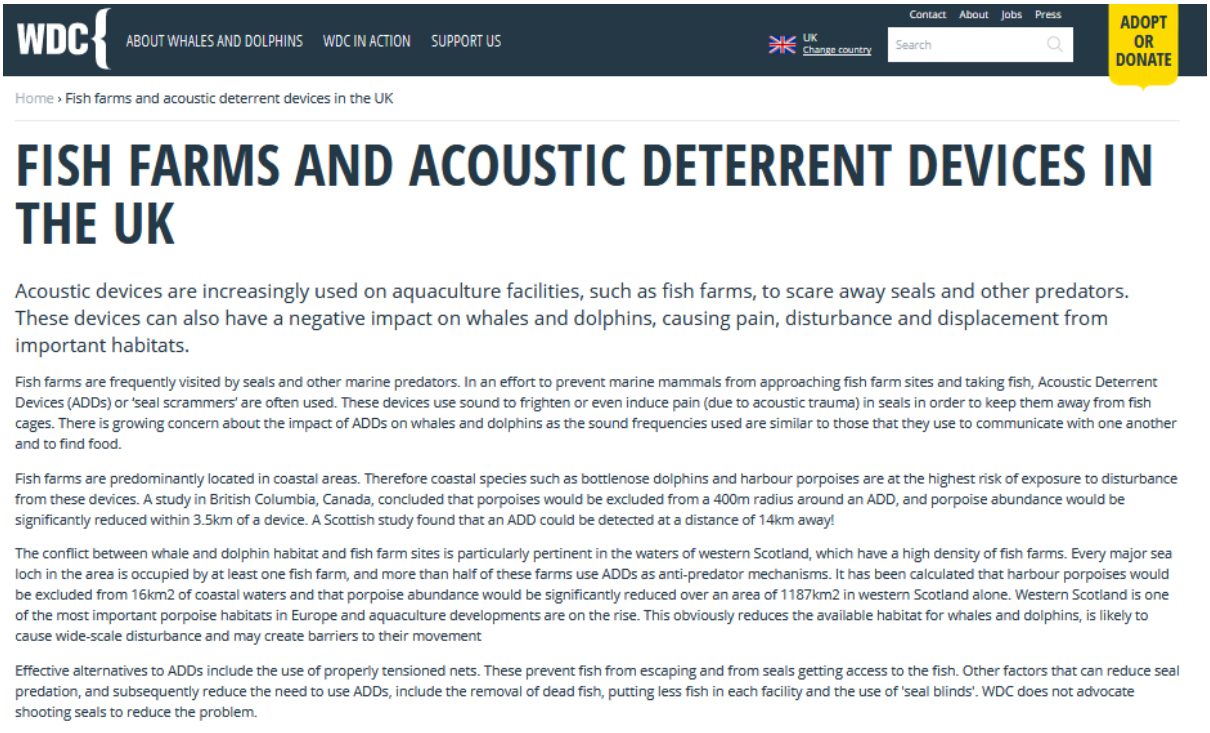
241. SNH raised concerns about the lack of a consistent approach to the monitoring and management of ADD usage. SNH suggest that a more formal ADD registration system would provide data required to better understand this issue and manage it effectively.

242. On ADD noise-related pollution Marine Scotland Licencing confirmed there is a case for better monitoring and licensing and they confirmed their intention to lead on this and to work collaboratively with Scottish Natural Heritage.

244. The Committee received evidence that the Aquaculture Stewardship Council requires that certified farms worldwide comply with strict requirements for responsible farming. Certified farms cannot use ADDs or kill marine mammals. The Committee understands in Norway a total of 115 salmon farms are certified including 49 Marine Harvest farms and in Scotland only 2 are certified.

248. The Committee heard ADD's are not effective as a seal deterrent and has seen little evidence of their efficacy. The Committee understands most ADDs are left to operate continuously and is particularly concerned about this as it heard impacts from ADDs are cumulative and unintended and widespread underwater noise pollution may be affecting cetaceans. The Committee is also concerned there appears to be no assessment by government and regulators of the scale of ADD-related noise pollution and its impact on marine species since 2014 and no related action. The Committee has significant concerns about the use and operation of ADDs and their cumulative impact and considers all fish farms in Scotland should be required, via legislative or any other appropriate means, to follow the position of the Aquaculture Stewardship Council in relation to ADDs. This ensures fish farms cannot use ADDs.

Whale & Dolphin Conservation state on their web-site:



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FISH FARMS AND ACOUSTIC DETERRENT DEVICES IN THE UK

Acoustic devices are increasingly used on aquaculture facilities, such as fish farms, to scare away seals and other predators. These devices can also have a negative impact on whales and dolphins, causing pain, disturbance and displacement from important habitats.

Fish farms are frequently visited by seals and other marine predators. In an effort to prevent marine mammals from approaching fish farm sites and taking fish, Acoustic Deterrent Devices (ADDs) or 'seal scrammers' are often used. These devices use sound to frighten or even induce pain (due to acoustic trauma) in seals in order to keep them away from fish cages. There is growing concern about the impact of ADDs on whales and dolphins as the sound frequencies used are similar to those that they use to communicate with one another and to find food.

Fish farms are predominantly located in coastal areas. Therefore coastal species such as bottlenose dolphins and harbour porpoises are at the highest risk of exposure to disturbance from these devices. A study in British Columbia, Canada, concluded that porpoises would be excluded from a 400m radius around an ADD, and porpoise abundance would be significantly reduced within 3.5km of a device. A Scottish study found that an ADD could be detected at a distance of 14km away!

The conflict between whale and dolphin habitat and fish farm sites is particularly pertinent in the waters of western Scotland, which have a high density of fish farms. Every major sea loch in the area is occupied by at least one fish farm, and more than half of these farms use ADDs as anti-predator mechanisms. It has been calculated that harbour porpoises would be excluded from 16km2 of coastal waters and that porpoise abundance would be significantly reduced over an area of 1187km2 in western Scotland alone. Western Scotland is one of the most important porpoise habitats in Europe and aquaculture developments are on the rise. This obviously reduces the available habitat for whales and dolphins, is likely to cause wide-scale disturbance and may create barriers to their movement

Effective alternatives to ADDs include the use of properly tensioned nets. These prevent fish from escaping and from seals getting access to the fish. Other factors that can reduce seal predation, and subsequently reduce the need to use ADDs, include the removal of dead fish, putting less fish in each facility and the use of 'seal blinds'. WDC does not advocate shooting seals to reduce the problem.

WDC's written submission to the Scottish Parliament's Environment, Climate Change & Land Reform Committee inquiry into the environmental impacts of salmon farming in February 2018 included:

Acoustic Deterrent Devices (ADDs)

Cetaceans (whales, dolphins and porpoises) are very sensitive to underwater noise. To date, the primary non- lethal method for controlling predators at salmon farms is the use of ADDs. It is important to establish the extent of ADD use at fish farms to help inform management and policy. Around half of fish farms in Scotland are thought to use ADDs and usage is largely unregulated, including no monitoring of the effectiveness of the devices or the impact on other species (Coram et al., 2016). Disturbance and habitat exclusion due to ADDs has been shown to affect a range of cetacean species that can be found in proximity to aquaculture facilities in Scotland (e.g., Johnston, 2002; Morton and Symonds, 2002; Olesiuk et al., 2002; Booth, 2010; Northridge et al., 2010, 2013; Brandt et al., 2012, Lepper et al., 2014; McGarry et al., 2017).

Acoustic signals from ADDs can be detected at more than 14km from the sound source (Northridge et al., 2010). Direct impacts to harbour porpoise relating to aquaculture include the use of commercially available ADDs that can cause injury, stress, hearing damage and behavioural disturbance (displacement). Modelling of the exposure time to exceed injury criteria for seals and porpoises at given ranges from active ADDs suggest that there is a credible risk of exceeding injury criteria for both seals and porpoises (Lepper et al., 2014).

Furthermore, the effectiveness of ADDs to deter seals is questionable. As noted in the review, seals are frequently seen around fish farm facilities actively using ADDs and to date there is no peer-reviewed evidence to show that they are effective in reducing seal depredation (Götz and Janik, 2013). Given the impacts on porpoises and the questionable effectiveness to deter seals, there should be a presumption against the use of ADDs in favour of more robust and benign solutions.

The majority of salmon farms on the west coast of Scotland are located within the candidate Inner Hebrides and Minches Special Area of Conservation (cSAC) for harbour porpoise which has recently been accepted by the European Commission. Potential impacts on harbour porpoise due to disturbance from ADDs would be

considered against the Habitats Directive (92/43/EEC). For ADDs to be used within the SAC, an Appropriate Assessment would be required for each site. The Appropriate Assessment(s) must include full details of the devices specifics, details of use (length of time, frequency, number of devices, etc.) and a full assessment of the impacts on cetacean species inhabiting the area, namely harbour porpoise, minke whale, killer whale and bottlenose dolphin.

ADD use should be considered in a harbour porpoise Hebrides and Minches SAC management scheme.

Potential impacts from ADDs would need to be considered cumulatively (including potential impacts from vessels associated with the fish farms and other developments) and in-combination e.g., with ADDs at other sites and other marine spatial planning within the management unit of each species.

There is the potential for disturbance to European Protected Species (EPS) so EPS licensing of ADDs should occur, including where the presence of ADD may cause a barrier to passage, e.g., around straits, sounds and embayments, or in favoured porpoise feeding habitat such as headlands and tidal upwellings (Northridge et al., 2010).

Should they remain in use, the application of ADDs needs to be reviewed, strictly regulated and monitored to ensure that at current levels and with any future expected expansion of the salmon farming industry, there is no impact on the integrity of the harbour porpoise SAC.

Clear, transparent and precautionary guidance around the use of existing and future ADDs should be produced, including in circumstances where ADDs could be used / not used, and if used, what conditions are needed. Monitoring effectiveness and impact should be a condition for use of ADDs. Clarity on the use of mitigation measures and licensing conditions is essential, to ensure consistent case by case assessment of facilities.

However, there should be a presumption against the use of ADDs in favour of more robust and benign solutions, particularly in protected areas. The mandatory use of anti-predator devices, such as tensioned nets and seal blinds, is a preferred method of reducing seal predation that would not have an acoustic displacement impact on harbour porpoise and other wildlife. The siting of aquaculture facilities away from important sites for seals and harbour porpoises would reduce local impacts and associated requirement for other management measures.

Whale & Dolphin Conservation's written submission to the Rural Economy & Connectivity's salmon farming inquiry in April 2018 included:

ADDs:

Around half of fish farms in Scotland are thought to use ADDs and usage is largely unregulated, including no monitoring of the effectiveness of the devices or the impact on other species (Coram *et al.*, 2016). Acoustic signals from ADDs can be detected at more than 14km from the sound source (Northridge *et al.*, 2010). ADDs have been shown to cause disturbance and habitat exclusion for a range of cetacean species that can be found in proximity to aquaculture facilities in Scotland (*e.g.*, Morton and Symonds, 2002; Olesiuk *et al.*, 2002; Booth, 2010; Northridge *et al.*, 2010, 2013; Brandt *et al.*, 2012, Lepper *et al.*, 2014; McGarry *et al.*, 2017).

Modelling of the exposure time to exceed injury criteria for seals and porpoises at given ranges from active ADDs suggest that there is a credible risk of exceeding injury criteria for both seals and porpoises (Lepper *et al.*, 2014). Furthermore, the majority of salmon farms on the west coast of Scotland are located within the candidate Inner Hebrides and Minches harbour porpoise Special Area of Conservation (cSAC), a species known to be particularly vulnerable to ADD disturbance.

The impact of ADDs could be addressed by:

- Mandatory use of passive anti-predator devices, such as tensioned nets and seal blinds. Tension nets and seal blinds would reduce seal predation whilst not having an acoustic displacement impact on harbour porpoise and other wildlife (or causing a ‘dinner bell’ effect for some seals).

- Any ADD use should be regulated, including the urgent production of clear, transparent and precautionary guidance around the use of existing and future ADDs, including in circumstances where ADDs could be used / not used, and if used, what conditions are needed.
- Monitoring effectiveness and impact should be a condition for use of ADDs. Clarity on the use of mitigation measures and licensing conditions is essential, to ensure consistent case by case assessment of facilities. Ensure there is no impact on the integrity of the harbour porpoise SAC.
- An Appropriate Assessment would be required for each site within the cSAC. The Appropriate Assessment(s) must include full details of the devices specifics, details of use (length of time, frequency, number of devices, *etc.*).
- Potential impacts from ADDs need to be considered cumulatively (including potential impacts from vessels associated with the fish farms and other developments) and in-combination *e.g.*, with ADDs at other sites and other marine spatial planning within the management unit of each species.
- There is the potential for disturbance to European Protected Species (EPS) so there should be EPS licensing of ADDs at fish farms.
- Siting aquaculture facilities away from important sites for seals and harbour porpoises would reduce local impacts and associated requirement for other management measures.

[3] The transcript of the Scottish Parliament's salmon farming inquiry on 2 May 2018 featured oral evidence from Ben Hadfield, Managing Director of Marine Harvest Scotland, including:

> **Ben Hadfield:** The company supports the ASC standards. They are robust and they deal with things that lie outwith regulation. When the ASC standards were written, they predominantly took a lot of the environmental regulations from Scotland, because they were the most robust and the best in the world for protecting the environment. The ASC standards go beyond that; they cover social standards, they go into wild fish in more depth and they cover mitigating impacts. The Marine Harvest board decided that it would try to make all its farms ASC accredited by 2020, and 40 per cent of our sites in Norway are now accredited.

> In Scotland, we had two accredited sites, but we now have one. We have just got over the hurdle that exists within the standard for smolt production in freshwater lochs in Scotland. The ASC standards prevented the farming of smolts in freshwater lakes, which is why we did not take them up. Now that that has been amended, we will move all our sites in Scotland to ASC accreditation.

"Our plans for investment over the next five to 10 years will help us fulfill the strict criteria in the ASC standards and we aim to have all of our farms certified under the scheme by 2020," said the then Managing Director of Marine Harvest Scotland, Alan Sutherland in 2013.

In 2016, Marine Harvest "pledged to have all its farms Aquaculture Stewardship Council (ASC) certified by 2020" (read via "Marine Harvest Pledges 100% of Farms ASC Certified by 2020").

The latest version (April 2017) of the Aquaculture Stewardship Council's salmon standard includes:

Criterion 2.5 Interaction with wildlife, including predators[30]

INDICATOR	REQUIREMENT
2.5.1 Number of days in the production cycle when acoustic deterrent devices (ADDs) or acoustic harassment devices (AHDs) were used	0

And by way of explanation:

> **Rationale** - The suite of requirements related to mortalities and lethal incidents of predators or other wildlife is intended to ensure that certified farms have minimal impact on populations of wildlife, placing limits on both accidental and intentional mortalities of these species. The requirements ensure that endangered species have not died as a result of interaction with the farm and require transparency of farms on any lethal incidents and wildlife mortalities for non-threatened species. Good management practices with regards to when to take action and how to reduce risk of future incidents are also required.
>
> A large variety of acoustic deterrent (and harassment) devices is used in salmon aquaculture. Based on available research,38 it appears that the effectiveness of these devices in reducing farmed salmon predation by marine mammals can vary widely including by location, marine mammal species, period of use, etc. Available research suggests that noise and high-pitched sounds resulting from currently available acoustic devices can cause pain to dolphins, porpoises and whales. As intended, acoustic devices can cause marine mammals including seals, porpoises and whales to avoid areas that may be important for feeding, breeding and travel/migration. While the devices may be initially effective in deterring marine mammals in certain scenarios, research studies suggest that they lose their

effectiveness over several years. Additionally, evidence suggests that alternative measures such as promptly removing dead fish, reducing stocking densities, net tensioning and use of seal blinds are important in reducing depredation on salmon farms.

Given the impacts associated with ADDs/AHDs and the availability of other, potentially less impactful and more effective deterrence practices, the requirements encourage farms not to use ADDs/AHDs, requires that they not be used on a continuous basis and that they are actively used less than 40 percent of the days in the production cycle. The requirement additionally requires that their use be phased out on certified farms within three years of the publication of the ASC Salmon Standard. Starting three years from the date of publication, no farm meeting the requirement shall use ADDs/AHDs. An exception to this requirement for new technologies may be granted by the Technical Advisory Group of the ASC if there is clear scientific evidence that future ADD/AHD technology presents significantly reduced risk to marine mammals and cetaceans.

[38] References for the section of the rationale related to ADDs/AHDs:

- Northridge, S.P., Gordon, J.G., Booth, C., Calderan, S., Cargill, A., Coram, A., Gillespie, D., Lonergan, M. and Webb, A. 2010. Assessment of the impacts and utility of acoustic deterrent devices. Final Report to the Scottish Aquaculture Research Forum, Project Code SARF044. 34pp. http://www.sarf.org.uk/cms-assets/documents/28820-18834.sarf044---final-report.pdf
- Morton, A. B., and Symonds, H. K. 2002. Displacement of *Orcinus orca* (L.) by high amplitude sound in British Columbia, Canada. ICES Journal of Marine Science, 59: 71–80. https://oup.silverchair-cdn.com/oup/backfile/Content_public/Journal/icesjms/59/1/10.1006_jmsc.2001.1136/3/59-1-71.pdf?Expires=1499859194&Signature=URpngb2fKVR8B2kFgMguget42wf4uSn3nDVMqD6C-nymcyQlow3frZfVe4l9aLUpkGsJ5H0M4y3h2S6WVJJKOBa0~gFI5fuVjJ2lQhobfCbLu3JkiexGslvDncRW498rq6-06oV8Qsk2Y-Up3QBNujCKBN-07SWDpXdX3GvFsJTvxeEecDNojXRgLrYV7z6~iWsFHiVW4CiFO4arHhveN8tpu0yhYte~-byBwFih0BNCPpwQnRbIOCuwclq6cVIsifQSDbMNSdkYUT72t3KJyocHMvMhvfPYBbAwvoZFYC3Bpvf~3pD4U0NjIkI9YnHQoY6zwShaORjbkq0CfRvc6w__&Key-Pair-Id=APKAIUCZBIA4LVPAVW3Q
- Scottish Association for Marine Science and Napier University (SAMS)2002. Review and synthesis of the environmental impacts of aquaculture. Scottish Executive Research Unit. www.scotland.gov.uk/cru/kd01/green/reia-00.asp.
- Milewski, I. 2001. Impacts of salmon aquaculture on the coastal environment: a review. https://www.iatp.org/sites/default/files/Impacts_of_Salmon_Aquaculture_on_the_Coastal_E.pdf
- Young, S. 2001. Potential adverse effects of aquaculture on marine mammals: in Tlusty, M.F., Bengston, D.A., Halvorson, H.O., Oktay, S.D., Pearce, J.B., Rheault, Jr., R.B. (eds.). Marine Aquaculture and the Environment: A Meeting for Stakeholders in the Northeast. Cape Cod Press, Falmouth, Massachusetts.

Download in full as a PDF online here

Here's correspondence with the ASC:

From: Daniela Ruz [mailto:Daniela.Ruz@asc-aqua.org] **On Behalf Of** Info
Sent: 01 June 2018 09:41
To: 'Don Staniford'
Subject: RE: Query re. salmon standard and ADD use

Dear Don,
Apologies for the delay in the answer.
From the auditing point of view the requirement is mandatory. In this case the indicator requires 0. If that is not the case in a farm, an NC should be raise.
About the footnote, I will flag it to the Standards team as the derogation is already expired after the third anniversary of the standard, that already happened. Thank you for pointing us that.
Let me know if you have additional questions.

Best regards,

Daniela Ruz

Programme Assurance Coordinator

Aquaculture Stewardship Council

NEW ADDRESS: HNK, Arthur van Schendelstraat 650| 3511 MJ Utrecht, The Netherlands
P.O Box 19107 | 3501 DC Utrecht, The Netherlands

T: +31(0)30 239.31.10
E: Daniela.Ruz@asc-aqua.org
I: www.asc-aqua.org

From: Bertrand Charron [mailto:Bertrand.Charron@asc-aqua.org]
Sent: 25 May 2018 21:55
To: Don Staniford
Subject: Re: Re. Query re. salmon standard and ADD use

Hi Don,
Quick reply: you can find the CAR 2.1. here: https://www.asc-aqua.org/wp-content/uploads/2017/07/ASC-Certification-and-Accreditation-Requirements-v.2.1_including-multi-site_clean-1.pdf

via this page: https://www.asc-aqua.org/what-you-can-do/get-certified/about-our-certification/

Best regards,
Bertrand

On 25 May 2018, at 19:03, Don Staniford <salmonfarmingkills@gmail.com> wrote:

Thanks. Much appreciated.

Re. Certification & Accreditation requirements v2.1

Where do I find those exactly?

Best fishes,

Don

Don Staniford

Director, Scottish Salmon Watch: https://scottishsalmonwatch.org/

Director, Global Alliance Against Industrial Aquaculture (GAAIA): http://www.salmonfarmingkills.com

Read my blog via http://donstaniford.typepad.com/my-blog

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From: Bertrand Charron [mailto:Bertrand.Charron@asc-aqua.org]
Sent: 25 May 2018 17:10
To: 'salmonfarmingkills@gmail.com'
Cc: Contessa Kellogg-Winters
Subject: Re. Query re. salmon standard and ADD use

Dear Don,

Thank you for your email and interest in the programme,

There are two versions of the Salmon Standard, v 1.0 and v1.1 that are relevant for your question.

Under version 1.0 it was allowed to us ADD/AHD for ≤ 40% of the days of the production cycle in which the devices are operational. This requirement was valid from the date of release of the Salmon stand v1.0 (June 2012) and the next three years after (as is written under indicator 2.5.1 and 2.5.2 of v1.0).

After three years of release—from July 2015 onwards—ADD/AHD are no longer allowed. This was embedded in indicator 2.5.1 in v1.0 and remains embedded under 2.5.1 in v1.1.

You are correct that the rationale under Criterion 2.5 in v1.1 indeed still includes the ≤40% requirement. This rationale applies to v1.0 but not to v1.1 and will therefore be corrected shortly. Perhaps is it needless to say that although this part of the rationale applies to v1.0, the following sentences: "*The requirement additionally requires that their use be phased out on certified farms within three years of the publication of the ASC Salmon Standard. Starting three years from the date of publication, no farm meeting the requirement shall use ADDs/AHDs. An exception to this requirement for new technologies may be granted by the Technical Advisory Group of the ASC if there is clear scientific evidence that future ADD/AHD technology presents significantly reduced risk to marine mammals and cetaceans."* should remove all doubt as to what is required of farms, regardless of the version of the standard.

I would like to make you aware of our Certification & Accreditation requirements v2.1, which detail the certification requirements—i.e. the way that standard is applied by certifiers. This is important because it spells out the consequences for farms that do use ADD/AHD's. If you need assistance interpreting these, or similar documents, or in case additional questions do arise,
Please feel free to contact me.

Bertrand

Bertrand Charron
Science & Sustainability Communications Manager

Aquaculture Stewardship Council (ASC)
HNK Utrecht Centraal Station
Arthur van Schendelstraat 650 |3511 MJ Utrecht, The Netherlands
P.O Box 19107 | 3501 DC Utrecht, The Netherlands

Email: Bertrand.Charron@asc-aqua.org
Web: www.asc-aqua.org

From: Don Staniford [mailto:salmonfarmingkills@gmail.com]
Sent: 21 May 2018 22:09
To: 'info@asc-aqua.org'
Subject: Query re. salmon standard and ADD use

Hopefully you can assist with a quick query re. the ADD indicator in your salmon standard.

I am clear that it states 0 under 'Requirement' and therefore assumed that ADD use was completely prohibited.

However, the text under 'Rationale' states that ADDs can be used "less than 40% of the days in the production cycle".

What is the correct position?

As full context, the latest version (April 2017) of the Aquaculture Stewardship Council's salmon standard includes:

Criterion 2.5 Interaction with wildlife, including predators[30]

INDICATOR	REQUIREMENT
2.5.1 Number of days in the production cycle when acoustic deterrent devices (ADDs) or acoustic harassment devices (AHDs) were used	0

And by way of explanation:

Rationale - The suite of requirements related to mortalities and lethal incidents of predators or other wildlife is intended to ensure that certified farms have minimal impact on populations of wildlife, placing limits on both accidental and intentional mortalities of these species. The requirements ensure that endangered species have not died as a result of interaction with the farm and require transparency of farms on any lethal incidents and wildlife mortalities for non-threatened species. Good management practices with regards to when to take action and how to reduce risk of future incidents are also required.

A large variety of acoustic deterrent (and harassment) devices is used in salmon aquaculture. Based on available research,38 it appears that the effectiveness of these devices in reducing farmed salmon predation by marine mammals can vary widely including by location, marine mammal species, period of use, etc. Available research suggests that noise and high-pitched sounds resulting from currently available acoustic devices can cause pain to dolphins, porpoises and whales. As intended, acoustic devices can cause marine mammals including seals, porpoises and whales to avoid areas that may be important for feeding, breeding and travel/migration. While the devices may be initially effective in deterring marine mammals in certain scenarios, research studies suggest that they lose their effectiveness over several years. Additionally, evidence suggests that alternative measures such as promptly removing dead fish, reducing stocking densities, net tensioning and use of seal blinds are important in reducing depredation on salmon farms.

Given the impacts associated with ADDs/AHDs and the availability of other, potentially less impactful and more effective deterrence practices, the requirements encourage farms not to use ADDs/AHDs, requires that they not be used on a continuous basis and that they are actively used less than 40 percent of the days in the production cycle. The requirement additionally requires that their use be phased out on certified farms within three years of the publication of the ASC Salmon Standard. Starting three years from the date of publication, no farm meeting the requirement shall use ADDs/AHDs. An exception to this requirement for new technologies may be granted by the Technical Advisory Group of the ASC if there is clear scientific evidence that future ADD/AHD technology presents significantly reduced risk to marine mammals and cetaceans.

[38] References for the section of the rationale related to ADDs/AHDs:

- Northridge, S.P., Gordon, J.G., Booth, C., Calderan, S., Cargill, A., Coram, A., Gillespie, D., Lonergan, M. and Webb, A. 2010. Assessment of the impacts and utility of acoustic deterrent devices. Final Report to the Scottish Aquaculture Research Forum, Project Code SARF044. 34pp. http://www.sarf.org.uk/cms-assets/documents/28820-18834.sarf044---final-report.pdf
- Morton, A. B., and Symonds, H. K. 2002. Displacement of *Orcinus orca* (L.) by high amplitude sound in British Columbia, Canada. ICES Journal of Marine Science, 59: 71–80. https://oup.silverchair-cdn.com/oup/backfile/Content_public/Journal/icesjms/59/1/10.1006_jmsc.2001.1136/3/59-1-71.pdf?Expires=1499859194&Signature=URpngb2fKVR8B2kFgMguget42wf4uSn3nDVMqD6C-nymcyQlow3frZfVe4l9aLUpkGsJ5H0M4y3h2S6WVJJKOBa0~gFl5fuVjJ2lQhobfCbLu3JkiexGslvDncRW498rq6-06oV8Qsk2Y-Up3QBNujCKBN-07SWDpXdX3GvFsJTvxeEecDNojXRgLrYV7z6~iWsFHiVW4CiFO4arHhveN8tpu0yhYte~-byBwFih0BNCPpwQnRbIOCuwclq6cVlsifQSDbMNSdkYUT72t3KJyocHMvMhvfPYBbAwvoZFYC3Bpvf~3pD4U0NjIkI9YnHQoY6zwShaORjbkq0CfRvc6w__&Key-Pair-Id=APKAIUCZBIA4LVPAVW3Q
- Scottish Association for Marine Science and Napier University (SAMS)2002. Review and synthesis of the environmental impacts of aquaculture. Scottish Executive Research Unit. www.scotland.gov.uk/cru/kd01/green/reia-00.asp.
- Milewski, I. 2001. Impacts of salmon aquaculture on the coastal environment: a review. https://www.iatp.org/sites/default/files/Impacts_of_Salmon_Aquaculture_on_the_Coastal_E.pdf
- Young, S. 2001. Potential adverse effects of aquaculture on marine mammals: in Tlusty, M.F., Bengston, D.A., Halvorson, H.O., Oktay, S.D., Pearce, J.B., Rheault, Jr., R.B. (eds.). Marine Aquaculture and the Environment: A Meeting for Stakeholders in the Northeast. Cape Cod Press, Falmouth, Massachusetts.

If I am missing something please let me know!

Best fishes,

Don

Don Staniford

Director, Scottish Salmon Watch: https://scottishsalmonwatch.org/

Director, Global Alliance Against Industrial Aquaculture (GAAIA):
http://www.salmonfarmingkills.com

Read my blog via http://donstaniford.typepad.com/my-blog

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[4] A FOI reply from Scottish Natural Heritage dated 20 April 2018 included 14 MB of collated information (a 76-page PDF) - including:

From: [redacted]@jncc.gov.uk [redacted]@jncc.gov.uk]
Sent: 12 January 2017 13:30
To: Caroline Carter
Cc: [redacted]@jncc.gov.uk
Subject: ADD use in Scotland (MSFD UK Marine Noise Registry)

Hi Caroline,

I hope you are well. I'm not sure if you will recognise me via this email, but it's [redacted] I have taken over the role of MSFD Noise Registry Adviser at JNCC while [redacted] which I believe you may have been informed about by my line manager [redacted]

I am emailing as I was recently informed by [redacted] that SNH and Marine Scotland are in talks about licensing/regulating the use of ADD at fish farms in Scottish waters. As part of the UK Marine Noise Registry (MNR) we are attempting to collect the time and source location of all anthropogenic impulsive noises, between 10 Hz and 10 kHz, produced in UK seas for each calendar year, but as of yet we have been unable to collect data associated with ADD use at fish farms [redacted]).

I wondered therefore if it would be possible for me to be included in any future meetings between SNH and Marine Scotland regarding ADD use at fish farms, and to work with both organisations to try and find a feasible method of collecting future ADD noise data for the Marine Noise Registry?

Could you let me know if you think this would be possible, as we would really like to start the process of recording ADD data in the MNR to ensure our data is inclusive of all impulsive noise sources.

From: Caroline Carter
Sent: 18 January 2017 16:24
To: [redacted]@jncc.gov.uk
Cc: [redacted]@jncc.gov.uk
Subject: RE: ADD use in Scotland (MSFD UK Marine Noise Registry)

Hi [redacted]

[redacted]

I've spoken to a few key folk about your request to join in on any future meetings, and our feeling is that our meetings have not been a formal forum and are (still) at quite an early stage of discussion so they probably won't help you in trying to collect ADD usage data. We actually do not have another meeting timetabled at the moment.

I'm not surprised you have had trouble collecting this information - because it doesn't really exist. Fish farms include ADDs in their planning application as potential mitigation, and there are instances where this doesn't necessarily mean that they will be used; often the industry just want to keep their options open. Having said that, we think that most are using ADDs continuously as a 'just in case', and we are in discussion with Industry to try and improve our understanding of how fish farms use ADDs.

How ADDs are used at each fish farm is decided by the manager on site, and often the details of this use is not known beyond the site itself. We have had discussions with Industry environmental managers and they do not have a handle on exactly how the devices are used on their farms. Managers can supply the make and number of ADDs that they have, they can log whether they are used continuously – or triggered – but it's not necessarily clear what this means. For example continuous can mean 24/7 – or when the cages are stocked – or switched on when the workers are on site, and then switched off when they leave! Or switched on when the manager 'feels' that there may be a problem.

From: [redacted]@aceaquatec.com>
Sent: 08 May 2017 14:01
To: Liam Wright
Subject: Re: Low Frequency Transducer - Proposed Trial and Monitoring in Orkney

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Liam,

I hope you're well.

I wondered if it might be a good time for me to come and give another presentation on the developments at Ace Aquatec regarding cetacean friendly acoustic deterrents? We're now part why through a trial on our 1-2Khz deterrent which was developed to avoid the sensitive hearing range of cetaceans and this seems to be going well. We're also about to deploy our sonar detection triggers on the base of our standard US3 deterrents which will allow general noise levels to be reduced across all of our rental sites. These will be tested over the summer in tank tests at SMRU.

I look forward to speaking further.

Best regards,

[redacted]

[redacted]
Ace Aquatec
[redacted]
www.aceaquatec.com

From: Cathy Tilbrook
Sent: 10 May 2017 10:21
To: Caroline Carter; Karen Hall; Fiona Manson; George Lees; Suzanne Henderson; Liam Wright; David Maclennan; John Uttley; Laura Steel; Jane Dodd
Cc: Katie Gillham; Andrew Bachell; Alison Bell; Ian Jardine; Dominic Shann; Rhoda Davidson; John Baxter; Erica Knott
Subject: Complaint re. ADD use in Scotland

Hi all

Many of you will be aware of a recent FoI request we have been responding to from [redacted] relating to the use of acoustic deterrents in aquaculture. This was followed by a Sunday Herald article last weekend on 'ADDs putting the health of cetaceans at risk'. The article focuses on recent research on the increasing extent of underwater noise from ADDs on the west coast of Scotland and states that GAAIA will file a formal complaint to the EC on failure to protect cetaceans from 'deliberate and reckless disturbance' from ADDs. The piece includes an SNH quote from Caroline (see below) and comments from Whale & Dolphin Conservation, SAMS and SSPO.

We have now received the formal complaint letter against the Scottish and UK Governments, submitted to the EC on 7 May (attached). On the basis of alleged breaches in EU law, [redacted] call for an immediate ban at all salmon farms in Scotland, although this is later qualified to suggest that all farms using ADDs should apply for a licence containing detailed evidence that there are no satisfactory alternatives to use of ADDs. The Marine Scotland seal licensing return spreadsheets are heavily used in the complaint letter to contend that ADDs are used on the vast majority of farms, in some cases continually. The complaint also quotes from a SMRU 2013 report to MS that refers to uncertainty about whether the use of ADDs should be construed as 'deliberate or reckless disturbance of cetaceans' and that this would not be clarified until the current interpretation is challenged in court.

In response to the complaint, we will now discuss next steps with Marine Scotland and seek to conclude our earlier discussions on the need for EPS licensing for ADD use in aquaculture. We are already in close liaison with SSPO and individual operators within the Inner Hebrides and Minches cSAC about developing best practice use of ADDs to minimise risk to cetaceans. Indications from SSPO are that the recent media coverage should not affect industry willingness to continue this work. We will develop some further lines to take on this issue, to help staff deal with any follow-up queries, but in the meantime, the quote below provides the headline messages that we want to get across.

Dr Caroline Carter (SNH marine mammal advisor) said: This is an interesting study which highlights an increase over time in the area where seal scarers can be detected above background noise levels. We would note that a noise signal that is detectable above background levels does not necessarily equate to an impact. However, available evidence shows that certain types of acoustic deterrents can disturb cetaceans and therefore we are actively working on this issue. We are already in discussion with the aquaculture industry to develop smarter use of acoustic deterrents to reduce the risk of unintended impacts on cetaceans. We are also supporting further research which will help inform our advice on this topic.

Please get in touch with me or Caroline if you need any further information.

Thanks, Cathy

From: Lynne Clark
Sent: 10 May 2017 11:45
To: Cathy Tilbrook
Cc: Caroline Carter; Katie Gillham; Mairi Cole
Subject: RE: Complaint re. ADD use in Scotland

Cathy,

In Andrew's absence, can you please ensure Eileen is kept sighted on this? Eileen received an email on behalf of Peter Chapman MSP yesterday asking for SNH's stance on this, which I forwarded on yesterday. Caroline has agreed to draft something and send it back to me, by Tues 16th May and Eileen has asked if you could please sign it off, before I send the response?

Let me know if you need any further info.

Kind regards,

Lynne Clark | Policy & Advice Directorate Support

Scottish Natural Heritage | Great Glen House | Leachkin Road | Inverness | IV3 8NW | t: 01463 725256

From: Caroline Carter
Sent: 17 May 2017 09:41
To: Lynne Clark
Cc: Cathy Tilbrook; Katie Gillham; Mairi Cole; Eileen Stuart
Subject: RE: Enquiry for Peter Chapman MSP

Lynne,

Please find below the text for our response.

Best wishes,
Caroline & Cathy

Dear [redacted]

Thanks for your enquiry about SNH's position on acoustic deterrents to inform a response to a constituent.

Acoustic deterrents have been used by fin-fish farms on the west coast for about 30 years and a recent study has highlighted the increased extent of detectable underwater ADD noise in this area. It is important to note that a noise signal that is detectable above background levels does not necessarily equate to an impact on marine wildlife. However, available evidence shows that certain types of acoustic deterrents can disturb cetaceans and so SNH is actively involved in work to minimise these risks.

We are already in discussion with the aquaculture industry to reduce the risk of unintended impacts on cetaceans through the smarter use of acoustic deterrents. We are also talking to Marine Scotland about the potential options for regulation of ADDs in aquaculture. Finally, we are supporting further research which will inform our future advice on this topic.

An outright ban on the use of acoustic deterrents would be likely to lead to increased demand for seal shooting licences. We recommend that the better management of ADDs is a more appropriate step at this time.

We hope this clarifies SNH's position but would be happy to provide further details if needed.

From: Cathy Tilbrook
Sent: 18 May 2017 14:48
To: Caroline Carter; Karen Hall; Liam Wright; Erica Knott; Alex Turner; Laura Steel
Cc: Jane Dodd; Suzanne Henderson; Fiona Manson; George Lees; Katie Gillham
Subject: Parl motion on ADDs

Hi all

For info...this was in the Parl Monitoring summary today.... If it gets enough cross-party support would then be debated in the Chamber. Will keep an eye on it! Cheers, Cathy

Motion S5M-05663: Maurice Golden, West Scotland, Scottish Conservative and Unionist Party, Date Lodged: 17/05/2017
Sustainable Aquaculture

That the Parliament recognises the importance of aquaculture to the Scottish economy and supports measures to safely expand the industry; recognises the need for fish farms to deter predators; notes the potential adverse commercial impact on exports of lethal measures; calls for research to be conducted on the potential for noise pollution from acoustic deterrence devices (ADDs) to inadvertently affect marine wildlife, especially along the west coast of Scotland, and for research on alternatives to both lethal and ADD measures, and further calls for that research to inform both a review of licensing requirements for ADD use in areas of special conservation and in the issuing of a best practice guide on ADD use by Scottish Natural Heritage.

Supported by: Finlay Carson, Ross Thomson

Cathy Tilbrook
Head of Coastal & Marine Ecosystems Unit (job-share)
Scottish Natural Heritage, Battleby, Redgorton, Perth, PH1 3EW

Direct tel: 01738 458620
Mobile: [redacted] – please note new number

ADD and Aquaculture – internal SNH teleconference
Notes taken by Fiona Manson
23 May 2017

	Topic for discussion	Notes and Actions
1.	Update on work with industry regarding Good Practice use of ADDs	Predator management: Industry-led principles paper Not currently able to circulate paper. SSPO to incorporate SNH's ideas and produce new version.
2.	Update on FOI and increased focus on ADD use	Any follow-up queries should go through Rhoda and Cathy
3.	Update MS/SNH EPS discussion	MS currently reviewing the marine EPS guidance. MS has requested SNH to submit formal advice on ADD use. **ACTION**: George to contact MS re timescales for this advice **ACTION**: Delivery of formal advice to MS (George to co-ordinate)
4.	Is planning the most appropriate mechanism? or EPS?	Options: 1) General EPS licence for less sensitive sites, site-specific licence where more sensitive (with conditions) 2) Management through planning consents (EMP) Currently is dealt with via EMP route, as MS unwilling to use EPS. Need to build in flexibility e.g. annual reviews (as for Portree). Propose that we continue to use planning option as an interim measure, but flag up to MS when we advise that an EPS licence is needed. **ACTION**: George to check with Sally Blyth whether this raises issues of Natura compliance **ACTION**: Erica to talk to John Uttley re whether this would require a conditioned objection from SNH
5.	Consideration of the baseline (Existing ADD usage)	Harbour porpoise cSAC designated based on data collected while ADDs in use, but we don't know where or when they are used. Baseline information could be used to detect trends, and to help in

		developing best practice. Baseline will improve if registration process for devices is implemented
6.	Consideration of the development of a register for logging ADD deployments and any linkage to the Marine Noise Register (JNCC)	Some information available from seal licensing scheme, but this is not very reliable, as not always filled in well in questionnaire. Need to be clear what data we want, and why. Could set up a contract to analyse the data once we get it. JNCC Noise Registry – could this be used to register aquaculture ADDs? (Already records pre-piling ADD use.) **ACTION**: Jane to calculate how many fish farm sites don't have seal licences (and therefore don't fill in the questionnaire). **ACTION**: Jane to identify inaccuracies in questionnaire returns and suggest improvements **ACTION**: follow-up work – discuss with Ian Walker how questionnaire can be improved to be more useful (and accessible) for us (lead person TBC).
7.	Assessment of cumulative impacts	Wait to see what comes out of underwater noise workshop in Newcastle (regulators).
8.	Information Note Comments	**ACTION**: Karen to add link to COs **ACTION**: discussion needed on which CMEU advisers should be point of contact for ops staff (paragraph 16)
9.	Guidance Note Comments (including suggested conditions and compliance questions)	**ACTION**: Liam, Suz and Laura to review previous cases against the decision tree. Following review – further consideration of the COs within the tree. **ACTION**: Caroline to follow up other comments individually. To work with Alex on text for scoping. It will be helpful if those with substantive comments on the current text can offer additional or alternative text where appropriate or requested.
10.	AOB - Message to take forward to SARF board and AGM	

From: Cathy Tilbrook
Sent: 01 June 2017 10:21
To: Caroline Carter; Donna Yule
Subject: FW: Acoustic deterrents in Orkney

Hi Caroline / Donna

This just in from [redacted]. Looks as though they are reverting to Toyness as preferred option for completing the trial. We had previously suggested that if they supplied a brief case that showed they had considered alternatives then we would re-consider Toyness. They have certainly considered and ruled out the Eday site, but I'm not sure if further justification would be needed. Please can one of you discuss with licensing team what would be required to progress this as an amendment to the EPS licence?

Given the potential wider benefits of this work for EPS I'm very keen that we facilitate this trial and provide a quick response.

Happy to discuss. Thanks, Cathy

From: [redacted]@st-andrews.ac.uk]
Sent: 01 June 2017 10:01
To: Cathy Tilbrook
Cc: [redacted]
Subject: Acoustic deterrents in Orkney

Dear Cathy,

As you know we have been trialling a new ADD that claims to be porpoise friendly at Wyre in Orkney.
You will recall we had hoped to run an experiment at two sites - the other being at Toyness.

The site at Wyre is now almost ready to go fallow as the last fish are harvested, and we will bring in the recording equipment in a couple of weeks.
The initial results from the first month of recordings are encouraging, but over two control and treatment periods, there was still a significant effect on porpoise click rates at the closest recording station (300m).
The difference in porpoise click detections at more distant sites (1500m and 3000m) during on and off periods were not significant.
This is very different from Airmar ADDs where the effect is evident at distances in excess of 3km, but still suggests a degree of displacement.

However, we detected a high frequency component to the signal that was not supposed to be there.
This is not part of the main signal, and is just a consequence of the switching in the device's circuitry, but it is right in the middle of the porpoise hearing sensitivity.
Because it's quite a low amplitude noise, it's possible that this explains the reaction we can see at close range.

The manufacturer is modifying the equipment to remove this unintended high frequency component.

So as a result we have a partial answer – but we will now need to test the modified equipment (which we will check before deployment for any stray high frequency signal components).
Wyre is no longer feasible, and we need a site where ADD use is restricted so we can control when it is on or off to satisfy the experimental needs and ensure we get a valid result.
At your suggestion we have proposed SSF's Eday site but we have been told that this site is not suitable as it will soon also be fallow and won't be restocked until February next year.

Further, therefore, to our previous request, I am wondering now if we could obtain permission to conduct a second phase of this experiment at Toyness.

I hope you will be able to consider this request,

With best wishes

[redacted]

[redacted]
Sea Mammal Research Unit
University of St Andrews
Bute Building
Queens Terrace
St Andrews
Fife KY16 9TS
[redacted]

From: [redacted]@aceaquatec.com>
Sent: 11 July 2017 13:49
To: Liam Wright
Subject: Re: Low Frequency Transducer - Proposed Trial and Monitoring in Orkney

Hi Liam,

I hope you're well.

I wondered if there would be an opportunity to present to snh again about the latest deterrents now being used around Scotland mitigating risk to non target species?

Best regards,

[redacted]

[redacted]

[redacted]@accaquatec.com

Scottish Natural Heritage
Dualchas Nàdair na h-Alba
All of nature for all of Scotland
Nàdar air fad airson Alba air fad

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

Date: 28 July 2017

Dear [redacted]

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.

Accordingly, we believe there to be a strong case for managing ADD deployment and use, and we would welcome further discussions with you on potential approaches to take this forward.

Should you have any questions in connection with this advice, please do not hesitate to contact George Lees at: george.lees@snh.gov.uk / 01738 458621.

Yours sincerely

[redacted]

Eileen Stuart
Head of Policy and Advice
Scottish Natural Heritage

cc [redacted]

Scottish Natural Heritage, Great Glen House, Leachkin Road, Inverness, IV3 8NW
Tel: 01463 725000 Fax: 01463 725067
www.snh.gov.uk

Dualchas Nàdair na h-Alba, Taigh a' Ghlinne Mhòir, Rathad na Leacainn, Inbhir Nis, IV3 8NW
Fòn: 01463 725000 Facs: 01463 725067
www.snh.gov.uk/gaelic

The 9-page Annex includes:

Annex

Introduction

This paper considers the available evidence for interaction between use of acoustic deterrent devices (ADDs) by the aquaculture industry and potential impacts on cetaceans. It provides advice to Scottish Government in considering the need for management or regulation of the use of ADDs to reduce risk of impacts on cetaceans.

Cetaceans are protected under European legislation 'Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora' adopted in 1992 and commonly known as the Habitats Directive. This legislation is transposed into Scottish law by the 'Conservation (Natural Habitats, &c.) Regulations 1994' known as the Habitats Regulations. Bottlenose dolphin and harbour porpoise are both listed on Annex II of the Habitats Directive as species of Community interest whose conservation requires the designation of Special Areas of Conservation (SACs). All whales, dolphins and porpoises are listed on Annex IV of the Directive as species of Community interest in need of strict protection. Of relevance to this paper, it is an offence to deliberately or recklessly capture, kill, injure, harass or disturb any whale, dolphin or porpoise.

Acoustic Deterrent Devices (ADDs) used in Aquaculture

The term ADD refers to a variety of acoustic deterrent types that range from lower power 'pinger' types that are used for bycatch mitigation in fisheries, to higher power devices used in aquaculture and offshore wind farm construction. This paper focuses on the higher power devices commonly used in aquaculture. Different device types have different acoustic characteristics in terms of source level[1], frequency content[2], mode of operation[3] and duty cycle[4], and these differences are likely to have a bearing on both the effectiveness in deterring seals and the impact on non-target species.

There are three main types of acoustic transducer/system used in Scottish aquaculture, namely Airmar (dB+II, Mohn Aqua, Gaelforce, OTAQ), Ace-Aquatec, and Terecos (Table 1). The Lofitech device is included for completeness; although not typically used in Scotland, it is marketed for aquaculture and is being used for offshore wind piling mitigation. All of these devices emit sound well within the hearing ranges of cetaceans (*e.g* Götz & Janik, 2013) (Figure 1) and at levels well above underwater background noise levels at substantial distances from source (e.g.15-20 km - Calderan *et al.*, 2007; Findley *et al.*, 2017).

And concludes:

Conclusions

The balance of scientific evidence indicates that ADDs emit frequencies within the hearing range of cetaceans; can cause disturbance and displacement; and have the potential to cause injury, masking and stress (though these latter aspects are difficult to demonstrate empirically).

The consensus in academic opinion is that ADDs can deter animals from an area[9] which implies a risk of habitat exclusion arising from persistent ADD use. This is particularly relevant in restricted environments (e.g. straits or narrows), where cumulative ADD use could present a barrier to passage by cetaceans. The extent of any habitat exclusion may well be site and context specific, and any resulting impacts on individual foraging success or population level consequences are not yet well understood. However current legislative protection requires a precautionary approach where a risk cannot be discounted beyond scientific doubt.

There is currently little formal regulation or monitoring of ADD use in aquaculture and as such it is difficult to understand the actual level of anthropogenic noise being contributed to the environment from this source. Given the increase in the marine area ensonified by ADD use and growing attention to the potential impacts of underwater noise (e.g. MSFD- Indicator 11) we consider that management of persistent noise sources such as ADD use by aquaculture is necessary.

---

[9] Note that the likelihood of such displacement is the reason why ADD use for pre-piling mitigation in the Moray Firth was agreed and why ADDs are being proposed as potential mitigation for tidal turbine operation impacts.

From: Cathy Tilbrook
Sent: 09 August 2017 16:37
To: [redacted]
Cc: Suzanne Henderson; Liam Wright; [redacted]
Subject: DZR meeting and ADD advice

Hi [redacted]

As discussed, I have booked a room at Battleby with VC for our DZR meeting – Wed 13 Sept, provisionally 11-3. Let us know if there are other issues you want to discuss so we can firm up the timing (and order lunch if needed!).

Also as mentioned, please see attached the formal advice we were recently asked to provide to Marine Scotland, which assesses the available evidence on risks to cetaceans from ADD use. We were not asked to advise on potential ADD management approaches at this stage, but if MS want to follow this up then we would expect to discuss options for EPS licensing linked to the sort of 'best practice' ADD use we have been discussing with yourselves and industry reps recently. We can keep you informed on how this progresses.

See you in a few weeks.

Cheers, Cathy

From: Caroline Carter
Sent: 26 October 2017 17:07
To: [redacted]@scottishsalmon.co.uk; [redacted]
Cc: Cathy Tilbrook
Subject: [redacted] PhD Studentships on ADDs and Aquaculture

Dear [redacted]

As promised I am writing to update you on the two ADD/harbour porpoise PhDs a[redacted] Both Students have just started (this month) and have had their initial supervisory meetings. At the moment they are very much finding their feet and are starting their literature review on the topic.

[redacted] project is looking at the far field signal of ADDs throughout the west coast. How exactly this will be done is still being developed but it will more than likely use HWDT acoustic data to develop underwater noise maps, [redacted]

The second student, [redacted] project will focus on near-field interactions between fish farms and harbour porpoise, i.e. fine-scale activity and behaviour of harbour porpoises around fish farms. Probably using acoustic click detectors to monitor activity; looking for patterns in activity and investigating the reasons for any pattern found.

Both of these projects should add useful information on the subject. I can keep you updated with how these projects are developing, but am also keen to facilitate a meeting at an early stage. I was wondering therefore whether we would be able to organise a meeting in January? The [redacted] folk are content to travel over to Perth from Oban and I can arrange a meeting room here if that suits. Please let me know if this is something you would be interested in, and if you have any suggested dates and we can take it from there.

Any questions – please shout.

All the best,
Caroline

From:	[redacted]@gov.scot
Sent:	31 October 2017 10:30
To:	Eileen Stuart; George Lees
Cc:	[redacted]@gov.scot; [redacted]@gov.scot [redacted]@gov.scot; [redacted]@gov.scot; [redacted]@gov.scot; Cathy Tilbrook
Subject:	Impact of Acoustic Deterrent Device (ADD) Use on Cetaceans

Dear Ms Stuart

I refer to your letter of 28 July 2017 enclosing advice on the above issue.

We have now considered your advice but feel that it only provides a partial response to our request. We feel that more information on ADD use and its potential impacts on cetaceans is required if future management options are to be considered.

We accept that there is some evidence to show that some ADDs can cause disturbance or displacement in certain circumstances but do not feel that your advice explored this issue in sufficient detail. We appreciate that not all of the information that might be required to fill this gap is available but feel that particular pieces of work have not been included in the advice that may be useful in enabling us to make progress on this matter.

We agree that further assessment is required before the potential for hearing damage, stress and masking can be demonstrated and consider that this should be part of the further assessment process.

We consider that there still remains significant work to be done before it can be demonstrated that there is a case for managing ADD deployment and use.

In particular, there is a need for further research and assessment of:-

- the wide range of ADDs currently available and their potential for impact on cetaceans. For example, in your advice you consider four main devices that are used in the aquaculture industry and provide details on their potential impact on cetaceans. It would be helpful for you to consider the outputs of the ORJIP ADD Study (Sparling *et al.*, 2015; Herschel *et al.*, 2013) which found that the evidence of impacts related to displacement effects for the majority of the devices referred to in your advice was limited to certain species and, in some cases, relied on modelling alone. It would therefore be helpful to consider these findings, as well as wider issues of ADD use and impacts, in moving forward.

- a greater consideration of the merits and shortfalls of "cetacean friendly" devices (e.g., Genuswave) which may offer the best future option in this area. When considering this point, it would be helpful to hghlight particular ADDs that are not considered a cause for concern for cetaceans.

- the different possibilities for how ADDs could be used (i.e. continuous, manually triggered or automatically triggered) to reduce their potential impact.

- the context in which ADDs are used (i.e. open seas, enclosed sea lochs or restricted passages) especially in relation to any use of these same areas by cetaceans. The overlap between the higher than average concentrations of harbour porpoise in the SAC and ADD distribution would appear to argue against a negative impact.

- the possible impact of ADD noise in the context of other noise in the local marine environment. We are aware that future work proposed by SAMS, as well as the new COMPASS project may assist in providing some of this information.

- the identification of areas where there is specific concern about the potential cumulative impact of ADD noise. For example, in your advice you discuss the cumulative effects of ADD use in restricted areas such as straits and sounds, which could be a particular issue. More information on specific areas where you deem this to be a particular concern would be helpful.

- the level of sound from ADDs that may evoke a behavioural response in cetaceans (although you note this may be a difficult issue due to the lack of information).

This is the kind of work that we feel is essential to provide the necessary scientific evidence required to consider potential future management measures in this area. We need first to explore the above issues in order to be in a position to consider if effective practical management measures are necessary and, if so, what the options might be.

Furthermore, since ADDs are often known to be used continuously at some sites without evidence of their efficacy in deterring seals from the area, it would be helpful if SNH could consider the practicalities of developing best practice guidance in partnership with the industry on ADD use, although we do appreciate that further research and assessment (as highlighted above) would be required to maximise the full potential of such guidance.

We appreciate that it might take time to resolve some of these issues and that some may prove intractable. We consider, however, that it is important to establish as many facts as possible to ensure that the basis for any potential future management measures is, as far as possible, sound science.

We are happy to meet to discuss this issue further if it would be helpful.

[redacted]
Marine Scotland
Marine Planning & Policy
Area 1A- South
Victoria Quay
Edinburgh
EH6 6QQ

From: Liam Wright <Liam.Wright@snh.gov.uk>
Date: Thursday, 9 November 2017 at 09:36
To: [redacted]@aceaquatec.com>
Cc: Caroline Carter <Caroline.Carter@snh.gov.uk>
Subject: ADD low frequency trials

Hi [redacted]

I hope you're well. You seem to have been getting around a bit recently as I'm seeing you pop up in various aquaculture news articles on a fairly regular basis – you seem to be picking up awards here, there and everywhere!

We're still keen to hear a bit about how the low frequency transducer trials have been going, and also any updates on any other new innovations you're developing (such as the electric fish!). I see you're now based in Dundee, so perhaps our Perth (Battleby) office would be a better venue? Your obviously extremely busy at the moment but if you could spare us an hour or two at some point that would be really useful. If you could let me know your availability over the next month or 2 then we can see if we can finally get something in diary.

Thanks,
Liam

Liam Wright| Marine Policy and Advice Officer - Aquaculture
Coastal and Marine Ecosystem Unit
Scottish Natural Heritage | 1 Kilmory Industrial Estate | Lochgilphead | PA31 8RR
T: 0131 316 2695
E: liam.wright@snh.gov.uk

From: [redacted]@gov.scot [mailto[redacted]@gov.scot]
Sent: 10 November 2017 10:32
To: Liam Wright
Subject: Your phone number

Hi Liam,

Do you have a moment to speak at all this morning? I was going to call you but realised that I don't actually have your number! So if you could call me on the number below or let me know the best number to call you on please?

Two things I wanted to discuss with you: one is a brief update on the Loch Laxford audit application (you will need to cast your mind back for this!) and secondly the meeting I understand you're going to have with Ace Aquatec on Monday. Mr Ewing met them yesterday and so I wanted to provide a little feedback on that.

Thanks,
[redacted]

[redacted]
Marine Scotland – Aquaculture, Crown Estate, Recreational Fisheries, EMFF and Europe Division (ACRE)

T: [redacted]
E: [redacted]@gov.scot
W: http://www.scotland.gov.uk/marinescotland

From: [redacted]@gov.scot
Sent: 13 December 2017 10:30
To: Liam Wright
Cc: Caroline Carter; Cathy Tilbrook
Subject: RE: Meeting with Ace Aquatec

Hi Liam,

I don't mean too much by it, just in the general sense of what the outcomes would have been had the meeting took place. He's obviously looking to get the device past various regulatory hurdles and so I'm interested in what, if any, issues SNH has with the device being used. I appreciate you've said before that you don't see SNH as having a significant role here and so even just knowing that this remains the case after your meeting with him would be helpful.

Thanks,
[redacted]

From: Liam Wright [mailto:Liam.Wright@snh.gov.uk]
Sent: 12 December 2017 17:07
To: [redacted]
Cc: Caroline Carter; Cathy Tilbrook
Subject: RE: Meeting with Ace Aquatec

Hi[redacted]

Unfortunately [redacted] of Ace-aquatec, had to cancel. He's giving us a presentation on Thursday instead. My understanding is that it's just to give us a quick update on how their trials up in Orkney have been going. I'm not entirely sure what the 'next steps' you refer to might be.

Any further clarification would be welcome.

Thanks,
Liam

From: [redacted]@aceaquatec.com>
Sent: 14 December 2017 09:30
To: Liam Wright
Subject: Re: ADD low frequency trials
Attachments: SNH Deterrents 2.pptx

Hi Liam,

Please see presentation attached.

Best regards,

[redacted]

[redacted]

ACE AQUATEC

[redacted]
W. www.aceaquatec.com

Ace Aquatec Ltd.
16B City Quay,
Dundee,
DD1 3JA

WINNER OF INNOVATION AWARD 2016 Aquaculture UK

WINNER OF INNOVATION AWARD AQUA NOR 2017

From: [redacted]@aceaquatec.com>
Sent: 14 December 2017 13:41
To: Liam Wright
Subject: Ace meeting

Hi Liam,

Thanks very much for the meeting today. Apologies for going to the wrong venue - you clearly stated Perth early on! I'm afraid a cold is effecting my mental capacities today?!

I appreciate everyone taking the time to discuss our new developments and hope to feed [redacted] report through shortly.

Best regards,

[redacted]

[redacted]

[redacted]

W. www.aceaquatec.com
Ace Aquatec Ltd.
16B City Quay,
Dundee,
DD1 3JA

From: Caroline Carter
Sent: 20 December 2017 12:44
To: Sally Blyth; Karen Hall
Subject: RE: ADDs & cetaceans research published

Hi Sally,

Yes, but thank you for forwarding. This article is in response to the ORJIP (Offshore Renewables Joint Industry Programme) work on testing the efficacy of an ADD on minke whales... now published on the ORJIP web site.

https://www.carbontrust.com/offshore-wind/orjip/acoustic-detterents/

& Merry Christmas to you too,
Caroline

From: Sally Blyth
Sent: 20 December 2017 12:34
To: Karen Hall; Caroline Carter
Subject: ADDs & cetaceans research published

Hi there
Just checking you're both aware of this recently published research
https://www.scotsman.com/news/subsea-pulse-can-safeguard-whales-during-offshore-turbine-construction-1-4643253

Merry Christmas
Sally

Sally Blyth
Operations officer – species
National Operations Unit

The Scotsman article is online here "Subsea pulse can safeguard whales during offshore turbine construction".

The Carbon Trust reported "New research builds confidence in wider use of Acoustic Deterrent Devices to safeguard marine mammals during offshore wind construction" (19 December 2017).

Read more via the Carbon Trust's "Efficacy of Acoustic Deterrent Devices" including Efficacy of acoustic deterrent devices - phase 1 report (PDF); The use of Acoustic Deterrents for the mitigation of injury to marine mammals during pile driving for offshore wind farm construction. ORJIP Project 4, Stage One of Phase Two (PDF) and Joint Statutory Nature Conservation Bodies Position Statement (PDF).

From: [redacted]@st-andrews.ac.uk>
Sent: 22 December 2017 15:11
To: Caroline Carter
Subject: ADD and sonar projects for 2018

Follow Up Flag: Follow up
Flag Status: Completed

Dear Caroline

Apologies for the long email! But read at your leisure - I'm not expecting a response any time soon for obvious reasons...

A bit of an update from our Orkney ADD project, and a couple of questions about new projects for the new year.

The low frequency ADD project we ran in Orkney went really well. I'm working on a write up for the funders now but wanted to give you a summary. We monitored porpoises with CPODs and soundtraps between 100m and 7km (from memory). I'm hoping to do a more in depth analysis and comparison of the noise data from the soundtraps if I get some time next year, but the cpods showed no effect of the ADD on porp detection rate. There was a slightly lower detection rate during the first 'ADD on' period, which could suggest a slight initial change in behaviour, but it was only for a week or two. The detection rate was quite high with a few detections most days.

Because we could remotely switch the ADD on and off, and use the soundtraps to double check it was active when we thought it was, it made a very powerful long-term on/off sound treatment relatively easy, and I'm keen to expand on this next year if we can find some more money. We also get the salmon mort records over the on/off periods as well, so should be able to answer the (in my opinion) more important question of whether ADDs prevent seal predation. It also has the great benefit of being a 'real-world' situation, rather than being at a study site, away from any farms, where the context for animal behaviour could be quite different.

[redacted] So I'm initially hoping to repeat this study but with the new signal, and possibly include some other test sounds (i.e. simulate different brands of ADD).

So first question is, will we be able to extend the SNH licence for that site (Wyre)? I know I will need to speak to the licencing dept, but just wanted to check with you if there is anything in particular I'll need to include. I have measurements (SPL and frequency spectrum) to confirm the new sound is what it should be.

I also thought it might be a good opportunity to think about what testing criteria, or metric might be appropriate when assessing/comparing ADDs. For example, are we more concerned about the size of any habitat exclusion, or, more complicated but maybe more important, any behavioural changes that might happen over a wider area.

[redacted] but no more than what [redacted] has been using (for example). I'm hoping to test this device at either the Isle of May or Tentsmuir from a

SMRU boat in late Jan/early Feb, [redacted] mentioned that you were involved in the licencing for his work so I though I'd mention it.

Anyway, sorry again for the long email - thought it was better than a long phone call on a Friday afternoon!

Have a nice holiday and happy new year,

Best,
[redacted]

--
[redacted]
Sea Mammal Research Unit
Scottish Oceans Institute
University of St Andrews
St Andrews, Fife, KY16 8LB
[redacted]

From: [redacted]
Sent: 30 December 2017 13:56
To: [redacted] Caroline Carter
Subject: Abstract for UKIRSC

Hi all,

Apologies for the delay in getting this to you, a combination of being unable to source any internet in the wilderness [redacted] put a damper on things!

Visiting Bloody Bay at the end of January sounds great [redacted] I hope everything went smoothly collecting the CPOD. I checked along at the Glenborrodale farm to see if I could pop in and say hello, but they seem to have taken down all the cages.

The abstract is to be 300 words, and I intend to present a 5 minute presentation.

The harbour porpoise (*Phocoena phocoena*) may be at risk of exposure to anthropogenic activities as it is highly abundant in coastal waters throughout its range. In Scotland the species may increasingly interact with an expanding Atlantic salmon (*Salmo salar*) aquaculture industry. Scottish salmon farms are mainly situated on the west coast, northern and western islands which also have some of the highest harbour porpoise densities in Europe. In response to this, the Minches and Inner Hebrides Candidate Special Area of Conservation (cSAC), proposes to protect 13,539km^2 of harbour porpoise habitat, which will show significant overlap with existing salmon farm sites.

The impacts of salmon farms on the harbour porpoise are not well established, and study efforts have mainly focused on the effect of Acoustic Deterrent Devices (ADDs) designed to prevent seal depredation. Research thus far indicates that some devices have the potential to induce habitat displacement in harbour porpoises, however it is unclear if all commercially available ADDs produce this effect. Additionally, the general effects of salmonid aquaculture in areas of porpoise habitat are little understood.

To address these knowledge gaps, the present study will identify if harbour porpoise use salmon farms as habitats on the Scottish west coast, and establish potential temporal or seasonal variation in usage patterns as well as the possibility for specific site preferences. Secondly, investigations will determine if porpoises exhibit discernible behavioural patterns around farms, such as foraging or socialising, and assess

potential attractants such as wild fish aggregations. Finally, the effects of ADDs and general farm activities on porpoise occurrence and behaviour will be assessed, providing an insight into potential population-level effects. The study will ultimately present multiple small-scale, site-specific examinations of the combined impacts of salmon aquaculture on harbour porpoises for the west coast of Scotland.

Speak soon and hope you all had a great Christmas!

[redacted]

[redacted]

Here's an abstract presented by Texa Sim at the UK and Ireland Regional Student Chapter (UKIRSC) of the Society for Marine Mammalogy at the University of St Andrews:

The purpose of porpoises around Scottish fish farms

Texa Sim

SAMS, University of Highlands and Islands

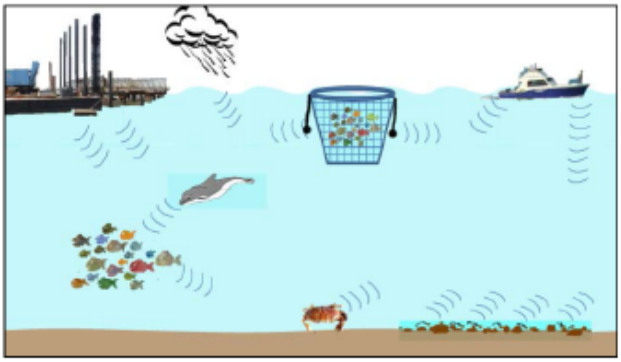
The harbour porpoise (*Phocoena phocoena*) has a widespread coastal distribution throughout the northern hemisphere, where there is potential for interaction with anthropogenic activities. In Scotland the species may interact with an expanding Atlantic salmon (*Salmo salar*) aquaculture industry. Scottish salmon farms are mainly situated on the west coast, northern and western islands which also have some of the highest harbour porpoise densities in Europe. Possible impacts to the species have been brought further into focus through the recently proposed Inner Hebrides and Minches Candidate Special Area of Conservation (cSAC). This protected area will cover 13,539km² of porpoise habitat and has significant overlap with existing salmon farm sites.

The impacts of salmon farms on the harbour porpoise are not well understood, and study efforts mainly focus on the effect of Acoustic Deterrent Devices (ADDs) deployed to prevent seal depredation. These may induce habitat displacement in harbour porpoises, or conversely cause habituation where individuals have been exposed to long-term use. However, the extent of these impacts on porpoises in Scotland is presently unclear. The significance of other factors, such as wild fish aggregations, has also received limited attention to date.

To address these knowledge gaps, the present study will use Passive Acoustic Monitoring (PAM) to identify whether harbour porpoise occur near Scottish salmon farms, and if so, establish temporal variation in usage patterns. Additional PAM will investigate evidence of behaviours such as foraging. Potential attractants such as wild fish aggregations will also be assessed using a combination of video and acoustic techniques. Finally, the effects of ADDs on porpoise occurrence and behaviour will be assessed, providing further understanding of the West of Scotland population. The study will ultimately present multiple small-scale, site-specific examinations on the relevance of salmon aquaculture to harbour porpoises in Scotland, with an aim to inform activity management within the cSAC.

An undated report/presentation by SNH included:

Underwater noise; Acoustic deterrents & marine mammals



1. Underwater noise can be classified according to its source.

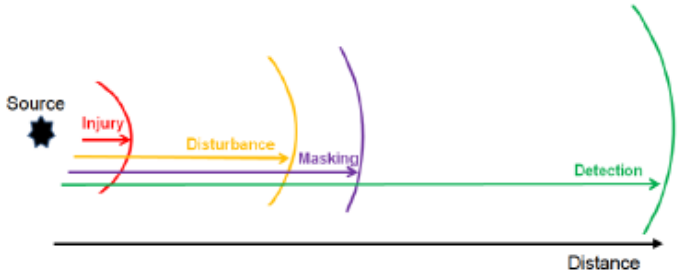
- Physical – wind, storms, waves, turbulence, earthquake, seabed, ice
- Biological – produced by animals, or as a by-product of their movement
- Man-made – human activities (boats, geological exploration, industry, military activity *etc.*)

2. Sound characteristics

- Two key characteristics – the sound level (volume) and the frequency content (pitch)
- The speed of sound is about five times faster in water than in air, which means sound can travel vast distances underwater (tens of km)
- In comparison, light can only travel a few hundred meters before it is absorbed or scattered

3. Importance of sound to marine mammals

- Because of the efficient sound propagation, and the relative inefficiency of light, hearing is marine mammals' primary sense
- Sound is used for orientation, finding food, locating partners, avoiding predators, and communication

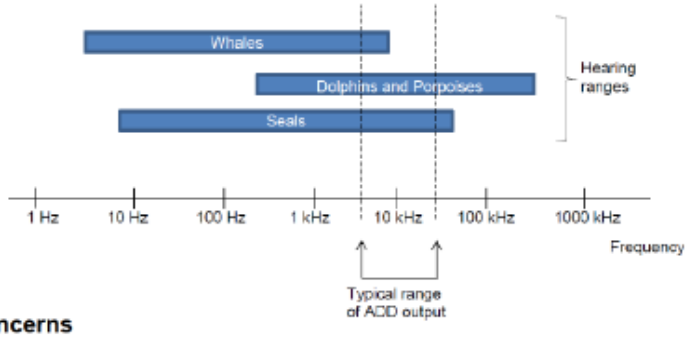


4. Potential issues with a noisy environment

- Depending on how loud the sound source is, it may result in physical injury, loss of hearing, masking (interference with the animal's ability to interpret a sound signal) and disturbance
- All of these could affect the an individual's ability to feed or protect itself

5. Marine mammals' hearing and ADD overlap

- Different marine mammals have different hearing ranges. For example humans can hear from about 20 Hz to 20 kHz (if we are not a bit deaf). Marine mammals have a much wider hearing range than us. The acoustic output of typical ADDs falls well within the hearing ranges of seals, whales and dolphins

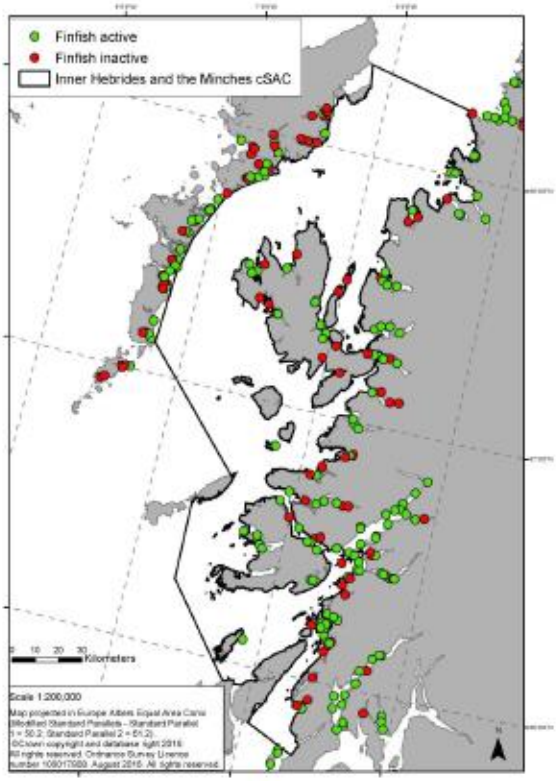


6. Concerns

- We know that ADD signals can be detected against background noise at distances potentially further than 10 km from source
- We know that some ADDs in some circumstances can disturb whales and dolphins between 2 and 7 km from source
- There is a growing concern about the impact of man-made noise in general on marine animals and therefore the ultimate aim is to minimise this impact by reducing unnecessary noise emissions into the marine environment

A undated report (perhaps the same as the six-point presentation above) includes:

ADD usage in the Inner Hebrides and the Minches candidate SAC



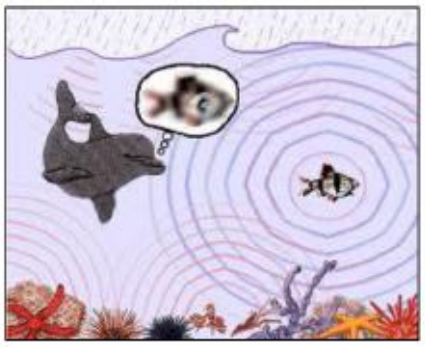
Dr Caroline Carter
Policy & Advice officer

Concerns re ADD use -

Underwater noise impact…

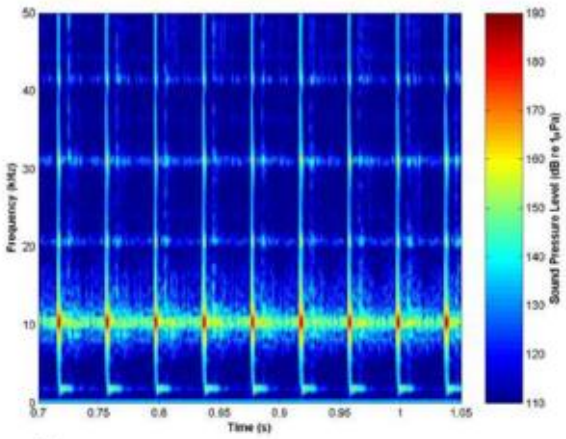
Hearing is marine mammals primary sense

- foraging
- navigation
- communication
- predator avoidance

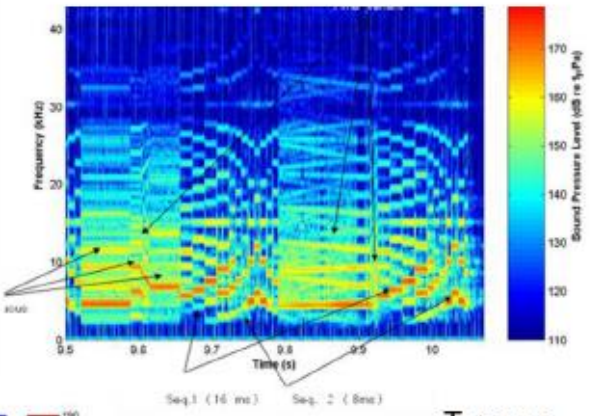


ADDs

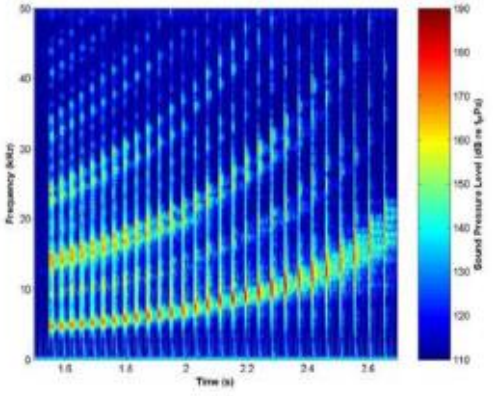
Manufacturer	Device	Source Level (dB)		Frequency (kHz)	Reference
		Scientific Literature	According to Manufacturer		
Airmar	dB Plus II	192 (RMS)	198 (RMS)	10 (tonal - with harmonics)	Lepper et al. (2014)
Lofitech	Universal Scarer	193 (RMS)	189 (Unknown)	14 (tonal - with harmonics)	Shapiro et al. (2009)
Ace Aquatec	Universal Scrammer 3	193 (RMS)	194 (Unknown)	10 - 65 (broadband)	Lepper et al. (2014)
Terecos	DSMS-4	179 (RMS)	None given	2 - 70 (broadband)	Lepper et al. (2014)
Ferranti-Thomson	4X	166 (Unknown)	200 (Unknown)	7 - 95 (broadband)	Terhune et al. (2002)
Fisheries pingers			130-155 (unknown)	10-160	
Dolphin Dissuasive Devices			162	2-500	



Airmar



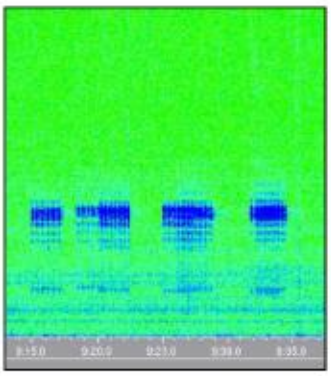
Terecos

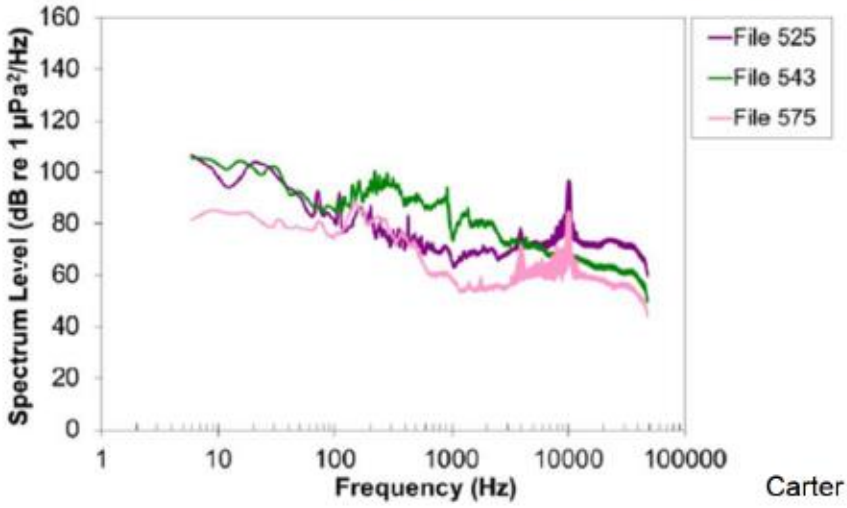


Ace-Aquatec

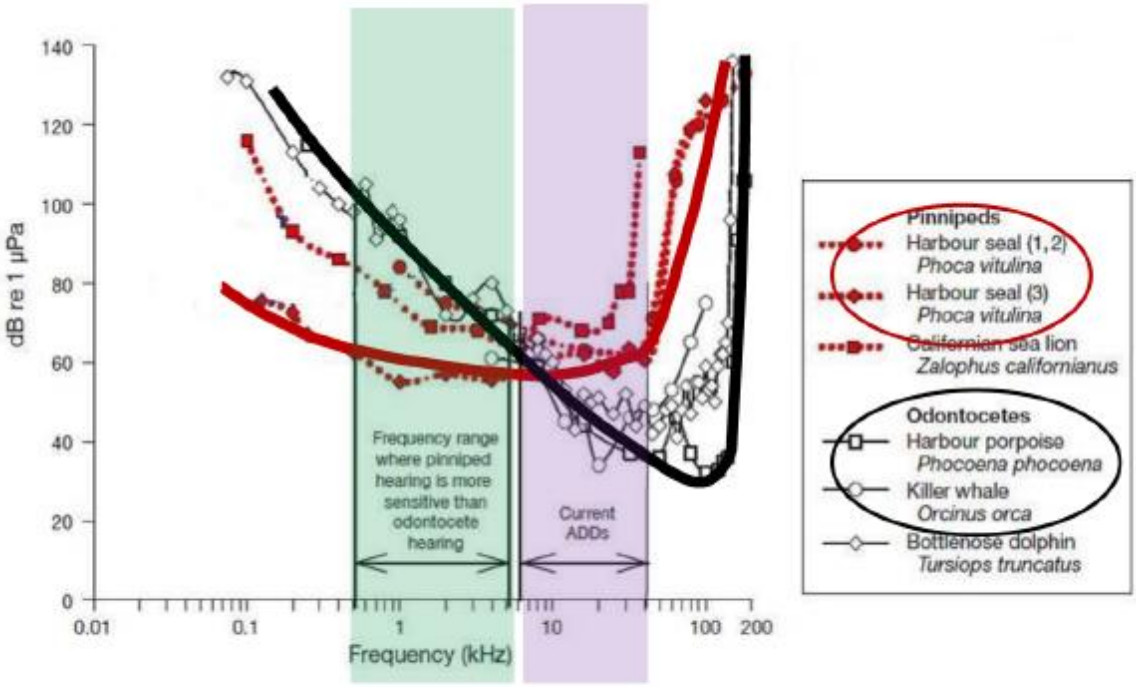
Lepper *et al*. (2014)

10 kHz



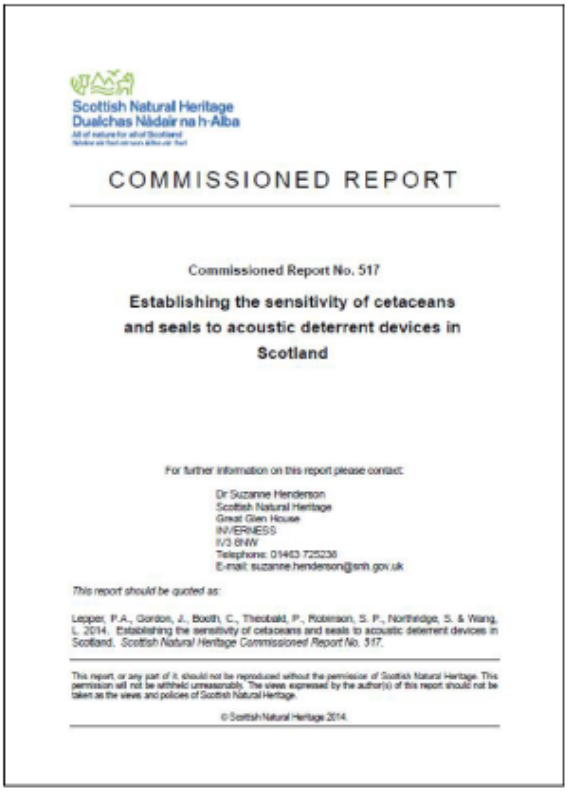


Carter (2013)



Gotz & Janik (2013)

Potential for hearing damage



Scottish Natural Heritage
Dualchas Nàdair na h-Alba

COMMISSIONED REPORT

Commissioned Report No. 517

Establishing the sensitivity of cetaceans and seals to acoustic deterrent devices in Scotland

For further information on this report please contact:

Dr Suzanne Henderson
Scottish Natural Heritage
Great Glen House
INVERNESS
IV3 8NW
Telephone: 01463 725236
E-mail: suzanne.henderson@snh.gov.uk

This report should be quoted as:

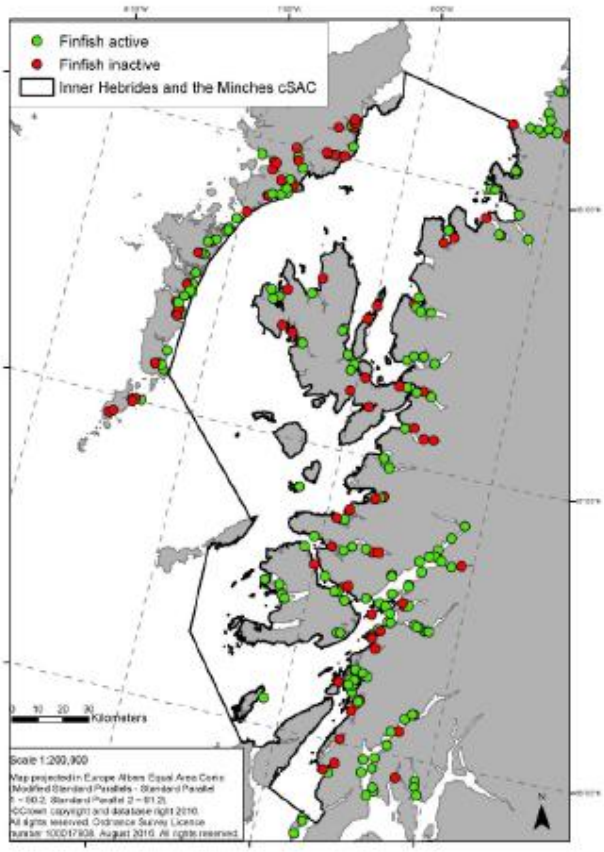
Lepper, P.A., Gordon, J., Booth, C., Theobald, P., Robinson, S. P., Northridge, S. & Wang, L. 2014. Establishing the sensitivity of cetaceans and seals to acoustic deterrent devices in Scotland. *Scottish Natural Heritage Commissioned Report No. 517.*

- Modelled sound propagation from an ADD source.
- Incorporated the hearing abilities of cetaceans and seals, and using current injury criteria thresholds to estimate the length of time taken for hearing damage to occur (only modelled out to 500m).
- Concluded that the risk of hearing damage to seals and cetaceans could not be discounted, if they stayed **within 100s of m for several hours.**
- Porpoises are more vulnerable than seals, but seem to show strong avoidance. Concerns may therefore focus on **longer term exposures, disturbance and habitat exclusion**.

Hearing damage also highlighted in Gordon & Northridge (2002); Gotz & Janik (2013) & Coram et al (2014)

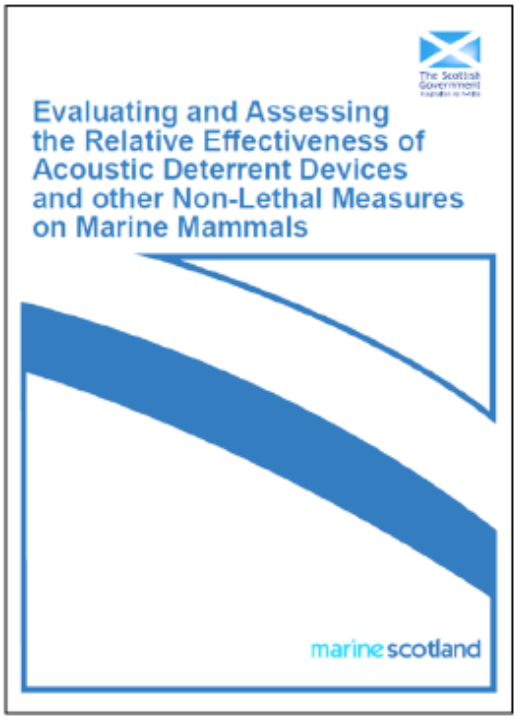
Our view:

- Given the output levels of available ADDs it is unlikely that hearing will be damaged by instant or short term exposure to the noise.
- But – we are concerned about cumulative exposure



Disturbance/ Habitat exclusion

- Review – published Nov 2014
- About half of all FF use ADDs – **but no register**
- HP known to avoid areas where Airmar and Lofitech
- Decrease in responsiveness over time
  - Habituation, hearing damage, learned strategies
  - Extent of habitat exclusion not well defined



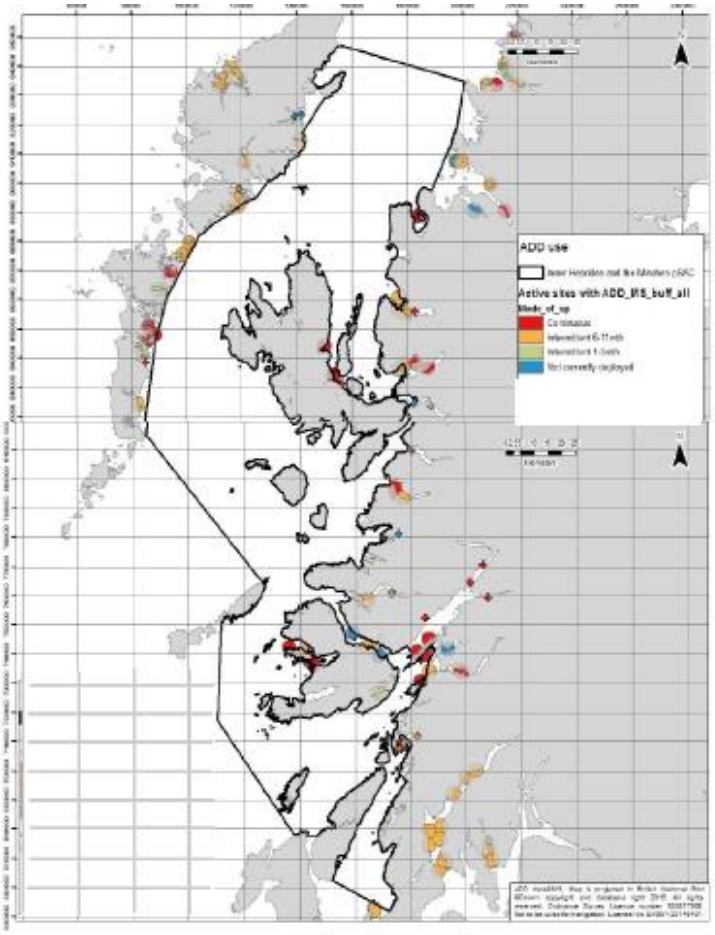
http://www.scotland.gov.uk/Resource/0046/00462305.pdf

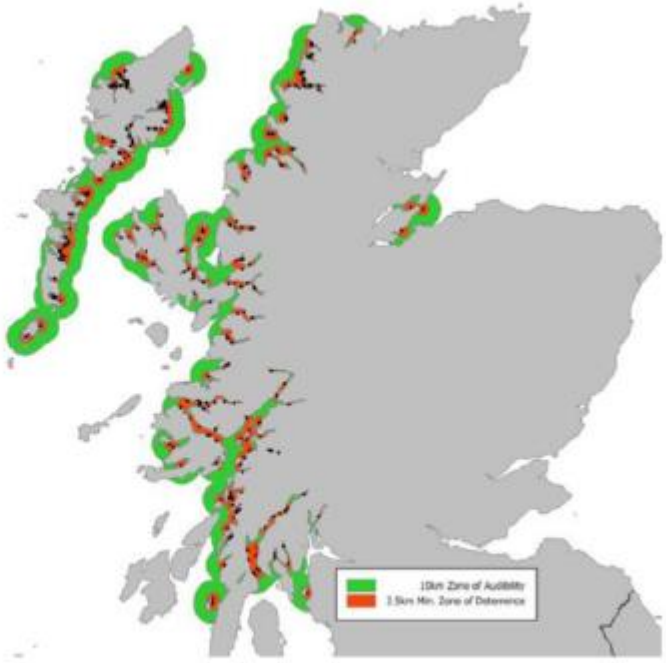
Data on Avoidance responses by harbour porpoises

Device	Response	Source
Airmar	Exclusion up to ~ 650m	Johnson 2002; Olesiuk 2002
?	Reductions in HP acoustic activity in Orkney in the vicinity of an ADD	Robertson 2004
Airmar	Evidence of avoidance, but not complete exclusion	Northridge, 1010
Lofitech	Significant reductions in hp detections out to 7.5km from source	Brandt et al, 2013
Airmar	Effective to 2.5 km	Kyhln 2015
Ace Aquatec	Likely to deter hp at ranges up to 1.2 km	Kastelein 2010
Terecos	Possible reduction in acoustic behaviour up to 1km	Northridge 2011
Terecos	No significant effect	Northridge 2013

Modelled Disturbance zones

- Airmar type – 2.5 km radius
- Terecos – 100's m radius





Coram et al, 2014

IH&M cSAC Draft Conservation Objectives

To avoid deterioration of the habitats or **significant disturbance** of harbour porpoise thus ensuring that the integrity of the site is maintained and it continues to make an appropriate contribution to harbour porpoise remaining at favourable conservation status in UK waters.

So what does this mean?

- A new or change in application /consent will need to be considered under Habitats Regulation Appraisal (HRA)
- The use of ADDs is likely to have a Likely Significant Effect (LSE) so we will need information to ascertain whether or not there's an adverse effect on site integrity (assessed against conservation objectives)
- We consider significant disturbance to relate to duration and/or spatial extent and/or potential for cumulative / passage blocking

- In an application, we would –
  - Seek methods that minimise potential injury risk and disturbance from ADD use
  - Consider the location within the cSAC
  - Currently we are of the view that continuous use is not good practice -
    - only activated in response to a predation threat
    - using the lowest power possible to reduce disturbance zone
    - devices that use frequencies less disturbing to cetaceans (as new devices come on line)

Thank you

Download collated information (14 MB) in full online here

[5] A FOI reply from Highland Council dated 9 March 2018 included:

From: Alex Turner [mailto:Alex.Turner@snh.gov.uk]
Sent: 25 July 2017 11:45
To: Shona Turnbull; Mark Harvey
Subject: RE: ADDs teleconference

Shona and Mark

Just a quick note to say that we had a teleconference with Marine Harvest re. ADD use at their Sconser sites at end of last week (see below). I have just received the revised information but haven't checked it yet. Claire L-H @ MHS has informed me that they are about to submit it to you and phone Mark to discuss. The proposed ADD at Sconser Quarry is the low frequency TR1 so one of the less disturbing devices for harbour porpoise. The challenging issue relates to assessing existing unregulated ADD noise from the 3 x existing sites which use the more disturbing US3 devices. MHS are moving in the right direction on that too (better guidance and training for Farm Managers) but clearly that's much more difficult to address in planning terms.

Formal advice to follow in due course (might be a couple of weeks depending on how quickly I can get advice from our specialist).

Alex

Alex Turner
Area Officer, Skye and Lochalsh

Scottish Natural Heritage
King's House
The Green
PORTREE
Isle of Skye
IV51 9BS
Tel: [redacted]
e-mail: alex.turner@snh.gov.uk

From: Alex Turner
Sent: 24 July 2017 10:02
To: 'Ewan.Gillespie@marineharvest.com'; 'Claire.Lumley-Holmes@marineharvest.com'
Subject: RE: ADDs teleconference

Dear Ewan,

We felt it was a useful meeting too. We're encouraged by your positive approach and the constructive dialogue regarding ADD use.

Here's my notes of where I think we got to:

- MHS policy document provides useful context but all the firm commitments will be in site-specific flow diagram. ASC 40% target is aspirational at the moment. Need to resolve introgression issues at freshwater sites before can roll out ASC to marine sites.
- MHS to clarify definition of 'perceived increased risk to stock'. Aim to differentiate

between current problem (fish killed by seals), imminent threat (seals attacking nets) and possible threat (more seal sighting around the farm). We agreed that ADDs should not be left on unnecessarily as 'insurance' in cases of possible threat.

- TR1 will be used at Sconser Quarry. The scientific trials have not been completed but based on the currently available information we expect low frequency transducer to have lower impacts on cetaceans than the US3. So TR1 better than US3 but still not as good as no ADD.
- Cumulative/in combination impacts need to be considered in EIA and Appropriate Assessment (as described in scoping advice). At the moment we don't know how ADDs have been/will be used at three existing sites. If existing ADD noise is already displacing cetaceans then any additional noise from Sconser Quarry would exacerbate the problem. MHS 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 next cycle. Provide log data if available or description from farm manager re. how much it was used in the past. Future use could refer to adoption of new flow diagram.
- Could flow diagram clarify what farm manager should do if the ADD is on but the predation continues. Perhaps discuss with manufacturer/supplier initially? 'Consider changing the settings' could be clearer - what is being changed?
- All MHS ADDs are currently manually triggered.
- MHS will confirm whether Sconser Quarry site can be operated without the use of ADDs and explain why.

I'm very happy to clarify any of these points or speak further. I'm around this week but away for the whole of next week.

Regards

Alex

From: Gillespie, Ewan [mailto:Ewan.Gillespie@marineharvest.com]
Sent: 21 July 2017 07:13
To: Alex Turner; Liam Wright
Cc: Lumley-Holmes, Claire
Subject: ADDs teleconference

Dear Alex, Liam,

Just to thank you for your time and positive input to the issue of using ADDs at our sea sites. We will take on board what we discussed and get back with amended documentation as soon as we can.

Kind Regards

Ewan

Documents available online here

Highland Council also disclosed a Marine Harvest report dated August 2017:

Marine Farming Site – Isle of Rum

Final Planning Application – Document 8. Environmental Statement
Appendix 7.5.3a – Technical Report - Predator Mitigation Plan

MARINE HARVEST (SCOTLAND) LIMITED
WRITTEN BY CLAIRE LUMLEY-HOLMES, AUGUST 2017

Acoustic Deterrent Devices (ADDs)

Not authorised for use.

Please contact the Environmental Team for further information.

The waters around the Small Isles, such as the Isle of Rum, are known to be visited by a number of different cetacean species. Under the Regulation 39(2) of the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended), it is an offence to deliberately or recklessly disturb any dolphin, porpoise or whale (cetacean). Furthermore, the farm is located within the Inner Hebrides and Minches candidate Special Area of Conservation (cSAC) for the protection of harbour porpoise. Scottish Natural Heritage have advised that the use of ADDs has the potential to lead to disturbance/habitat exclusion of harbour porpoise and the continuous noise emission from ADDs is not best practice. In the absence of further information, assessment and certainty, the decision has been made not to install ADDs at the proposed site as precautionary mitigation.

ADDs are capable of emitting a frequency of sound which effectively deters seals from the pens and the ADD systems are switched off as soon as the significant risk is removed. Should seals become a common predator the site manager should speak with the production managers to discuss options. However, the future use of ADDs would need discussion and approval from Scottish Natural Heritage prior to use. Please contact the Environmental Team at Stob Ban for further information.

Download document online here

Other documents disclosed included correspondence with Grieg Seafood:

From: Alex Turner
Sent: 19 January 2018 19:09
To: 'Kaye Williamson (kaye.williamson@griegseafood.com)'
Cc: 'Shona Turnbull (Shona.Turnbull@highland.gov.uk)'; 'andrea.dilley@sepa.org.uk'; 'Anna.M.Donald@gov.scot'
Subject: Leinish & Gob na Hoe fish farms - Request for clarification/
Importance: High

Kaye,

Thanks for sending through the USB sticks with the benthic visual footage.

I have now reviewed the rest of the information submitted for Leinish and Gob na Hoe against the information we requested at scoping. I have also considered the change in status of Inner Hebrides and the Minches candidate SAC that has occurred since EIA scoping was completed in summer 2016. We now offer more detailed guidance on ADD usage.

We will require further information in order to advise the Council on their Habitats Regulations Appraisals:

1. Secondary anti-predator nets

In our scoping responses we said:

We request that details be provided on the design, deployment and management of the additional nets. In particular:

- will they be of a curtain/skirt type or full enclosure box/bag net;
- will they surround the entire farm or individual cages;
- how will they be tensioned;
- how will the separation between the predator net and cage net be maintained;
- confirm net mesh size.
- frequency of checking for entangled animals, reporting of such entanglement and feedback loops for their continued use;
- experience of use of similar equipment at other Grieg sites.

The only information I can find is *'If the above options fail and predation continues to be an issue underwater anti-predator nets may be utilised. Anti-predator nets will be 80mm2 x 5mm HDPE and will only be deployed if problematic seal predation occurs'.*

Please can you provide the additional information listed above.

2. ADDs

Our standard guidance is now that:

1. If ADDs are proposed then the applicant should provide an ADD deployment plan with their final planning application / ER. The plan should include the following details;
    a. Details of the ADD model to be used, including
        i. The device name (and version if appropriate)
        ii. The indicative source level
        iii. The typical frequency content of the chosen device
        iv. Details of any triggering method
        v. Details of the duty cycle to be used (or the settings available), and
        vi. The number and locations of device(s) to be deployed
    b. How ADD use will be managed, including
        i. Detail of the cues/triggers and decision process to activate ADDs
        ii. How their use would be reviewed
        iii. Criteria for deactivation or removal of ADDs
    c. Undertaking on reporting
        i. confirmation that a log will be kept recording
            1. the exact dates when the device was operated, how often it was operated on that date, for what duration and what the cue for its manual or auto-sensor operation was
            2. details of any predation events by seals and any predation measures (including ADD deployment) in use at that time should be logged
            3. details of the person or persons responsible for maintaining the logs.
        ii. an undertaking that all logs will be maintained for review by the Planning Authority and/or SNH if deemed necessary by the Planning Authority.

2. In addition to the ADD deployment plan the final planning application / ER should include as assessment of how the development could combine with existing activities to increase the potential for cumulative impacts upon harbour porpoise.

Some of the above information has been provided in your EMP but more detail is required, in particular on the aspects I've highlighted above.

With reference to point 2, please confirm what ADD models are currently used, how they are used and managed, at your three farms in Loch Dunvegan. The ES states that they are currently used on an 'ad hoc' basis. Do you have a log of past usage or can you describe current usage in more detail?

Your flow chart is a good starting point for the ADD deployment plan. I suggest that it would be useful if you could consider whether it is necessary to leave the ADDs on for a month at a time before review.

Documents available online here

Other documents disclosed included correspondence with the Scottish Salmon Company:

From: Alex Turner
Sent: 24 January 2017 13:55:17
To: Alison Harvey
Subject: Further advice from SNH - Response to additional information submitted by SCC re. ADDs - Portree Outer fish farm - 16/03352/FUL - 24 January 2017
Importance: Normal

Alison

Further to the additional information submitted by SCC on 16 January you requested further comment from us:

Summary

The additional information does not change the position detailed in our response of 7 October 2016. We can provide you with further advice on the particular ADD system now proposed but in order to do so we would require further information from the developer. Based on the information currently available it seems unlikely that the proposed control system is an appropriate way to address the issues we laid out in our previous response. **Please let me know if you require further advice at this stage**.

Additional advice:

We are not familiar with the cetacean triggered control system proposed and could not find any additional information on the manufacturers website. However the noise profile described is similar to the one we assessed previously and suggests that it is just a different control system. In order to evaluate the control system we would need further information on how it detects the presence of cetaceans (including at what distance) and how that controls sound output.

The proposed system does not appear to meet our aim of minimising additional noise inputs into the cSAC. Rather than following the principle of being targeted to sound when seals are present, it appears that this device would sound intermittently most of the time.

Documents available online here

Another document disclosed in relation to Grieg Seafood included:

Grieg Seafood Shetland Ltd
Per: Miss Elizabeth Macleod
Grieg Seafood Shetland Ltd
Gremista
Lerwick
Shetland
Scotland
ZE1 0PX

For attention of: Shona Turnbull
E-mail: shona.turnbull@highland.gov.uk

Your Ref: 17/02430/FUL

Date: 11th August 2017

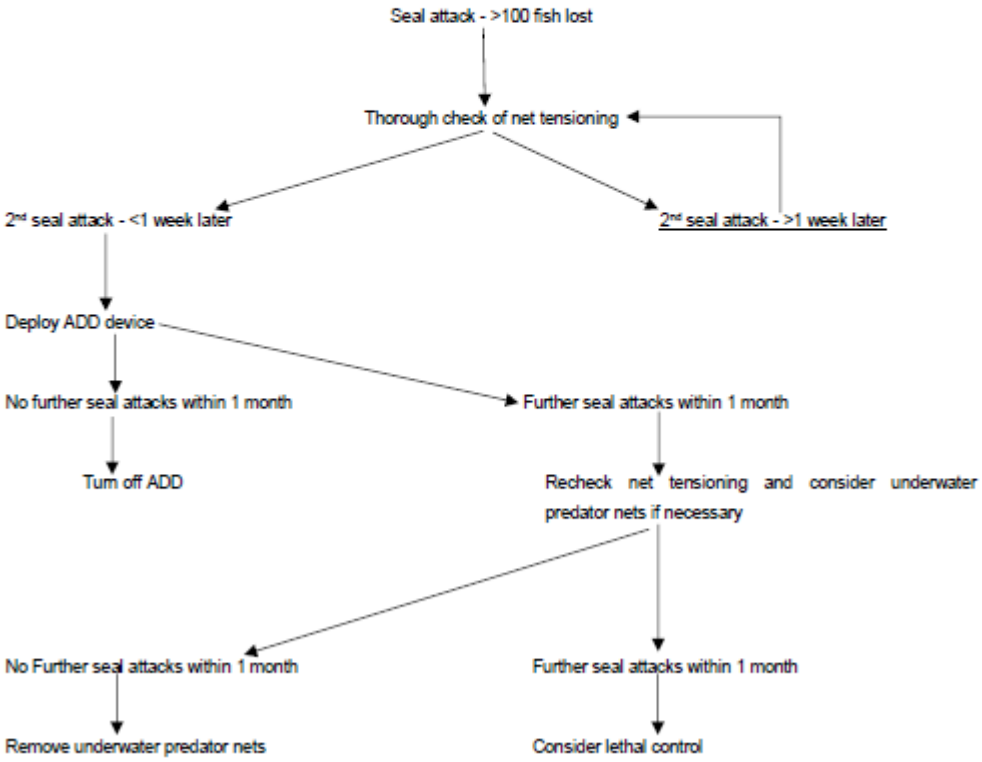
Dear Shona,

In response to your letter dated 29th June 2017 please find the additional information requested.

Additional information on the ADD's at Grieg Seafood Shetland Ltd's Loch Snizort East (Ru Chorachan)

Number	2
Make and model	Ace Aquatec US3
Output	Can be set to a max 144 beats per minute with a frequency between 10kHz - 20kHz. Devices are set up and used as per the recommendations within the instruction manual http://www.aceaquatec.com/us3-user-manual-2.2
Frequency of use	As and when required
Potential impacts on qualifying features	ADD's have the potential to impact on the Harbour Porpoises covered by the Inner Hebrides and the Minches SAC and may result in disturbance/habitat exclusion
Mitigation proposed	Obtain an EPS Licence, if necessary, as detailed in the existing species protection section of the Marine Scotland Guidance http://www.gov.scot/Resource/0044/00446679.pdf Feedback loops as detailed in the flow chart attached as appendix 1. Use of triggered devices. Non-continuous use of ADDs. We will discuss and look to implement where practical any recommendations from statutory agencies to reduce any potential impact on qualifying features.

Appendix 1



Flow diagram showing the trigger levels used to determine the appropriate predator control methods

Document available online here

[6] FOI reply from the Scottish Government dated 2 June 2017 - including:

1	Licenced Company	Fish Farm Name	ADD Used	ADD Count	ADD Model	ADD Always On
2	The Scottish Salmon Company	Ardyne	TRUE	2	ACE Aquatec US3	TRUE
3	Cooke Aquaculture Scotland	Bay of Cleat North	TRUE	10	Ace Aquatec	TRUE
4	Cooke Aquaculture Scotland	Ouseness	TRUE	10	Ace Aquatec	TRUE
5	Scottish Sea Farms Ltd	Loch Spelve (B)	TRUE	10	Mohn Aqua Airmar DB11	TRUE
6	Scottish Sea Farms Ltd	Dunstaffnage	TRUE	9	Airmar DB2	TRUE
7	Scottish Sea Farms Ltd	Loch Creran (B)	TRUE	14	Mohn Aqua Airmar DB II	TRUE
8	Scottish Sea Farms Ltd	Fishnish (A)	TRUE	8	Mohn Aqua Airmar DBII	TRUE
9	Scottish Sea Farms Ltd	Nevis A	TRUE	12	Mohn Aqua airmar DB II	TRUE
10	Scottish Sea Farms Ltd	Nevis C (Ardintigh)	TRUE	12	Mohn Aqua Airmar DBII	TRUE
11	Scottish Sea Farms Ltd	Tanera	TRUE	24	Mohn Aqua MAG Seal Deterrent	TRUE
12	Scottish Sea Farms Ltd	Nevis B	TRUE	12	Mohn Aqua Airmar DBII	TRUE
13	Scottish Sea Farms Ltd	Loch Spelve (A)	TRUE	10	Airmar DBII	TRUE
14	Scottish Sea Farms Ltd	Kerrera B	TRUE	13	Mohn Aqua Airmar DB11	TRUE
15	Scottish Sea Farms Ltd	Fishnish (B)	TRUE	8	Mohn Aqua Airmar DB Plus II	TRUE
16	Scottish Sea Farms Ltd	Kishorn A (South)	TRUE	12	Mohn Aqua Airmar DBII	TRUE
17	Scottish Sea Farms Ltd	Lismore North	TRUE	4	Mohn Aqua Airmar DB Plus II	TRUE
18	Scottish Sea Farms Ltd	Kishorn B (North)	TRUE	16	Mohn Aqua Airmar DBII	TRUE
19	Scottish Sea Farms Ltd	Fada	TRUE	12	Mohn Aqua Airmar DBII	TRUE
20	Scottish Sea Farms Ltd	Walters (East Lismore)	TRUE	11	Mohn Aqua Airmar ADD 2000	TRUE
21	Scottish Sea Farms Ltd	Lismore West	TRUE	10	Mohn Aqua Airmar DBII	TRUE
22	Scottish Sea Farms Ltd	Kishorn West	TRUE	14	Mohn Aqua Airmar DBIII	TRUE
23	Cooke Aquaculture Scotland	Burrastow	TRUE	6	Ace Aquatec	TRUE
24	Cooke Aquaculture Scotland	Mid Taing	TRUE	6	Ace Aquatech	TRUE
25	The Scottish Salmon Company	Eughlam	TRUE	15	ACE Aquatec US3	TRUE
26	The Scottish Salmon Company	Taranaish	TRUE	4	Airmar dB Plus 11	TRUE
27	The Scottish Salmon Company	Gometra	TRUE	15	ACE Aquatec US3	TRUE
28	Dawnfresh Farming Ltd	Etive 6	TRUE	10	Mohn Aqua	TRUE
29	Kames Fish Farming Ltd	Shuna SW (Rubhan Trilleachain)	TRUE	2	Terecos DSMS 4	TRUE
30	Scottish Sea Farms Ltd	South Sound	TRUE	14	Mohn Aqua Mag	TRUE
31	Scottish Sea Farms Ltd	Vidlin North	TRUE	20	Mohn Aqua MAG	TRUE
32	Scottish Sea Farms Ltd	Loura Voe	TRUE	10	Mohn Aqua MAG	TRUE
33	Scottish Sea Farms Ltd	Holms Geo	TRUE	12	Ace Aquates US3	TRUE
34	Scottish Sea Farms Ltd	Slocka Ronas Voe	TRUE	14	Mohn aqua MAG	TRUE
35	Scottish Sea Farms Ltd	Teisti Geo	TRUE	14	Mohn aqua MAG	TRUE
36	Scottish Sea Farms Ltd	Bight of Bellister, Dury Voe	TRUE	12	Ace Aquatec US3	TRUE
37	Scottish Sea Farms Ltd	Dury Voe	TRUE	10	Mohn aqua MAG	TRUE
38	Scottish Sea Farms Ltd	Foreholm	TRUE	10	Mohn aqua MAG	TRUE
39	Scottish Sea Farms Ltd	Snarraness	TRUE	8	Ace Aquatec US3	TRUE
40	Marine Harvest (Scotland) Ltd	HELLISAY	TRUE	2	mon aqua airmar II	TRUE
41	Marine Harvest (Scotland) Ltd	HELLISAY	TRUE	2	mon aqua airmar II	TRUE
42	Marine Harvest (Scotland) Ltd	Ornish	TRUE	2	ACE AQUATEC	TRUE
43	Marine Harvest (Scotland) Ltd	Ornish	TRUE	2	ACE AQUATEC	TRUE
44	Marine Harvest (Scotland) Ltd	SEAFORTH	TRUE	2	TERECOS DSMS-4	TRUE
45	Marine Harvest (Scotland) Ltd	SEAFORTH	TRUE	2	TERECOS DSMS-4	TRUE
46	Marine Harvest (Scotland) Ltd	STULAIGH	TRUE	16	Airmar	TRUE
47	Marine Harvest (Scotland) Ltd	STULAIGH	TRUE	16	Airmar	TRUE
48	Marine Harvest (Scotland) Ltd	Tabhaigh	TRUE	4	Terecos DSMS-4	TRUE
49	Marine Harvest (Scotland) Ltd	Tabhaigh	TRUE	4	Terecos DSMS-4	TRUE
50	Marine Harvest (Scotland) Ltd	Scotasay	TRUE	2	Terecos DSMS-4	TRUE
51	Marine Harvest (Scotland) Ltd	Scotasay	TRUE	2	Terecos DSMS-4	TRUE
52	Northern Salmon Management Group	Badcall Bay	TRUE	18	Air Db Plus 11	TRUE
53	Northern Salmon Management Group	Calbha	TRUE	14	Airmar Db Plus 11	TRUE
54	Northern Salmon Management Group	Drumbeg (Loch Dhrombaig)	TRUE	6	Airmar Db Plus 11	TRUE
55	Northern Salmon Management Group	Loch A Chairn Bhain	TRUE	14	Airmar Db Plus 11	TRUE
56	Northern Salmon Management Group	Loch Laxford	TRUE	18	Airmar Db Plus 11	TRUE
57	Northern Salmon Management Group	Oldany	TRUE	10	Airmar Db Plus 11	TRUE
58	Northern Salmon Management Group	Outer Bay (Loch Droighniche)	TRUE	6	Airmar Db Plus 11	TRUE
59	Northern Salmon Management Group	Wester Ross Fisheries	TRUE	14	Airmar Db Plus 11	TRUE
60	Northern Salmon Management Group	Wester Ross Fisheries	TRUE	12	Airmaar Db Plus 11	TRUE
61	Northern Salmon Management Group	Wester Ross Fisheries	TRUE	8	Airmaar Db Plus 11	TRUE
62	Scottish Sea Farms Orkney and Eriboll	Kempie Bay	TRUE	4	Airmar dbII	TRUE
63	Scottish Sea Farms Orkney and Eriboll	Sian Bay	TRUE	10	Airmar dbII	TRUE
64	Scottish Sea Farms Orkney and Eriboll	Puldrite	TRUE	10	Airmar dbII	TRUE
65	Scottish Sea Farms Orkney and Eriboll	Shapinsay	TRUE	8	Ace Aquatec US3	TRUE
66	Marine Harvest (Scotland) Ltd	North Shore	TRUE	6	Terecos DSMS-4	TRUE
67	Marine Harvest (Scotland) Ltd	North Shore	TRUE	6	Terecos DSMS-4	TRUE
68	Marine Harvest (Scotland) Ltd	Raineach	TRUE	2	Terecos DSMS4	TRUE
69	Marine Harvest (Scotland) Ltd	Raineach	TRUE	2	Terecos DSMS4	TRUE

70	Marine Harvest (Scotland) Ltd	Marulaig Bay	TRUE	4	Terecos DSMS4	TRUE
71	Marine Harvest (Scotland) Ltd	Marulaig Bay	TRUE	4	Terecos DSMS4	TRUE
72	Marine Harvest (Scotland) Ltd	Groatay	TRUE	14	Terecos DSMS4	TRUE
73	Marine Harvest (Scotland) Ltd	Groatay	TRUE	14	Terecos DSMS4	TRUE
74	Marine Harvest (Scotland) Ltd	Grey Horse Channel	TRUE	7	Terecos DSMS 4	TRUE
75	Marine Harvest (Scotland) Ltd	Grey Horse Channel	TRUE	7	Terecos DSMS 4	TRUE
76	Marine Harvest (Scotland) Ltd	Bagh Dail Nan Cean	TRUE	2	Terecos DSMS 4	TRUE
77	Marine Harvest (Scotland) Ltd	Polle Na Gille	TRUE	2	Terecos DSMS 4	TRUE
78	Marine Harvest (Scotland) Ltd	Port Na Cro	TRUE	2	Terecos DSMS 4	TRUE
79	Marine Harvest (Scotland) Ltd	ARDINTOUL	TRUE	6	Terecos DSMS 4	TRUE
80	Marine Harvest (Scotland) Ltd	CAIRIDH	TRUE	8	Terecos DSMS 4	TRUE
81	Marine Harvest (Scotland) Ltd	CAMAS GLAS	TRUE	20	Airmar	TRUE
82	Marine Harvest (Scotland) Ltd	CREAG AN T SAGAIRT	TRUE	4	Terecos DSMS 4	TRUE
83	Marine Harvest (Scotland) Ltd	DUICH	TRUE	8	Terecos DSMS 4	TRUE
84	Marine Harvest (Scotland) Ltd	Gorsten	TRUE	12	Terecos DSMS 4	TRUE
85	Marine Harvest (Scotland) Ltd	GRESHORNISH	TRUE	12	Terecos DSMS 4	TRUE
86	Marine Harvest (Scotland) Ltd	INVASION BAY	TRUE	3	Terecos DSMS 4	TRUE
87	Marine Harvest (Scotland) Ltd	KINGAIRLOCH	TRUE	1	Terecos DSMS4	TRUE
88	Marine Harvest (Scotland) Ltd	LEVEN	TRUE	2	Terecos DSMS 4	TRUE
89	Marine Harvest (Scotland) Ltd	LINNHE	TRUE	2	Terecos DSMS 4	TRUE
90	Marine Harvest (Scotland) Ltd	MAOL BAN	TRUE	8	Terecos DSMS 4	TRUE
91	Loch Duart Ltd	Lochmaddy	TRUE	20	AIRMAR / MAG - MOHN AQUA GR	TRUE
92	Loch Duart Ltd	Sound of Harris	TRUE	14	AIRMAR / MAG - MOHN AQUA GR	TRUE
93	Loch Duart Ltd	Loch Carnan	TRUE	12	AIRMAR / MAG - MOHN AQUA GR	TRUE
94	Marine Harvest (Scotland) Ltd	ISLE EWE	TRUE	12	MON AQUA AIRMAR II	TRUE
95	Marine Harvest (Scotland) Ltd	TORRIDON	TRUE	10	Terecos DSMS4	TRUE
96	Marine Harvest (Scotland) Ltd	Eilean Grianain	TRUE	2	Terecos DSMS4	TRUE
97	Marine Harvest (Scotland) Ltd	ISLE EWE	TRUE	12	Mhon Aqua Airmar II	TRUE
98	Marine Harvest (Scotland) Ltd	TORRIDON	TRUE	10	Terecos DSMS4	TRUE
99	Marine Harvest (Scotland) Ltd	Bagh Dail Nan Cean	TRUE	2	Terecos DSMS4	TRUE
100	Marine Harvest (Scotland) Ltd	Polle Na Gille	TRUE	2	Terecos DSMS4	TRUE
101	Marine Harvest (Scotland) Ltd	Port Na Cro	TRUE	2	Terecos DSMS4	TRUE
102	Marine Harvest (Scotland) Ltd	ARDINTOUL	TRUE	6	Terecos DSMS 4	TRUE
103	Marine Harvest (Scotland) Ltd	CAIRIDH	TRUE	8	Terecos DSMS 4	TRUE
104	Marine Harvest (Scotland) Ltd	CAMAS GLAS	TRUE	20	2 x Airmar II 2 x Aqu Mag	TRUE
105	Marine Harvest (Scotland) Ltd	CREAG AN T SAGAIRT	TRUE	4	Terecos DSMS 4	TRUE
106	Marine Harvest (Scotland) Ltd	DUICH	TRUE	8	Terecos DSMS 4	TRUE
107	Marine Harvest (Scotland) Ltd	Gorsten	TRUE	12	Terecos DSMS 4	TRUE
108	Marine Harvest (Scotland) Ltd	GRESHORNISH	TRUE	12	Terecos DSMS 4	TRUE
109	Marine Harvest (Scotland) Ltd	INVASION BAY	TRUE	3	Terecos DSMS4	TRUE
110	Marine Harvest (Scotland) Ltd	KINGAIRLOCH	TRUE	1	Terecos DSMS4	TRUE
111	Marine Harvest (Scotland) Ltd	LEVEN	TRUE	2	Terecos DSMS4	TRUE
112	Marine Harvest (Scotland) Ltd	LINNHE	TRUE	2	Terecos DSMS 4	TRUE
113	Marine Harvest (Scotland) Ltd	MAOL BAN	TRUE	8	Terecos DSMS 4	TRUE
114	Marine Harvest (Scotland) Ltd	SCONSER	TRUE	12	Terecos DSMS 4	TRUE
115	The Scottish Salmon Company	Ardcastle	TRUE	2	ACE AQUATEC US3	FALSE
116	The Scottish Salmon Company	Ardgadden	TRUE	2	ACE Aquatec US3	FALSE
117	The Scottish Salmon Company	Furnace	TRUE	2	ACE Aquatec US 3	FALSE
118	The Scottish Salmon Company	Glenan Bay	TRUE	3	Ace Aquatec US 3	FALSE
119	The Scottish Salmon Company	Gob a Bharra	TRUE	2	Ace Aquatec US 3	FALSE
120	The Scottish Salmon Company	Lamlash Bay	TRUE	2	Ace Aquatec US3	FALSE
121	The Scottish Salmon Company	Meall Mhor	TRUE	2	ACE Aquatec US 3	FALSE
122	The Scottish Salmon Company	Quarry Point	TRUE	2	ACE Aquatec US 3	FALSE
123	The Scottish Salmon Company	Rubha Stillaig	TRUE	2	Ace Aquatec US 3	FALSE
124	The Scottish Salmon Company	Sgian Dubh	TRUE	2	ACE Aquatec US3	FALSE
125	The Scottish Salmon Company	Strone	TRUE	2	ACE Aquatec US3	FALSE
126	The Scottish Salmon Company	Tarbert South	TRUE	2	ACE Aquatec	FALSE
127	Scottish Sea Farms Ltd	Scallastle	TRUE	8	Mohn Aqua Airmar DB plus 11	FALSE
128	Scottish Sea Farms Ltd	Loch Creran (D)	TRUE	14	Mohn Aqua Airmar DB II	FALSE
129	Scottish Sea Farms Ltd	Fiunary	TRUE	8	Mohn Aqua MAG Seal Deterrent	FALSE
130	Cooke Aquaculture Scotland	Cloudin	TRUE	12	Ace Aquatec	FALSE
131	The Scottish Salmon Company	Gousam	TRUE	4	Airmar db Plus 11	FALSE
132	The Scottish Salmon Company	Kyles Vuia	TRUE	4	Airmar dB Plus 11	FALSE
133	The Scottish Salmon Company	Vacasay	TRUE	4	Airmar dB Plus 11	FALSE
134	The Scottish Salmon Company	Vuia Beag	TRUE	2	Airmar dB Plus 11	FALSE
135	The Scottish Salmon Company	Vuia Mor	TRUE	4	Airmar dB Plus 11	FALSE
136	The Scottish Salmon Company	Trilleachan Mor	TRUE	3	Airmar dB Plus 11	FALSE

137	The Scottish Salmon Company	Strome	TRUE	4	ACE AQUATEC US3	FALSE
138	The Scottish Salmon Company	Plocrapol	TRUE	4	Airmar db 11 plus	FALSE
139	The Scottish Salmon Company	Reibinish	TRUE	2	Airmar db11 plus	FALSE
140	The Scottish Salmon Company	Scadabay	TRUE	2	Airmar db11 plus	FALSE
141	The Scottish Salmon Company	Gravir	TRUE	3	Airmar dB Plus 11	FALSE
142	The Scottish Salmon Company	Portree	TRUE	4	ACE Aquatec US3	FALSE
143	The Scottish Salmon Company	Druimyeon Bay	TRUE	4	ACE Aquatec US3	FALSE
144	The Scottish Salmon Company	East Tarbert Bay	TRUE	2	ACE Aquatec US3	FALSE
145	The Scottish Salmon Company	Geasgill	TRUE	12	OTAQ SF3	FALSE
146	The Scottish Salmon Company	Inch Kenneth	TRUE	3	AIRmar bb PLUS 11	FALSE
147	The Scottish Salmon Company	Tuath	TRUE	12	OTAQ SF3	FALSE
148	The Scottish Salmon Company	Aird	TRUE	2	ACE Aquatec US3	FALSE
149	The Scottish Salmon Company	Kenmore	TRUE	2	ACE Aquatec US3	FALSE
150	The Scottish Salmon Company	Sgeir Dughall	TRUE	2	ACE Aquatec US3	FALSE
151	The Scottish Salmon Company	Greanamul	TRUE	4	Airmar db 11 plus	FALSE
152	The Scottish Salmon Company	Outer Eport	TRUE	2	Airmar db11 plus	FALSE
153	Marine Harvest (Scotland) Ltd	Ardnish	TRUE	2	Terecos DSMS 4	FALSE
154	Marine Harvest (Scotland) Ltd	MacLean's Nose	TRUE	1	Terecos DSMS 4	FALSE
155	Marine Harvest (Scotland) Ltd	Colonsay	TRUE	2	Terecos DSMS 4	FALSE
156	The Scottish Salmon Company	Petersport	TRUE	14	OTAQ SealFence	FALSE
157	The Scottish Salmon Company	Trenay	TRUE	2	Airmar db 11 plus	FALSE
158	The Scottish Salmon Company	Uiskevagh	TRUE	4	Airmar db11 plus	FALSE
159	Dawnfresh Farming Ltd	Ardchattan Bay	TRUE	6	Mohn Aqua	FALSE
160	Kames Fish Farming Ltd	Kames Bay (west)	TRUE	1	DSMS4 Terecos	FALSE
161	Kames Fish Farming Ltd	Kames Bay (east)	TRUE	1	Terecos DSMS4	FALSE
162	Kames Fish Farming Ltd	Shuna Castle	TRUE	1	Terecos DSMS4	FALSE
163	Kames Fish Farming Ltd	Eilean Coltair	TRUE	1	Terecos DSMS 4	FALSE
164	Marine Harvest (Scotland) Ltd	Ardnish	TRUE	2	Terecos DSMS 4	FALSE
165	Marine Harvest (Scotland) Ltd	MacLean's Nose	TRUE	1	Terecos DSMS4	FALSE
166	Marine Harvest (Scotland) Ltd	SCONSER	TRUE	12	Terecos DSMS 4	FALSE
167	Marine Harvest (Scotland) Ltd	North Moine	TRUE	2	Terecos DSMS 4	FALSE
168	Northern Salmon Management Group	Wester Ross Fisheries	TRUE	8	Airmaar Db Plus 11	

[Note that the Northern Salmon Management Group includes salmon farms operated by Loch Duart and Wester Ross Fisheries; Dawnfresh farm rainbow trout not salmon]

Download an Excel spreadsheet detailing ADD use on Scottish salmon farms online here and online here (edited version showing ADD use only)

Read more via Press Release: "Deafening Impact of Salmon Farms on Cetaceans" (18 April 2018)

SCOTTISH SALMON WATCH

MARINE MAMMALS