

## **Media Backgrounder: ADDs & Salmon Farms (May 2017)**

Please read in conjunction with:

[Press Release: "Cetaceans Sound Alarm On Salmon Farms - new research sparks EC complaint & call to ban Acoustic Deterrent Devices"](#) (7 May 2017)

[Complaint filed by GAAIA with the European Commission](#) (7 May 2017)

['FOI Backgrounder: ADDs & Salmon Farms' \(May 2017\)](#)

This document contains:

### **Summary**

**Data on ADD use on Scottish Salmon Farms**

**Follow Ups**

**Contacts**

**FOI documents released by SNH on 25 April 2017 (14 MB)**

**Background to FOI request**

**Snapshots of FOI documents disclosed by SNH on 25 April 2017**

- [Download SNH FOI 25 April 2017 document #1](#)
- [Download SNH FOI 25 April 2017 document #2](#)
- [Download SNH FOI 25 April 2017 document #3](#)
- [Download SNH FOI 25 April 2017 document #4](#)
- [Download SNH FOI 25 April 2017 document #5](#)
- [Download SNH FOI 25 April 2017 document #6](#)
- [Download SNH FOI 25 April 2017 document #7](#)

### **Background Context**

- Special Area of Conservation for harbour porpoise (Inner Hebrides & the Minches) submitted to EC in 2016
- The SSPO oppose the SAC as it "could significantly affect our sector in the future"
- European Protected Species via the Habitats Regulations 1994 and "deliberate and reckless" disturbance of cetaceans
- Challenged in Court
- ADDs = Acoustic Deterrent Devices (or 'seal scrammers')
- ADDs used in Scotland (2016-2017)
- ADDs can be detected by harbour porpoises over 14 km away
- "Commerically Confidential" Information Withheld
- Alternatives to ADDs
- Salmon Aquaculture & Seal Working Group
- Translocation of seals

- **Humpback whale mortality in Sound of Mull at salmon farm**
- **HWDT research**
- **Certification via Freedom Foods (now called RSPCA Assured) promotes marine mammal disturbance (e.g. harbour porpoises via ADD noise) and killing (e.g. seals)**

**Summary:**

As [European Protected Species](#) (EPS) all cetaceans are protected under national and EU wildlife legislation. Specifically, [deliberate or reckless disturbance](#) of any cetacean could constitute an offence under [The Conservation \(Natural Habitats, &c.\) Regulations 1994 \(as amended in Scotland\)](#).

The Scottish Government [submitted the Inner Hebrides and the Minches candidate Special Area of Conservation \(cSAC\) for harbour porpoise to the European Commission in 2016](#).

Research presented by MSc students at the Scottish Association of Marine Science (SAMS) in August 2016 (based on acoustic data collected by the Hebridean Whale & Dolphin Trust) showed that "the Sound of Mull and Loch Linnhe were completely ensonified, and that the ADD signal can be detected all the way across the Minch". "There was preliminary analysis of how the levels dropped with distance (from two locations) - from Portree the signal could be detected out to 20km from source, in Lochmaddy the signal could be detected out to 30km. This is in keeping with literature which suggests the signal can travel up to 50km," [reported SNH in an internal email](#).

Last month, GAAIA asked SAMS and HWDT for more details on the MSc projects:

**From:** Lauren Hartny-Mills [mailto:science@hwdt.org]  
**Sent:** 28 April 2017 14:14  
**To:** salmonfarmingkills@gmail.com  
**Subject:** FW: Contact for MSc students researching ADDs?

Dear Don,

Thank you for your email and your interest in our work.

Our policy is not to pass on the names of students who we are working with, but I have passed your email on to the relevant parties at SAMS so they can contact you about this directly. We have been working closely with SAMS on this piece of work over the last year or so and are working with them on a manuscript at the moment which is due for submission over the coming month. The work is also being presented at several conferences over the coming weeks, and as I am sure you will understand, I cannot pass on any of the maps until the work has been published/presented. The email you have obtained does however provide a good summary of the work. If you have any other specific questions about this work or the email below, please do let me know and I will do my best to pass on what I can. Alternatively, if you are interested I could keep you up to date with development of the manuscript and let you know when it has been published.

I look forward to hearing from you,

Kind regards,

Lauren

Dr Lauren Hartny-Mills  
Science and Policy Officer  
Hebridean Whale and Dolphin Trust  
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Here's the abstract of a paper - "[Large-scale underwater noise pollution from Acoustic Deterrent Devices \(ADDs\) on the west coast of Scotland](#)" - presented on 1 May 2017 at the [European Cetacean Society conference in Denmark](#) (read conference abstracts [online here](#)):



Monday 1 May 2017

Large-scale underwater noise pollution from Acoustic Deterrent Devices (ADDs) on the west coast of Scotland

Denise Risch<sup>3</sup>, Charlotte Rose Findlay<sup>1,2</sup>, Hayden Ripple<sup>2</sup>, Steven Benjamins<sup>3</sup>, Ben Wilson<sup>3</sup>, Frazer Coomber<sup>4</sup>

(1) Joint Nature Conservation Committee, Aberdeen, AB, United Kingdom.

(2) University of St Andrews; Scottish Association for Marine Science.

(3) Scottish Association for Marine Science.

(4) Hebridean Whale and Dolphin Trust.

Expansion of the aquaculture industry off Scotland has led to conflicts with marine predators such as seals, which predate species bred in aquaculture facilities and cause damage to equipment. To mitigate this, non-lethal management tools have been developed, the most popular of which are Acoustic Deterrent Devices (ADDs) or 'seal scarers'. ADDs broadcast loud, aversive sounds within the hearing range of the target species (i.e. seals). However their success in addressing the issue has been variable. In addition their unregulated use in Scotland could pose unintended ecological impacts to non-target species such as the harbour porpoise (*Phocoena phocoena*). This study aimed to address the gap in knowledge on the extent of ADD use in the Scottish aquaculture industry, and to quantify the scale of their acoustic presence in Scottish waters. Acoustic data collected during cetacean line-transect surveys carried out by the Hebridean Whale and Dolphin Trust (HWDT) were used to map the acoustic presence of ADDs across the west coast between 2006 and 2015. Results found a significant spatial and temporal increase in ADD presence across the west coast study regions (detections per unit effort; 2006 = 0.5%; 2015 = 15.3%). This study highlights the large-scale extent of noise from ADDs use at fish farms across Scotland and illustrates its gradual increase over the study period. The increasing ensonification of the Scottish coastline which includes multiple protected areas for marine mammals, due to these devices may pose a risk to both target and non-target species (e.g. odontocete cetaceans) that use these areas either seasonally or year round. This study is one of the first to highlight the large-scale extent of ADD noise pollution and its overlap with marine mammal habitat. This information is crucial in order to effectively address European legislation related to underwater noise and marine species protection.

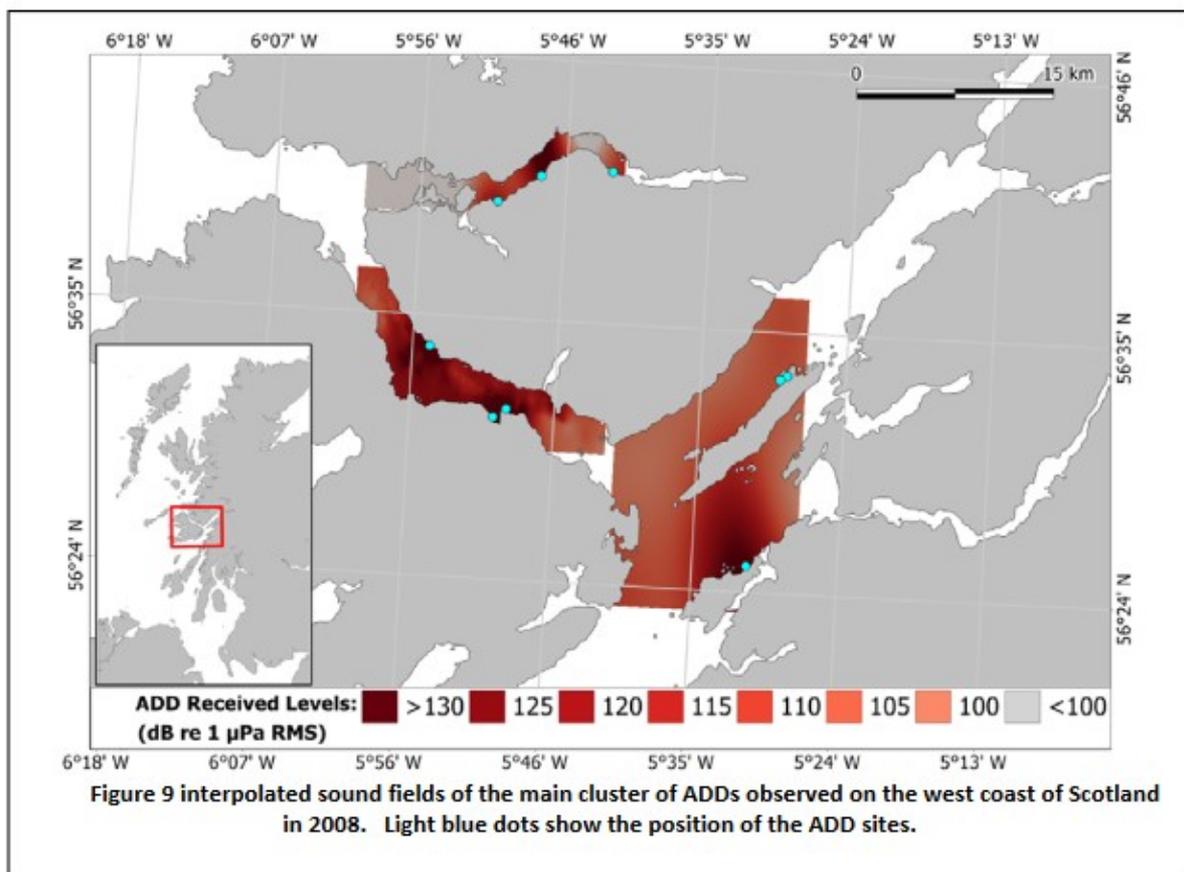
A HWDT report - "[Cetacean Conservation in Scotland](#)" - published in 2000 included:

"Extrapolating from data presented by Olesiuk (1996), that AHDs would exclude cetaceans from an area of 50,2654 m<sup>2</sup> around each fish farm and would have acoustic impacts over an area of 38.4 km<sup>2</sup> around each site, if all the fish farms in West Scotland used AHDs the area affected by AHDs would total 8,102 km<sup>2</sup>. This would represent a major loss of cetacean habitat."

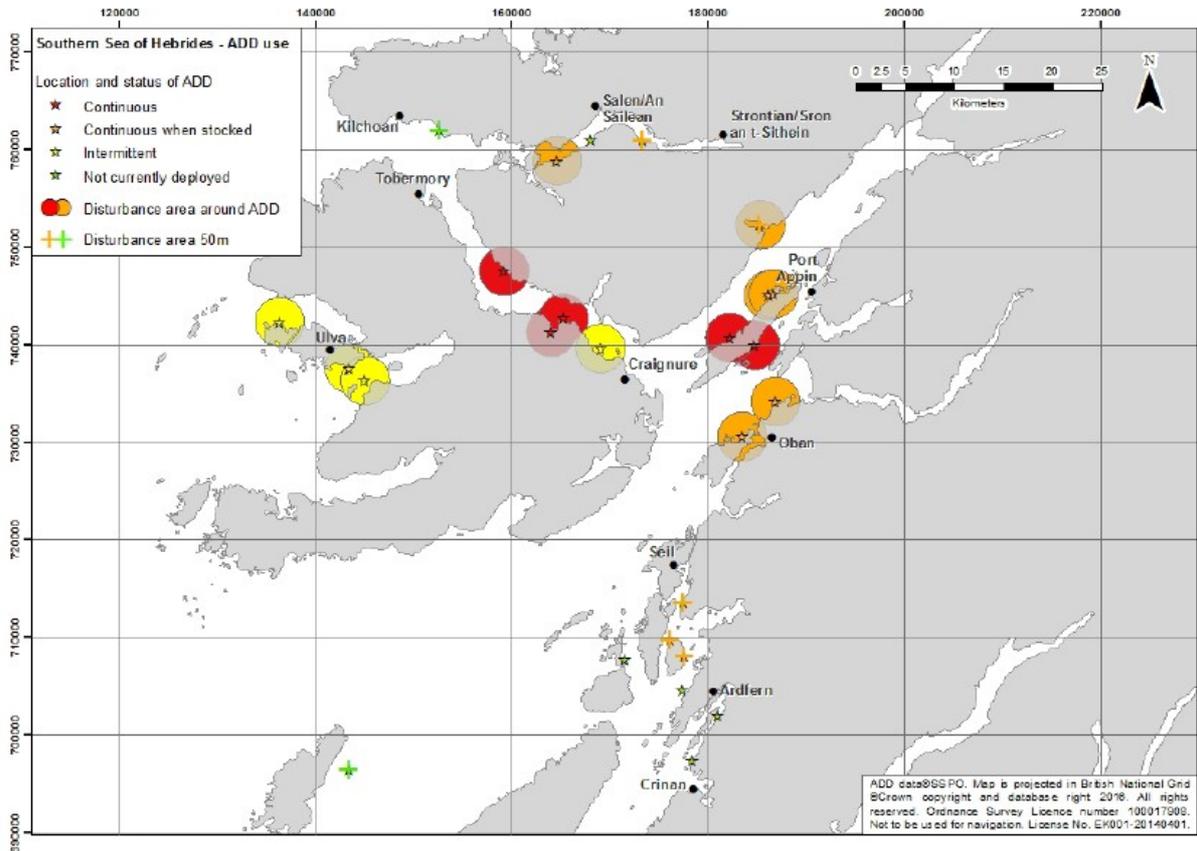
Scientific research [published by the Scottish Aquaculture Research Forum in 2010](#) showed that ADDs could be detected by porpoises 14.7 km from the sound source (i.e. salmon farm).

### 2.3.2.1 Sound Fields

Figure 9 shows a map of ADD received levels in the Sound of Mull in 2008. It is clear that received levels were elevated well above background at ranges of many km from fish farm sites. From this and from Figure 9 it's clear that ADDs can be detected at ranges of up to 14.7 km and that with several fish farms using ADDs there, ADDs can be detected through most of the Sound of Mull. Previous studies of the effects of ADDs on porpoise distributions have not measured received levels directly however research in the Bay of Fundy (Johnston, 2002) estimated that porpoises would be excluded from an ADD at received levels of 125dB.



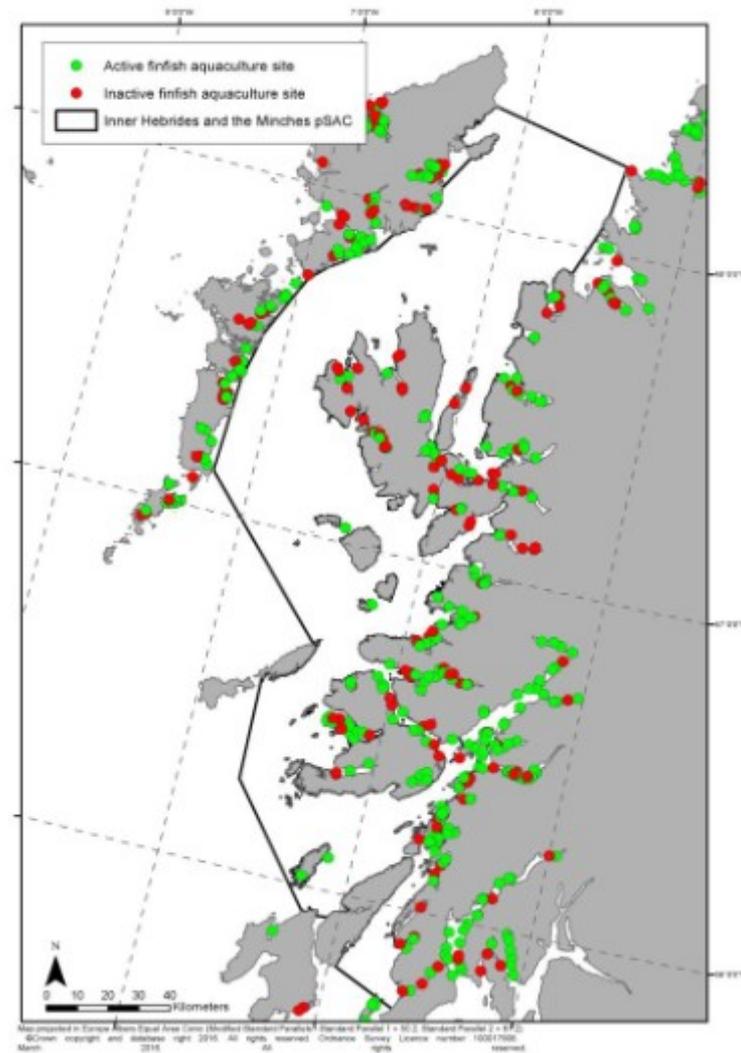
In 2016, SNH drafted various 'disturbance zone maps' showing ADD use on salmon farms in the Inner Hebrides and the Minches SAC. "We tentatively identified the area that we thought would be highest cumulative risk to ADD use currently based on this information - as Sound of Mull, Lismore, West of Mull and Raasay, but we did say there may be more," [said SNH](#).



In 2015, Scottish Natural Heritage (SNH) and Marine Scotland (MS) [raised the issue](#) of whether the use of Acoustic Deterrent Devices (ADDs) on salmon farms could be deemed an offence via 'reckless disturbance'. SNH expressed the view that mitigation measures could be applied but in practice "all would have logistical or financial implications for aquaculture companies that would render them, for the most part, infeasible to apply". It was suggested that the tightening of ADD specifications and guidance on ADD use with the salmon farming industry's best practice guidelines "may not be palatable to the industry".

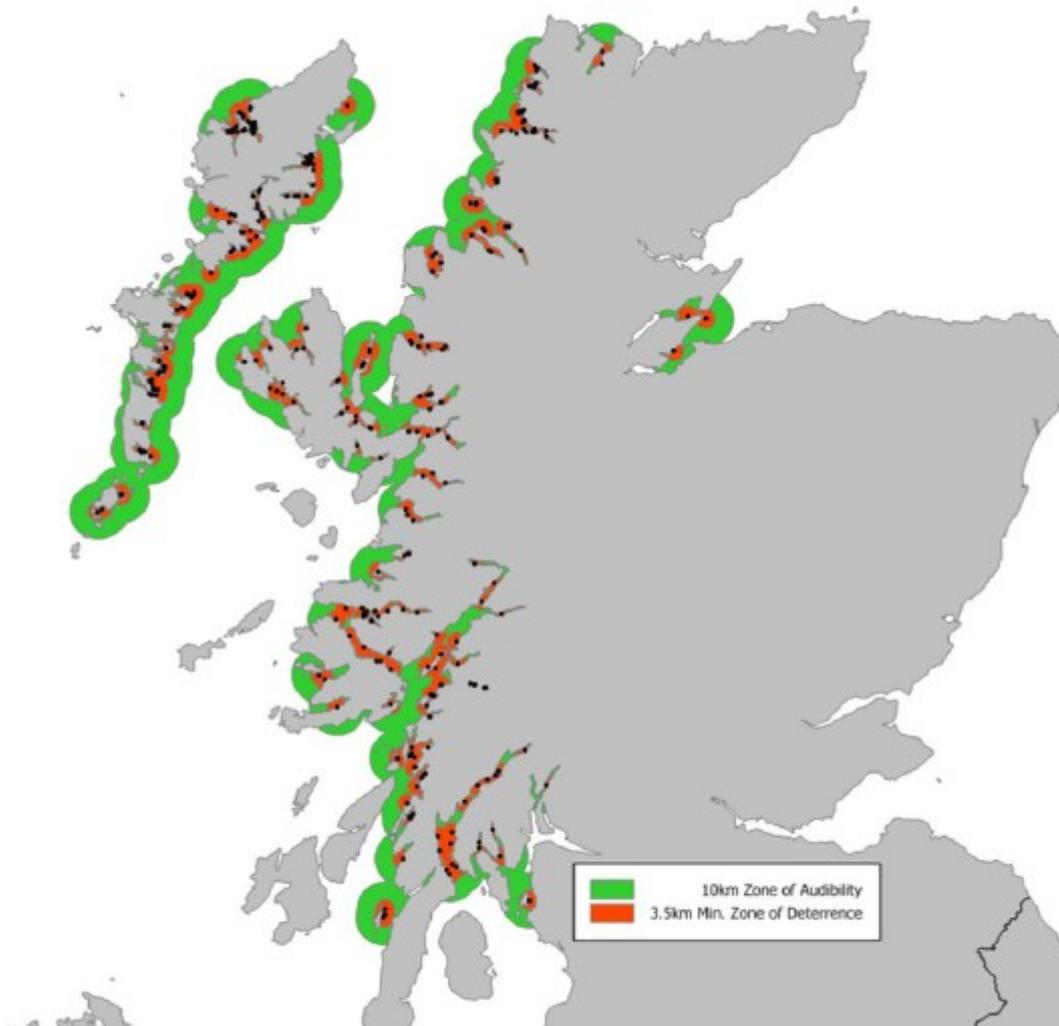
Here's a map - published by SNH and the Scottish Government via "[Inner Hebrides and the Minches Proposed SAC - advice to support management](#)" - showing dozens of salmon farms within the Inner Hebrides and the Minches SAC:

**Map 2.** *Finfish aquaculture sites in relation to the Inner Hebrides and the Minches pSAC*



Juxtapose the location of salmon farms with a map ([published by SNH](#)) of sightings of harbour porpoise calves and juveniles and the problem becomes clear:





**Figure 5 Map of Potential Extent of ADD Audibility to Harbour Porpoise (Mainland and Hebrides)**

"It is our view that continuous noise emission from ADDs at fish farm sites is not best practice," stated an undated report "[Inner Hebrides and the Minches Proposed SAC - advice to support management](#)" published by SNH and the Scottish Government. "In areas of higher cumulative risk to the Conservation Objectives (e.g. areas with larger numbers of fish farms within straits, sounds and embayments where ADD use may limit access to these areas), further measures to reduce ADD noise emission should be considered via ongoing discussions with industry". "The use of ADDs for predator control at salmon farms may require an EPS licence," [stated the report](#) (believed to be dated 2016).

In November 2016, [SNH suggested to the SSPO](#) that "we don't believe noise emitting constantly is best practice" and that "no noise emitting constantly....would appear to be quite a big ask for lots of farms?"

In November 2016, [SNH presented in a meeting with Marine Scotland](#) "maps illustrating the range of audibility of ADDs in NW Scotland, and increasing persistent detection over the last decade; Areas within cSAC which recent studies have identified as being ensonified".

In November 2016, [minutes of a meeting between SNH and Marine Scotland](#) reported that "recent legal advice received by Marine Scotland on the definition of 'reckless'....was not definitive but, in case law, implied 'culpable indifference and blameless disregard'". "Examples of recklessness in a driving context were also given," [reported the minutes](#). "It was Marine Scotland's opinion, on the basis of this advice that ADD use by the aquaculture sector, is not 'reckless', the intention of ADD use being different for aquaculture to that for other industries where ADDs may be applied to 'deliberately' scare/disturb EPS (cetaceans)."

"Marine Scotland considered that, unless there was an identified negative effect of ADDs used in aquaculture upon EPS species, and that operators had been made aware of the negative consequences of their actions, potentially via guidance which informed operators that what they were doing could disturb cetaceans, and provided them with routes by which they might avoid this, it would be difficult to infer recklessness," continued the [minutes of a meeting between SNH and Marine Scotland in November 2016](#). "Further to this, [named redacted] argued that since ADD use for aquaculture was (in Marine Scotland opinion) not, by this token, reckless and not therefore a criminal offence, there was no basis for introducing an EPS licensing regime. Rather, regulators should promote good practice to help achieve safeguard of EPS."

The [minutes of a meeting between SNH and Marine Scotland in November 2016 continued](#):

SNH questioned this interpretation, indicating that the objective of the EPS legislation was to minimise or avoid disturbance and harm to protected species and, given our understanding of the potential risks to cetaceans from exposure to certain levels of underwater noise, that a reasonable interpretation of the legislation and accompanying guidance would conclude that disturbance through ADD use (irrespective of the sector employing it) falls within its scope. SNH further queried the interpretation of 'reckless / deliberate' for use of ADDs, where there has been widespread discussion with industry on potential risks to EPS, such that an operator would be 'aware of the likelihood that disturbance would result from his actions...'

**Action 1. MS (■ or ■).** To provide SNH with a copy of the legal question raised by MS and the advice received from lawyers on defining reckless behaviour and written confirmation of how MS interpret that advice (as set out in the meeting). Also in relation to Reg 39 (2) issue raised later.

**Action 2. SNH (CT).** To investigate the potential for SNH to obtain a separate legal opinion on defining 'reckless / deliberate behaviour' (in the context of the EPS) and perhaps also in relation to Reg 39 (2), noting that SNH lawyers may not wish to offer advice on the same question asked by MS.

■ & ■ indicated that legal advice received on the definition of 'reckless' within the MS Marine EPS Guidance would, need to be fully considered.

"Marine Scotland expressed concern at introducing an administrative process, without clear understanding of the effects of ADDs on EPS and what positive outcomes are expected, against a backdrop of reducing the administration of other aspects of fish farming control," [continued the minutes of a meeting between SNH and Marine Scotland in November 2016](#).

The [minutes of a meeting between SNH and Marine Scotland in November 2016 continued](#) (CT = Cathy Tilbrook of SNH):

CT (and others) outlined three objectives:

- Securing a mechanism for monitoring and managing the use of ADDs, so as to safeguard EPS (and especially HP within the cSAC) in the face of growing use of ADDs, increasing scientific evidence of their potential to cause disturbance and a growing aquaculture industry;
- Reducing or preventing the risk of legal challenge / infraction of MS, in relation to non-delivery of its statutory functions, under the Habitats Regulations (insofar as they apply to EPS) and noting high levels of public/ NGO scrutiny on such issues;
- Consistency with other industries in Scotland that are using or planning to use ADDs.

The [minutes of a meeting between SNH and Marine Scotland in November 2016 continued](#) (SH = Sue Henderson of SNH; LW = Liam Wright of SNH):

■ observed that, in relation to fish-farm management we (collectively) are trying to manage a range of competing impacts, namely: escaped fish, shot seals and disturbed cetaceans. By changing the approach we take to management of any one of these (eg cetacean disturbance) we risk increasing other, undesirable impacts. ■ emphasised that improved management may be better delivered through guidance than a legislative approach.

SH & LW suggested that, as the cSAC has policy protection, measures to protect the qualifying species would need to be enforceable, and hence the need for a legislative approach (whether that be via EPS legislation, planning legislation or another mechanism). **Action 4. SNH (SH/LW)** to confirm with Greg Mudge.

■ noted that Scottish Govt is strongly advocating the streamlining of aquaculture regulation and that any introduction of a new licensing regime (irrespective of the justification or otherwise for that) would be inconsistent with this. ■ also indicated that any new EPS licensing regime would be a huge administrative burden for MSLOT and effectively undeliverable with current resources.

The [minutes of a meeting between SNH and Marine Scotland in November 2016 concluded](#):

- **Action 7. SNH (CT/All)**. To compile a list of questions for MS and also to include, for further discussion, our initial views on possible approaches that could be implemented (whether via EPS legislation or otherwise) to address the concerns we are raising. See Annexes 1 and 2.
- SNH emphasised the opinion that ADD use by the aquaculture industry, and the associated EPS licensing issues, is an issue of growing concern, that needs to be addressed to ensure safeguard of HP and compliance with European legislation.
- **Action 8. MS** To provide a timetable to SNH for addressing the points raised at today's meeting.

George Lees.  
8 December 2016.

The [Annexes included](#):

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

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

## Annex 2. Potential approaches for addressing concerns about impact of ADD use on cetaceans and ensuring compliance with legislative requirements.

- Options for EPS licensing for all aquaculture ADDs:
  - Introduce a 'general licence' which permits the use of ADDs in less sensitive locations, provided that they comply with general mitigation conditions (e.g. advertised on website and promoted to industry). Note that this approach does not require any application process and therefore no information on devices is submitted, which would make future monitoring of cumulative impacts more difficult. An offence is still committed if non-compliance with conditions can be demonstrated.
  - Introduce a 'class licence' which permits use of ADDs in less sensitive locations, subject to registering devices with regulator and providing certain information (such as model, location, whether or not linked to triggering mechanism etc). Operation is permitted subject to general terms and conditions applicable to all devices covered by the Licence. An offence is committed if these conditions are not complied with. This approach may provide a good trade-off between provision of information and potential for compliance monitoring via a light-touch and simple approach to licensing process.
  - Individual EPS licence may still be required for sensitive / higher risk locations, with specific mitigation conditions attached to the licence.
- Using planning conditions as first stage mitigation
  - Condition 'best practice' mitigation at all sites through planning (likely to be through an Environmental Management Plan).
  - Any breach of these conditions would breach planning consent (enforcement action?) but could also be considered reckless disturbance and a potential offence, leading to requirement for an EPS licence?.
  - For sensitive locations, 'best practice' mitigation may not be sufficient and so additional mitigation may be required (potentially including no ADDs without an EPS license or that use of ADDs would be inappropriate in certain locations).
  - Issues with this approach are that it is not deemed competent for planning conditions to cover matters that are dealt with under other legislation, and LA may be reluctant to condition issues over which they have little control / experience. This approach could only be applied gradually as sites apply for planning consent for other aspects, so would mean a piecemeal approach to managing ADDs and difficulties in monitoring and managing any cumulative issues.

### Potential mitigation conditions (currently under discussion with industry):

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

In November 2016, [SNH suggested in an internal email](#): "We perhaps need to get to the bottom of how we feel about the level of noise emitting from triggered devices in 'high risk' areas.....My thoughts are that cumulative issues might be more tricky to deal with, particularly in the higher risk areas - perhaps the farms need to work together to have suitable mitigation in place....?"

"One question I would be keen to ask Marine Scotland is the whole issue about higher risk areas (in terms of both EPA and the harbour porpoise SAC)," wrote SNH's Dr. Suzanne Henderson in an [internal email to SNH staff in November 2016](#). "Higher numbers of farms using ADDs in areas where there could be a restriction in movement/disturbance to harbour porpoises (in terms of the Conservation Objectives and the EPS tests for elsewhere) seems to suggest higher risk, particularly cumulative risk....do they agree?"

"I feel that our stance should be no ADD unless the need is substantiated, or that the applicant is using a device that specifically targets seals and has no effect on cetaceans (i.e. the new ones - hopefully in the future," [said SNH in an internal email in October 2016](#). "To cut down on noise pollution no device (low frequency or other-wise) should be deployed continuously."

In December 2016, action points and notes of an industry workshop on ADD use attended by SNH, SSPO, the Scottish Salmon Company, Marine Harvest Scotland and Scottish Sea Farms included:

#### **Action points and notes from: SNH & SSPO industry workshop on ADD use**

Tuesday 13<sup>th</sup> December, Oban

Present: Suz Henderson, Caroline Carter, Liam Wright (all SNH); [REDACTED] (TSSC); [REDACTED] (MHS); [REDACTED] (SSF); [REDACTED] (SSPO)

1. Update on HP SAC/Conservation Objectives

The SAC for harbour porpoise has been submitted to the EU as a candidate site and therefore is now legally protected.

Two masters projects on ADD noise surveys have been undertaken.

ACTION: SNH to distribute these to the group when they are published.

2. Discussion on current ADD use and how they are used (e.g. definition of continuous/triggered).

Current use in Sound of Mull area discussed, including how and why. Managers decisions and technical capacity of the equipment are key. Ultimate aim is to minimise noise levels in general.

ACTION: SSPO to speak to the ADD manufacturers about low frequency devices, logging use and impact on HP.

In April 2016, [SNH met with the Salmon Aquaculture & Seals Working Group](#) (including Sainsbury's, Waitrose, the Crown Estate, Seal Protection Action Group, Born Free Foundation, International Animal Rescue, RSPCA and the SSPO) at Marine Harvest office in Rosyth to discuss ADDs and salmon farms. [A work plan circulated before the meeting](#) (understood to date from 2012) included: "Promote urgent development of more effective, more porpoise friendly, ADDs". "We have agreed that new designs of ADD that are less disturbing are needed and have tried to assist in the market development of one such device," [reported \[name redacted\] of the Sea Mammal Research Unit at St. Andrews University in an update in April 2016](#).

Notes from a [liaison meeting in May 2016](#) between SNH and the salmon farming industry included:

It was highlighted by industry that the requirements of some accreditation schemes such as freedom foods require operators to undertake certain management measures in order to retain accreditation. Concerns were raised that if a seal attack takes place and ADDs were not used as a form of defence that this could risk accreditation being lost.

Retaining Freedom Foods accreditation is deemed by industry to be a major barrier in reducing ADD use.

In January 2017, [SNH suggested in an internal email](#) that "the 'Class EPS licence' is the most promising approach for most options".

### Data on ADD use on Scottish Salmon Farms:

Data disclosed by SNH via an Excel spreadsheet ([Download SNH FOI 25 April 2017 document #6](#)) details 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

A Scottish Government report - "[Evaluating and Assessing the Relative Effectiveness of Acoustic Deterrent Devices and other Non-Lethal Measures on Marine Mammals](#)" - published in 2014 stated that: "At least five different types of ADD are used in Scotland....About half of all fish farm sites appear to use ADDs, but there is no register of which sites are using what devices".

Table 2 Acoustic Characteristics of Acoustic Deterrent Devices Used at Scottish Aquaculture Sites

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 <i>et al.</i> (2004)
Lofitech	Universal Scarer	193 (RMS)	189 (Unknown)	14 (tonal – with harmonics)	Shapiro <i>et al.</i> (2009)
Ace Aquatec	Universal Scrammer 3	193 (RMS)	194 (Unknown)	10 – 65 (broadband)	Lepper <i>et al.</i> (2004)
Terecos	DSMS-4	179 (RMS)	None given	2 – 70 (broadband)	Lepper <i>et al.</i> (2004)
Ferranti-Thomson	4X	166 (Unknown)	200 (Unknown)	7 – 95 (broadband)	Terhune <i>et al.</i> (2002)

Data disclosed by SNH via Excel spreadsheets ([Download SNH FOI 25 April 2017 document #5](#) and [Download SNH FOI 25 April 2017 document #7](#)) effectively provides a register of salmon farms using and not using ADDs. The ADDs reported as being in use on Scottish salmon farms during the last two licensing periods include:

ACE Aquatec  
 ACE Aquatec US 3  
 Air Db Plus 11  
 Airmar Db Plus 11  
 AIRMAR / MAG - MOHN AQUA GROUP  
 Airmar DB2  
 Lofitech universal scrammer  
 Mohn Aqua  
 Mohn Aqua Airmar ADD 2000  
 Mohn Aqua Airmar DB II  
 Mohn Aqua MAG Seal Deterrent  
 OTAQ SealFence  
 OTAQ SF3  
 Terecos DSMS 4

Of the 119 salmon farms which reported the use of ADDs during 2015\*, 69 salmon farms used an [Airmar/Mon Aqua](#); 26 salmon farms used an [Ace Aquatec](#), 22 salmon farms used a [Terecos](#), one salmon farm used a [Lofitech](#) and one salmon farm used an [OTAQ](#).

\* 1 October 2015 to 30 September 2016 is listed as the 'Application Period'; October 2015 is listed as a 'Creation Date' and 1 February 2016 to 31 January 2017 is listed as the 'Licence Period'.

From data provided by SNH ([Download SNH FOI 25 April 2017 document #5](#)) it appears that nearly 400 licences to use ADDs were granted for the period 1 February 2016 to 31 January 2017 (although it is believed the file contains multiple duplicates; confirmed by Ian Walker of Marine Scotland, pers.comm) - including 119 salmon farms where ADDs were used compared to 86 salmon farms where ADDs were not used [Note that the [latest Scottish Government fish farm production survey 2015](#) - published in September 2016 - reported 254 salmon farm sites but only 139 were active (i.e. 115 reported zero production). In other words, it seems that the vast majority of active salmon farms - perhaps as high as 86% - use ADDs].

Of the 119 salmon farms where ADDs were used there were 103 salmon farms where ADDs were described as "always on".

Reasons listed why ADDs were not used included:

- "The use of ADDs has been refused by SNH due to cetacean movements in Scapa Flow. An EPS license is required."
- "SNH have prohibited the use of ADDs in Rousay sound due to cetaceans. Prior to use an EPS license is required."
- "Not allowed by Wholefoods accreditation scheme for which this site is part of."
- "Not allowed by SNH or planning authority due to perceived potential impact on Cetaceans."

Of the 135 salmon farms which reported the use of ADDs in 2016\*, 67 salmon farms used an [Airmar/Mon Aqua](#); 33 salmon farms used a [Terecos](#); 32 salmon farms used an [Ace Aquatech](#) and 3 salmon farm used an [OTAQ](#).

\* 1 February 2017 to 31 January 2018 is listed as a 'Licence Period' and 1 October 2016 to 30 September 2017 is listed as the 'Application Period'.

In total, there are 135 salmon farms listed as using ADDs and 70 not using ADDs (9 sites have no data available for ADD use). Of the 135 salmon farms using ADDs, 84 are listed as "ADD Always On" and 50 as not "ADD Always On" (one site has no data re. the question "ADD Always On").

Here's the 135 salmon farms listed as using ADDs (including 84 listed as "ADDs Always On") - read the full list via [Download SNH FOI 25 April 2017 document #7 ADDs used only](#):

1	FishFarmName	Reg #	SiteOwner	ADDUsed	ADDCount	ADDModel	ADDFreq	ADDOutput	ADDAlwaysOn
2	Aird	FS0594	The Scottish Salmon Company	TRUE	2	ACE Aquatec US3	12	195 to 197	FALSE
3	Ardcastle	FS0818	The Scottish Salmon Company	TRUE	2	ACE AQUATEC US3	14	195 to 197	FALSE
4	Ardchattan Bay	FS0197	Dawnfresh Farming Ltd	TRUE	6	Mohn Aqua	10.00	192 dB re	FALSE
5	Ardgadden	FS0851	The Scottish Salmon Company	TRUE	2	ACE Aquatec US3	14	195 to 197	FALSE
6	ARDINTOUL	FS0245	Marine Harvest (Scotland) Ltd	TRUE	6	Terecos DSMS 4	9.3	135-178	TRUE
7	Ardnish	FS0249	Marine Harvest (Scotland) Ltd	TRUE	2	Terecos DSMS 4	9.3	135-178	FALSE
8	Ardyne	FS0559	The Scottish Salmon Company	TRUE	2	ACE Aquatec US3	16	194 to 197	TRUE
9	Badcall Bay	FS0067	Northern Salmon Management C	TRUE	18	Air Db Plus 11	60	180	TRUE
10	Bagh Dail Nan Ceann	FS0805	Marine Harvest (Scotland) Ltd	TRUE	2	Terecos DSMS 4	9.3	135-178	TRUE
11	Bay of Cleat North	FS1080	Cooke Aquaculture Scotland	TRUE	10	Ace Aquatec	10-20KHz	195dbre1c	TRUE
12	Bight of Bellister, Du	FS1121	Scottish Sea Farms Ltd	TRUE	12	Ace Aquatec US3	12	195 to 197	TRUE
13	Burrastow	FS0666	Cooke Aquaculture Scotland	TRUE	6	Ace Aquatec	10-20KHz	195dbre1c	TRUE
14	CAIRIDH	FS0252	Marine Harvest (Scotland) Ltd	TRUE	8	Terecos DSMS 4	9.3	135-178	TRUE
15	Calbha	FS0068	Northern Salmon Management C	TRUE	14	Airmar Db Plus 11	60	180	TRUE
16	CAMAS GLAS	FS0413	Marine Harvest (Scotland) Ltd	TRUE	20	Airmar	10	0	TRUE
17	Cloudin	FS0088	Cooke Aquaculture Scotland	TRUE	12	Ace Aquatec	10-20KHz	195dbre1c	FALSE
18	CREAG AN T SAGAIR	FS0605	Marine Harvest (Scotland) Ltd	TRUE	4	Terecos DSMS 4	9.3	135-178	TRUE
19	Druimyeon Bay	FS0336	The Scottish Salmon Company	TRUE	4	ACE Aquatec US3	14	195 to 197	FALSE
20	Drumbeg (Loch Dhro	FS0487	Northern Salmon Management C	TRUE	6	Airmar Db Plus 11	6	180	TRUE
21	DUICH	FS0248	Marine Harvest (Scotland) Ltd	TRUE	8	Terecos DSMS 4	9.3	135-178	TRUE
22	Dunstaffnage	FS0299	Scottish Sea Farms Ltd	TRUE	9	Airmar DB2	10	197	TRUE
23	Dury Voe	FS0033	Scottish Sea Farms Ltd	TRUE	10	Mohn aqua MAG	10	198	TRUE
24	East Tarbert Bay	FS1010	The Scottish Salmon Company	TRUE	2	ACE Aquatec US3	14	195 to 197	FALSE
25	Eilean Coltair	FS0777	Kames Fish Farming Ltd	TRUE	1	Terecos DSMS 4	9.3	179	FALSE
26	Eilean Grianain	FS1176	Marine Harvest (Scotland) Ltd	TRUE	2	Terecos DSMS4	9.3	135-178	TRUE
27	Etive 6	FS1288	Dawnfresh Farming Ltd	TRUE	10	Mohn Aqua	10.00	192 dB re	TRUE
28	Eughlam	FS1233	The Scottish Salmon Company	TRUE	15	ACE Aquatec US3	20	195 to 197	TRUE
29	Fada	FS0858	Scottish Sea Farms Ltd	TRUE	12	Mohn Aqua Airmar	10	197	TRUE
30	Fishnish (A)	FS0427	Scottish Sea Farms Ltd	TRUE	8	Mohn Aqua Airmar	10	197	TRUE
31	Fishnish (B)	FS0694	Scottish Sea Farms Ltd	TRUE	8	Mohn Aqua Airmar	10	197	TRUE
32	Fiunary	FS0696	Scottish Sea Farms Ltd	TRUE	8	Mohn Aqua MAG Se	10	197	FALSE
33	Foreholm	FS0936	Scottish Sea Farms Ltd	TRUE	10	Mohn aqua MAG	10	198	TRUE
34	Furnace	FS0567	The Scottish Salmon Company	TRUE	2	ACE Aquatec US 3	12	195 to 197	FALSE
35	Geasgill	FS0839	The Scottish Salmon Company	TRUE	12	OTAQ SF3	10	196	FALSE
36	Glenan Bay	FS0590	The Scottish Salmon Company	TRUE	3	Ace Aquatec US 3	12	195 to 197	FALSE
37	Gob a Bharra	FS0683	The Scottish Salmon Company	TRUE	2	Ace Aquatec US 3	12	195 to 197	FALSE
38	Gometra	FS1267	The Scottish Salmon Company	TRUE	15	ACE Aquatec US3	12	195 to 197	TRUE
39	Gorsten	FS0237	Marine Harvest (Scotland) Ltd	TRUE	12	Terecos DSMS 4	9.3	135-178	TRUE
40	Gousam	FS0998	The Scottish Salmon Company	TRUE	4	Airmar db Plus 11	6.5	195 to 198	FALSE
41	Gravir	FS0242	The Scottish Salmon Company	TRUE	3	Airmar dB Plus 11	6.5	195 to 198	FALSE
42	Greanamul	FS1282	The Scottish Salmon Company	TRUE	4	Airmar db 11 plus	6.5	195 to 198	FALSE
43	GRESHORNISH	FS0015	Marine Harvest (Scotland) Ltd	TRUE	12	Terecos DSMS 4	9.3	135-180	TRUE
44	Grey Horse Channel	FS1122	Marine Harvest (Scotland) Ltd	TRUE	7	Terecos DSMS 4	9.3	135-178	TRUE
45	Groatay	FS1083	Marine Harvest (Scotland) Ltd	TRUE	14	Terecos DSMS4	9.3	135-178	TRUE
46	HELLISAY	FS1261	Marine Harvest (Scotland) Ltd	TRUE	2	mon aqua airmar II	10	135-178	TRUE
47	Holms Geo	FS0749	Scottish Sea Farms Ltd	TRUE	12	Ace Aquates US3	12	195-197	TRUE
48	Inch Kenneth	FS0593	The Scottish Salmon Company	TRUE	3	AIRmar bb PLUS 11	1.8 per ch	198	FALSE
49	INVASION BAY	FS0212	Marine Harvest (Scotland) Ltd	TRUE	3	Terecos DSMS 4	9.3	135-178	TRUE
50	ISLE EWE	FS1084	Marine Harvest (Scotland) Ltd	TRUE	12	MON AQUA AIRMAR	10	135-178	TRUE
51	Kames Bay (east)	FS0462	Kames Fish Farming Ltd	TRUE	1	Terecos DSMS4	5	179	FALSE
52	Kames Bay (west)	FS0271	Kames Fish Farming Ltd	TRUE	1	DSMS4 Terecos	5	179	FALSE
53	Kempie Bay	FS0359	Scottish Sea Farms Orkney and E	TRUE	4	Airmar dbII	10.3	192	TRUE
54	Kenmore	FS0050	The Scottish Salmon Company	TRUE	2	ACE Aquatec US3	12	195 to 197	FALSE
55	Kerrera B	FS0663	Scottish Sea Farms Ltd	TRUE	13	Mohn Aqua Airmar	10	197dB	TRUE
56	KINGAIRLOCH	FS0241	Marine Harvest (Scotland) Ltd	TRUE	1	Terecos DSMS4	9.3	135-178	TRUE
57	Kishorn A (South)	FS0709	Scottish Sea Farms Ltd	TRUE	12	Mohn Aqua Airmar	10	197	TRUE
58	Kishorn B (North)	FS0804	Scottish Sea Farms Ltd	TRUE	16	Mohn Aqua Airmar	10	197	TRUE
59	Kishorn West	FS1274	Scottish Sea Farms Ltd	TRUE	14	Mohn Aqua Airmar	10	197	TRUE
60	Kyles Vuia	FS0927	The Scottish Salmon Company	TRUE	4	Airmar Db Plus 11	6.5	195 to 198	FALSE
61	Lamlash Bay	FS0423	The Scottish Salmon Company	TRUE	2	Ace Aquatec US3	12	195 to 197	FALSE
62	LEVEN	FS0244	Marine Harvest (Scotland) Ltd	TRUE	2	Terecos DSMS 4	9.3	135-178	TRUE
63	LINNHE	FS0240	Marine Harvest (Scotland) Ltd	TRUE	2	Terecos DSMS 4	9.3	135-178	TRUE
64	Lismore North	FS0745	Scottish Sea Farms Ltd	TRUE	4	Mohn Aqua Airmar	10	197	TRUE
65	Lismore West	FS0914	Scottish Sea Farms Ltd	TRUE	10	Mohn Aqua Airmar	10	197	TRUE
66	Loch A Chairn Bhain	FS0621	Northern Salmon Management C	TRUE	14	Airmar Db Plus 11	60	180	TRUE

67	Loch Carnan	FS1280	Loch Duart Ltd	TRUE	12	AIRMAR / MAG - MC	10	198	TRUE
68	Loch Creran (B)	FS0426	Scottish Sea Farms Ltd	TRUE	14	Mohn Aqua Airmar	10	197	TRUE
69	Loch Creran (D)	FS1047	Scottish Sea Farms Ltd	TRUE	14	Mohn Aqua Airmar	10	197	FALSE
70	Loch Laxford	FS0065	Northern Salmon Management C	TRUE	18	Airmar Db Plus 11	60	180	TRUE
71	Loch Spelve (A)	FS0634	Scottish Sea Farms Ltd	TRUE	10	Airmar DBII	10	197	TRUE
72	Loch Spelve (B)	FS0253	Scottish Sea Farms Ltd	TRUE	10	Mohn Aqua Airmar	10	197	TRUE
73	Lochmaddy	FS0853	Loch Duart Ltd	TRUE	20	AIRMAR / MAG - MC	10	198	TRUE
74	Loura Voe	FS0699	Scottish Sea Farms Ltd	TRUE	10	Mohn Aqua MAG	10	198	TRUE
75	MacLean's Nose	FS0599	Marine Harvest (Scotland) Ltd	TRUE	1	Terecos DSMS4	9.3	135-178	FALSE
76	MAOL BAN	FS0519	Marine Harvest (Scotland) Ltd	TRUE	8	Terecos DSMS 4	9.3	135-178	TRUE
77	Marulaig Bay	FS0865	Marine Harvest (Scotland) Ltd	TRUE	4	Terecos DSMS4	9.3	135-178	TRUE
78	Meall Mhor	FS0091	The Scottish Salmon Company	TRUE	2	ACE Aquatec US 3	12	195 to 197	FALSE
79	Mid Taing	FS0167	Cooke Aquaculture Scotland	TRUE	6	Ace Aquatec	10-20KHz	195dbre1u	TRUE
80	Nevis A	FS0430	Scottish Sea Farms Ltd	TRUE	12	Mohn Aqua airmar	10	197	TRUE
81	Nevis B	FS0616	Scottish Sea Farms Ltd	TRUE	12	Mohn Aqua Airmar	10	197	TRUE
82	Nevis C (Ardintigh)	FS0546	Scottish Sea Farms Ltd	TRUE	12	Mohn Aqua Airmar	10	197	TRUE
83	North Moine	FS0356	Marine Harvest (Scotland) Ltd	TRUE	2	Terecos DSMS 4	9.3	135-178	FALSE
84	North Shore	FS1033	Marine Harvest (Scotland) Ltd	TRUE	6	Terecos DSMS-4	9.3	135-178	TRUE
85	Oldany	FS0933	Northern Salmon Management C	TRUE	10	Airmar Db Plus 11	60	180	TRUE
86	Ornish	FS0531	Marine Harvest (Scotland) Ltd	TRUE	2	ACE AQUATEC	10	135-180	TRUE
87	Ouseness	FS1209	Cooke Aquaculture Scotland	TRUE	10	Ace Aquatec	10-20KHz	195dbre1u	TRUE
88	Outer Bay (Loch Droil)	FS0671	Northern Salmon Management C	TRUE	6	Airmar Db Plus 11	60	180	TRUE
89	Outer Eport	FS1254	The Scottish Salmon Company	TRUE	2	Airmar db11 plus	6.5	195 to 198	FALSE
90	Petersport	FS0340	The Scottish Salmon Company	TRUE	14	OTAQ SealFence	20	195	FALSE
91	Plocrapol	FS1256	The Scottish Salmon Company	TRUE	4	Airmar db 11 plus	6.5	195 to 198	FALSE
92	Polle Na Gille	FS0629	Marine Harvest (Scotland) Ltd	TRUE	2	Terecos DSMS 4	9.3	135-178	TRUE
93	Port Na Cro	FS0859	Marine Harvest (Scotland) Ltd	TRUE	2	Terecos DSMS 4	9.3	135-178	TRUE
94	Portree	FS0708	The Scottish Salmon Company	TRUE	4	ACE Aquatec US3	12	195 to 197	FALSE
95	Puldrite	FS0813	Scottish Sea Farms Orkney and E	TRUE	10	Airmar dbII	10.3	192	TRUE
96	Quarry Point	FS0698	The Scottish Salmon Company	TRUE	2	ACE Aquatec US 3	12	195 to 197	FALSE
97	Raineach	FS1263	Marine Harvest (Scotland) Ltd	TRUE	2	Terecos DSMS4	9.3	135-178	TRUE
98	Reibinish	FS1277	The Scottish Salmon Company	TRUE	2	Airmar db11 plus	6.5	195 to 198	FALSE
99	Rubha Stillaig	FS0894	The Scottish Salmon Company	TRUE	2	Ace Aquatec US 3	12	195 to 197	FALSE
100	Scadabay	FS1293	The Scottish Salmon Company	TRUE	2	Airmar db11 plus	6.5	195 to 198	FALSE
101	Scallastle	FS0209	Scottish Sea Farms Ltd	TRUE	8	Mohn Aqua Airmar	10	197dB	FALSE
102	SCONSER	FS0602	Marine Harvest (Scotland) Ltd	TRUE	12	Terecos DSMS 4	9.3	135-178	FALSE
103	Scotasay	FS0502	Marine Harvest (Scotland) Ltd	TRUE	2	Terecos DSMS-4	9.3	135-178	TRUE
104	SEAFORTH	FS1042	Marine Harvest (Scotland) Ltd	TRUE	2	TERECOS DSMS-4	9.3	135-178	TRUE
105	Sgeir Dughall	FS1262	The Scottish Salmon Company	TRUE	2	ACE Aquatec US3	12	195 to 197	FALSE
106	Sgian Dubh	FS1281	The Scottish Salmon Company	TRUE	2	ACE Aquatec US3	16	194 to 197	FALSE
107	Shapinsay	FS0860	Scottish Sea Farms Orkney and E	TRUE	8	Ace Aquatec US3	20	195	TRUE
108	Shuna Castle	FS0465	Kames Fish Farming Ltd	TRUE	1	Terecos DSMS4	5	179	FALSE
109	Shuna SW (Rubhan T	FS1290	Kames Fish Farming Ltd	TRUE	2	Terecos DSMS 4	9.3	135 - 178	TRUE
110	Sian Bay	FS0361	Scottish Sea Farms Orkney and E	TRUE	10	Airmar dbII	10.3	192	TRUE
111	Slocka Ronas Voe	FS1018	Scottish Sea Farms Ltd	TRUE	14	Mohn aqua MAG	10	198	TRUE
112	Snarraness	FS0400	Scottish Sea Farms Ltd	TRUE	8	Ace Aquatec US3	12	195 to 197	TRUE

113	Sound of Harris	FS1260	Loch Duart Ltd	TRUE	14	AIRMAR / MAG - MC	10	198	TRUE
114	South Sound	FS0183	Scottish Sea Farms Ltd	TRUE	14	Mohn Aqua Mag	10	198	TRUE
115	Strome	FS0570	The Scottish Salmon Company	TRUE	4	ACE AQUATEC US3	12	195 to 197	FALSE
116	Strone	FS1056	The Scottish Salmon Company	TRUE	2	ACE Aquatec US3	16	194 to 197	FALSE
117	STULAI GH	FS1259	Marine Harvest (Scotland) Ltd	TRUE	16	Airmar	10	135-178	TRUE
118	Tabhaigh	FS1297	Marine Harvest (Scotland) Ltd	TRUE	4	Terecos DSMS-4	9.3	135-178	TRUE
119	Tanera	FS0549	Scottish Sea Farms Ltd	TRUE	24	Mohn Aqua MAG Se	10	197	TRUE
120	Taranaish	FS0752	The Scottish Salmon Company	TRUE	4	Airmar dB Plus 11	12	195 to 198	TRUE
121	Tarbert South	FS0767	The Scottish Salmon Company	TRUE	2	ACE Aquatec	12	195 to 197	FALSE
122	Teisti Geo	FS1093	Scottish Sea Farms Ltd	TRUE	14	Mohn aqua	10	198	TRUE
123	TORRIDON	FS0234	Marine Harvest (Scotland) Ltd	TRUE	10	Terecos DSMS4	9.3	135-178	TRUE
124	Trenay	FS0796	The Scottish Salmon Company	TRUE	2	Airmar db 11 plus	6.5	198	FALSE
125	Trilleachan Mor	FS1118	The Scottish Salmon Company	TRUE	3	Airmar dB Plus 11	6.5	194 to 198	FALSE
126	Tuath	FS0617	The Scottish Salmon Company	TRUE	12	OTAQ SF3	10	196	FALSE
127	Uiskevagh	FS1255	The Scottish Salmon Company	TRUE	4	Airmar db11 plus	6.5	198	FALSE
128	Vacasay	FS1091	The Scottish Salmon Company	TRUE	4	Airmar dB Plus 11	12	195 to 198	FALSE
129	Vidlin North	FS0608	Scottish Sea Farms Ltd	TRUE	20	Mohn Aqua MAG	10	198	TRUE
130	Vuia Beag	FS0411	The Scottish Salmon Company	TRUE	2	Airmar dB Plus 11	6.5	195 to 198	FALSE
131	Vuia Mor	FS1103	The Scottish Salmon Company	TRUE	4	Airmar dB Plus 11	6.5	195 to 198	FALSE
132	Walters (East Lismor	FS0875	Scottish Sea Farms Ltd	TRUE	11	Mohn Aqua Airmar	10	197	TRUE
133	Wester Ross Fisherie	FS0057	Northern Salmon Management	TRUE	12	Airmaar Db Plus 11	1	198	TRUE
134	Wester Ross Fisherie	FS0517	Northern Salmon Management	TRUE	8	Airmaar Db Plus 11	10	198	TRUE
135	Wester Ross Fisherie	FS0675	Northern Salmon Management	TRUE	8	Airmaar Db Plus 11			
136	Wester Ross Fisherie	FS0056	Northern Salmon Management	TRUE	14	Airmar Db Plus 11	10	198	TRUE

A [document circulated by the Sea Mammal Research Unit of St. Andrews University](#) to the Salmon Aquaculture & Seals Working Group in April 2016 included:

Had hoped to help and follow the commercialisation of a new acoustic deterrent system: this has become mired in problems concerning finance, engineering and patents, but is ongoing.

We have engaged with WWF and SNH about possible curtailment of ADD use, which might result in increased levels of depredation, damage and shooting.

### Follow Ups:

GAAIA today (7 May) filed a formal complaint with the European Commission against the Scottish and UK Governments for failure to protect cetaceans from deliberate and reckless disturbance via ADDs used by salmon farms - read [GAAIA's EC complaint online here](#).

GAAIA today (7 May) wrote to SNH, the Scottish Government and the UK Government recommending that ADDs are banned immediately from use at all salmon farms in Scotland..

GAAIA maintains that, at a bare minimum, all salmon farms currently using ADDs must apply for a licence including detailed evidence that "there are no satisfactory alternatives" (e.g. anti-predator nets, closed containment on land; translocation of seals; or startle devices).

GAAIA is calling on MSPs to support a motion calling for the immediate ban on ADDs on salmon farms to protect cetaceans. In particular:

Maureen Watt MSP is [species champion for the harbour porpoise](#)

Kenneth Gibson MSP is [species champion for the blue whale](#)

Peter Chapman MSP is [species champion for the bottlenose dolphin](#)

James Dornan MSP is [species champion for the common dolphin](#)

Richard Leonard MSP is [species champion for the humpback whale](#)

Richard Lochhead MSP is [species champion for the minke whale](#)

Tavish Scott MSP is [species champion for the orca](#)

Neil Bibby MSP is [species champion for the Risso's dolphin](#)

Kevin Stewart MSP is [species champion for the Sei whale](#)

Christina McKelvie is [species champion for the white beaked dolphin](#)

**Contacts:**

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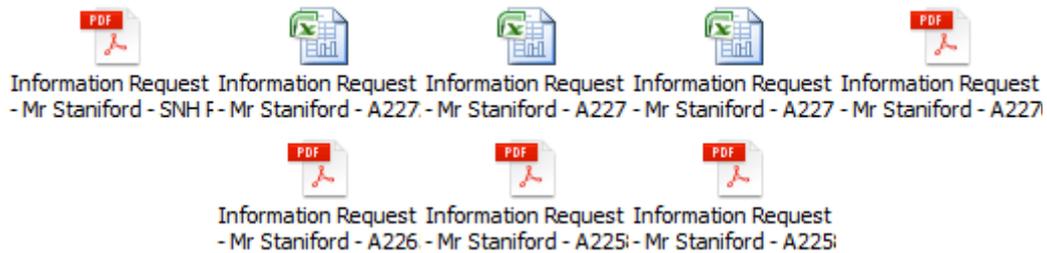
[Dr Thomas Gotz \(Sea Mammal Research Unit, University of St. Andrews\): tg45@st-andrews.ac.uk](mailto:tg45@st-andrews.ac.uk) (01334 463459)

[Dr Simon Northridge \(Sea Mammal Research Unit, University of St. Andrews\): spn1@st-andrews.ac.uk](mailto:spn1@st-andrews.ac.uk) (01334 462654)

[Dr Paul Lepper \(Loughborough University\): p.a.lepper@lboro.ac.uk](mailto:p.a.lepper@lboro.ac.uk) (01509 227080)

## FOI documents released by SNH on 25 April 2017 (14 MB):

Here's 14 MB of FOI documents released by SNH:



Download via [FOI Backgrounder: ADDs & Salmon Farms' \(May 2017\)](#)

Read SNH's covering letter [online here](#)

- [Download SNH FOI 25 April 2017 document #1](#)
- [Download SNH FOI 25 April 2017 document #2](#)
- [Download SNH FOI 25 April 2017 document #3](#)
- [Download SNH FOI 25 April 2017 document #4](#)
- [Download SNH FOI 25 April 2017 document #5](#)
- [Download SNH FOI 25 April 2017 document #6](#)
- [Download SNH FOI 25 April 2017 document #7](#)

### Background to FOI request:

On 26 February 2017, the Global Alliance Against Industrial Aquaculture (GAAIA) filed a FOI request with Scottish Natural Heritage for information on ADDs, predator control and salmon farms since 1 January 2016.

The FOI request was prompted by [FOI documents disclosed by SNH on 24 February 2017](#) - including the following action points and notes from a meeting in December 2016 between SNH, the Scottish Salmon Producers Organisation (SSPO), the Scottish Salmon Company (TSSC), Marine Harvest Scotland (MHS) and Scottish Sea Farms (SSF):

## Action points and notes from: SNH & SSPO industry workshop on ADD use

Tuesday 13<sup>th</sup> December, Oban

Present: Suz Henderson, Caroline Carter, Liam Wright (all SNH); [REDACTED] (TSSC); [REDACTED]  
[REDACTED] (MHS); [REDACTED] (SSF); [REDACTED] (SSPO)

### 1. Update on HP SAC/Conservation Objectives

The SAC for harbour porpoise has been submitted to the EU as a candidate site and therefore is now legally protected.

Two masters projects on ADD noise surveys have been undertaken.

ACTION: SNH to distribute these to the group when they are published.

### 2. Discussion on current ADD use and how they are used (e.g. definition of continuous/triggered).

Current use in Sound of Mull area discussed, including how and why. Managers decisions and technical capacity of the equipment are key. Ultimate aim is to minimise noise levels in general. ACTION: SSPO to speak to the ADD manufacturers about low frequency devices, logging use and impact on HP.

ACTION: TSSC / MHS / SSF to identify reasons and justifications for continuous use situations

ACTION: TSSC / MHS / SSF to define what is meant by: triggered, manually triggered, continuous in their particular circumstances and where use is logged (electronically / manually)

ACTION: SNH to interrogate seal licence data from MS and identify gaps.

### 3. Potential options for best practice/mitigation within SAC– SNH thoughts and industry views/input

ACTION: SNH to develop awareness raising information / poster for industry to distribute to all farms

ACTION: SSPO to investigate holding industry workshop on predator control, including ADD use

ACTION: SSPO to develop first draft of guidance for decision making on predator control and ADD use

ACTION: SNH to initiate discussions with Freedom Foods

### 4. Next steps

ACTION: SSPO to invite WRS and Loch Duart to be involved in the process due to proximity to SAC

The FOI documents supplied by SNH on 24 February 2017 also included:

**From:** Suzanne Henderson [<mailto:Suzanne.Henderson@snh.gov.uk>]  
**Sent:** 15 November 2016 12:29  
**To:** [REDACTED] <[\[REDACTED\]@scottishsalmon.co.uk](mailto:[REDACTED]@scottishsalmon.co.uk)>; Caroline Carter <[Caroline.Carter@snh.gov.uk](mailto:Caroline.Carter@snh.gov.uk)>;  
Liam Wright <[Liam.Wright@snh.gov.uk](mailto:Liam.Wright@snh.gov.uk)>  
**Cc:** Cathy Tilbrook <[Cathy.Tilbrook@snh.gov.uk](mailto:Cathy.Tilbrook@snh.gov.uk)>  
**Subject:** RE: ADD workshop

Hi [REDACTED]

Sorry for delay in replying.

Cathy is not available that date so there are a couple of options –

- postpone until the new year – this would also allow some further updates from ongoing research on ADDs to feed into discussions (PhD research and SARF project)
- continue with the meeting on 13<sup>th</sup> to discuss best practice options for ADD use in the Sound of Mull area in particular (Caroline, Liam and myself could all attend this meeting)

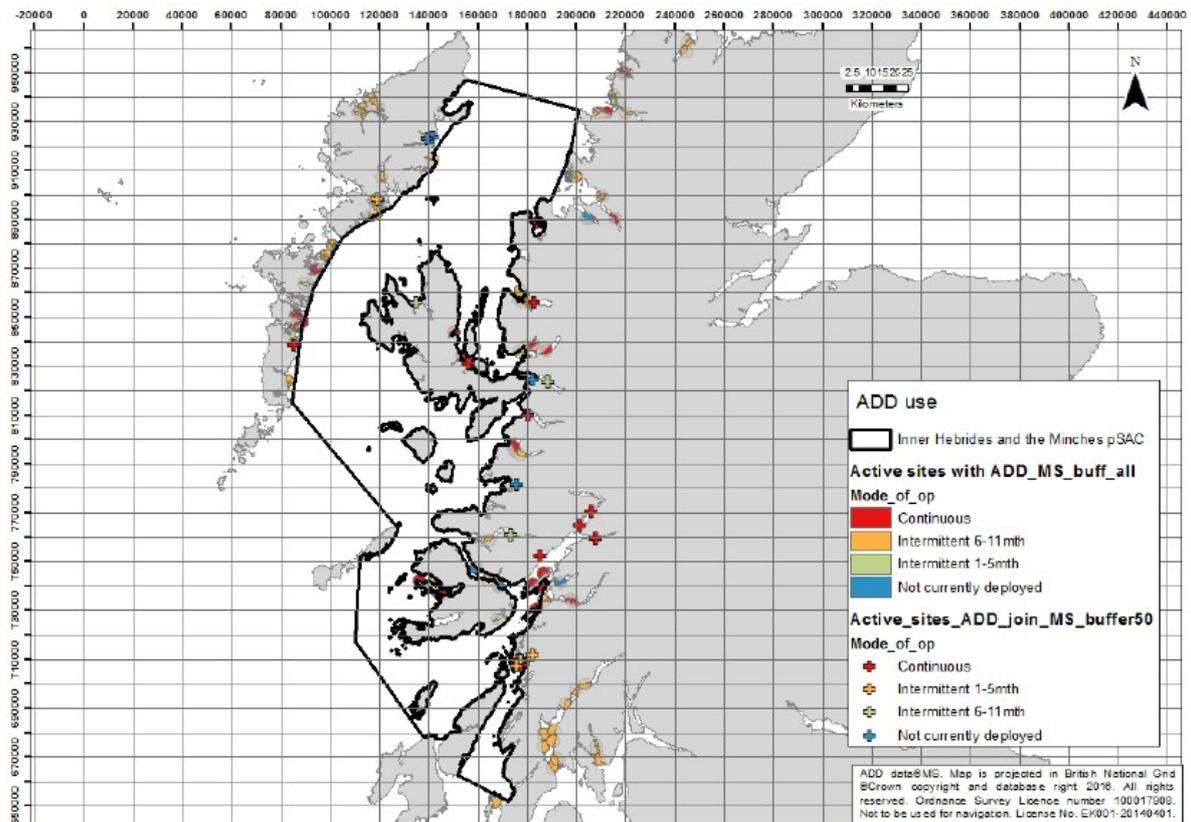
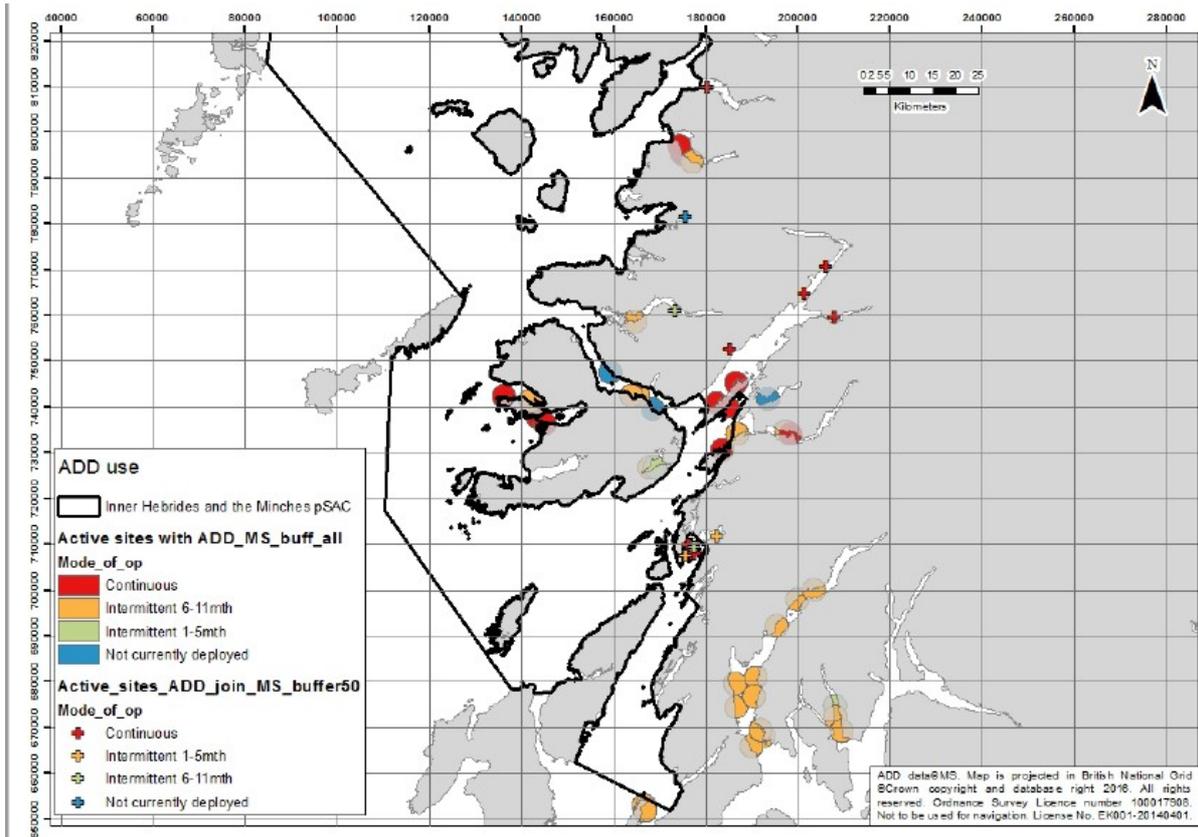
We don't believe noise emitting constantly is best practice so discussion points on best practice from our side have included:

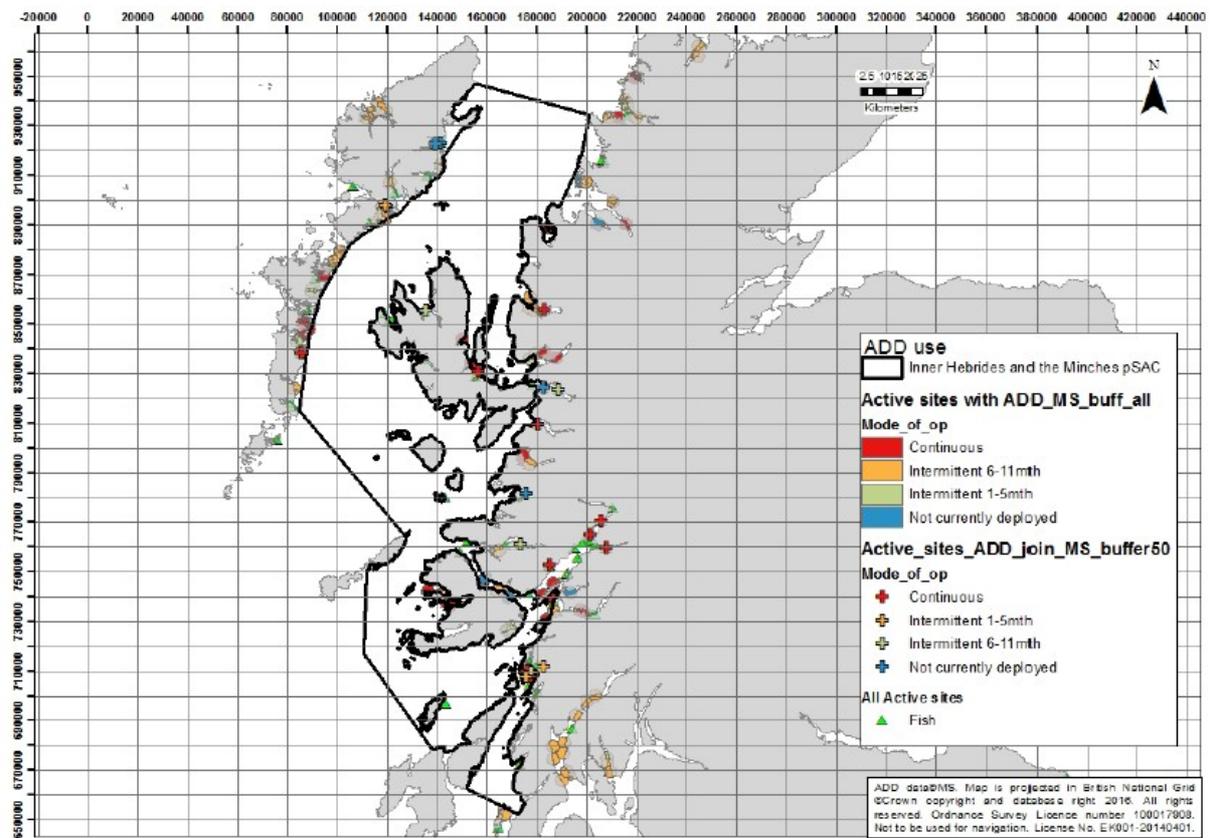
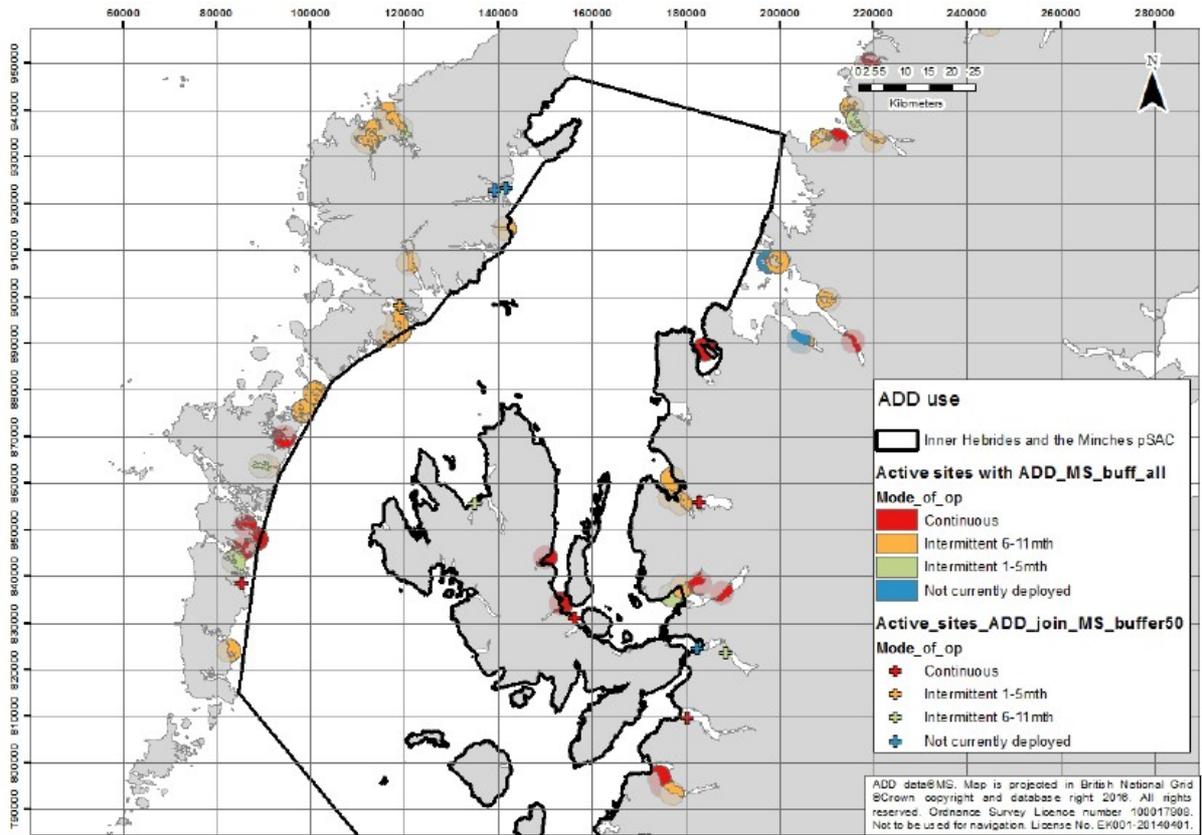
- No noise emitting constantly -from the seal licensing questionnaire – this would appear to be quite a big ask for lots of farms?
- Triggered ADDs – what this actually means in terms of the amount of time noise is being emitted, using ADD equipment reports to help get a feel for this? Do mechanically triggered devices emit more noise in terms of time being on than manually triggered (e.g. on seal sightings)?
- How feasible might a strategic approach be to avoid time noise being emitted increasing any further in future and minimising the time noise being emitted where possible?

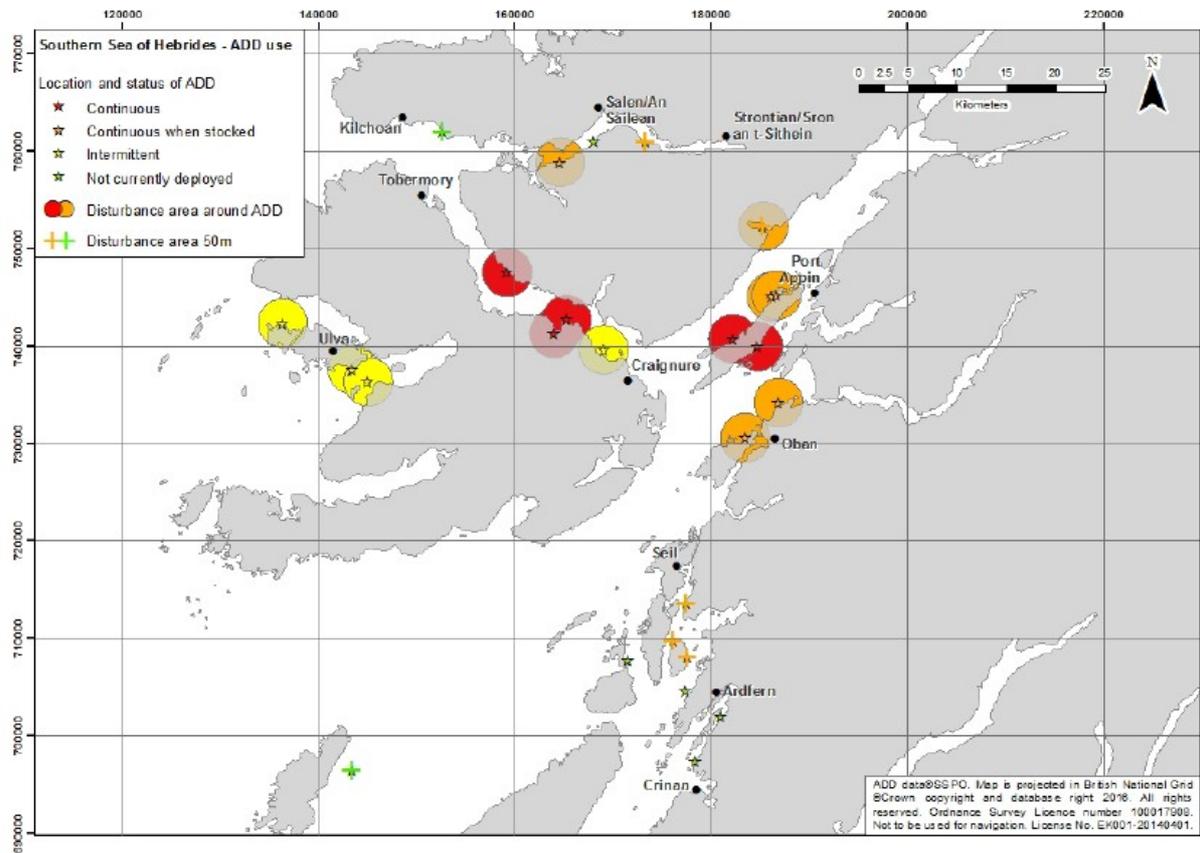
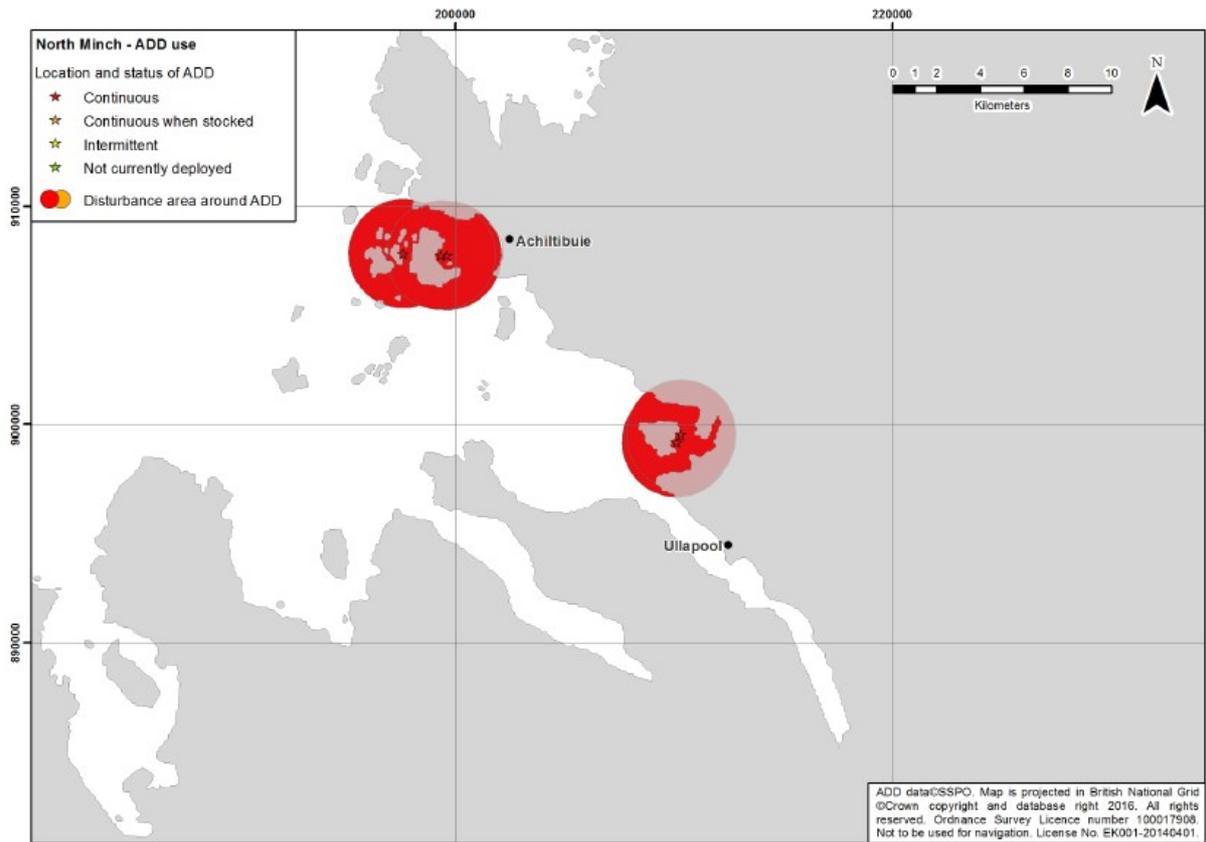
## **Snapshots of FOI documents disclosed by SNH on 25 April 2017:**

### [Document #1:](#)

This [95-page PDF included](#) a series of maps showing ADDs on salmon farms in the Inner Hebrides and the Minches SAC:







It appears the following emails relates to the maps above:

**From:** Suzanne Henderson  
**Sent:** 15 September 2016 15:06  
**To:** Alex Turner; Cathy Tilbrook; Liam Wright  
**Subject:** ADD usage in HP pSAC  
**Attachments:** ADD info- PL model presentation for SSPO meeting on the 17 March 2016.obr;  
Harbour porpoise - advice to support management - all activities\_no maps - 18  
August 2016.obr; SSPO Liaison meeting - minutes - May 2016 - DRAFT.obr

Hi

I said I would share the disturbance zone maps that Caroline and I created. These were to aid discussion of the current situation on ADD usage within the pSAC.

See the attached presentation Caroline gave at the last SSPO meeting.

Slide 14 – Coram et al 2016 map showing 3.5km zone of disturbance based on literature of disturbance

Slide 15 and 16 – our first attempts at maps using the 2.5km zone of disturbance from Caroline's model and the data SSPO gave us – and when there were 2 separate areas. Note that industry found difficulty in giving definitive answers on ADD usage as this seems to change continually and up to farm managers mostly.

Slides 17, 18, 19, - second attempts at maps using data from SOI questionnaire to industry that is used for the seal licencing process. This was for 2015 I think. These latter maps show the 2.5km zone, and the categories of ADD usage declared within the SOI questionnaire. Note there are some ambiguities with these categories and how farmers might be answering the questions.

We tentatively identified the areas that we thought would be at highest cumulative risk to ADD use currently based on this information – as Sound of Mull, Lismore, West of Mull and Rassay, but we did say there may be more. We have not mapped these, nor have we have thought about future farms or existing farms that might want additional ADD usage.

Also attached is what I believe to be the latest advice on management for the pSAC – within this there is promise of guidance for aquaculture.

Lastly – our list of AP from our last meeting with SSPO – just to remind ourselves. AP1 is to meet with Industry who farm in the key areas -to develop best practice guidelines.

I had thought about asking Jane if she would mind looking at the AP involving reviewing the questions in the SOI survey – as she deals with the seal licencing. However it would be useful to discuss how we might want to use the information to ensure we get any changes right. Questionnaires go out in the autumn I believe.

I think it would be useful to redraw the maps based on the next survey answers (with hopefully better questions posed) and also include the higher risk areas we have identified – this would fit nicely into any guidance/standing advice drawn up.

Happy to chat further

Cheers

**From:** Suzanne Henderson  
**Sent:** 22 March 2016 12:09  
**To:** Jane Dodd; Andrew Campbell  
**Cc:** Liam Wright  
**Subject:** SSPO HP dSAC pre consultation discussions

Jane, Andrew,

Attached are the maps we produced along with Caroline's method for the modelling of acoustic disturbance zones. There are 2 buffers (with lots of caveats due to unknowns!): one for terecos -50m – but so small it is represented by a cross, and the other ADDs – 2500m.

There are two SSPO data maps and these are for the 2 original HP dSAC areas which we asked SSPO for their data (2015 info).

There are 3 MS licence data maps - I did these using the data in the seal licence info Oana sent me (2014/15 info). I tried to do something with the information on how often the ADDs are being used – hence the different colours.

There maybe other sites which were not in the seal licence data information – but are still active fish farm sites- that we might have missed – see the all active sites map.

Discussions were more about assurances that we would not be suggesting a complete ban on ADDs, but more about working with them to reduce noise pollution particularly in areas of higher risk (SoMull), and a longer term goal of other types of ADDs (if the low frequency ones prove to have no impacts on cetaceans).

We highlighted the ongoing work on CO.

The new Impact Assessment by MS – shows a small financial impact on industry and SSPO seemed happy with that too.

Note we have not spoken directly to actual companies yet – SSPO were tasked in doing that, but a meeting is planned in April some time.

**From:** Suzanne Henderson  
**Sent:** 16 March 2016 17:11  
**To:** Caroline Carter  
**Cc:** Karen Hall  
**Subject:** ADD use and all active sites - Inner Hebrides and the Minches (A1914167)  
**Attachments:** ADD use and all active sites - Inner Hebrides and the Minches.obr

Hi Caroline,

I have quickly done a map overlaying all the active sites on top of the MS data buffers.

Hopefully this is ok?

There doesn't appear to be many areas which are not covered by the MS seal licence data within the dSAC - although there are 2 at the mouth of Sound of Mull....

Suz

**From:** Suzanne Henderson  
**Sent:** 15 March 2016 14:06  
**To:** Caroline Carter  
**Cc:** Cathy Tilbrook; Liam Wright; Katie Gillham  
**Subject:** RE: ADD use maps?

Hi Caroline,  
Presentation looks good.

A few minor comments:

Slide 1 – perhaps tie in (just verbally) with our action b. in suggested agenda below- i.e. the deterrence its part of the work on information on areas of higher concern

Are we agreed on the terminology as we have used acoustic disturbance/deterrence and ranges/zones previously in discussions. Does it matter?

Slide 2 – this is fine for our Thursday meeting ,but perhaps we need to be mindful of sharing this slide at our next meeting with all operators? Unsure if they are ok with sharing these details with each other....

Slide 9 – question for me really – I would be interested in how NOAA set their behavioural thresholds of disruption– based on literature I presume, but what exactly and have they adjusted at all for a more precautionary approach??

Slide 13/14 – do we need the boundaries of the previous 2 pSACs in these maps?

Slide 15/16 – Perhaps need one map of whole extent of new pSAC? Could use the map from the draft MOP?

I have put a suggested agenda below – in case we think we need additional slides for other items, although we won't have much time to develop!

Cheers  
Suz

Suggested Agenda – will update after agreed at meeting tomorrow and will bring some printed copies

1. Further development on HP pSAC – MS  
(we might want the previous 2 boundaries and the new one on slides?)
2. New timeframe of SAC process – MS
3. Summary of science/SNH input?? – [REDACTED] (not sure if we offer this or just wait for questions)
4. Previous actions from last meeting
  - a. Salmon farming industry to supply data on ADD use
  - b. SNH work on areas of “higher concern”
  - c. SNH consider knowledge gaps and options for research – SARF112/SAMS/HWDT research/ MSc - Caroline – did you ever discuss this with [REDACTED]?? It came up at the MASTs student day I believe.
  - d. SNH consider cetacean observation information from farms – (this links in to above)
5. Next steps – MS/SNH
6. SPA workshop and follow up

Direct Dial: 01463 725238  
Email: [Suzanne.henderson@snh.gov.uk](mailto:Suzanne.henderson@snh.gov.uk)

**From:** Caroline Carter  
**Sent:** 14 March 2016 14:00  
**To:** Suzanne Henderson  
**Cc:** Cathy Tilbrook; Liam Wright; Katie Gillham  
**Subject:** RE: ADD use maps?

Hi Suz,

I think the maps look great. Much better than what I could do in GeoView!

But, I'm wondering if the colours are too subtle? I agree we should maybe avoid the traffic light system – but as they are just now it takes a bit of studying to work out where the different categories are. It's a minor point, I'm not sure we would want to get them redone necessarily...

I don't think it's an issue that the classes are different between the SSPO data and the MS licence data... and yes useful to show the cross for the Terecos device.

I think it is useful to have these available for presentation. I was thinking of doing a short presentation on the model (it's always easier if folk can see what we are referring to) so we can incorporate these maps in as well.

Do we want to think about areas that warrant further discussion in our pre-meeting on Wednesday?

**From:** Suzanne Henderson  
**Sent:** 14 March 2016 12:21  
**To:** Caroline Carter  
**Cc:** Cathy Tilbrook; Liam Wright; Katie Gillham  
**Subject:** ADD use maps?  
**Attachments:** ADD use - Inner Hebrides and the Minches\_MS\_Licence data.obr; ADD use - Inner Hebrides and the Minches\_MS\_Licence data\_North.obr; ADD use SSPO data w modelled buffer - North Minch.obr; ADD use SSPO data w modelled buffer - Southern Sea of Hebrides.obr

Hi Caroline,  
Cc Cathy, Liam, Katie

I got a bit of help with these – so managed to complete- although could be tweaked if not right. Could you have a look please and see what you think? Do we need anything else to make things clearer. It would be nice to have our thoughts established on any high risk areas for HP for further investigation/discussion.

The MS-Licence maps are ones using information on ADD use from the seal licences questionnaire, combined with information on “active” fish farms from the Aquaculture Scotland website (drawn in through NMPi). So these maps may not be a complete record of farms using ADDS.

Due to the information within the questionnaire – I have made 4 classes of ADD mode of operation which is different to the classes for the SSPO data. Note in all of them the 50m is too small to show – hence the crosses. Think this is helpful in case farms decide to change ADD type....

Do you think it would be useful to have these (or similar) in a presentation format for the meeting – powerpoint? Are you planning on doing something like that for your model explanation?

We will be able to show HP pSAC boundaries, but not able to give maps for SSPO to take away.

Happy to chat on phone if easier

Cathy – wondering if we might need to show MS these maps and our thoughts before Thursday somehow – just so we don't talk at cross purposes at the meeting!

Other emails disclosed included:

**From:** Suzanne Henderson  
**Sent:** 11 October 2016 10:27  
**To:** [REDACTED]@gov.scot'; [REDACTED]@gov.scot'; [REDACTED]@gov.scot');  
[REDACTED]@gov.scot'; [REDACTED]@gove.scot'; [REDACTED]@gov.scot';  
[REDACTED]@gov.scot'; [REDACTED]@gov.scot'; [REDACTED]@gov.scot';  
[REDACTED]@gov.scot'; Cathy Tilbrook; Caroline Carter; Liam Wright; Karen Hall  
**Cc:** George Lees; Jane Dodd  
**Subject:** EPS and ADD use at fish farms meeting

Hello all,

If you recall we had a meeting way back in April 2015 to discuss the consideration of EPS licensing or otherwise for the use of ADDs at fish farms, particularly in light of the then newly published EPS Guidance, and various bits of research on ADDs.

We are keen to reopen this dialogue and suggest another meeting in the first half of November to try and reach some consensus between us.

I have attached some draft notes and actions from the last meeting that George and Caroline were working on. Apologies, but I do not think this was ever sent round.

**Dr Suz Henderson**  
**Marine Policy and Advice Officer**  
**Coastal and Marine Ecosystems Unit**  
**Scottish Natural Heritage**  
**Great Glen House**  
**Leachkin Road**  
**Inverness**  
**IV3**

Direct Dial: 01463 725238  
Email: [Suzanne.henderson@snh.gov.uk](mailto:Suzanne.henderson@snh.gov.uk)

[Note EPS guidance on [SNH's web-site](#)]

The document included notes of a meeting in April 2015:

# SNH / MS Discussion on ADDs and EPS – 22<sup>nd</sup> April 2015

## Meeting notes

Caroline Carter & George Lees

### Attendees:

SNH: Cathy Tilbrook (Chair); George Lees; Suz Henderson; Liam Wright; Caroline Carter; Karen Hall

MS: [REDACTED]

## 2. Consideration of EPS licensing needs for ADD development

- Discussion structures using the MS guidance flowchart (pg 3 [www.scotland.gov.uk/Resource/0044/00446679.pdf](http://www.scotland.gov.uk/Resource/0044/00446679.pdf))
- **Are EPS likely to be present?**
  - It was agreed for the purposes of assessing licence requirements that it could be assumed that there were EPS species present in all locations. It is likely that harbour porpoise at least will be present. This assumption was preferred instead of any requirement for the industry to undertake survey work.
- **Are you planning an activity which could potentially cause injury or disturbance to marine EPS?**
  - Have no definitive information on any ADDs which could allow us to be sure they weren't causing disturbance, therefore the potential to cause injury or disturbance can not be refuted. Given lack of knowledge and provisions in guidance to avoid or mitigate against disturbance, have to conclude 'yes' at present time
  - Purpose of ADDs is to disturb, and so will disturb cetaceans unless designed specifically to target seals and not cetaceans (eg GenusWave)
  - Potential problems with the interpretation of the guidance – no suitable test – no precedent set. Need clarification of guidance before proceeding down the path of a regulatory change.
  - Likely push back from Aquaculture industry who may not accept preceding argument. Discussion centred on whether it could be proven that the aquaculture companies' use of ADDs could be held as 'reckless' disturbance'
- **Can the impact be fully or partially mitigated?**
  - GL detailed our thoughts on mitigation possibilities and that it was our conclusion that theoretically, yes, mitigation could be applied in certain circumstances. In

practice, however, all would have logistical or financial implications for aquaculture companies that would render them, for the most part, infeasible to apply.

- [REDACTED] made comment that we do not have the regulatory regime to say that if a specific device was being used that there would not be an EPS offence.
- It was noted that, without an EPS licence, use of ADDs can't actually be controlled nor mitigation enforced. There is a lack of certainty about where 'mitigation' fits within the EPS licensing process. Is it applied to prevent need for an EPS licence or to enable ADD use on provision of an EPS licence.
- Suggestion was made that good practice could be encouraged by tightening of the ADD specifications and guidance on ADD use within the industry's best practice guidelines, though again this may not be palatable to the industry.
- **Will an offence be committed despite mitigation plans?**
  - The definition of disturbance was queried.
  - Is it likely that an offence will be committed?
  - Whole discussion boils down to the definition and application of the term 'reckless'.
  - Suggestion was made that awareness that ADDs could cause disturbance should be noted in guidance (after meeting note – MS guidance pg 15 section 2.2.2 notes ADD *"to be an activity that have the potential in certain circumstances to be associated with the disturbance, injury and/or killing of cetaceans"*)

[Read the MS guidance document - "[The protection of Marine European Protected Species from injury and disturbance: guidance for Scottish inshore waters](#)" - published in 2014]

'Action Points' noted from the meeting included:

- **Action points**
  - Marine Scotland to consider the interpretation of the term 'reckless'
  - Marine Scotland to look into the issue relating to the wording in the guidance relating to REG 39(1 & 2) and to clarify the sections in the guidance.
  - In doing this, MS will clarify the Commission Guidance.
  - MS will ask supplementary questions to SMRU relating to the evidence behind disturbance of cetaceans from ADDs
  - Also to ask SMRU if they can discriminate ADDs that are likely to cause disturbance and those that are unlikely to.
- Roles and responsibilities to be agreed after the answers to the above are considered
- The question was raised as to what other options there might be if reckless does not apply.
  - Incorporate into the industries code of practice – but this route has no weight and relies completely on good practice.
  - Possible route through seal shooting licenses – could be used to apply pressure – for example seal licenses are not granted unless certain ADDs are used...

An undated document (published online by SNH via "[Inner Hebrides and the Minches Proposed SAC - advice to support management](#)") included:

### **Aquaculture - finfish**

In assessing likely impact, our focus has been on the equipment on site, likely vessel routes, and the use of Acoustic Deterrent Devices (ADDs) which together represent the main interactions between aquaculture developments and harbour porpoise.

There are numerous finfish farms within or immediately adjacent to the pSAC, mainly close to the shore. Map 2 shows the distribution of aquaculture developments within or close to the boundary of the pSAC.

Aquaculture farm equipment includes pens, nets, moorings and can include floating buildings. We consider that there is a low risk of entanglement for harbour porpoise from aquaculture infrastructure.

Predator control at fish farms is necessary to ensure that welfare of the farmed stock is not compromised. Finfish farms often use ADDs as part of their anti-predator measures, however, these may result in disturbance/habitat exclusion of harbour porpoise. The evidence of impacts on cetaceans from ADDs currently in use is varied and is dependent on many variables (e.g. noise characteristics of device, how the device is used, the topography, animal behaviour and importance of the area/habitat where the ADD is being used). Therefore, we consider it is important that efforts be made to further investigate this issue. Scottish Aquaculture Research Forum is funding research into the effectiveness of acoustic deterrents at lower frequencies than are typical of devices in current use. The aim is to better understand any disturbance to cetaceans, including harbour porpoise, relating to the use of these new devices. Further research is required but these new devices may in the future provide a suitable alternative seal defence mechanism which is more compatible with the conservation objectives of the site.

Working with industry, we are currently undertaking a review of ADD use within or near the pSAC. Information relating to current ADD use within the pSAC is required to determine the level of ADD noise emission currently in operation and whether further constraints on or more targeted use of ADDs should be considered. Our view is that there could be a risk to the Conservation Objectives as a result of the cumulative effects of ADD use within the site.

A strategic approach is required to reduce/limit the potential of cumulative risks from ADD use on the Conservation Objectives of the SAC, and we suggest that appropriate feedback loops within predator control management are considered to ensure ADD noise emission is minimised. This could be done through the development of a best practice ADD use protocol in discussion with industry and regulators; this could include a preference for triggered devices and only activating devices when seal predation becomes a problem. It is our view that continuous noise emission from ADDs at fish farm sites is not best practice. In areas of higher cumulative risk to the Conservation Objectives (e.g. areas with larger numbers of fish farms within straits, sounds and embayments where ADD use may limit access to

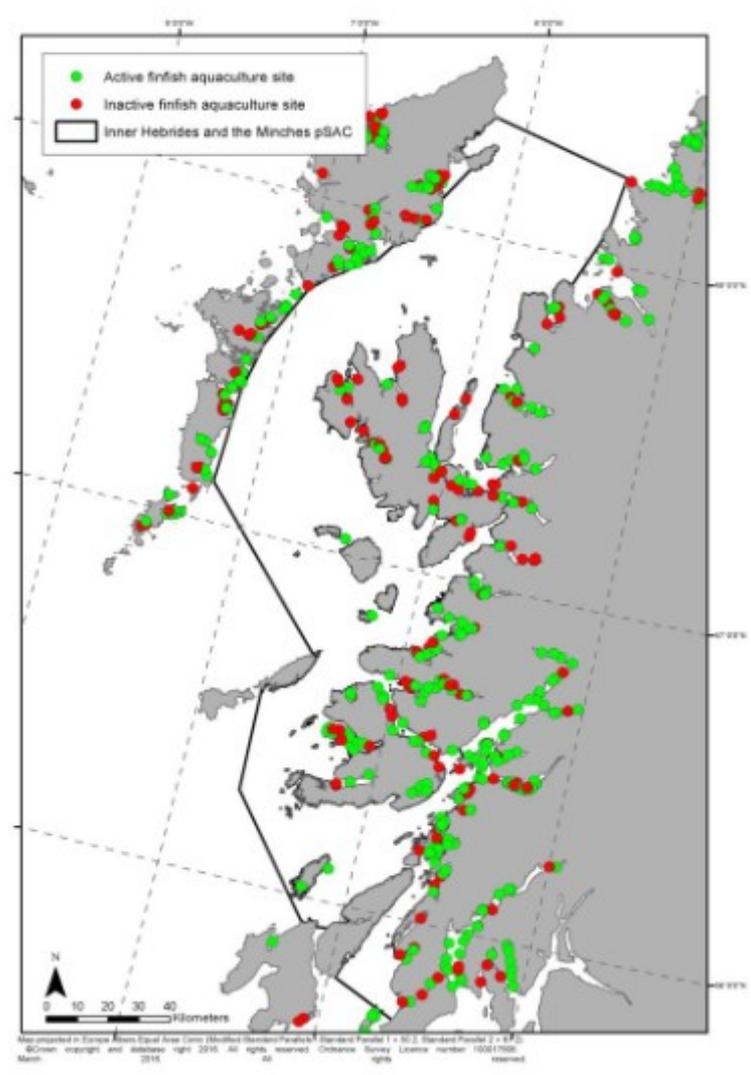
these areas), further measures to reduce ADD noise emission should be considered via ongoing discussions with industry.

Vessel activity associated with aquaculture farms include small rapid staff transfer boats and larger operational vessels. Although there is limited evidence of collision risk for harbour porpoise from vessels of this type, there is potentially more risk of disturbance. Disturbance is considered further under *Potential cumulative effects*. In our view, no additional management is required for vessel activity providing best practice is followed.

**Map 2.** *Finfish aquaculture sites in relation to the Inner Hebrides and the Minches pSAC*

[Note that Map 2 was not disclosed but the published version via "[Inner Hebrides and the Minches Proposed SAC - advice to support management](#)" is detailed below]

**Map 2.** *Finfish aquaculture sites in relation to the Inner Hebrides and the Minches pSAC*



**Recommended management option:**

**Reduce or limit pressures as required:**

- ADD deployment plans and codes of conduct (utilising best practice and taking into account site-specific circumstances) should be considered for all existing and new developments. This may include use of triggered devices, non-continuous use of ADDs, or other non-lethal methods of predator control. The cumulative effects of ADD use within the pSAC should also be considered and taken into account in the development of such plans. For further details see section on Potential cumulative effects.
- In areas of higher cumulative risk (areas with larger numbers of fish farms within straits, sounds and embayments where ADD use may restrict access) a more strategic approach is required and use of ADDs or restrictions of use should be considered at a wider scale.

Comment [KH1]: Perhaps remove depending on how the cumulative section develops

**Proposed way forward:**

Initial discussions with the industry have taken place. We agreed that the next stage was to meet with operators in areas of higher cumulative risk to discuss recommended management options, best practice and deployments plans and look at cumulative issues. Following this, we will review/take stock and see if revised management or working practices could be applied to a wider area. We will also continue

discussions with the industry about all methods of non – lethal predator control, any new ADDs that come into use and how existing ADDs are used. New finfish sites planning to use ADDs will require careful consideration to ensure that cumulative impacts will not compromise the Conservation Objectives of the pSAC.

We plan to develop guidance to help with assessing and mitigating potential impacts to the pSAC. In addition, we will work with the aquaculture industry develop specific codes of conduct and guidance on the use of ADDs within the pSAC as needed

Where management measures are required, the development of these would be undertaken via discussion with industry and regulators.

**Relationship with existing management:**

The use of ADDs for predator control at salmon farms may require an EPS licence. See Existing Species protection (page 12) for Marine Scotland's guidance on [The protection of marine European Protected Species from injury and disturbance](#)

See Annex 2 for *Existing good practice for vessels and mobile species*.

Other emails disclosed included:

**From:** [REDACTED]@gov.scot  
**Sent:** 13 October 2016 11:23  
**To:** Suzanne Henderson  
**Cc:** Liam Wright; Jane Dodd  
**Subject:** RE: ADD use and SOI questionnaire

Ok, so after speaking to [REDACTED] at SMRU, it seems that out of all the ADD models available on the market, only Ace Aquatec has an actual triggering mechanism when fish are excited / panicked – when the fish rush around they bash into a sensor and that can trigger the transducer to make a noise.

Mohn Aqua does not have a triggering system, but it has a low power mode you can switch to high power when you feel the need (you can check the weblink for more info).

Note that in the survey only 2 say ADD triggered 'when the fish behaviour changes' – this is the cue that one site is using Ace Aquatec with a triggering system. The one other person who said they are triggered by fish behaviour with a Mohn Aqua must be referring to visual observations of fish behaviour not a triggering device because the Mohn Aqua device has no trigger (as above).

So clearly there are some interpretation issues here - I suspect they may be interpreting the word triggered in a more vague way – like they switch them on when they see seals.

I went back to our IT developers to ask for some changes, unfortunately they are reluctant to make any changes in case it might cause bugs or twitches and they just don't want to risk it. It will have to wait until next year. I will have to submit the request as early as possible as I understand they are also very short on staff. So I suggest we add the following questions to be added next year, but I would be grateful for any other suggestions from your side.

- 'If ADD triggered, does the device has its own triggering system or is it switched on manually'
- 'Please specify the amount of time the device is kept 'on' and is emitting noise'

We can definitely look at the amount of noise the devices are emitting and include this in the report.

Thanks.

[REDACTED]

[REDACTED]

Marine Conservation  
[marinescotland](#) Scottish Government | 1A-South | Victoria Quay | Edinburgh EH6 6QQ  
Tel: 0131 2440318  
[\[REDACTED\]@gov.scot](#)

**From:** Suzanne Henderson [mailto:Suzanne.Henderson@snh.gov.uk]  
**Sent:** 11 October 2016 14:35  
**To:** [REDACTED]  
**Cc:** Liam Wright; Jane Dodd  
**Subject:** ADD use and SOI questionnaire

Hello [REDACTED]

Cc Liam, Jane for info

Thanks for getting back to me re the seal licensing survey already being online.

Just been thinking a bit more about this, and some of our recent internal discussions about ADD use in the HP cSAC. We want to discuss "best practice" ADD use with industry, and the potential amount of noise being emitted in the cSAC from ADDs– with an overall aim of reducing that noise where we can. We therefore were thinking triggered devices might be a preferred approach.

We will be in touch soon about a meeting with industry– hopefully before Christmas, which we hope you can attend.

With this in mind we have had questions over industry using ADDs "continuously" and triggered device use and what is really meant by this.

The question currently in the questionnaire I believe is "Is ADD on constantly or used only at certain times?" Then there are months which can be ticked.

So – what does constantly on mean? A few thoughts/questions...

- Does this mean the device is always emitting noise at whatever predetermined setting (this can vary significantly!)
- If a triggered device is constantly on - should we assume it will only be on when triggered (by whatever means)?
- Some (or all) ADDs can report the amount of time they are emitting noise, however I think it is only Freedom Foods who request to see this information. Is this something we could perhaps ask for?
- We currently have no idea how often ADDs might be triggered, and believe some models can be triggered by bad weather too. I also understand triggered devices have a setting where it can emit noise at predetermined times in addition to the trigger.
- Perhaps triggered devices are emitting as much noise as other devices?

There are perhaps some assumptions we can make if we know the model and manufacturer to help our discussions. It may be the survey can only provide us with some information and discussions with industry can do the rest. Hopefully best practice can help alleviate some concerns of potential cumulative noise issues within the cSAC.

One final thought is - would there be any chance the report you write with [REDACTED] could perhaps also include some analysis of the amount of noise being emitted from ADDs in Scotland – perhaps particularly in certain areas where topography and a greater number of fish farms may highlight an increased risk of potential disturbance issues to cetaceans? We feel this would be a useful consideration in assessing the non-lethal measures of seal control as well as aid HP cSAC and EPS discussions.

Many thanks  
Suz

**From:** Caroline Carter

**Sent:** 26 August 2016 13:19

**To:** George Lees; Suzanne Henderson; Liam Wright; Jane Dodd; Fiona Manson; Karen Hall; Katie Gillham

**Subject:** ADD use on the west coast of Scotland

Hi All,

I was at a meeting yesterday at SAMS where the two MSc students working with HWDT acoustic data were to present their findings. The focus of the studies was to investigate ADD use throughout the HWDT survey area. The intention was to have both students presenting, but unfortunately one missed the bus – so didn't make it!

This may be of interest to us, so I've noted some key points below for info;

- [REDACTED] looked at data from 2011 – 2015. She initially checked the volunteer ADD signal presence/absence logs by re looking at the sound files in PAMGuard. She found that the volunteers were pretty successful in identifying an ADD signal in real time (ie when they were listening on survey) but [REDACTED] analysis extended the occurrence of ADD as she could pick out the quieter signals. (She wanted to check this – I think – so that the analysis can be stretched further into the past where volunteer logs exist – but the acoustic files don't).
- She found that over the years there had been a significant increase in ADD presence. An increase of 0.084 to 0.153 was identified (the metric used was a standardised figure, i.e. number of ADD identifications divided by the number of listening stations).
- She could identify three types of ADD in use (Airmar; Terecos and Ace-Aquatec) and that the increase over time was primarily due to more Airmar signals.
- Presence/absence of detectable ADD signal were mapped in 10km square blocks (this shows where a ADD signal can be identified, but not how many signals were there – nor the level of the signal(s)).
- The maps showed the extent that ADDs were detectable, in particular you could see that the Sound of Mull and Loch Linnhe were completely ensonified, and that the ADD signal can be detected all the way across the Minch.

- There was preliminary analysis of how the levels dropped with distance (from two locations) From Portree the signal could be detected out to 20km from source, in Lochmaddy the signal could be detected out to 30km. This is in keeping with literature which suggests the signal can travel up to 50km. The rate of decline is location specific but the majority of decay is in the first 5km.
- This project highlights presence/absence of signal, it does not give an indication of absolute level. The analysis was done on a relative dB scale rather than absolute (due to an absence of calibration info).
- This work shows how prevalent the ADD signal is in the area (in itself this does not tell us the effect on species of interest, it also does not show where the signal came from – just that it was present).
- They hope to turn this work into a publication (from a marine pollution angle) – I've asked if we can be kept in the loop on that, and in the meantime, I've asked if we could have copies of their thesis' (if we can, they need to go through the university process...)
- [REDACTED] hopes to continue work in this area – and look at determining absolute levels and then using the data to ground truth a propagation model, and there may be potential for working on this with [REDACTED] (provided funding can be found).
- Also there may be scope to look at the acoustic data in conjunction with concurrent HWDT sightings data which may highlight any fine scale disturbance effects – this is something that they would like to consider in addition.

I think this work is useful in that it is highlighting the increase over time and prevalence of the ADD signal on the west coast, but to be of more use it I think we would need absolute levels, and some comparative analysis with marine mammal data. There is clearly more that can be done, but this was only a three month project and I think [REDACTED] did a good job with the time she had.

Any questions on the above – please shout.

Best,  
Caroline

Dr. Caroline Carter  
Policy and Advice Officer - Marine Ecology  
Scottish Natural Heritage, Battleby, Redgorton, Perth, PH1 3EW  
01738 458562 | [www.snh.gov.uk](http://www.snh.gov.uk)

**From:** Caroline Carter  
**Sent:** 26 August 2016 13:33  
**To:** Karen Hall; George Lees; Suzanne Henderson; Liam Wright; Jane Dodd; Fiona Manson; Katie Gillham  
**Subject:** RE: ADD use on the west coast of Scotland

No, there were no industry present as it was really just a student end-of-thesis presentation. Hopefully the work will be publically available via the University so we should be able to refer to it from then. Even better if they do get a paper published – but that might take some time.

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**From:** Karen Hall  
**Sent:** 26 August 2016 13:26  
**To:** Caroline Carter; George Lees; Suzanne Henderson; Liam Wright; Jane Dodd; Fiona Manson; Katie Gillham  
**Subject:** RE: ADD use on the west coast of Scotland

Thanks Caroline

That's sounds really interesting and potentially useful for when looking at management options within the pSAC. Were any of the industry at this talk and /or are there any plans to share this work with them?

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From: Suzanne Henderson [mailto:Suzanne.Henderson@snh.gov.uk]

Sent: 15 November 2016 12:29

To: [REDACTED] <[REDACTED]@scottishsalmon.co.uk>; Caroline Carter <Caroline.Carter@snh.gov.uk>; Liam Wright <Liam.Wright@snh.gov.uk>

Cc: Cathy Tilbrook <Cathy.Tilbrook@snh.gov.uk>

Subject: RE: ADD workshop

Hi [REDACTED]

Sorry for delay in replying.

Cathy is not available that date so there are a couple of options –

- postpone until the new year – this would also allow some further updates from ongoing research on ADDs to feed into discussions (PhD research and SARF project)
- continue with the meeting on 13<sup>th</sup> to discuss best practice options for ADD use in the Sound of Mull area in particular (Caroline, Liam and myself could all attend this meeting)

We don't believe noise emitting constantly is best practice so discussion points on best practice from our side have included:

- No noise emitting constantly -from the seal licensing questionnaire – this would appear to be quite a big ask for lots of farms?
- Triggered ADDs – what this actually means in terms of the amount of time noise is being emitted, using ADD equipment reports to help get a feel for this? Do mechanically triggered devices emit more noise in terms of time being on than manually triggered (e.g. on seal sightings)?
- How feasible might a strategic approach be to avoid time noise being emitted increasing any further in future and minimising the time noise being emitted where possible?

Let me know if you think the above would be useful to discuss on the 14<sup>th</sup> or whether you wish to wait until the new year where we could possibly have an additional section to the wider SSPO liaison meeting for those interested?

**From:** [REDACTED]@griegseafood.com]  
**Sent:** 23 March 2016 19:06  
**To:** Suzanne Henderson  
**Cc:** [REDACTED]  
**Subject:** Re: Consultation on a new harbour porpoise SAC

Hi Suz. Nice to hear from you and hope you are well. We would certainly be keen to be involved in the consultation process. We are happy to meet together with the SSPO members as long as they have no objections. Please let us know the dates. I have copied [REDACTED] and [REDACTED] from our environmental dept into this email.

Best regards, [REDACTED]

Sent from my iPhone

On 23 Mar 2016, at 16:58, Suzanne Henderson <[Suzanne.Henderson@snh.gov.uk](mailto:Suzanne.Henderson@snh.gov.uk)> wrote:

Dear [REDACTED]  
I hope all is well in Shetland.

A consultation for a new harbour porpoise SAC has gone live today and will run for 8 weeks– please see [www.snh.gov.uk/porpoiseSAC](http://www.snh.gov.uk/porpoiseSAC).

Some of Grieg fish farm sites are within the newly proposed SAC boundary and we want to offer you the opportunity to meet up to discuss the proposed site and in particular our developing thoughts on potential management options over the use of ADDs. We had pre-consultation meetings in August last year with SSPO members over 2 smaller sites that were originally proposed. These original sites did not include any Grieg farms, but the new boundary means that these discussions are now relevant to your company.

We are about to canvas dates with SSPO and their members to meet up and discuss the proposed site and the associated supporting documents sometime in May. Would you or someone else from your company like to attend this meeting as well? Inverness or Perth are usually the most suitable venues for the majority. If you would prefer to meet separately – we hope we could arrange that too, but it might be logistically better to hold it on the same day as we meet SSPO - if possible.

We will shortly be contacting everyone via a doodle poll and so would like to add you to the list of contacts. Please let me know your thoughts.

**From:** Suzanne Henderson  
**Sent:** 27 January 2017 12:00  
**To:** Cathy Tilbrook; George Lees  
**Cc:** Liam Wright; Caroline Carter; Karen Hall  
**Subject:** RE: Draft Note of ADD / EPS Meeting with MS - 8 Nov 2016

Hi Cathy, George,

I think this all makes sense – and good to see it moving forward (note [REDACTED] was asking how things were progressing).

A couple of points:

In Annex 2 - we talk a bit about less sensitive locations and sensitive/higher risk areas – I think it would be worth stating what these might be, or the sorts of things we might use to pinpoint areas – if we can agree. In addition – do we want MS input/thoughts on this? If so we perhaps need to highlight we want their opinion and further discussion so that ultimately these areas can be made clear to everyone – which would help any licence process.

A similar point for Annex 1 where we talk about higher cumulative pressure – might be worth clarifying what we mean here (e.g. topographically restrictive and/or higher number of farms?) – so that MS can respond appropriately?

Cheers  
Suz

Direct Dial: 01463 725238  
Email: [Suzanne.henderson@snh.gov.uk](mailto:Suzanne.henderson@snh.gov.uk)

**From:** Cathy Tilbrook  
**Sent:** 26 January 2017 16:15  
**To:** George Lees  
**Cc:** Suzanne Henderson; Liam Wright; Caroline Carter; Karen Hall  
**Subject:** RE: Draft Note of ADD / EPS Meeting with MS - 8 Nov 2016

Hi all

Many thanks to George for doing such a good job in pulling the note together and my apologies for such a long delay in commenting. I have spent a bit of time on this today and have added a fair bit of text, plus some queries that I'd value quick further comments on before we finalise and send (next week?). I also had a useful chat with Ben Ross and am even more convinced that the 'Class EPS licence' is the most promising approach for most options (see annex 2).

Might be useful to set up a quick t/c (next Tues?) if we need to discuss and reach final agreement on any of this?

Cheers, Cathy

**From:** George Lees  
**Sent:** 08 December 2016 18:43  
**To:** Suzanne Henderson; Liam Wright; Caroline Carter; Karen Hall; Cathy Tilbrook  
**Subject:** RE: Draft Note of ADD / EPS Meeting with MS - 8 Nov 2016  
**Importance:** High

All: am conscious that I've left this hanging a bit. Have taken my original meeting note and tweaked it very slightly (inc edits suggested by Liam / Suz), so that it can be sent to MS for comment and subsequent endorsement as a minute of the meeting. NB Suz / Liam: have added in an action for one of you to check with [REDACTED] the point made in the meeting about enforceable conditions being a requirement for the cSAC.

Have added an annex for listing the questions we wanted answers to but not got very far. Please can you all have a think about what the key questions are and add them in (Annex 1). We were also asked to outline some suggestions of how EPS licensing (or planning control) might be implemented, practically. Haven't added anything there yet, though have copied Liam's suggestions into the main body of the note. Again, if you have suggestions, add them in (Annex 2).

Get back to me (and mark on draft) any final changes needed for the minute so we can send out.

Ta.  
George

**From:** Suzanne Henderson  
**Sent:** 10 November 2016 15:34  
**To:** Liam Wright; George Lees; Caroline Carter; Karen Hall; Cathy Tilbrook  
**Subject:** RE: Draft Note of ADD / EPS Meeting with MS - 8 Nov 2016

George,  
I agree – well done on summarising the rambling discussions from Tuesday!  
Very minor comments in document.

Liam – your table is very useful, and think it might be a good starting point if we.  
We perhaps need to get to the bottom of how we feel about the level of noise emitting from triggered devices in "high risk" areas.....  
My thoughts are that cumulative issues might be more tricky to deal with, particularly in the higher risk areas- perhaps the farms need to work together to have suitable mitigation in place.....?

One question I would be keen to ask MS is the whole issue about higher risk areas (in terms of both EPA and the HP SAC).  
Higher numbers of farms using ADDs in areas where there could be a restriction in movement/disturbance to HP (in terms of the CO and the EPS tests for elsewhere) seems to suggest higher risk, particularly cumulative risk... do they agree? Perhaps we need to ascertain Caroline and Karen's view on this first, in light of the changed CO? Sorry – I don't know the details ehre.

One other point that wasn't made at the meeting - was the argument over current levels of noise emission from ADDs should be taken to be ok – as we have managed to select an area good for HP despite the ADDs being used currently. I think you highlight our concerns to address this – in the first of your bulleted objectives below Action 3.

**From:** Liam Wright  
**Sent:** 10 November 2016 13:08  
**To:** George Lees; Caroline Carter; Karen Hall; Suzanne Henderson; Cathy Tilbrook  
**Subject:** RE: Draft Note of ADD / EPS Meeting with MS - 8 Nov 2016

Hi George,

I think you've done a really good job of making sense of the discussions!

In terms of the point:

[The pros and cons of different options for managing ADD use, whether via EPS or legislation or Planning control, were discussed](#)

My recollection of two specific examples / option are as follows:

Options:

- a) Introduce EPS process for all aquaculture ADDs
  - i) Have a general licence which sets out / conditions basic 'best practice' mitigation in less sensitive locations
  - ii) In sensitive locations have a site-specific licence which sets out site-specific mitigation to be conditioned
  
- b) Use planning conditions as first stage mitigation
  - i) Condition 'best practice' mitigation at all sites through planning
  - ii) Any breach of these conditions would be considered reckless disturbance and would require a licence or else an offence would be committed

Though not specifically mentioned on Tuesday, if we went down the route of option b) it would follow that in sensitive locations 'best practice' mitigation may not be sufficient and so additional mitigation may be required (potentially including no ADDs without a license).

I was thinking this through again last night and comparing ADDs as mitigation for pilling vs ADD use at fish farms. I have tried to summarise that thought process in the attached table. This depends on the definition of reckless, but assuming the most basic definition of reckless as 'doing something without regard for the consequences' my thought process led me along this line. Almost certainly jumping the gun but I would be interested if folk could have a think about this and consider whether route b) along the lines of the attached might be a legislatively tight compromise, should MS dig their heels in wrt. route a).

**From:** Caroline Carter  
**Sent:** 06 October 2016 15:33  
**To:** Suzanne Henderson; Liam Wright; Alex Turner  
**Cc:** Cathy Tilbrook; Karen Hall  
**Subject:** RE: Draft text for Portree fish farm response relating to ADDs and Inner Hebrides and the Minches cSAC

Hi All,

I think the draft Alex sent through is in keeping with what we have said within our HP SAC management options paper and isn't diverging from what we have said to industry. I don't have anything major to add. Given the timescale for this response, I think as long as industry are aware that our view is still being formed and they are involved in discussions, we shouldn't get tied into this being precedent setting (I hope).

Is the proforma for our use only? Or does it get sent with our response? If it's sent, we probably should clarify the conservation objectives, the text is being refined currently and as far as I'm aware it's not quite finalised. Karen is off now until the end of October, so we might need to check with Katie or Greg what text we should be using? I think the latest is:

1. 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.
2. To ensure that, **except where due to natural changes**, the following are maintained in the long term:
  - 2a. The relatively high density of harbour porpoise throughout the site compared to other parts of the continental shelf within the West Scotland Management Unit.
  - 2b. The **distribution of harbour porpoise throughout the site by avoiding significant disturbance**
  - 2c. The condition of supporting habitats and processes, and the availability of prey for harbour porpoise.

For 2. This might be changed to - "To ensure that, **except where due to environmental change**, the following are maintained in the long term." it's not finalised yet...

**From:** George Lees  
**Sent:** 09 November 2016 19:02  
**To:** Caroline Carter; Karen Hall; Suzanne Henderson; Liam Wright; Cathy Tilbrook  
**Subject:** Draft Note of ADD / EPS Meeting with MS - 8 Nov 2016

All: I've pulled together my notes of yesterday's meeting. It is a bit of a brain dump. Also, because we jumped around a bit I've grouped points, broadly, thematically, and some of the items may appear out of order (in terms of when we discussed them). Please can you all check and correct anything I've got wrong and add in anything I've missed. **NB This is an internal note, not for sharing with MS, at this stage.** I'll prepare something more succinct and tidier for that purpose, once I've got feedback on this from you.

While you are at it you'll recall the action that we provide to MS a list of questions. I've not started that here (though various of the actions are probably relevant to that) but it would probably be helpful if, when responding, there are any specifically that you want Cathy (or whoever) to raise with them.

George

Dr George Lees  
Policy & Advice Manager (Marine Renewables)  
Scottish Natural Heritage  
Battleby  
Redgorton  
PERTH  
PH1 3EW

Tel: 01738 444177 (s'board)  
01738 458621 (direct)

**From:** Caroline Carter  
**Sent:** 06 October 2016 15:33  
**To:** Suzanne Henderson; Liam Wright; Alex Turner  
**Cc:** Cathy Tilbrook; Karen Hall  
**Subject:** RE: Draft text for Portree fish farm response relating to ADDs and Inner Hebrides and the Minches cSAC

Hi All,

I think the draft Alex sent through is in keeping with what we have said within our HP SAC management options paper and isn't diverging from what we have said to industry. I don't have anything major to add. Given the timescale for this response, I think as long as industry are aware that our view is still being formed and they are involved in discussions, we shouldn't get tied into this being precedent setting (I hope).

Is the proforma for our use only? Or does it get sent with our response? If it's sent, we probably should clarify the conservation objectives, the text is being refined currently and as far as I'm aware it's not quite finalised. Karen is off now until the end of October, so we might need to check with Katie or Greg what text we should be using? I think the latest is:

1. 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.
2. To ensure that, **except where due to natural changes**, the following are maintained in the long term:
  - 2a. The relatively high density of harbour porpoise throughout the site compared to other parts of the continental shelf within the West Scotland Management Unit.
  - 2b. The **distribution of harbour porpoise throughout the site by avoiding significant disturbance**
  - 2c. The condition of supporting habitats and processes, and the availability of prey for harbour porpoise.

For 2. This might be changed to - "To ensure that, **except where due to environmental change**, the following are maintained in the long term." it's not finalised yet...

We've highlighted straits and sounds as areas that we want to look at more closely, including possible cumulative effect with other fish farms, and this application falls within that category. The conditions we are asking for here are in keeping with what the applicant is planning so that shouldn't be a problem for this application.

Liam makes a good point in that the fact we are saying it's ok to use a triggered device in an SAC may mean we won't be able to object to the use of ADDs anywhere else, and I'm not sure of a good answer to that. This isn't for this application, but I feel that our stance should be no ADD unless the need is substantiated, or that the applicant is using a device that specifically targets seals and has no effect on cetaceans (ie the new ones – hopefully in the future). To cut down on noise pollution no device (low freq or other-wise) should be deployed continuously. Triggered devices logically seem the next step. I'm not sure how other non-triggered devices could be operated in a similar way though? This would mean a person would need to be present to switch it on? When/how would this be switched off? (and do we know how triggered devices stop after being triggered?).

My reading of the device that they are proposing is that it is using an Airmar transducer – in the application, they cite acoustic characteristics identical to the Airmar (freq/level) so the 'new system' is I think to do with the operation – wireless links, communication to the lap top – and some form of trigger not specified. The website has very little information that is of use to us (also they call the device ultrasonic – which it is not, if it emits at 10kHz as we have been told – this is within human hearing and therefore not ultrasonic – ug...).

As an aside, this company are located at the marine 'park' next to SAMS in Oban. I know Denise has spoken to the guy in detail about ADDs so we could probably arrange for him to come and tell us all about his system if it would be of interest.

We could add in something about noise reduction and the work towards better acoustic targeting to seals, there is text in the management options paper that we could add in (Obj A2067288)??

I agree the anti-predator nets and gill nets are two separate things. I'm not aware of anti-predator nets being an issue for porpoise, I don't think there is much out there on small cetaceans being entangled in fish farm nets. The gill nets maybe more of an issue as this is linked to bycatch. As mitigation for gill nets in fisheries, pingers are used (much as I don't want to recommend more noise pollution....) but pingers are much lower in power than typical fish farm ADDs and are designed to 'alert' the cetacean to the presence of the net therefore avoiding entanglement. We could think about this I guess.

Sorry this is last minute and rushed...  
Caroline

**From:** Suzanne Henderson  
**Sent:** 06 October 2016 12:27  
**To:** Liam Wright; Alex Turner; Caroline Carter  
**Cc:** Cathy Tilbrook; Karen Hall  
**Subject:** RE: Draft text for Portree fish farm response relating to ADDs and Inner Hebrides and the Minches cSAC

Hi All,

My queries re triggered devices still stand - do we really want to stipulate a triggered device - or would we also be happy with a device operated in a certain manner similar to triggered devices - i.e. when seals are present/stressing/damaging fish?

Also – the device they are proposing – I am not sure it's a triggered device in terms of the same design as the Ace aquatec one. This is more a device aimed at causing real discomfort to seals – so suspect the noise emission is different – but no details are available from my search of the website?

<http://www.otaq.co.uk/products/sealfence-seal-and-sea-lion-deterrent/>

Perhaps when the seal crosses the "fence" the noise is triggered, but its not clear what the trigger is.

For info The ace aquatic US3 device is a triggered device that can be set to a rate of 0 – so it only scrams when triggered by fish bumping into the sensors (when stressed) or by sensors bumping into the net by bad weather. You can also set the rate differently – see below- this rate is the number of scrams per minute (from 0 to 144), and works independently of a trigger event. I am less sure about what noise is emitted during each "scram".

<http://www.aceaquatec.com/us3-user-manual-2.2>

MORTS	RATE	WARNING!
HIGH	141	<ul style="list-style-type: none"> <li>No longer than 2 weeks</li> <li>Check power settings daily</li> <li>Shift rate to 72 when Morts reach MEDIUM</li> </ul>
MEDIUM	72	<ul style="list-style-type: none"> <li>Use until Morts reach Low</li> <li>Check power settings every 2 days</li> <li>Shift down to 36 when seal morts are low</li> </ul>
LOW	36	<ul style="list-style-type: none"> <li>Maintain level if morts are rare</li> <li>Check power levels every 4 days</li> </ul>
NONE	12	<ul style="list-style-type: none"> <li>Maintain level if morts are gone</li> </ul>
NONE	0	<ul style="list-style-type: none"> <li>TRIGGER USERS ONLY!</li> <li>Once the seal morts are very low or gone you can set Rate to Zero and the US3 will scream when a seal is detected.</li> </ul>

Karen, Caroline - do we want to say anything alongside the reducing noise in general bit, about moving towards ADDs that are more specific to seals and less impacts to cetaceans?

I think the antipredator nets (to protect fish from seals) and gill nets (to capture escape fish) are two different things to consider. If the farm can guarantee well tensioned antipredator nets - (although this is not always the case if too exposed), then I am not sure this is a big issue for HP but better if Caroline or Karen advise here.

I think we *should* be able to rely on MS to consider HP in any fish escape plan and therefore consider gill nets in this light- but unsure really if MS will do this. There is still an issue over their role as a competent authority from FHI for instance. Karen/Caroline - any thoughts here? Maybe one to tackle separately though as Alex suggests rather than through the planning process?

From: Liam Wright

Sent: 06 October 2016 11:17

To: Alex Turner; Caroline Carter

Cc: Suzanne Henderson; Cathy Tilbrook; Karen Hall

Subject: RE: Draft text for Portree fish farm response relating to ADDs and Inner Hebrides and the Minches cSAC

Hi Alex,

Well done. I think this looks good and don't have further comments on your draft text. Do we want to suggest that these measures should be included in an EMP or are we happy to leave that up to THC to decide? There's still some

difficult questions to answer - not least the fact that we are saying disturbance is likely (but in terms of CO not significant) so technically it would follow that EPS appraisal / licence would be required too. Is this something we should flag in the response? Or at least that it should be considered / discussed with MS-LOT (which will ultimately come back to us). Also, I'm still aware that this will open the door to ADD use (in line with the mitigation we suggest in this response) across the SAC, in areas we have said no to them before we had the SAC, as well as more widely in other wider seas areas we have advised against previously, though we will just have to deal with this issue as and when it arises. I think we need to progress EPS licencing discussions with MS-LOT as a matter of high priority as this has definitely forced the issue of EPS licensing for aquaculture.

Happy to discuss further.

Liam

-----Original Message-----

From: Alex Turner

Sent: 04 October 2016 17:36

To: Liam Wright; Caroline Carter

Cc: Suzanne Henderson; Cathy Tilbrook; Karen Hall

Subject: Draft text for Portree fish farm response relating to ADDs and Inner Hebrides and the Minches cSAC

Importance: High

Liam and Caroline

Following discussions with Cathy and George Hogg I have drafted the attached text to support a conditioned objection. Please could you provide comment on whether you think it is appropriate in the next couple of days. I need to get the response to George by Friday at the latest.

I also attach the link to the (very draft) HRA, mainly because it summarises the proposals (the assessment of impacts is incomplete).

Many thanks

Alex

Open in Navigator

Double click on the attachment

Open in Your Browser

NATURA APPRAISAL PROFORMA - Portree FF - 9 September 2016

Latest: <https://erdms.snh.gov.uk/id:A2102461/document/versions/latest>

Published: <https://erdms.snh.gov.uk/id:A2102461/document/versions/published>

Draft text options for Portree fish farm response relating to ADDs and Inner Hebrides and the Minches cSAC - 3 October 2016

Latest: <https://erdms.snh.gov.uk/id:A2102462/document/versions/latest>

Published: <https://erdms.snh.gov.uk/id:A2102462/document/versions/published>

**From:** Karen Hall  
**Sent:** 28 October 2016 11:38  
**To:** Suzanne Henderson; Cathy Tilbrook; Caroline Carter; Liam Wright; Nathan Mclaughlan; Kate Thompson; Donna Yule  
**Cc:** George Lees; Jane Dodd  
**Subject:** RE: EPS and ADD use at fish farms meeting

All

Related to ongoing discussions: Nathan (with his licensing hat on) has had a query from [REDACTED] at Scottish Seafarms ( we think she is based in Orkney?) about undertaking some research on ADDs by trialling different frequencies and what they need to supply for an EPS license. We are not sure if this is linked to the previous/ongoing study, the location of the trial or anything else. Nathan is going back to Kirsty to request more details and will pass them on in due course.

Donna/Kate – I don't suppose you know anything further about what is planned?

Karen

**From:** Kate Thompson  
**Sent:** 28 October 2016 11:48  
**To:** Karen Hall  
**Cc:** Suzanne Henderson; Caroline Carter; Donna Yule; Nathan Mclaughlan  
**Subject:** RE: EPS and ADD use at fish farms meeting

Hi Karen,

Donna has been dealing with pre-app on this and has had some discussions with Suz and Caroline; given Caroline's involvement to date she may be able to assist licensing team in considering this one. My understanding is that they were proposing trials at a site near Shapinsay and another one in Scapa Flow, which would potentially be more challenging to licence.

Donna doesn't work Fridays but will be back in on Monday so should be able to give Nathan more information then.

Cheers

Kate

Other emails included follow up to an ADD Best Practice meeting in Oban in December 2016  
:

**From:** [REDACTED]@scottishsalmon.co.uk]  
**Sent:** 10 January 2017 12:43  
**To:** Suzanne Henderson; Liam Wright; Caroline Carter  
**Cc:** [REDACTED]@scottishseafarms.com); [REDACTED]  
**Subject:** Follow up: ADD workshop

Dear Suz, Liam and Caroline,

Attached are some brief notes and actions from the meeting we held in Oban on the 13th December. Hopefully they are fairly self-explanatory. One of the actions was for SNH to provide some posters / fliers to raise awareness. Caroline, is this something that could be done fairly promptly? One of our member companies is undertaking an event with their farm managers and it would be an ideal opportunity to raise awareness with them about underwater noise. Let me know what sort of timescales are involved, i.e. whether it's a case of distributing something or starting from scratch with design and print.

Best Regards

[REDACTED]  
Scottish Salmon Producers' Organisation

Tel: [REDACTED]  
Mb: [REDACTED]  
Email: [REDACTED]@scottishsalmon.co.uk

**From:** Liam Wright  
**Sent:** 16 January 2017 12:11  
**To:** Caroline Carter; Suzanne Henderson; Cathy Tilbrook  
**Subject:** FW: Follow up: ADD workshop

Hi all,

We have some actions from the recent ADD BP meeting we had in Oban. I have put suggested names against each but happy to change as required. The most pressing action appears to be the awareness raising material. Caroline, just wondered what your thoughts are on us pulling something together for this? Do we have any existing materials that could be used, or tweaked and then used? Is this something we could do ourselves or do you think we need to involve our comm's people too?

SNH actions:

ACTION: Two masters projects on ADD noise surveys have been undertaken. SNH to distribute these to the group when they are published. – Caroline

ACTION: SNH to interrogate seal licence data from MS and identify gaps. – All (Liam undertake initial filter and circulate spreadsheet)

ACTION: SNH to develop awareness raising information / poster for industry to distribute to all farms - Caroline if required with help from Liam and Comm's?

ACTION: SNH to initiate discussions with Freedom Foods – Cathy / Caroline via SASWAG / freedom foods review [REDACTED]?

Though it's not in the minutes I also recall us saying we would consider our position on the sites on the east coast of the OH. These sites are outside the boundary of the SAC but will have connectivity. It would be good to agree a position on how we consider these sites. Perhaps we could discuss this tomorrow?

**From:** Liam Wright  
**Sent:** 25 January 2017 17:04  
**To:** Caroline Carter; Suzanne Henderson; Cathy Tilbrook  
**Subject:** RE: Follow up: ADD workshop

Hi Caroline,

Just a quick email to let you know that I had a chat with Jim Jeffries about the possibility of producing some awareness raising material for industry. He was very positive and thought, given the very defined scope, that there would be a good chance that our internal designers would be able to turn something round in-house relatively quickly (based on the assumption it would be something along the lines of an A4 flier) without us needing to bid for their time. Jim is going to speak to Alison Herman who manages our design team next week, she should hopefully be able to confirm this will be ok.

We need to gather some images (Jim thought it would be best to keep the images simple but strong!) and pull together a few bullet points on the info we want to convey. He thought we should try and keep it as simple and non-scientific as possible, given the target audience is going to be farm managers.

Might be easiest for us to have a quick chat on what sort of info we want to convey and think about how to pull it all together in a form that will fit on an A4 flier!

**From:** Caroline Carter  
**Sent:** 25 January 2017 17:36  
**To:** Liam Wright; Suzanne Henderson; Cathy Tilbrook  
**Subject:** RE: Follow up: ADD workshop

Thanks Liam,

I have already made a start on thinking about what should be included for this purpose, and I agree that it should not be scientific in style. It's a big technical subject, so I have already put some thought into how to present this to a lay audience. We will need to be careful with the images, many that are available may have copywrite, I may be able to use some from my previous presentations, but I think I may need to put some together myself as a lot will be too technical. Having said that I would not want to make it too simple.

I'm on it - I don't think this will take me too long, but I just need some concerted time to consider it fully. My plan was once I had ideas together to then circulate for us to discuss, and at that point look at the form it should take.

I was speaking to [REDACTED] the other day (he rang me re killer whale sound deterrent) and we touched upon this material. When we spoke about this at the meeting we were talking more about a poster than a flyer. This all came about from a request for some help re images from ourselves to help the companies themselves raise awareness. [REDACTED] suggested something that could be in digital form for them to either project or print out as needed. They were not looking for a corporate type flyer – but is this how we now want to progress this?

Caroline

**From:** Caroline Carter  
**Sent:** 30 January 2017 10:55  
**To:** Liam Wright; Suzanne Henderson; Cathy Tilbrook  
**Cc:** George Lees  
**Subject:** RE: Follow up: ADD workshop

Hi all,

This is where I've got to on this. It's A3 because I thought that would be printable as well as projectable. I've generated all the diagrams using word to avoid any copy write issues and I've added a bit of text in bullet point and non-science wording. I'm happy to hear what you think. I can change any or all of it - it's not set in stone - but this is kinda what I had in mind. Depending on your thoughts, we could also send it on to the group for their input?

Thanks,  
Caroline

**From:** Suzanne Henderson  
**Sent:** 30 January 2017 16:57  
**To:** Caroline Carter; Liam Wright; Cathy Tilbrook  
**Cc:** George Lees  
**Subject:** RE: Follow up: ADD workshop

Hi Caroline,

Its looking good so far and know it's a balance on having too much info and not enough.....

A few quick comments –

2. I find the diagram with source and distance text a bit difficult to read – sorry – might be something to do with original quality?

4. I know we want to keep this non- technical but think we need some reference to legislation/importance of existing protection?

Also in the text – might be worth a brackets after the text *disturbance* and say something like *altered normal behaviour*.... or something...?

6. Ultimate aim – do we want to emphasise here anything about strategic initiatives (MS sign up to things such as MSFD without actually mentioning the detail) or leave it as an SNH goal to ensure regulators and others don't fall foul of legislation? We need to persuade them its their ultimate aim and to understand the strength of the reasons why?

Do we need a few references? I know this is for site managers, but some of them are involved in research and may be keen to follow up some of the information?

Maybe one to run past Jamie....? I just worry they might think its all just SNH opinion- when we know there is published research.

I think we should brand it in some way – so its clear we have produced it - although hesitant as not sure we need publishing team involved, as its shaping up well so far.

Other emails also included a discussion on ADDs in Orkney by Scottish Sea Farms:

**From:** [REDACTED] [@scottishseafarms.com](mailto:[REDACTED]@scottishseafarms.com)  
**Sent:** 15 September 2016 16:05  
**To:** Donna Yule  
**Cc:** Kirsty Brown; Suzanne Henderson  
**Subject:** Low Frequency ADD's

Hi Donna

I was hoping that you could help me out. We were hoping to trial a new low frequency (Cetacean Friendly) Anti Deterrent Device at two sites in Orkney this winter. The sites we had in mind were Toyness and Wyre, I'd appreciate it if you could advise on how we would get the appropriate permission to install the systems.

Further details on the proposed system is attached, the manufacturer claims that they have permission from SNH (Via Suzanne Henderson) to deploy these ADD's in protected areas. However, I thought I'd double check locally that this was indeed the case before I took the project any further.

Look forward to hearing back in due course.

Regards

████████████████████ - Orkney | Scottish Sea Farms Limited

Regional Office, Scapa, St Ola, Kirkwall, ORKNEY ISLANDS, KW15 1SD

Tel ██████████ Mobile ██████████

[www.scottishseafarms.com](http://www.scottishseafarms.com) | [www.facebook.com/scottishseafarms](https://www.facebook.com/scottishseafarms) | [www.twitter.com/scotseafarms](https://www.twitter.com/scotseafarms)



**THE CROWN**  
 **ESTATE** *Best Aquaculture Company of 2015*

**From:** Suzanne Henderson  
**Sent:** 15 September 2016 16:56  
**To:** Donna Yule; Liam Wright  
**Subject:** RE: Low Frequency ADD's

Hi

To be aware - I have not given any such permission!

Not sure if this has been through licensing though and maybe Caroline was involved?

██████████ from SSF did speak to me about wanting to trial using ADDs though in Scapa – and wondered who should they contact - think I relayed this to you both, so maybe related?

Suz

Direct Dial: 01463 725238  
Email: [Suzanne.henderson@snh.gov.uk](mailto:Suzanne.henderson@snh.gov.uk)

**From:** Liam Wright  
**Sent:** 15 September 2016 17:28  
**To:** Donna Yule; Suzanne Henderson  
**Subject:** RE: Low Frequency ADD's

Also note that in the PDF they provided the manufacturer states:

The system is now being evaluated by academics on a new SARF call. SNH has also given Ace Aquatec special dispensation to use the system on sites that would otherwise be banned from using acoustic deterrents because of the low impact on cetaceans as a result of its generating sound outside the hearing threshold of porpoises.

**OTHER DEVELOPMENTS:**

Ace Aquatec has developed this system in conversation with Freedom Foods and the SNH. It was funded with SMART funding in 2012 and has now been brought to market.

Other new systems developed, trialled and now in operation include electric netting for the improved deterrence of seals that may be suffering natural deafness. This system deploys electrodes around a salmon pen and the deterrent noise is paired with an electric shock to create conditioning in the seal to avoid the seal pens. At trials at SSF Shapinsay and Cooke on Hoy the system has proven 100% effective at eliminating seal mortalities.

**From:** Donna Yule  
**Sent:** 19 September 2016 09:11  
**To:** Liam Wright; Suzanne Henderson  
**Subject:** RE: Low Frequency ADD's

Very interesting and quite worrying! To my knowledge, there has been no testing in Orkney and that no EPS licences had been issued. I have just had a quick chat with Kate to see if she was aware of anything while I was off, I will forward the emails she has sent me.

Suz, are you able to shed any light on this testing and the claims made in the product pdf?

Thanks  
Donna

**Donna Yule**  
Operations Officer, Orkney

Scottish Natural Heritage | 54-56 Junction Road | Kirkwall | Orkney | KW15 1AW  
Direct dial: 01856 886157  
Extension: 7206157  
e-mail: [Donna.yule@snh.gov.uk](mailto:Donna.yule@snh.gov.uk)

The document also included details of a liaison meeting between SNH and the salmon farming industry in May 2016:



**Industry / SNH Liaison Meeting**  
**10<sup>th</sup> May 2016**

#### 4. Harbour Porpoise SAC Update

4.1 Consultation - A brief update on the consultation process was provided by SNH. Final date for representations was 18<sup>th</sup> May. The key concern for industry relates to management measures in relation to the use of ADDs within and close to site boundary.

4.2 ADDs – SNH provided a presentation relating to modelling work used to help understand the scale of underwater noise emanating from ADDs used within the site boundary. SNH highlighted that while it is possible to model sound propagation it is difficult to predict what effect that sound will have on cetaceans as behavioural response is highly context driven. In-house modelling indicated that most ADDs in current use could cause disturbance up to 2.5km from source (other literature suggests potentially greater distances for harbour porpoise). The exception related to the Teracos model which has a reduced possible disturbance range of only 50-100m from source, primarily due to the lower sound output level. Other variables will also influence sound propagation and subsequent risk of disturbance but are not straightforward to model and will therefore have to be taken in to account on a site-by-site basis (such as shadowing effect of islands etc).

Initial thoughts are that ADDs will not be a major concern for most of the SAC (the exception being areas which are identified as high cumulative risk / narrow straits where there may be barriers to passage). However, it is likely that a more formal arrangement will be required, in terms of how ADDs are used, to ensure potential risks are minimised.

Concerns were raised by industry that the SAC status would result in more sites not being allowed to use ADDs without formal permission to do so (i.e. more frequent implementation planning conditions). SNH indicated that this may not necessarily be the case. However,

there would be changes in terms of the assessment process that is required (new sites inside the SAC will require Habitats Regulation Appraisal and possible Appropriate Assessment prior to planning consent being granted).

Industry suggested developing best practice measure by focusing closely on 2 or 3 higher cumulative risk areas. The measures developed in these areas could subsequently be applied more widely across the SAC, if required.

Key areas of higher cumulative risk / barrier effects were deemed to be the Sound of Mull, Lismore, west of Mull and the Sound of Raasay but it may also be necessary to think about other areas in due course.

**AP1 – Establish a ‘working group’ with SNH, MS, and operators in these key areas to develop best practice guidelines to apply across the site.**

It was highlighted by industry that the requirements of some accreditation schemes such as freedom foods require operators to undertake certain management measures in order to retain accreditation. Concerns were raised that if a seal attack takes place and ADDs were not used as a form of defence that this could risk accreditation being lost.

Retaining Freedom Foods accreditation is deemed by industry to be a major barrier in reducing ADD use.

**AP 2 - SNH to seek discussions with Freedom Foods regarding ADD use inside the Inner Hebrides and the Minches pSAC.**

Similar concerns were raised regarding the legal responsibility that operators have to protect the welfare of their stock; ADDs are deemed by industry as an essential element of this protection.

Further work is required to help understand why certain ADDs work in some locations but not in others. A suggestion was made that this may be something that could be pursued through SARF or MASTs.

It was noted that it will be important to understand how industry uses ADDs and specifically to clarify what is meant by certain terms such as 'continuous use' and 'intermittent use' as interpretation of these terms will differ between farm managers.

A suggestion was made that the wording of the annual seal licensing survey could be amended to clarify these terms and subsequently capture more detail which could be used to help guide management measures.

**AP3 – SNH / MS to discuss amended wording of annual SOI survey to capture the information required to guide further management / best practice development. SSPO to comment on any proposed changes.**

**4.3 EPS Licencing** – Industry questioned whether the designation of the SAC would have an influence on the requirement for EPS licencing.

It was pointed out by SNH that there is currently a discrepancy between how EPS licencing is applied to aquaculture when compared to other industries, such as marine renewables. Though this issue does need to be addressed to ensure a joined up national approach is being taken to the use of ADDs in relation to EPS licencing, it is not an issue which will be influenced by the designation of the SAC.

Industry expressed concerns over confusion in the way that EPS licencing is currently handled.

SNH noted these concerns and pointed out that in fact they are only obliged to provide advice to MS-LOT on whether the favourable conservation status of the EPS would be affected.

**AP4 – SNH and MS to further discuss the interplay between planning permission and EPS licencing and clarify the roles and responsibilities of SNH and MS-LOT**

Other emails included:

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**From:** Caroline Carter  
**Sent:** 24 March 2016 14:20  
**To:** Jane Dodd  
**Cc:** Liam Wright; Suzanne Henderson; Andrew Campbell  
**Subject:** RE: SSPO HP dSAC pre consultation discussions

Hi Jane,

I don't think we would be able to meaningfully model disturbance zones for harbour seals. The disturbance thresholds for cetaceans are tenuous enough as behavioural reactions are highly context driven and there is huge variability of observed responses event to the same stimulus.

The zones as modelled for HP use the only useable disturbance threshold published (dBht could offer a disturbance zone – but there are serious concerns with this methodology, it's also proprietary to Subacoustec so we would not be able to model this effectively). There is not the equivalent for seals for disturbance to continuous sounds specified in the literature (there is a threshold for impulsive sounds but this is related to sources such as pile driving or explosives).

The modelling I did was unweighted, it essentially takes the source level, subtracts the modelled propagation loss (PL) to estimate received levels at distance, the RL is then compared to the disturbance threshold to estimate a range. Unweighted - means there was no filter applied to account for differences in hearing abilities, but PL was modelled at 10kHz which is well within the hearing ability of both cetaceans and pinnipeds which would not be filtered out using weighting.

Southall et al (2007) is a key resource that we use for injury and disturbance and in this text, they state –

*“The effects of nonpulse exposures on pinnipeds are poorly understood”* (the nonpulse category includes ADDs)

*“...limited available data suggest exposures between 90 – 140 dB re 1µPa generally do not induce strong behavioural responses”*.

The threshold level used for the modelling I did was 120 dB re 1µPa. So we could infer that the disturbance zone for seals would be less than the 2.5km as modelled?? But I'm not sure we should put a number on this as the evidence is not there – and defining behavioural responses is really on shaky ground.

Sorry not to be more positive, please come back to me if you have any queries.

**From:** Suzanne Henderson  
**Sent:** 10 March 2016 16:16  
**To:** Caroline Carter; Cathy Tilbrook; Liam Wright; John Baxter  
**Cc:** Katie Gillham; George Lees  
**Subject:** SSPO HP SAC preconsultation meeting  
**When:** 16 March 2016 15:00-16:00 (UTC) Dublin, Edinburgh, Lisbon, London.  
**Where:** teleconference

Hello all, (cc Katie and George for info only) and John in case you are attending on the 17<sup>th</sup>!

I think we might need a quick catch up before the SSPO meeting on 17<sup>th</sup> next week, to agree on how to present the updated HP SAC information.

We will find out on Wednesday morning – on the specifics of what we can and can't say at the meeting, but I think the main discussion will be our actions from the last meeting.

Attached below are the last HP SAC ADD workshop notes, Caroline's draft internal note on acoustic disturbance zones from current ADDs, the latest MOP, and draft acoustic disturbance maps using buffers from Caroline's modelling. Note that the Terecos modelled buffer is so small you can't see it on the maps, so I have labelled these with a big cross. The maps should help discussions on cumulative/higher risk areas – so let me know what you think. I will try and map a wider area using the MS seal survey data which has ADD information – needing help with this so might not get this done by our meeting next week.

<< File: ADD workshop notes 25-08-15 - FINAL.obr >> << File: ADDs and Aquaculture\_DRAFT Internal note of acoustic disturbance zones\_CC 1-03-16.obr >> << File: Combined Reg 33 & MOP - version 3 - Inner Hebrides and the Minches pSAC - 23 February 2016.obr >>  
<< File: ADD use SSPO data w modelled buffer - North Minch.obr >> << File: ADD use SSPO data w modelled buffer - Southern Sea of Hebrides.obr >>

The action points from the last workshop are below with some of my comments.  
Is there anything else we can feed back for point 3?

**Action points:**

1. Salmon farming industry to provide information on ADD use to SNH (via SSPO, using the proforma provided) – provided by end of October 2015.
2. SNH to provide more information on the areas of "higher concern" within the respective dSAC's. Caroline to chat through the modelling approach and all caveats, and show maps produced (still working on this to discuss). Potential implications for SSPO members – MOP discussion- if appropriate?
3. SNH to investigate knowledge gaps surrounding porpoise behaviour within the dSAC's and consider options for research. SARF research proposal, anything else?
4. SNH to consider the potential for using cetacean observation information from farms – we suggested this as a MSc topic at MASTs/SNH research day which has attracted interest from a PhD student...
5. Future meetings: To be decided once the above action points are complete.

[Download SNH FOI 25 April 2017 document #1](#)

**Document #2:**

Documents disclosed included [a 7-page PDF](#):-

## MINUTES - SNH / MS DISCUSSION ON ADDs AND EPS : Tue 8 November 2016

11.30 – 15.30. Silvan House meeting room 2, Edinburgh

### Attendees:

SNH: Cathy Tilbrook (Chair); George Lees; Suz Henderson; Liam Wright; Caroline Carter; Karen Hall.

MS: [REDACTED] (t/c for part)

Apologies: [REDACTED] (all MS).

### Aims:

- To reach an agreed policy position on requirement for EPS licensing for use of ADDs in aquaculture.
- To discuss and agree approaches to monitoring and regulating the use of ADDs within the Inner Hebrides and the Minches cSAC.

### 1. Intro / context to ADD/EPS Issue

- CT explained context and objectives for meeting, including summary of previous (April 2015) meeting and recent developments such as harbour porpoise cSAC and aquaculture consents review. CT concluded that SNH recognises that it is for MS / SG to determine their approach on this issue, but that SNH requires a clear and formal policy statement that sets out the government position, especially where this seems to diverge from published guidance.
- CC delivered short presentation, providing background and recent research on the issue of ADDs and aquaculture, including:
  - o Diversity of applications for ADDs
  - o Maps illustrating the range of audibility of ADDs in NW Scotland, and increasing persistent detection over last decade
  - o Areas within cSAC which recent studies have identified as being ensonified
  - o Ranges of audibility of differing ADDs.

### 2. EPS Legislation and MS Marine EPS Guidance

- CT suggested it would help to re-visit the decision-making flowchart in the MS Marine EPS guidance and offered SNH's view on the likely responses to each question in turn:
  - o Q1 Are EPS likely to be present? => Yes.
  - o Q2 Are you planning an activity which could potentially cause injury or disturbance to marine EPS? => Yes (noting that the guidance itself indicates this, for ADDs).
  - o Q3 Can the impact be fully or partially mitigated? => potentially, there being various options here (eg see Annex 2). However, any such mitigation needs to be enforceable (eg via planning conditions) to ensure delivery.
  - o Q4. Will an offence be committed despite mitigation plans? Yes, in some cases – leading to requirement for EPS licence
- Q4 prompted [REDACTED] to outline recent legal advice received by MS on the definition of 'reckless'. The advice received was not definitive but, in case law, implied 'culpable indifference and blameless disregard'. Examples of recklessness in a driving context were also given. It was MS's opinion, on the basis of this advice that ADD use *by the aquaculture sector*, is not 'reckless', the intention of ADD use being different for aquaculture to that for other industries where ADDs may be applied to 'deliberately' scare / disturb EPS (cetaceans).

[Download SNH FOI 25 April 2017 document #2](#)

**Document #3:**

This [15-page PDF included](#) discussions relating to the [SASWG \(Salmon Aquaculture & Seals Working Group\)](#):

**From:** Cathy Tilbrook [<mailto:Cathy.Tilbrook@snh.gov.uk>]  
**Sent:** 03 November 2016 15:35  
**To:** [REDACTED]  
**Cc:** Caroline Carter; Suzanne Henderson; Liam Wright  
**Subject:** RE: SASWG 17 Meetings dates

Hi [REDACTED]

Is there a draft agenda and timings for SASWG yet? We would like to provide a quick verbal update on SNH discussions on ADD use with industry and others, but this would not be a formal presentation due to the difficulties of joining remotely. I note your recent email re linking to the meeting by laptop / webcam and will need to check with our IT support whether we have the technology to enable this (back-up plan might be via a telephone link!). I'm afraid I can't join you on that date but (depending on agenda), we will confirm who will join you.

Thanks, Cathy

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

# Salmon Aquaculture and Seal Working Group Meeting 17

11<sup>th</sup> November 2016

10:30-15:00\*

RSPCA Wilberforce Road Horsham

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## Attendees:

### Confirmed attendees:

1. [REDACTED]
2. [REDACTED]
3. [REDACTED]
4. Cathy Tilbrook + n (Skype?)
5. [REDACTED]
6. [REDACTED]
7. [REDACTED] (Skype?)
8. [REDACTED]
9. [REDACTED]
10. [REDACTED]
11. [REDACTED] (Skype)
12. [REDACTED] (?)
13. [REDACTED] (late)
14. [REDACTED]
15. [REDACTED]

### Apologies

1. [REDACTED] - Marine Scotland
2. [REDACTED] - Crown Estates
3. [REDACTED]
4. SNH ??

1. **Opening matters (standing items):**
  - a. Introductions and Housekeeping
  - b. Minutes from Meeting 15
  - c. Previous Actions.
2. **Latest SG Seal Shooting Figures**  
 ??? who will table???
3. **Update from Marine Harvest (█)**  
 Anything to report ?? Latest shooting figures and salmon losses –  
 █ to supply
4. **Update from FF/RSPCA (█)**  
 Post mortem investigations

*(Lunch provided by RSPCA - around 1pm*

5. **Seal trapping for translocation – █**
6. **Welfare implications of seal shooting (█)**
7. **Any Other Business**
- 9 **Next meeting**

Actions from last meeting August 2015

**Draft Consolidated Action Points from SASWG 16**

1. **Action █ to find regional figures for PBR calculations and circulate to group. DONE**
2. **Action █ to check dates the ADD system was changed at Sconser in 2015– did seal depredation cease once a new ADD system was installed – or before, or after? ??**
3. **Action █ to circulate PDF of MHS presentation DONE (I have not circulated yet!)**
4. **Action █ to take suggestions for further analysis of shooting incidents back to MHS (Any?)**
5. **Action █ to organise meeting with FF members to address seal concerns ???**
6. **Action █ to circulate a copy of presentation, report and link to the videos DONE**
7. **Action █ to circulate his own timeline on startle response device ??**
8. **Action █ to make enquires about state of developments on the startle device within the University of St Andrews - not so easy.....**
9. **Action █ to approach Knox nets and/or other net manufacturers to try to build on previous studies examining net deformation by seals in captivity ...**
10. **Action █ to consult with group on suitable dates later, and with █ about venue availability  
 DONE**

**From:** [REDACTED]@st-andrews.ac.uk  
**Sent:** 29 September 2016 08:43  
**To:** Cathy Tilbrook  
**Subject:** RE: SASWG 17 Meetings dates

Hi Cathy – I have assumed Caroline, Suzanne and yourself will be unable to attend as per your email below. I think there is an option for having people connect remotely as there is a big screen I am told in the room, though it may involve using skype.  
Is that okay and how many of you would be likely to want to join?  
I appreciate this may be hard without an agenda – I will endeavour to get that sorted asap – is there anything you might be able to contribute?  
I gather SNH has done some work on ADDS and potential impacts on porpoises? Are there other ongoing projects of relevance to SASWG?

Best wishes,

[REDACTED]

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

**From:** Cathy Tilbrook [mailto:Cathy.Tilbrook@snh.gov.uk]  
**Sent:** 20 September 2016 09:52  
**To:** [REDACTED] International Animal Rescue; [REDACTED]@thecrownestate.co.uk); [REDACTED]@campaign-whale.org); Caroline Carter; [REDACTED] Marine Scotland; [REDACTED]@rspca.org.uk); [REDACTED] SSPO; [REDACTED]@waitrose.co.uk); [REDACTED]

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[REDACTED]@freedomfood.co.uk); [REDACTED]@bornfree.org.uk); [REDACTED] Suzanne Henderson  
**Subject:** RE: SASWG 17 Meetings dates

Hi [REDACTED]

I assume RSPCA HQ is in London? I'm afraid it's highly unlikely we'd be able to send an SNH representative in person due to current travel budget constraints. Would there be a v/c or t/c option?

Thanks, Cathy

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

Direct tel: 01738 458620

**From:** Liam Wright  
**Sent:** 29 March 2016 10:11  
**To:** Cathy Tilbrook; Suzanne Henderson; Jane Dodd; Caroline Carter  
**Subject:** RE: SASWG No 16

Thanks Cathy. I've never heard of Pulcea Ltd so it would be interesting to have someone present to hear what they have to say. I see their company is based in Inverness so I'm quite surprised I haven't heard of them before now – maybe others have?

Cheers  
Liam

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**Salmon Aquaculture and Seal Working Group – Meeting 16**  
**6<sup>th</sup> April 2016**  
**Marine Harvest – Rosyth**

**Meeting notes**

Drafted by Caroline Carter

Associated documents:

Email ([A1933802](#))  
Analysis of seal return shooting figures ([A1933805](#))  
Research themes and discussion points ([A1933804](#))  
SASWG meeting 16 draft agenda ([A1933803](#))

These notes are not the meeting minutes; minutes were taken down by [REDACTED] and will follow. These are my notes from the meeting for our info.

RSPCA/SMRU have approached Marine Scotland to discuss the definition of 'last resort'. MS are open to this discussion but a meeting has not yet been arranged.

[REDACTED] presented his review '*Analysis of seal licence returns shooting figures for 2015*'.

- o Data was obtained from Marine Scotland ([REDACTED] sent links).
- o Overall reduction in seals being shot.
- o Numbers appear to be plateauing. There was some discussion as to whether it was realistic to expect a continued reduction in seal shot and the question was raised as to what the next step might be if there are animals that cannot be mitigated.
- o Question was raised as to whether anyone has ever looked at all available mitigation in comparison to numbers of seals shot?
  - SSPO has tried to look at this but have found it difficult to disentangle due to a number of different variables between sites.
- o Comment was made that the industry have aspirations for growth and therefore the numbers may not necessary be expected to reduce.
- o Suggestion was made that instead of using the metric of numbers of individuals shot it might be more informative if we looked at % of population shot.
  - [REDACTED] cautioned the use of % of population as this may not relate to the number of problem seals.



FF/RSPCA (in conjunction with SSPO) are planning a meeting involving industry and predator control manufacturers (nets and ADDs). The aim is to bring together a mix of personnel of both workers and managers and have a 'sales pitch' from the manufacturers with the intention of proving the efficacy of their systems.

- Meeting to be linked with a technical working group for each of the RSPCA standards.
- Also a separate meeting with RSPCA trustees to communicate understanding and awareness of this issue.
- FF/RSPCA have a 72 hour reporting system where a report must be sent to them within 72 hours of a seal being shot. This enables them to investigate the shooting to make sure that all correct procedures were followed.
  - Currently data is just being collated, but there may be option for this to be analysed at some point in the future.

Presentation by Pulcea – [REDACTED]

- Pulcea is a partnership organisation with Score Group Plc (branches in 30 countries worldwide). Score group is largely an engineering company and mainly involved with the oil and gas industry.
- Proposed device is at the prototype stage – the presentation gave very little information as to how the device actually works.
- In conversation with the 'inventor' at lunch it seems that the intention is to generate an asymmetric pulse with similar amplitude (volume) to existing ADDs. He suggested that the benefit of an asymmetric pulse is that it should not interact with following pulses (constructive and destructive interactions as found in existing ADDs) which means essentially means that it should not propagate as far into open water. It would be a physically longer pulse than other ADDs, with a longer inter-pulse time, and therefore fewer pulses emitted in comparison to traditional devices. The intention here is to reduce the noise pollution into the environment.
- Low frequency (but they did not state at what frequency).
- They advertised this as species specific – but it can't be and on challenge they admitted that it would 'work' on any animal within the range, so it can't be considered species specific based.
- Idea is not to target hearing thresholds, but to generate a shock wave (but not one powerful enough to injure the target).
- They intend the device to exclude target animals within a 500m range.
- They are calling it a 'seal persuader'.
- No technical detail presented and no evidence as yet as to whether this would work.

Presentation by SMRU

- SARF 97- 'Plugging the gaps – Improving our knowledge of how predators impact salmon farms'
  - Tested how seals eat fish through netting using captive trained seals at their pool facility in St Andrews.

- All seals tested found it difficult to feed on salmon through the net. They had to be trained using small pieces of salmon and worked up to trying to take whole fish.
- Stereotypical gashes and abdominal bite marks were not observed in these trials and are probably indicative of fish being live at the point of attach. Only dead fish were able to be used in this experiment.
- Seals exhibited great patience in waiting for the fish to be close enough to the net in order for them to take it.
- Seals could depress a tensioned net by ~30cm in order to reach the fish. The net tested was nylon which is more stretchy in comparison to newer netting materials.
- Seals would hold station by the net using their hind flippers, with their nose on (or close to) the net, and then use an explosive push forward to move the net to reach the fish using their neck muscles.
- Also deployed an underwater camera at four sites.
  - No seals were observed in these locations.
  - Recording period of ~90 days.
- Report should be available on the SARF website after 8<sup>th</sup> April and the intention was to include links to video clips of the captive seal feeding techniques, but they were not sure whether this would be direct links or links to YouTube.
- It was stressed that more work needs to be done to assess this in the 'real world' situation.
- Study into sound propagation around fish farms.
  - Used multiple recorders situated around a fish farm cage approx. 10m away from each transducer.
  - Scenario recorded where one of the transducers was not operating at the same level as the others (it was much quieter).
  - However on analysis the recordings could not differentiate any difference in sound level (this would therefore not be a useable technique to assess ADD operation in the field).
  - They also tested the received levels around a steel square fish farm pen where only one ADD was being used at one corner. Mapping the output suggests that the cage does shadow the acoustic output and they noted a 3dB reduction in the shadow zone.

Meeting minutes taken by [REDACTED] to follow.

No date was given for the following meeting – but it was suggested that it should be held south of the border next time. A further suggestion was made for two locations connected by VC.

**Comment [CC1]:** What this suggests to me is that numerous ADDs deployed around a fish farm cage does not necessarily increase the noise levels by much more than would be observed by one ADD, but will increase the time that the noise is emitted over – i.e. makes it continuous rather than having gaps between the pulses.

**Comment [CC2]:** This could make a difference in the seal approaching the net from the 'quieter' direction.

**From:** Cathy Tilbrook  
**Sent:** 29 March 2016 10:02  
**To:** Suzanne Henderson; Jane Dodd; Liam Wright; Caroline Carter  
**Subject:** FW: SASWG No 16

Hi all

Please see draft agenda (pasted below) for SASWG meeting next Wed in Rosyth (Marine Harvest). There's not much detail yet, but note the presentation by new ADD company and the report on sound field mapping. I am available that day but wondered if one of you might be interested to attend instead (e.g. Caroline's input to sound mapping might be useful to the group, but would then need briefing from others re any points we want to raise on seal licensing issues?). Happy to discuss. Thanks, Cathy

PS Note that one [REDACTED] is attending for RSPCA!

**Draft Agenda to include**

**1. Freedom Food –**

- progress on liaison/discussions with members
- improving information gathering on seal incidents

**2. Pulcea – “ADD's - can we learn from the lessons of the past?”**

**3. Marine Harvest – results of investigations into factors underlying seal shooting in 2015**

**4. SMRU**

- Report on sound field mapping of a site with ADDs and ongoing seal depredation
- Report on captive seal behaviour with nets & salmon, & tests on netting properties

[Download SNH FOI 25 April 2017 document #3](#)

**Document #4:**

The [23-page PDF included:](#)

From [REDACTED]  
To: SASWG Members

Please find my analysis for SASWG 17 of the Seal Licence figures provided by Marine Scotland 2011-15 inclusive, and my predictions for 2016:

1. Total Seals reported shot 2011-15 = 1,531
  - **Total seals shot: 1,245 Grey and 286 common**
  - **Average number shot is 306 seals per year**
  
2. Reported shootings fell from 461 in 2011 to 160 in 2015
  - **Overall reduction in seals shot 2011-15 is 65%**
  
3. Total licences granted: 66 in 2011 to 53\* in 2015  
\*(incl 2 pending in 2015 ( POSD))
  - **The overall reduction in licences granted 2011-15 is 20%**

2011: 66 licences: 32 PHW and 34 PSD  
2015: 53 licences: 29 PHW and 24 PSD

  - **Reduction in licences: 9% for POHW and 29% for PSD**

4. Reductions in grey and common shootings are:

2011: 368 grey and 93 common (461)

2015: 118 grey and 42 common (160)

- **Reduction in grey seals shot is 68%**
- **Reduction in common seals shot is 64%**

5. In 2011, 241 (52%) seals were shot across 235 fish-farms  
In 2011, 218 (48%) seals shot over 40 fisheries and netting stations.

In 2015, 79 (49%) were shot across 214 fish farms

In 2015, 81 (51%) were shot at over 40 fisheries and netting stations

6. % seals shot by aquaculture by FF accredited farms

- **In 2011: c 60+ seals\* c26%**
- **In 2015: 41 seals 52%**

\*(no definite figure provided)

7. During 2015 the greater number of seals shot were by:

<b>1. Moray Firth Management Group:</b>	<b>28</b>
<b>2. Usan Fisheries (Scottish Wild Salmon Company):</b>	<b>22</b>
<b>3. Marine Harvest (FF accredited)</b>	<b>18</b>
<b>4. Scottish Seafarms: (FF accredited)</b>	<b>15</b>
<b>5. Scottish Salmon Company: (supply Waitrose)</b>	<b>11</b>

8. In 2011, 32% of licence holders shot no seals  
In 2015, 44% of licence holders shot no seals.

- **Number of licence holders not shooting seals has risen from 32% - 44%**

9. Total shooting by area and species 2011-15, with % increase or decrease:

<u>Area</u>	<u>Species</u>	<u>%+-</u>
<b>East Coast:</b>	<b>133 grey + 0 common</b>	<b>(-87%)</b>
<b>Moray Firth:</b>	<b>159 grey + 30 common</b>	<b>(+68%)</b>
<b>Orkney and North Coast:</b>	<b>497 grey + 9 common</b>	<b>(-77%)</b>
<b>Shetland:</b>	<b>234 grey + 7 common</b>	<b>(-86%)</b>
<b>SW Scotland:</b>	<b>9 grey + 23 common</b>	<b>(-91%)</b>
<b>W Scotland:</b>	<b>115 grey + 201 common</b>	<b>(-42%)</b>
<b>W Isles:</b>	<b>98 grey + 16 common</b>	<b>(-67%)</b>

10. Shooting per area and species comparison 2011 to 2015:

	<u>2011</u>	-	<u>2015</u>
<b>East Coast:</b>	<b>46 grey + 0 common</b>	-	<b>6 grey + 0 common</b>
<b>Moray Firth:</b>	<b>16 grey + 6 common</b>	-	<b>32 grey + 5 common</b>
<b>Orkney/N.Coast:</b>	<b>167 grey + 4 common</b>	-	<b>39 grey + 0 common</b>
<b>Shetland:</b>	<b>69 grey + 2 common</b>	-	<b>10 grey + 0 common</b>
<b>SW Scotland:</b>	<b>4 grey + 12 common</b>	-	<b>1 grey + 0 common</b>
<b>W.Scotland:</b>	<b>36 grey + 58 common</b>	-	<b>18 grey + 36 common</b>
<b>W Isles:</b>	<b>28 grey + 11 common</b>	-	<b>12 grey + 1 common</b>

11. Shooting per area as % of total 2011-15 (1,531) and 2015 (160):

	<u>2011-15</u>	<u>2015</u>
<b>Orkney/ N.Coast:</b>	<b>33%</b>	<b>24%</b>
<b>W Scotland:</b>	<b>21%</b>	<b>34% (+)</b>
<b>Shetland:</b>	<b>16%</b>	<b>6%</b>
<b>Moray Firth:</b>	<b>12%</b>	<b>23% (+)</b>
<b>W Isles:</b>	<b>7%</b>	<b>8% (+)</b>
<b>E Coast</b>	<b>9%</b>	<b>4%</b>
<b>SW Scotland</b>	<b>2%</b>	<b>0.6%</b>

12. In April 2016, a three-year coastal netting ban was introduced to protect wild salmon. This will help protect wild stocks, but should also further significantly reduce shooting of seals. It will also focus more attention on aquaculture which was responsible for 49% of seals shot in 2015.

1. The biggest individual seal shooting companies in 2015 were both RSPCA - FF accredited salmon producers that supply both Sainsbury's and Waitrose
2. In 2014, (number to be provided by FF) almost 70% of seals shot by aquaculture were at FF accredited sites.

3. In 2015, 41 seals were reported shot to FF, 52% of those reported shot by aquaculture overall.
4. It would be a useful to compare the numbers reported shot on licence returns to Marine Scotland with the 41 reported to FF and SASWG members for 2015 to see if they correlate.

13. 2016 analysis 1<sup>st</sup> and 2<sup>nd</sup> quarters:

46 Seal Licences were granted in 2016: 28 for Protection of Health and Welfare (PHW) from 29 in 2015 (-3%), 18 for Prevention of Serious Damage (PSD) from 24 in 2015 (-25%)

- **46 Seal Licences were granted in 2016 (53 in 2015) a reduction of 13%**
- **PHW represents 63% of all licences granted in 2016**
- **PHW represented 48% of all licences granted in 2011**
- **PSD represents 37% of all licences granted in 2016**
- **PSD represented 52% of all licences granted in 2011**

Seal Licences for aquaculture\*\*:

29 licences for PHW + 1 for PSD in 2015,  
28 licences for PHW + 1 for PSD in 2016

*(\*\*across 214 fish farms both years)*

- **PHW now represents 97% of all licences granted for aquaculture in 2016, only 3% for PSD**
- **PHW represented 48% of all licences granted for aquaculture in 2011, 52% for PSD**

Seals reported shot 1<sup>st</sup> and 2<sup>nd</sup> quarter of 2016:

- **36 grey + 7 common in 2016 = 43**
- **86 grey + 24 common in 2015 = 110**
- **This represents a reduction of 61% on 2015**

Prediction for 2016, total using quarters 3/4 (40 grey and 18 common) from 2015 as guide:

- **Predicted total for 2016 = 101 seals shot**
- **If correct, this would represent a 72% reduction on 2011 figures, but reduction may be greater still due to netting ban.**

### **Analysis of Seal Licence return shooting figures for 2015.**

According to Scottish Government figures a total of 160 seals were shot under licence in 2015: 118 grey and 42 common or harbour seals

The new figures represent a 22% reduction from the number of seals shot in 2014 (205) and a 67% reduction on those shot in 2011 (459) when the scheme began. They also reveal a total of 1,531 seals have been shot during the first five years of the Seal Licence scheme, an average of 306 seals each year.

Highlights of the figures show:

- **reported shootings by aquaculture have declined from 241 in 2011 to 79 in 2015, a reduction of 67%**
- **reported shootings by fisheries and netting companies have declined from 218 in 2011 to 81 in 2015, an overall reduction of 63%.**

The new figures do not show any reduction in shooting by the fish-farming sector in the past two years, 2014 and 2015, when 80 and 79 seals were reported shot respectively.

During 2015 greatest numbers of seals shot were:

- 1. Moray Firth Management Group: 28 seals (Sports fishing)**
- 2. Usan Fisheries (Scottish Wild Salmon Company) of Montrose: 22 seals (Salmon netting)**
- 3. Marine Harvest: 17 seals Fish-farmers (Freedom Food label)**
- 4. Scottish Seafarms: 15 seals Fish-farmers (Freedom Food label)**
- 5. The Scottish Salmon Company: 11 seals (Waitrose)**

In April 2016, a three-year coastal netting ban will be introduced to protect wild salmon. This will help protect wild stocks of salmon and should lead to a further significant fall in the number of seals being shot. It will also focus more attention on the aquaculture sector.

Remarks:

1. The biggest individual seal shooting aquaculture companies in 2015 were both RSPCA-FF approved salmon producers that supply both Sainsbury's and Waitrose.
2. In 2014, almost 70% of seals shot by aquaculture were at RSPCA approved Freedom Food farms.
3. Would be useful to compare these numbers with the 2015 shooting figures reported to Freedom Food.

**From:** [REDACTED]@st-andrews.ac.uk>  
**Sent:** 09 February 2016 10:52  
**To:** [REDACTED] International Animal Rescue; [REDACTED] Sainsbury's;  
[REDACTED]@thecrownestate.co.uk); [REDACTED] (Seal Protection Action Group); Cathy Tilbrook; [REDACTED]  
Marine Scotland; [REDACTED]  
[REDACTED]@waitrose.co.uk); [REDACTED]@rspca.org.uk); [REDACTED]  
SSPO; [REDACTED]@bornfree.org.uk); [REDACTED]  
**Subject:** Progressing SASWG

Dear SASWG,

When we last met in August we agreed to meet again – possibly by teleconference in February. I regret that this has not been and won't now be possible for me due to teaching commitments this month. However I am about to circulate a Doodle Poll for dates that are possible for me at present in March and half of April. Please could people fill in the poll and also advise whether a teleconference is feasible or desirable, and if not what alternatives people might have in mind.

I attach again the draft minutes of the last meeting FYI.

Action points were as follows:

**Actions:**

1. RSPCA/SMRU to organise a meeting with marine Scotland to discuss FF 'last resort' requirement and its applicability to government license conditions
2. FF/SSPO to consider ways of improving information gathering on seal predation mitigation techniques and dissemination within industry
3. [REDACTED] to circulate list of issues, group to comment on points worth seeking industry feedback on
4. FF to circulate questions to industry members based on agreed key issues with a view to getting responses in time for December STAG meeting
5. FF (in consultation with MH/SMRU) to approach ADD manufacturers to follow-up on feedback on device innovation and monitoring, and arrange a meeting
6. MH to report back to group on its investigations into increased seal shooting incidents in 2015, and to feed back to FF on how standards might evolve in light of its findings
7. [REDACTED] encourage Waitrose/Aquascot to participate in the group
8. FF to inform the group on the agenda and outcomes of its October meeting with its members

At least some of these actions points have been progressed; I attach the notes from a FF meeting held in November (AP8) and forwarded to me by [REDACTED] I gather FF will be organising another meeting soon that will explore seal issues in more detail with industry partners.

Waitrose/Aquascot have indeed agree to join the SASWG and have been included in this email (AP7).

**Other news:**

- Sainsbury's and MHS have agreed to fund us (SMRU) to do a small study to look at the issue of sound shadowing – that is to see if we can find areas around a farm site with ADDs where sound shadows might exist, and which seals might exploit. We have taken extensive acoustic measurements from one MHS site and my research assistant is currently working these data up – and is nearly done.

- We (SMRU) have just submitted a draft final report to SARF looking at seal behaviour in relation to nets in captivity –some interesting findings I hope we can share at the next meeting.
- I understand [REDACTED] has been to Canada and has asked industry people there about their approach to damage caused by seals – I understand from [REDACTED] that anti-predator nets are widely used; not so clear about ADDs.

If others have any news on the action points above – or any other issues of relevance to SASWG – please advise me or the group and I can prepare a draft agenda.

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]@st-andrews.ac.uk>  
**Sent:** 05 April 2016 17:24  
**To:** [REDACTED], International Animal Rescue; [REDACTED] Sainsbury's; [REDACTED] (Seal  
[REDACTED]@thecrownstate.co.uk); [REDACTED] Marine  
Protection Action Group; Cathy Tilbrook; [REDACTED]  
Scotland; [REDACTED]@waitrose.co.uk); [REDACTED]  
[REDACTED]@rspca.org.uk); [REDACTED] SSPO; [REDACTED]  
**Cc:** [REDACTED]@bornfree.org.uk); [REDACTED]@freedomfood.co.uk);  
[REDACTED]@rspca.org.uk); [REDACTED]  
**Subject:** Caroline Carter  
SASWG 16

Dear All – a little later than I had hoped – please find attached a slightly revised version of the draft agenda I circulated two weeks ago.

I also attach three documents that address two of the action points from the last meeting and one of the current agenda items:

First – a summary of the latest shooting figures – compiled by [REDACTED]  
Second– a report of the Freedom Food Members meeting was circulated some months ago  
Third - a compilation of two documents I have circulated in the past – intended to address an action point on me to summarise the research options that the group has discussed over the years.  
It represents my views only and much of it was initially drafted you may recall in the development of our website.

Finally- the unapproved minutes of the last meeting

I look forward to seeing you all tomorrow at 10:30 in Rosyth.

[REDACTED]

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

## Previous roundups of research items and discussion points under the SASWG

From 2014 Subgroup report: Group's Opinions on Which Methods are Most Promising

<u>METHOD</u>	<u>Average Rank</u>
1. Modifications and improvements to ADDs (including triggered devices)	3.0
2. Improved understanding of how seals are able to damage fish without holing the net	3.3
3. Measures for validating acoustic deterrents functioning properly	4.3
4. Analysis of existing data on site characteristics and seal damage and seal shooting	4.5
5. Improvements to net tensioning	4.8
6. Trialling new netting materials	5.0
7. Approaches in other countries	5.3
8. Use of lower frequency transducers (maybe should be included in mods to ADDs above)	6.0
9. Use of electric fields as a deterrent	6.5
10. Lighting or not lighting as a deterrent	9.0
11. Aversive tastes	9.8

From paper circulated

### Main themes and benefits of SASWG (SN view (2012)):

ToRs drafted and agreed. Built confidence and understanding among various interested parties. Improved dialogue to help better address the issues. Membership expanded to include Scottish Government, SSPO, other fish farming companies.

Focused attention on a wide variety of concerns about how and why seals cause damage to farms.

Explored numerous ideas and options for minimising seal damage and the motivation for seal shooting: these have included -

- Use of ADDs
- Novel acoustic measures (██████████ device)
- Dummy killer whales and killer whale noises (no effect – ██████████)
- Best practice in using ADDs (check they are working)
- Anti-predator nets
- Net tensioning
- New netting materials – Dyneema – Aquagrid and Micanti, copper nets (MH)
- Avoiding proximity to seal haul out sites
- Bubble curtains
- Emetics
- Electric fields ...

**Explored factors that may contribute to elevated damage levels and risk of shooting:**

- Proximity to seal haul outs
- Wider geographical location
- Stage of production cycle
- Season
- Species?

**Monitoring and encouraging:**

- Industry trials of new procedures / equipment
- Licencing scheme process and RSPCA guidelines and Freedom Food verification: 'best practice'
- Relevant academic research and development

**Have developed a work plan that currently includes four themes:**

- Collating information (via FF and licencing scheme) on
  - o shooting incidents to understand what is not working in such circumstances and why
  - o fish farm practices at sites with and without shooting to identify what is working
- Investigating seal behaviour to better understand successful seal attacks occur
- Promote development of ADD testing kit to ensure ADDs are functioning as expected
- Promote urgent development of more effective, more porpoise friendly, ADDs.

### **In more detail, we:**

- Have reviewed what processes seem to be most effective in reducing seal damage – these mostly involve better attention to husbandry techniques – properly tensioned nets, frequent and effective mort removals, use of seal blinds, proper use and maintenance of ADDs etc.
  - Included Marine Scotland in the group and discussed with them the information being collected on the licence application forms and how that might be analysed.
  - Have reviewed and commented on the licencing process that controls the number of seals salmon farms are allowed to shoot, and in particular made recommendations about the need to collect information on seal damage and net types as part of the licencing procedure. Specifically – details of the numbers of fish damaged or killed, whether or not ADDs were being used and what type, what methods of tensioning are in use and what cage type is being used.
  - Had hoped to help and follow the commercialisation of a new acoustic deterrent system: this has become mired in problems concerning finance, engineering and patents, but is ongoing.
  - Noted and followed work of the containment group – a part of the Marine Scotland Aquaculture Framework Review process. Draft report now produced and is being discussed by SASWG.
  - Encouraged trials on electric fields – now funded by SARF.
  - Contacted SSPO to see if we could build a better picture through them of what measures are being used at each site and how those measures are related to damage levels.
  - We have engaged with WWF and SNH about possible curtailment of ADD use, which might result in increased levels of depredation, damage and shooting.
- 
- Have followed up questions about why anti-predator nets are generally not in favour.
  - Have pressed for the development of a testing device to check that ADDs are functioning correctly.
  - Have reviewed trends in kill numbers and damage levels over recent years and explored why these have been coming down so rapidly.
  - Have pressed for timelier reporting under the seal licence scheme
  - Have noted an apparent change in the seal haulout of numbers close to farm sites in the Strathclyde region – though no overall decline – which deserves closer investigation.
  - Have investigated differences in damage levels between and among farm sites; proximity to seal haul outs does not seem to be related to damage levels; damage most frequent after

first 7 or 8 months in a production cycle; damage appears to be most prevalent in certain areas. Peak damage is around month 10 of the cycle. No obvious relationship between how long a site has been operational and damage levels.

- Have focused on why and how seal attacks occur. Have noted stereo typical bite types suggesting attack from below – further suggesting bottom of the nets are the weak point, and noted that contrary to previous speculation, seals are not specifically targeting salmon livers; more likely they bite the easiest part of the fish they can reach.
- Have raised concerns about when shooting seals may be justified – and whether fish welfare is an adequate reason in the absence of any actual depredation; FF scheme requires evidence of actual damage.
- Discussions have led to RSPCA revising their guidelines, and FF consequently requiring further demonstration of need to shoot seals as last resort.
- Have agreed that it is important to collate information on what has happened each time it is deemed necessary to shoot a seal to better understand what goes wrong when seals are shot. Discussing how best to do this.
- Have agreed that it is also useful to see what is being done on sites and at times when no damage is being caused; ongoing discussion.
- Have agreed that research into how, why and when seals attack salmon pens is important and useful.
- Have agreed that where ADDs are deployed it is very important to know if they are functioning correctly and that suitable testing equipment needs developing
- Have funded development of a prototype testing device to measure source level (output volume) for each transducer (FF funded).
- Have agreed that new designs of ADD that are less disturbing to cetaceans are needed and have tried to assist in the market development of one such device.

## Seal shooting: Key issues to address and consider taking forward

### Funding

- 1) How do we go about managing funds for getting research done?
  - Possible routes – use RSPCA as a front for funding – to hold funds on an ad hoc basis
  - See if SASWG itself could be a funding body – what legal admin constraints
  - SARF – possible links – could we co-opt them
  - ***Best option may be to fund a PhD studentship (an experienced candidate is available) – which would have advantages of :***
    - a) probably being cheaper than commissioned research
    - b) enabling one person to get to grips with several issues at the same time

### Other issues

- 2) **Carcass collection** – can we improve the carcass collection scheme – but maybe via Marine Scotland?
- 3) **Investigative team** - What do we do to investigate promptly when high levels of damage occur at a site precipitating shooting.... who will or can investigate and how? What resources are needed or available? What are the constraints?

### Research topics

- 4) Analysis of data on damage and shooting
  - Company records - analyse data going back years (don't forget effect of lights)
  - Ongoing data collection / interviews by FF / RSPCA
  - Licencing scheme data from Marine Scotland
  - Feedback from companies about other approaches e.g. Econet

Explore funding some research analysis on each and all of the above areas by, or in co-operation with, Industry / RSPCA / Scot Gov.

- 5) **Cameras on site** - Get cameras on sites with problems to find out more about seal behaviour. This would require complete cooperation from industry and would need to address any industry concerns about footage of seals damaging fish, but there are ways of doing so.

6) **Net trials** - Do more trials in the SMRU seal pool to explore how different netting materials affect the ability of seals to take fish from behind them (e.g. net stretchiness or how easy it is to manipulate) -

7) **ADD testing stick** – explore this further and get a better prototype developed for wider use.

8) **Electric fields** - Possible further work either testing or developing deterrent

7) **Taste or texture aversion** - Can we make nets taste or feel bad enough that seals do not want to touch them.

8) **Computer modelling** – to look at net design, deformation and tensioning

(9) **Seal trap** – develop a seal trap and possible relocation programme, tagging and release to see if animals return. Trial would mean zero kills and possibly offer solution to predation issue as habituated seal most likely to be caught and removed. Thought needed re lactating females, however capture may per se deter further attacks

(10) **Other countries** - What's going on in other countries –something the aforementioned student could undertake as part of a PhD programme? Methodical search required – personal contacts needed. This work would be best focused on countries that do not allow lethal control.

# Salmon Aquaculture and Seal Working Group Meeting 16

6<sup>th</sup> April 2016

10:30-15:00\*

Marine Harvest Scotland, Admiralty Park  
Admiralty Road, Rosyth, Fife KY11 2YW

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## Attendees:

### Confirmed attendees

1. [REDACTED] - Marine Harvest
2. [REDACTED] - Waitrose
3. [REDACTED] - Aquascot
4. [REDACTED] - Born free Foundation
5. [REDACTED] - International Animal Rescue
6. [REDACTED] - Seal Protection Action Group
7. Caroline Carter as alternate for Cathy Tilbrook - Scottish Natural Heritage
8. [REDACTED] - Freedom Food
9. [REDACTED] - Freedom Food
10. [REDACTED] - RSPCA
11. [REDACTED] - RSPCA
12. [REDACTED] - RSPCA
13. [REDACTED] - RSPCA
14. [REDACTED] - Sea Mammal Research Unit
15. [REDACTED] - Sea Mammal Research Unit
16. [REDACTED] - SSPO

Making a presentation: [REDACTED] : Pulcea Ltd

### Apologies

1. [REDACTED] - Marine Scotland
2. [REDACTED] - Crown Estates
3. [REDACTED] - Sainsbury's

## DRAFT AGENDA

1. **Opening matters (standing items):**
  - a. Introductions and Housekeeping
  - b. Minutes from Meeting 15
  - c. Working Group Operation and Membership
  - d. Previous Actions.
  
2. **Latest SG Seal Shooting Figures**  
Discussion paper by [REDACTED] circulated
  
3. **Update from Marine Harvest ([REDACTED])**  
Results of investigations into factors underlying seal shooting in 2015
  
4. **Update from FF/RSPCA ([REDACTED])**
  - a. Progress on liaison/discussions with members
  - b. Improving information gathering on seal incidents
  
5. **Progressing the aims of the SASWG – future directions.**
  
6. (about 12:30) – “ADD’s - can we learn from the lessons of the past?”  
Presentation by Pulcea – [REDACTED]
  
- (Lunch provided by MHS - around 1pm or after Item 6)*
  
7. **Recent Research Results - SMRU ([REDACTED])**
  - a. Report on captive seal behaviour with nets & salmon, & tests on netting properties
  - b. Report on sound field mapping of a site with ADDs and ongoing seal depredation
  
8. **Any Other Business**
  
9. **Next meeting**

## Actions from last meeting August 2015

1. RSPCA/SMRU to organise a meeting with marine Scotland to discuss FF 'last resort' requirement and its applicability to government license conditions
2. FF/SSPO to consider ways of improving information gathering on seal predation mitigation techniques and dissemination within industry
3. ■ to circulate list of issues, group to comment on points worth seeking industry feedback on (document attached – research themes and discussion points)
4. FF to circulate questions to industry members based on agreed key issues with a view to getting responses in time for December STAG meeting
5. FF (in consultation with MH/SMRU) to approach ADD manufacturers to follow-up on feedback on device innovation and monitoring, and arrange a meeting
6. MH to report back to group on its investigations into increased seal shooting incidents in 2015, and to feed back to FF on how standards might evolve in light of its findings
7. ■ encourage Waitrose/Aquascot to participate in the group
8. FF to inform the group on the agenda and outcomes of its October meeting with its members (document attached - FF members meeting)

## *Salmon Aquaculture and Seals Working Group Meeting No 16*

*April 6<sup>th</sup> 2016, Marine Harvest, Rosyth*

*Draft Minutes for Approval at 17 meeting*

### *Present:*

██████████ (SMRU – Chair), ██████████ (Marine Harvest – Host), ██████████ (RSPCA), ██████████ (Aquascot), ██████████ (Waitrose), ██████████ (RSPCA), ██████████ (Seal Protection Action Group), ██████████ (RSPCA), ██████████ (Born free Foundation), ██████████ (International Animal Rescue), ██████████ (RSPCA), ██████████ (Freedom Food), ██████████ (Freedom Food), Caroline Carter (standing in for Cathy Tilbrook – Scottish Natural Heritage), ██████████ (SSPO), ██████████ (SMRU – minutes), ██████████ (SNH – remote)

### *Previous minutes:*

██████████ had pointed out that AP 4 should not have been directed at FF. The substance of AP 4 is anyway subsumed into a wider initiative by FF to organise a workshop with members to address key issues.

Minutes approved subject to above.

### *Actions arising from previous meeting as listed:*

1. RSPCA/SMRU to organise a meeting with marine Scotland to discuss FF 'last resort' requirement and its applicability to government license conditions
2. FF/SSPO to consider ways of improving information gathering on seal predation mitigation techniques and dissemination within industry
3. ██████████ to circulate list of issues, group to comment on points worth seeking industry feedback on (document attached – research themes and discussion points)
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7. ██████████ encourage Waitrose/Aquascot to participate in the group
8. FF to inform the group on the agenda and outcomes of its October meeting with its members (document attached - FF members meeting)



[REDACTED]

#### *Update from [REDACTED] on Freedom Foods progress/liaison*

- In process of arranging meeting between stakeholder companies (FF have 7 company members)
- Would like to invite netmakers, ADD manufacturers etc. to 'pitch' new ideas for predator mitigation devices/techniques at this meeting
- Questions asked about what is happening to new 72-hour reporting data
  - No analysis has been done, but this may be possible in time
- [REDACTED] has spoken to 7 sites shortly after shooting has taken place, one in person, six via telephone interview
- [REDACTED] asked whether there was scope for collecting data/interviews/checking for 'last resort' status *before* shooting has taken place
  - In some cases, this does happen
  - Ramifications for not meeting protocols were serious: no precise details given
- Action [REDACTED] to organise meeting with FF members to address seal concerns

#### *Presentation from [REDACTED] (PULSEA)*

- Will be developing a new pulse emitting device to deter seals
- Will be looking for sites to test device and run studies

#### *Presentation from [REDACTED] on recent research at SMRU – University of St Andrews*

- SARF funded project using SMRUs captive seal facility to examine how seals manipulate fish through nets
  - Seals difficult to train to take fish through netting – not innately obvious to them
  - Seals prefer to use flippers to manipulate fish
  - Very hard to bite fish through meshes unless they can also hold them in a fold of netting ...
  - Seals able to exert a surprising amount of force (up to 1000N)
  - Mechanism mainly uses head lunges – neck/shoulder muscles not 'ramming'
  - Even smaller animals expected to be able to move base of a typical net by around 30cm do to nylon elasticity.
- Marine Harvest & Sainsbury's funded project looking at sound propagation of an Airmar and Ace-Aquatec device
  - Single transducer showed that sound shadowing can occur – a 3dB loss was found from one side of the site to the other due to netting and other infrastructure
  - But when 8 transducers in use – site was effectively saturated with signal
- Action [REDACTED] to circulate a copy of presentation, report and link to the videos

## AOB

- ■ raised question of porpoise SACs – will they prevent the use of ADDs?
  - CC – SNH is currently consulting on plans for SAC, see website for consultation details and to contribute
  - See Management Options Paper (MOP) on website for reference as to where discussions have got to
  - SNH internal noise propagation modelling exercise considered the scale of potential HP disturbance zones.
  - Modelled disturbance zones were not large in comparison to the extent of the HP SAC – but highlighted potential barrier zones within narrows and straits (eg Sound of Mull)
  - They believe that there is no need to alter the status quo in any significant manner in response to the SAC
  - But they would like to continue to push toward more targeted devices, and SNH are currently supporting a project through SARF with this intention
- ■ asked for details on progress with startle response device
  - Concern that public money had been spent and the device is still not available
  - No-one aware of any progress since this was last discussed
  - ■ asked for a summary of history events – who should the group be asking/leaning on for details and to produce results?
  - Action ■ to circulate his own timeline on startle response device
  - Action ■ to make enquires about state of developments on the startle device within the University of St Andrews
- Future Directions for SASWG
  - AO concerned the group was not revisiting previous suggestions for research themes

- Eleven themes discussed\*
  - It was felt that there is no suitable mechanism for the group to take action
- Action [redacted] to approach Knox nets and/or other net manufacturers to try to build on previous studies examining net deformation by seals in captivity
  - It was felt this could be an area where progress could be made

### *Next SASWG Meeting*

- RSPCA offered facilities in Sussex for next meeting
- About 6 months' time
- Action [redacted] to consult with group on suitable dates later, and with [redacted] about venue availability
- [redacted] emphasised need for members to make extra effort to attend with the group's new biannual schedule.

Meeting closed at 1500

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### **Draft Consolidated Action Points from SASWG 16**

1. Action [redacted] to find regional figures for PBR calculations and circulate to group.
  2. Action [redacted] to check dates the ADD system was changed at Sconser in 2015– did seal depredation cease once a new ADD system was installed – or before, or after?
  3. Action [redacted] to circulate PDF of MHS presentation
  4. Action [redacted] to take suggestions for further analysis of shooting incidents back to MHS
  5. Action [redacted] to organise meeting with FF members to address seal concerns
  6. Action [redacted] to circulate a copy of presentation, report and link to the videos
  7. Action [redacted] to circulate his own timeline on startle response device
  8. Action [redacted] to make enquires about state of developments on the startle device within the University of St Andrews
  9. Action [redacted] to approach Knox nets and/or other net manufacturers to try to build on previous studies examining net deformation by seals in captivity
  10. Action [redacted] to consult with group on suitable dates later, and with [redacted] about venue availability
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\* The eleven themes or areas for further work previously identified by the Group are:

Working Group's Opinions on Which Methods are Most Promising

METHOD	Average Rank
1. Modifications and improvements to ADDs (including triggered devices)	3.0
2. Improved understanding of how seals are able to damage fish without holing the net	3.3
3. Measures for validating acoustic deterrents functioning properly	4.3
4. Analysis of existing data on site characteristics and seal damage and seal shooting	4.5
5. Improvements to net tensioning	4.8

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6. Trialling new netting materials	5.0
7. Approaches in other countries	5.3
8. Use of lower frequency transducers (maybe should be included in mods to ADDs above)	6.0
9. Use of electric fields as a deterrent	6.5
10. Lighting or not lighting as a deterrent	9.0
11. Aversive tastes	9.8

[Download SNH FOI 25 April 2017 document #4](#)

**Document #5:**

Excel document with 400 rows of data and dozens of columns of data - GAAIA has spoken to SNH and Marine Scotland re. various aspects of the data ([Download SNH FOI 25 April 2017 document #5](#)) but still requires some clarification (the Marine Scotland staff person responsible for assembling the data was away on holiday).

The Excel spreadsheet includes 86 salmon farms where ADDs were not used for the licensing period (1 February 2016 to 31 January 2017) - with various reasons listed why ADDs are not used:

1	FishFarmName	Registrati	SiteOwner	ADDNotUsedReason
2	Bay of Vady	FS1020	Cooke Aquaculture Scot	Use not allowed by SNH due to cetaceans, an EPS license would be required if deployed.
3	Chalmers Hope	FS0993	Cooke Aquaculture Scot	Use not allowed by SNH due to cetaceans an EPS license would be required.
4	Snarraness	FS0400	Scottish Sea Farms Ltd	They will be installed at a later date so will confirm manufacturer then
5	HELLISAY	FS1261	Marine Harvest (Scotlan	Stored on site, for deployment when required
6	MacLean's Nose	FS0599	Marine Harvest (Scotlan	Stored at shore base ready for deployment if required
7	Shuna	FS0695	Scottish Sea Farms Ltd	SNH has not allowed use of ADDs
8	Bagh Dail Nan Ceann	FS0805	Marine Harvest (Scotlan	Site not yet in operation
9	Setter Voe	FS0316	Hjaltland Seafarms Ltd	Site not stocked
10	Kames Bay (west)	FS0271	Kames Fish Farming Ltd	Site near homes which would be disturbed by ADD
11	Groatay	FS1083	Marine Harvest (Scotlan	Site fallow at present
12	Maragay Mor	FS1304	The Scottish Salmon Con	Site currently not stocked
13	SEAFORTH	FS1042	Marine Harvest (Scotlan	Site currently fallow
14	Bay of Ham	FS0122	Cooke Aquaculture Scot	Seal-scarers not allowed by SNH due to cetacean movements. An EPS license would requ
15	Loch Ba	FS0429	Scottish Sea Farms Ltd	seals are a rare occurrence in the loch
16	Linga	FS1027	Hjaltland Seafarms Ltd	SAC for common seals, use requires permission from SNH
17	Bomlo	FS1076	Hjaltland Seafarms Ltd	SAC for common seals, use of ADDs requires permission from SNH
18	Bight of Foraness	FS0292	Hjaltland Seafarms Ltd	SAC for common seals, use of ADD requires permission from SNH
19	Swinning Voe 3	FS0903	Hjaltland Seafarms Ltd	SAC for common seals, requires permission of SNH to use
20	Poseidon	FS0408	Hjaltland Seafarms Ltd	Requires permission from SNH
21	Baigh Chlann Neill (	FS0051	The Scottish Salmon Con	Predator net used
22	Eilean Grianain	FS1176	Marine Harvest (Scotlan	Planning condition
23	Cole Deep	FS0489	Hjaltland Seafarms Ltd	not required or effective
24	Hogan	FS1053	Cooke Aquaculture Scot	Not required or cost effective with current predation levles
25	Bow of Hascosay	FS0477	Cooke Aquaculture Scot	Not required at present
26	Djubawick	FS0656	Cooke Aquaculture Scot	Not required at present
27	Stead of Aithness	FS0637	Cooke Aquaculture Scot	Not required at present due to low predation levels
28	Flaeshins	FS1275	Cooke Aquaculture Scot	Not required at present and not allowed by Whole foods accreditation scheme
29	Belmont	FS0472	Cooke Aquaculture Scot	Not required at present and not allowed by accreditation scheme whole foods
30	Carness Bay	FS0390	Cooke Aquaculture Scot	Not required at present along with the requirement to apply and hold an EPS license due to cetacean movements
31	Bastaness	FS1279	Cooke Aquaculture Scot	Not required at present
32	Copister	FS1043	Cooke Aquaculture Scot	Not required at present
33	Vatsetter	FS/0407	Cooke Aquaculture Scot	Not required at present
34	Bastavoe South	FS0074	Cooke Aquaculture Scot	Not required
35	Sandwick	FS0710	Thompson Bros Salmon	Not required
36	Kirkabister	FS0802	Thompson Bros Salmon	Not required
37	East Vope Laxfirth	FS0333	Hjaltland Seafarms Ltd	not required
38	Gletness	FS1099	Hjaltland Seafarms Ltd	not required
39	Taing of Railbrough	FS0501	Hjaltland Seafarms Ltd	not required
40	Corlarach	FS1287	Hjaltland Seafarms Ltd	not required
41	Gob na Hoe	FS1175	Hjaltland Seafarms Ltd	not required
42	Leinish	FS0800	Hjaltland Seafarms Ltd	not required
43	Bay of Cleat North	FS1080	Cooke Aquaculture Scot	Not permitted by accreditation scheme (Label Rouge and Soil Association)
44	Bloody Bay	FS0964	Scottish Sea Farms Ltd	not permitted
45	Muck	FS1286	Marine Harvest (Scotlan	Not permitted
46	Cloudin	FS0088	Cooke Aquaculture Scot	Not cost effective at present.
47	Noust Geo	FS0823	Scottish Sea Farms Orkn	Not allowed by SNH/Planning
48	Bring Head	FS1023	Scottish Sea Farms Orkn	Not allowed by SNH/planning
49	Toyness	FS1024	Scottish Sea Farms Orkn	Not allowed by SNH/Planning
50	Wyre	FS1294	Scottish Sea Farms Orkn	Not allowed by SNH/Planning
51	Pegal Bay	FS0031	Cooke Aquaculture Scot	Not allowed by SNH due to Cetaceans. An EPS license would be required.
52	South Cava	FS1198	Cooke Aquaculture Scot	Not allowed by SNH due to cetaceans. An EPS license would be required .
53	Quanterness	FS/0908	Cooke Aquaculture Scot	Not allowed by SNH due to cetaceans. An EPC license would be required.
54	Kirknoust	FS0645	Cooke Aquaculture Scot	Not allowed by SNH due to cetaceans, EPS license required for use.
55	Lyrava Bay	FS0054	Cooke Aquaculture Scot	Not allowed by SNH due to cetaceans & EPS license would be required to use.
56	West Fara	FS/1017	Cooke Aquaculture Scot	Not allowed by SNH due to cetaceans. EMS license required if deployed
57	Ouseness	FS1209	Cooke Aquaculture Scot	Not allowed by Label Rouge and Soil association
58	Vestness	FS/1210	Cooke Aquaculture Scot	Not allowed by accreditation schemes Label Rouge and Soil association.
59	Turness	FS0451	Cooke Aquaculture Scot	Not allowed by accreditation scheme, whole foods.
60	Vee Taing	FS/1057	Cooke Aquaculture Scot	Not allowed by accreditation scheme Whole Foods. Not cost effective at current predation levels.
61	Burkwell	FS0960	Cooke Aquaculture Scot	Not allowed by accreditation scheme Whole Foods.
62	Mula	FS/0896	Cooke Aquaculture Scot	Not allowed by accreditation scheme whole foods.
63	Winna Ness	FS0871	Cooke Aquaculture Scot	Not allowed by accreditation scheme Whole foods & not cost effective at current predation levels.
64	Baltasound Harbour	FS0449	Balta Island Seafare Ltd	no fish on site
65	Meil Bay	FS0597	Cooke Aquaculture Scot	Insufficient mortality to warrant use. SNH restriction on use due to Cetaceans likely and EPS requirement.
66	Score Holm	FS0948	Hjaltland Seafarms Ltd	inefficient
67	Hamnavoe	FS1144	Hjaltland Seafarms Ltd	ineffective and requires permission from SNH
68	East of Papa Little	FS1278	Hjaltland Seafarms Ltd	ineffective
69	Goe of Valladale	FS1115	Hjaltland Seafarms Ltd	ineffective
70	Hamar Sound	FS1114	Hjaltland Seafarms Ltd	ineffective
71	Langa Isle (East)	FS0433	Hjaltland Seafarms Ltd	ineffective

72	North Havra	FS0674	Hjaltland Seafarms Ltd	ineffective
73	North Papa	FS0515	Hjaltland Seafarms Ltd	ineffective
74	North Voe	FS0946	Hjaltland Seafarms Ltd	ineffective
75	Olna South	FS0764	Hjaltland Seafarms Ltd	ineffective
76	Spoose Holm	FS0785	Hjaltland Seafarms Ltd	ineffective
77	West of Burwick	FS0937	Hjaltland Seafarms Ltd	ineffective
78	Etive 3 (Port na Min	FS1101	Dawnfresh Farming Ltd	Funding required for site development
79	Etive 4	FS1112	Dawnfresh Farming Ltd	Funding required for site development
80	Inverawe (East) Etiv	FS1067	Dawnfresh Farming Ltd	Funding for the development of the site
81	Uyaea Isle	FS0382	Cooke Aquaculture Scotl	Due to accreditation scheme
82	Colonsay	FS1296	Marine Harvest (Scotland)	Condition of planning
83	Caolas A Deas	FS1291	Marine Harvest (Scotland)	Available to be deployed if required
84	LOCHALSH	FS0016	Marine Harvest (Scotland)	Available if required
85	Marulaig Bay	FS0865	Marine Harvest (Scotland)	available for deployment if required
86	SOAY	FS0646	Marine Harvest (Scotland)	Available for deployment if deemed necessary
87	CAIRIDH	FS0252	Marine Harvest (Scotland)	ADD's were used but were moved to neighbouring site to double up on resources there -

[Download data on ADD's not used for the licensing period 1 February 2016 to 31 January 2017 via [Download SNH FOI 25 April 2017 document #5 ADDs NOT used](#)]

However, there were 119 salmon farms where ADDs were used for the licensing period (1 February 2016 to 31 January 2017) and 103 salmon farms where ADDS were "always on":

1	FishFarmName	Registr	SiteOwner	SiteStatus	ADDUsed	ADDAlwaysOn	ADDCount	ADDModel	ADDFreque	ADDOutp.
2	Aird	FS0594	The Scottish Salmon Company	Existing	TRUE	TRUE	4	Airmar db 11 plus	6.50	198
3	Ardcastle	FS0818	The Scottish Salmon Company	Existing	TRUE	TRUE	2	ACE AQUATEC - US3	20.00	195
4	Ardgadden	FS0851	The Scottish Salmon Company	Existing	TRUE	TRUE	2	ACE AQUATEC - US3	20.00	195
5	Ardyne	FS0559	The Scottish Salmon Company	Existing	TRUE	TRUE	8	Ace Aquatec - US3	20.00	194
6	Badcall Bay	FS0067	Northern Salmon Management	Existing	TRUE	TRUE	18	Airmar Db Plus 11	60.00	180
7	Bight of Bellister, Dury Voe	FS1121	Scottish Sea Farms Ltd	Existing	TRUE	TRUE	10	Ace Aquatec US3	12.00	195 to 197
8	Calbha	FS0068	Northern Salmon Management	Existing	TRUE	TRUE	14	Airmar Db Plus 11	60.00	180
9	CAMAS GLAS	FS0413	Marine Harvest (Scotland) Ltd	Existing	TRUE	TRUE	8	Airmar	10.00	198
10	CREAG AN T SAGAIRT	FS0605	Marine Harvest (Scotland) Ltd	Existing	TRUE	TRUE	6	Terecos DSMS4	9.30	135-178
11	Druimyeon Bay	FS0336	The Scottish Salmon Company	Existing	TRUE	TRUE	4	ACE AQUATEC - US3	20.00	195 dB re
12	Drumbeg (Loch Dhrombaig)	FS0487	Northern Salmon Management	Existing	TRUE	TRUE	6	Airmar Db Plus 11	6.00	180
13	DUICH	FS0248	Marine Harvest (Scotland) Ltd	Existing	TRUE	TRUE	8	Terecos DSMS4	9.30	135-178
14	Dunstaffnage	FS0299	Scottish Sea Farms Ltd	Existing	TRUE	TRUE	9	Mohn Aqua Airmar DB11	10	197
15	Dury Voe	FS0033	Scottish Sea Farms Ltd	Existing	TRUE	TRUE	12	Ace Aquatec US3	12.00	195 to 197
16	East Tarbert Bay	FS1010	The Scottish Salmon Company	Existing	TRUE	TRUE	2	ACE AQUATEC - US3	20.00	195
17	Etive 6	FS1288	Dawnfresh Farming Ltd	Existing	TRUE	TRUE	10	Mohn Aqua	10.00	192 dB re
18	Eughlam	FS1233	The Scottish Salmon Company	Existing	TRUE	TRUE	15	ACE AQUATEC US3	20.00	195
19	Fada	FS0858	Scottish Sea Farms Ltd	Existing	TRUE	TRUE	12	Mohn Aqua Airmar DBII	10	197
20	Foreholm	FS0936	Scottish Sea Farms Ltd	Existing	TRUE	TRUE	10	Mohn aqua MAG	10.00	198
21	Furnace	FS0567	The Scottish Salmon Company	Existing	TRUE	TRUE	2	ACE AQUATEC - US3	20.00	195
22	Geasgill	FS0839	The Scottish Salmon Company	Existing	TRUE	TRUE	4	Airmar dB Plus 11	6.50	198
23	Glenan Bay	FS0590	The Scottish Salmon Company	Existing	TRUE	TRUE	3	ACE AQUATEC US3	20.00	195
24	Gob a Bharra	FS0683	The Scottish Salmon Company	Existing	TRUE	TRUE	3	ACE AQUATEC US3	20.00	195
25	Gometra	FS1267	The Scottish Salmon Company	Existing	TRUE	TRUE	15	ACE AQUATEC US3	20.00	195
26	Gousam	FS0998	The Scottish Salmon Company	Existing	TRUE	TRUE	4	Airmar dB Plus 11	6.50	198
27	Gravir	FS0242	The Scottish Salmon Company	Existing	TRUE	TRUE	3	Airmar dB Plus 11	6.50	198
28	Greanamul	FS1282	The Scottish Salmon Company	Existing	TRUE	TRUE	4	Airmar db 11 plus	6.50	198
29	GRESHORNISH	FS0015	Marine Harvest (Scotland) Ltd	Existing	TRUE	TRUE	12	Terecos DSMS4	9.30	135-178
30	Grey Horse Channel	FS1122	Marine Harvest (Scotland) Ltd	Existing	TRUE	TRUE	14	Mon Aqua	10.00	198
31	Holms Geo	FS0749	Scottish Sea Farms Ltd	Existing	TRUE	TRUE	12	Mohn aqua	10.00	198
32	Inch Kenneth	FS0593	The Scottish Salmon Company	Existing	TRUE	TRUE	3	Airmar dB Plus 11	6.50	198
33	INVASION BAY	FS0212	Marine Harvest (Scotland) Ltd	Existing	TRUE	TRUE	1	Terecos DSMS4 and Air	9.30	135-178
34	ISLE EWE	FS1084	Marine Harvest (Scotland) Ltd	Existing	TRUE	TRUE	8	Mon Aqua	10.00	198
35	Kempie Bay	FS0359	Scottish Sea Farms Orkney and	Existing	TRUE	TRUE	4	Airmar dB 11	10.30	192
36	Kenmore	FS0050	The Scottish Salmon Company	Existing	TRUE	TRUE	2	Airmar db11 plus	6.50	198
37	Kerrera B	FS0663	Scottish Sea Farms Ltd	Existing	TRUE	TRUE	13	Mohn Aqua AirmarDB11	10	197
38	KINGAIRLOCH	FS0241	Marine Harvest (Scotland) Ltd	Existing	TRUE	TRUE	1	Terecos DSMS4	9.30	135-178
39	Kishorn A (South)	FS0709	Scottish Sea Farms Ltd	Existing	TRUE	TRUE	12	Airmar DBII	10	197
40	Kishorn B (North)	FS0804	Scottish Sea Farms Ltd	Existing	TRUE	TRUE	16	Mohn Aqua Airmar DBII	10	197
41	Kishorn West	FS1274	Scottish Sea Farms Ltd	Existing	TRUE	TRUE	12	Mkohn Aqua Airmar DBIII	10	197
42	Kyles Vuia	FS0927	The Scottish Salmon Company	Existing	TRUE	TRUE	4	Airmar dB Plus 11	6.50	198
43	Lamlash Bay	FS0423	The Scottish Salmon Company	Existing	TRUE	TRUE	2	Ace Aquatec US3	20.00	195
44	LEVEN	FS0244	Marine Harvest (Scotland) Ltd	Existing	TRUE	TRUE	2	Terecos DSMS4	9.30	135-178
45	LINNHE	FS0240	Marine Harvest (Scotland) Ltd	Existing	TRUE	TRUE	3	Terecos DSMS4	9.30	135-178
46	Lippie Geo	FS0850	Scottish Sea Farms Ltd	Existing	TRUE	TRUE	10	Mohn Aqua MAG	10.00	198
47	Lismore North	FS0745	Scottish Sea Farms Ltd	Existing	TRUE	TRUE	10	Mohn Aqua Airmar DB Pl	10	197

48	Lismore West	FS0914	Scottish Sea Farms Ltd	Existing	TRUE	TRUE	10 Mohn Aqua Airmar DB11	10	197
49	Loch A Chairn Bhain	FS0621	Northern Salmon Management	Existing	TRUE	TRUE	14 Airmar Db Plus 11	60.00	180
50	Loch Carnan	FS1280	Loch Duart Ltd	Existing	TRUE	TRUE	18 Airmar	10.00	198
51	Loch Creran (B)	FS0426	Scottish Sea Farms Ltd	Existing	TRUE	TRUE	14 Mohn Aqua Airmar DB II	10	197
52	Loch Laxford	FS0065	Northern Salmon Management	Existing	TRUE	TRUE	18 Airmar Db Plus 11	60.00	180
53	Loch Spelve (A)	FS0634	Scottish Sea Farms Ltd	Existing	TRUE	TRUE	10 Mohn Aqua airmar DB11	10	197
54	Loch Spelve (B)	FS0253	Scottish Sea Farms Ltd	Existing	TRUE	TRUE	8 Mohn Aqua Airmar	10	197
55	Lochmaddy	FS0853	Loch Duart Ltd	Existing	TRUE	TRUE	16 Airmar	10.00	198 range
56	Loura Voe	FS0699	Scottish Sea Farms Ltd	Existing	TRUE	TRUE	20 Mohn Aqua MAG	10.00	198
57	MAOL BAN	FS0519	Marine Harvest (Scotland) Ltd	Existing	TRUE	TRUE	8 Terecos DSMS4	9.30	135-178
58	Meall Mhor	FS0091	The Scottish Salmon Company	Existing	TRUE	TRUE	2 ACE AQUATEC US3	20.00	195
59	Nevis A	FS0430	Scottish Sea Farms Ltd	Existing	TRUE	TRUE	12 Mohn Aqua airmar DB II	10	197
60	Nevis B	FS0616	Scottish Sea Farms Ltd	Existing	TRUE	TRUE	12 Mohn Aqua Airmar DBII	10	197
61	Nevis C (Ardintigh)	FS0546	Scottish Sea Farms Ltd	Existing	TRUE	TRUE	9 Mohn Aqua Airmar DBII	10	197
62	Oldany	FS0933	Northern Salmon Management	Existing	TRUE	TRUE	10 Airmar Db Plus 11	60.00	180
63	Ornish	FS0531	Marine Harvest (Scotland) Ltd	Existing	TRUE	TRUE	2 Terecos DSMS4	9.30	135-178
64	Outer Eport	FS1254	The Scottish Salmon Company	Existing	TRUE	TRUE	2 Airmar db11 plus	6.50	198
65	Petersport	FS0340	The Scottish Salmon Company	Existing	TRUE	TRUE	14 OTAQ SealFence	20.00	195
66	Plocrapol	FS1256	The Scottish Salmon Company	Existing	TRUE	TRUE	4 Airmar db 11 plus	6.50	198
67	Polle Na Gille	FS0629	Marine Harvest (Scotland) Ltd	Existing	TRUE	TRUE	8 Terecos DSMS4	9.30	135-178
68	Port Na Cro	FS0859	Marine Harvest (Scotland) Ltd	Existing	TRUE	TRUE	4 Terecos DSMS4	9.30	135-178
69	Portree	FS0708	The Scottish Salmon Company	Existing	TRUE	TRUE	4 Ace Aquatech US3	20.00	195
70	Puldrite	FS0813	Scottish Sea Farms Orkney and	Existing	TRUE	TRUE	10 Airmar dbII	10.30	192
71	Quarry Point	FS0698	The Scottish Salmon Company	Existing	TRUE	TRUE	2 ACE AQUATEC US3	20.00	195
72	Raineach	FS1263	Marine Harvest (Scotland) Ltd	Existing	TRUE	TRUE	2 Terecos DSMS4	9.30	135-178
73	Reibinish	FS1277	The Scottish Salmon Company	Existing	TRUE	TRUE	2 Airmar db11 plus	6.50	198
74	Rubha Stillaig	FS0894	The Scottish Salmon Company	Existing	TRUE	TRUE	2 ACE AQUATEC US 3	20.00	195
75	Scadabay	FS1293	The Scottish Salmon Company	Existing	TRUE	TRUE	2 Airmar db11 plus	6.50	198
76	SCONSER	FS0602	Marine Harvest (Scotland) Ltd	Existing	TRUE	TRUE	12 Ace Aquatet	0.00	0
77	Scotasay	FS0502	Marine Harvest (Scotland) Ltd	Existing	TRUE	TRUE	2 Terecos DSMS4	9.30	135-178
78	Sgeir Dughall	FS1262	The Scottish Salmon Company	Existing	TRUE	TRUE	4 Airmar db 11 plus	6.50	198
79	Sgian Dubh	FS1281	The Scottish Salmon Company	Existing	TRUE	TRUE	8 Ace Aquatech - US3	20.00	194
80	Shapinsay	FS0860	Scottish Sea Farms Orkney and	Existing	TRUE	TRUE	8 Ace Aquatec US3	20.00	195
81	Sian Bay	FS0361	Scottish Sea Farms Orkney and	Existing	TRUE	TRUE	10 Airmar dBII	10.30	192
82	Slocka Ronas Voe	FS1018	Scottish Sea Farms Ltd	Existing	TRUE	TRUE	14 Ace Aquatec US3	12.00	195 to 197
83	Sound of Harris	FS1260	Loch Duart Ltd	Existing	TRUE	TRUE	2 Mohnaqua	10.00	198 range
84	South Sound	FS0183	Scottish Sea Farms Ltd	Existing	TRUE	TRUE	14 Mohn aqua MAG	10.00	198
85	Strome	FS0570	The Scottish Salmon Company	Existing	TRUE	TRUE	4 ACE AQUATEC US3	20.00	195
86	Strondoir Bay	FS1019	The Scottish Salmon Company	Existing	TRUE	TRUE	4 Airmar dB Plus 11	6.50	198
87	Strone	FS1056	The Scottish Salmon Company	Existing	TRUE	TRUE	8 Ace Aquatech - US3	20.00	194
88	STULAIGH	FS1259	Marine Harvest (Scotland) Ltd	Existing	TRUE	TRUE	16 Airmar	10.00	198
89	Tanera	FS0549	Scottish Sea Farms Ltd	Existing	TRUE	TRUE	24 Mohn Aqua MAG seal det	10	197
90	Taranaish	FS0752	The Scottish Salmon Company	Existing	TRUE	TRUE	4 Airmar db Plus 11	20.00	198
91	Tarbert South	FS0767	The Scottish Salmon Company	Existing	TRUE	TRUE	3 ACE AQUATEC US3	20.00	195
92	Teisti Geo	FS1093	Scottish Sea Farms Ltd	Existing	TRUE	TRUE	14 Mohn Aqua MAG	10.00	198
93	TORRIDON	FS0234	Marine Harvest (Scotland) Ltd	Existing	TRUE	TRUE	4 Terecos DSMS4	9.30	135-178
94	Trenay	FS0796	The Scottish Salmon Company	Existing	TRUE	TRUE	2 Airmar db 11 plus	6.50	198
95	Trilleachan Mor	FS1118	The Scottish Salmon Company	Existing	TRUE	TRUE	3 Airmar dB Plus 11	6.50	198
96	Tuath	FS0617	The Scottish Salmon Company	Existing	TRUE	TRUE	3 Airmar dB Plus 11	6.50	198
97	Uiskevagh	FS1255	The Scottish Salmon Company	Existing	TRUE	TRUE	4 Airmar db11 plus	6.50	198
98	Vacasy	FS1091	The Scottish Salmon Company	Existing	TRUE	TRUE	4 Airmar db 11 Plus	20.00	198
99	Vidlin North	FS0608	Scottish Sea Farms Ltd	Existing	TRUE	TRUE	20 Mohn aqua MAG	10.00	198
100	Vuia Beag	FS0411	The Scottish Salmon Company	Existing	TRUE	TRUE	4 Airmar db 11 Plus	6.50	198
101	Vuia Mor	FS1103	The Scottish Salmon Company	Existing	TRUE	TRUE	4 Airmar db 11 plus	6.50	198
102	Walters (East Lismore)	FS0875	Scottish Sea Farms Ltd	Existing	TRUE	TRUE	9 Mohn Aqua Airmar DB pl	10	197
103	Wester Ross Fisheries	FS0056	Northern Salmon Management	Existing	TRUE	TRUE	14 Airmaar Db Plus 11	10.00	198
104	Wester Ross Fisheries	FS0057	Northern Salmon Management	Existing	TRUE	TRUE	12 Airmaar Db Plus 11	1.00	198
105	Ardchattan Bay	FS0197	Dawnfresh Farming Ltd	Existing	TRUE	FALSE	6 Mohn Aqua	10.00	192 dB re
106	ARDINTOUL	FS0245	Marine Harvest (Scotland) Ltd	Existing	TRUE	FALSE	4 Terecos DSMS4	9.30	135-178
107	Ardnish	FS0249	Marine Harvest (Scotland) Ltd	Existing	TRUE	FALSE	1 Terecos DSMS4	9.30	135-178
108	Balta Island	FS0717	Balta Island Seafare Ltd	Existing	TRUE	FALSE	3 ace aquatec us3	10.20	195
109	Baltsound Pier	FS1102	Balta Island Seafare Ltd	Existing	TRUE	FALSE	1 lofitech universal scamrn	14.00	189
110	Fishnish (A)	FS0427	Scottish Sea Farms Ltd	Existing	TRUE	FALSE	8 Mohn Aqua airmar DB Pl	10	197
111	Fishnish (B)	FS0694	Scottish Sea Farms Ltd	Existing	TRUE	FALSE	6 Airmar DB Plus II	10	197
112	Gorsten	FS0237	Marine Harvest (Scotland) Ltd	Existing	TRUE	FALSE	2 Terecos DSMS4	9.30	135-178
113	Kames Bay (east)	FS0462	Kames Fish Farming Ltd	Existing	TRUE	FALSE	1 Terrecos Ultrasonic Seals	0.00	0
114	North Shore	FS1033	Marine Harvest (Scotland) Ltd	Existing	TRUE	FALSE	1 Terecos DSMS4	9.30	135-178
115	Scallastle	FS0209	Scottish Sea Farms Ltd	Existing	TRUE	FALSE	6 Mohn Aqua MAG seal det	10	197
116	Shuna Castle	FS0465	Kames Fish Farming Ltd	Existing	TRUE	FALSE	1 Terrecos Ultrasonic Seal	0.00	0
117	Shuna SW (Rubhan Trilleachan)	FS1290	Kames Fish Farming Ltd	Existing	TRUE	FALSE	4 Terrecos Ultrasonic Seals	0.00	0
118	Swarta Skerry	FS0814	Balta Island Seafare Ltd	Existing	TRUE	FALSE	1 ace aquatec scammer	10.20	195
119	Tabhaigh	FS1297	Marine Harvest (Scotland) Ltd	New	TRUE		1 Terecos DSMS4		
120	Wester Ross Fisheries	FS0675	Northern Salmon Management	New	TRUE		8 Airmaar Db Plus 11		

[Download data on ADD's used for the licensing period 1 February 2016 to 31 January 2017 via [Download SNH FOI 25 April 2017 document #5 New version for ADDs only LIST of all sites using ADDs](#)]

[Download SNH FOI 25 April 2017 document #5](#)

**Document #6:**

SNH's Cathy Tilbrook confirmed (via a phone conversation with GAAIA) that this document was authored by SNH:

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

[Download SNH FOI 25 April 2017 document #6](#)

**Document #7:**

Excel document with over 200 rows of data and dozens of columns - GAAIA has asked SNH for clarification on various aspects of the data.

GAAIA has spoken to SNH and Marine Scotland re. various aspects of the data ([Download SNH FOI 25 April 2017 document #7](#)) but still requires some clarification (the Marine Scotland staff person responsible for assembling the data was away on holiday).

The data includes 214 pending licences (1 February 2017 to 31 January is listed as a 'Licence Period' and 1 October 2016 to 30 September 2017 is listed as the 'Application Period') - and include salmon farms where ADDs are not used for various reasons:

F	G	H	I	J
ApplicationPeriod	FishFarmName	Registrat	SiteOwner	ADDNotUsedReason
01/10/2016 - 30/09/2017	Meil Bay	FS0597	Cooke Aquaculture	The use of ADDS is not permitted without the issue of an EPS license
01/10/2016 - 30/09/2017	Pegal Bay	FS0031	Cooke Aquaculture	The use of ADDS has been refused by SNH due to cetacean movements in Scapa Flow. An EPS license is required.
01/10/2016 - 30/09/2017	West Fara	FS/1017	Cooke Aquaculture	The use of ADDS has been prohibited by SNH due to cetacean movements in Scapa Flow. An EPS License is required.
01/10/2016 - 30/09/2017	Bay of Vady	FS1020	Cooke Aquaculture	SNH have prohibited the use of ADDS in Rousay sound due to cetaceans. Prior to use an EPS license is required. Also
01/10/2016 - 30/09/2017	Shuna	FS0695	Scottish Sea Farms	scheme that does not allow the use of ADDS.
01/10/2016 - 30/09/2017	Belmont	FS0472	Cooke Aquaculture	SNH has not allowed use of ADDS
01/10/2016 - 30/09/2017	Flaeshins	FS1275	Cooke Aquaculture	Not allowed by Wholefoods that this site forms part of.
01/10/2016 - 30/09/2017	Mula	FS/0896	Cooke Aquaculture	Not allowed by Wholefoods accreditation scheme which this site forms part of.
01/10/2016 - 30/09/2017	Turness	FS0451	Cooke Aquaculture	Not allowed by Wholefoods accreditation scheme for which this site is part of
01/10/2016 - 30/09/2017	Winna Ness	FS0871	Cooke Aquaculture	Not allowed by Wholefoods accreditation scheme for which this farm is part of.
01/10/2016 - 30/09/2017	Burkwell	FS0960	Cooke Aquaculture	Not allowed by Wholefoods accreditation scheme for which thios site is part of
01/10/2016 - 30/09/2017	Uyea Isle	FS0382	Cooke Aquaculture	Not allowed by Wholefoods accreditation scheme for which site forms part of.
01/10/2016 - 30/09/2017	Bay of Ham	FS0122	Cooke Aquaculture	Not allowed by SNH without EPS license due to cetaceans.
01/10/2016 - 30/09/2017	Kirknoust	FS0645	Cooke Aquaculture	Not allowed by SNH without an EPS license due to cetacean movements in Rousay Sound.
01/10/2016 - 30/09/2017	Carness Bay	FS0390	Cooke Aquaculture	Not allowed by SNH without an EPS license
01/10/2016 - 30/09/2017	Noust Geo	FS0823	Scottish Sea Farms	Not allowed by SNH or planning authority due to perceived potential impact on Cetaceans
01/10/2016 - 30/09/2017	Bring Head	FS1023	Scottish Sea Farms	Not allowed by SNH or planning authority due to perceived potential impact on Cetaceans
01/10/2016 - 30/09/2017	Toyness	FS1024	Scottish Sea Farms	Not allowed by SNH or planning authority due to perceived potential impact on Cetaceans
01/10/2016 - 30/09/2017	Wyre	FS1294	Scottish Sea Farms	Not allowed by SNH or planning authority

In total, there are 135 salmon farms listed as using ADDs and 70 not using ADDs (9 sites have no data available for ADD use). Of the 135 salmon farms using ADDs, 84 are listed as "ADD Always On" and 50 as not "ADD Always On" (one site has no data re. the question "ADD Always On").

Here's the 135 salmon farms listed as using ADDs (including 84 listed as "ADDs Always On") - read the full list via [Download SNH FOI 25 April 2017 document #7 ADDs used only:](#)

1	FishFarmName	Reg #	SiteOwner	ADDUsed	ADDCount	ADDModel	ADDFreq	ADDOutput	ADDAlwaysOn
2	Aird	FS0594	The Scottish Salmon Company	TRUE	2	ACE Aquatec US3	12	195 to 197	FALSE
3	Ardcastle	FS0818	The Scottish Salmon Company	TRUE	2	ACE AQUATEC US3	14	195 to 197	FALSE
4	Ardchattan Bay	FS0197	Dawnfresh Farming Ltd	TRUE	6	Mohn Aqua	10.00	192 dB re	FALSE
5	Ardgadden	FS0851	The Scottish Salmon Company	TRUE	2	ACE Aquatec US3	14	195 to 197	FALSE
6	ARDINTOUL	FS0245	Marine Harvest (Scotland) Ltd	TRUE	6	Terecos DSMS 4	9.3	135-178	TRUE
7	Ardnish	FS0249	Marine Harvest (Scotland) Ltd	TRUE	2	Terecos DSMS 4	9.3	135-178	FALSE
8	Ardyne	FS0559	The Scottish Salmon Company	TRUE	2	ACE Aquatec US3	16	194 to 197	TRUE
9	Badcall Bay	FS0067	Northern Salmon Management C	TRUE	18	Air Db Plus 11	60	180	TRUE
10	Bagh Dail Nan Ceann	FS0805	Marine Harvest (Scotland) Ltd	TRUE	2	Terecos DSMS 4	9.3	135-178	TRUE
11	Bay of Cleat North	FS1080	Cooke Aquaculture Scotland	TRUE	10	Ace Aquatec	10-20KHz	195dbre1u	TRUE
12	Bight of Bellister, Du	FS1121	Scottish Sea Farms Ltd	TRUE	12	Ace Aquatec US3	12	195 to 197	TRUE
13	Burrastow	FS0666	Cooke Aquaculture Scotland	TRUE	6	Ace Aquatec	10-20KHz	195dbre1u	TRUE
14	CAIRIDH	FS0252	Marine Harvest (Scotland) Ltd	TRUE	8	Terecos DSMS 4	9.3	135-178	TRUE
15	Calbha	FS0068	Northern Salmon Management C	TRUE	14	Airmar Db Plus 11	60	180	TRUE
16	CAMAS GLAS	FS0413	Marine Harvest (Scotland) Ltd	TRUE	20	Airmar	10	0	TRUE
17	Cloudin	FS0088	Cooke Aquaculture Scotland	TRUE	12	Ace Aquatec	10-20KHz	195dbre1u	FALSE
18	CREAG AN T SAGAIR	FS0605	Marine Harvest (Scotland) Ltd	TRUE	4	Terecos DSMS 4	9.3	135-178	TRUE
19	Druimyeon Bay	FS0336	The Scottish Salmon Company	TRUE	4	ACE Aquatec US3	14	195 to 197	FALSE
20	Drumbeg (Loch Dhro	FS0487	Northern Salmon Management C	TRUE	6	Airmar Db Plus 11	6	180	TRUE
21	DUICH	FS0248	Marine Harvest (Scotland) Ltd	TRUE	8	Terecos DSMS 4	9.3	135-178	TRUE
22	Dunstaffnage	FS0299	Scottish Sea Farms Ltd	TRUE	9	Airmar DB2	10	197	TRUE
23	Dury Voe	FS0033	Scottish Sea Farms Ltd	TRUE	10	Mohn aqua MAG	10	198	TRUE
24	East Tarbert Bay	FS1010	The Scottish Salmon Company	TRUE	2	ACE Aquatec US3	14	195 to 197	FALSE

25	Eilean Coltair	FS0777	Kames Fish Farming Ltd	TRUE	1	Terecos DSMS 4	9.3	179	FALSE
26	Eilean Griainain	FS1176	Marine Harvest (Scotland) Ltd	TRUE	2	Terecos DSMS4	9.3	135-178	TRUE
27	Etive 6	FS1288	Dawnfresh Farming Ltd	TRUE	10	Mohn Aqua	10.00	192 dB re	TRUE
28	Eughlam	FS1233	The Scottish Salmon Company	TRUE	15	ACE Aquatec US3	20	195 to 197	TRUE
29	Fada	FS0858	Scottish Sea Farms Ltd	TRUE	12	Mohn Aqua Airmar	10	197	TRUE
30	Fishnish (A)	FS0427	Scottish Sea Farms Ltd	TRUE	8	Mohn Aqua Airmar	10	197	TRUE
31	Fishnish (B)	FS0694	Scottish Sea Farms Ltd	TRUE	8	Mohn Aqua Airmar	10	197	TRUE
32	Fiunary	FS0696	Scottish Sea Farms Ltd	TRUE	8	Mohn Aqua MAG Se	10	197	FALSE
33	Foreholm	FS0936	Scottish Sea Farms Ltd	TRUE	10	Mohn aqua MAG	10	198	TRUE
34	Furnace	FS0567	The Scottish Salmon Company	TRUE	2	ACE Aquatec US 3	12	195 to 197	FALSE
35	Geasgill	FS0839	The Scottish Salmon Company	TRUE	12	OTAQ SF3	10	196	FALSE
36	Glenan Bay	FS0590	The Scottish Salmon Company	TRUE	3	Ace Aquatec US 3	12	195 to 197	FALSE
37	Gob a Bharra	FS0683	The Scottish Salmon Company	TRUE	2	Ace Aquatec US 3	12	195 to 197	FALSE
38	Gometra	FS1267	The Scottish Salmon Company	TRUE	15	ACE Aquatec US3	12	195 to 197	TRUE
39	Gorsten	FS0237	Marine Harvest (Scotland) Ltd	TRUE	12	Terecos DSMS 4	9.3	135-178	TRUE
40	Gousam	FS0998	The Scottish Salmon Company	TRUE	4	Airmar db Plus 11	6.5	195 to 198	FALSE
41	Gravir	FS0242	The Scottish Salmon Company	TRUE	3	Airmar dB Plus 11	6.5	195 to 198	FALSE
42	Greanamul	FS1282	The Scottish Salmon Company	TRUE	4	Airmar db 11 plus	6.5	195 to 198	FALSE
43	GRESHORNISH	FS0015	Marine Harvest (Scotland) Ltd	TRUE	12	Terecos DSMS 4	9.3	135-180	TRUE
44	Grey Horse Channel	FS1122	Marine Harvest (Scotland) Ltd	TRUE	7	Terecos DSMS 4	9.3	135-178	TRUE
45	Groatay	FS1083	Marine Harvest (Scotland) Ltd	TRUE	14	Terecos DSMS4	9.3	135-178	TRUE
46	HELLISAY	FS1261	Marine Harvest (Scotland) Ltd	TRUE	2	mon aqua airmar II	10	135-178	TRUE
47	Holms Geo	FS0749	Scottish Sea Farms Ltd	TRUE	12	Ace Aquates US3	12	195-197	TRUE
48	Inch Kenneth	FS0593	The Scottish Salmon Company	TRUE	3	AIRmar bb PLUS 11	1.8 per ch	198	FALSE
49	INVASION BAY	FS0212	Marine Harvest (Scotland) Ltd	TRUE	3	Terecos DSMS 4	9.3	135-178	TRUE
50	ISLE EWE	FS1084	Marine Harvest (Scotland) Ltd	TRUE	12	MON AQUA AIRMAR	10	135-178	TRUE
51	Kames Bay (east)	FS0462	Kames Fish Farming Ltd	TRUE	1	Terecos DSMS4	5	179	FALSE
52	Kames Bay (west)	FS0271	Kames Fish Farming Ltd	TRUE	1	DSMS4 Terecos	5	179	FALSE
53	Kempie Bay	FS0359	Scottish Sea Farms Orkney and E	TRUE	4	Airmar dbII	10.3	192	TRUE
54	Kenmore	FS0050	The Scottish Salmon Company	TRUE	2	ACE Aquatec US3	12	195 to 197	FALSE
55	Kerrera B	FS0663	Scottish Sea Farms Ltd	TRUE	13	Mohn Aqua Airmar	10	197dB	TRUE
56	KINGAIRLOCH	FS0241	Marine Harvest (Scotland) Ltd	TRUE	1	Terecos DSMS4	9.3	135-178	TRUE
57	Kishorn A (South)	FS0709	Scottish Sea Farms Ltd	TRUE	12	Mohn Aqua Airmar	10	197	TRUE
58	Kishorn B (North)	FS0804	Scottish Sea Farms Ltd	TRUE	16	Mohn Aqua Airmar	10	197	TRUE
59	Kishorn West	FS1274	Scottish Sea Farms Ltd	TRUE	14	Mohn Aqua Airmar	10	197	TRUE
60	Kyles Vuia	FS0927	The Scottish Salmon Company	TRUE	4	Airmar dB Plus 11	6.5	195 to 198	FALSE
61	Lamlash Bay	FS0423	The Scottish Salmon Company	TRUE	2	Ace Aquatec US3	12	195 to 197	FALSE
62	LEVEN	FS0244	Marine Harvest (Scotland) Ltd	TRUE	2	Terecos DSMS 4	9.3	135-178	TRUE
63	LINNHE	FS0240	Marine Harvest (Scotland) Ltd	TRUE	2	Terecos DSMS 4	9.3	135-178	TRUE
64	Lismore North	FS0745	Scottish Sea Farms Ltd	TRUE	4	Mohn Aqua Airmar	10	197	TRUE
65	Lismore West	FS0914	Scottish Sea Farms Ltd	TRUE	10	Mohn Aqua Airmar	10	197	TRUE
66	Loch A Chairn Bhain	FS0621	Northern Salmon Management C	TRUE	14	Airmar Db Plus 11	60	180	TRUE
67	Loch Carnan	FS1280	Loch Duart Ltd	TRUE	12	AIRMAR / MAG - MC	10	198	TRUE
68	Loch Creran (B)	FS0426	Scottish Sea Farms Ltd	TRUE	14	Mohn Aqua Airmar	10	197	TRUE
69	Loch Creran (D)	FS1047	Scottish Sea Farms Ltd	TRUE	14	Mohn Aqua Airmar	10	197	FALSE
70	Loch Laxford	FS0065	Northern Salmon Management C	TRUE	18	Airmar Db Plus 11	60	180	TRUE
71	Loch Spelve (A)	FS0634	Scottish Sea Farms Ltd	TRUE	10	Airmar DBII	10	197	TRUE
72	Loch Spelve (B)	FS0253	Scottish Sea Farms Ltd	TRUE	10	Mohn Aqua Airmar	10	197	TRUE
73	Lochmaddy	FS0853	Loch Duart Ltd	TRUE	20	AIRMAR / MAG - MC	10	198	TRUE
74	Loura Voe	FS0699	Scottish Sea Farms Ltd	TRUE	10	Mohn Aqua MAG	10	198	TRUE
75	MacLean's Nose	FS0599	Marine Harvest (Scotland) Ltd	TRUE	1	Terecos DSMS4	9.3	135-178	FALSE
76	MAOL BAN	FS0519	Marine Harvest (Scotland) Ltd	TRUE	8	Terecos DSMS 4	9.3	135-178	TRUE
77	Marulaig Bay	FS0865	Marine Harvest (Scotland) Ltd	TRUE	4	Terecos DSMS4	9.3	135-178	TRUE
78	Meall Mhor	FS0091	The Scottish Salmon Company	TRUE	2	ACE Aquatec US 3	12	195 to 197	FALSE
79	Mid Taing	FS0167	Cooke Aquaculture Scotland	TRUE	6	Ace Aquatec	10-20KHz	195dbre1u	TRUE
80	Nevis A	FS0430	Scottish Sea Farms Ltd	TRUE	12	Mohn Aqua airmar	10	197	TRUE
81	Nevis B	FS0616	Scottish Sea Farms Ltd	TRUE	12	Mohn Aqua Airmar	10	197	TRUE
82	Nevis C (Ardintigh)	FS0546	Scottish Sea Farms Ltd	TRUE	12	Mohn Aqua Airmar	10	197	TRUE
83	North Moine	FS0356	Marine Harvest (Scotland) Ltd	TRUE	2	Terecos DSMS 4	9.3	135-178	FALSE
84	North Shore	FS1033	Marine Harvest (Scotland) Ltd	TRUE	6	Terecos DSMS-4	9.3	135-178	TRUE
85	Oldany	FS0933	Northern Salmon Management C	TRUE	10	Airmar Db Plus 11	60	180	TRUE
86	Ornish	FS0531	Marine Harvest (Scotland) Ltd	TRUE	2	ACE AQUATEC	10	135 -180	TRUE
87	Ouseness	FS1209	Cooke Aquaculture Scotland	TRUE	10	Ace Aquatec	10-20KHz	195dbre1u	TRUE
88	Outer Bay (Loch Dro	FS0671	Northern Salmon Management C	TRUE	6	Airmar Db Plus 11	60	180	TRUE
89	Outer Eport	FS1254	The Scottish Salmon Company	TRUE	2	Airmar db11 plus	6.5	195 to 198	FALSE

90	Petersport	FS0340	The Scottish Salmon Company	TRUE	14	OTAQ SealFence	20	195	FALSE
91	Plocrapol	FS1256	The Scottish Salmon Company	TRUE	4	Airmar db 11 plus	6.5	195 to 198	FALSE
92	Polle Na Gille	FS0629	Marine Harvest (Scotland) Ltd	TRUE	2	Terecos DSMS 4	9.3	135-178	TRUE
93	Port Na Cro	FS0859	Marine Harvest (Scotland) Ltd	TRUE	2	Terecos DSMS 4	9.3	135-178	TRUE
94	Portree	FS0708	The Scottish Salmon Company	TRUE	4	ACE Aquatec US3	12	195 to 197	FALSE
95	Puldrite	FS0813	Scottish Sea Farms Orkney and E	TRUE	10	Airmar dbII	10.3	192	TRUE
96	Quarry Point	FS0698	The Scottish Salmon Company	TRUE	2	ACE Aquatec US 3	12	195 to 197	FALSE
97	Raineach	FS1263	Marine Harvest (Scotland) Ltd	TRUE	2	Terecos DSMS4	9.3	135-178	TRUE
98	Reibinish	FS1277	The Scottish Salmon Company	TRUE	2	Airmar db11 plus	6.5	195 to 198	FALSE
99	Rubha Stillaig	FS0894	The Scottish Salmon Company	TRUE	2	Ace Aquatec US 3	12	195 to 197	FALSE
100	Scadabay	FS1293	The Scottish Salmon Company	TRUE	2	Airmar db11 plus	6.5	195 to 198	FALSE
101	Scallastle	FS0209	Scottish Sea Farms Ltd	TRUE	8	Mohn Aqua Airmar	10	197dB	FALSE
102	SCONSER	FS0602	Marine Harvest (Scotland) Ltd	TRUE	12	Terecos DSMS 4	9.3	135-178	FALSE
103	Scotasay	FS0502	Marine Harvest (Scotland) Ltd	TRUE	2	Terecos DSMS-4	9.3	135-178	TRUE
104	SEAFORTH	FS1042	Marine Harvest (Scotland) Ltd	TRUE	2	TERECOS DSMS-4	9.3	135-178	TRUE
105	Sgeir Dughall	FS1262	The Scottish Salmon Company	TRUE	2	ACE Aquatec US3	12	195 to 197	FALSE
106	Sgian Dubh	FS1281	The Scottish Salmon Company	TRUE	2	ACE Aquatec US3	16	194 to 197	FALSE
107	Shapinsay	FS0860	Scottish Sea Farms Orkney and E	TRUE	8	Ace Aquatec US3	20	195	TRUE
108	Shuna Castle	FS0465	Kames Fish Farming Ltd	TRUE	1	Terecos DSMS4	5	179	FALSE
109	Shuna SW (Rubhan T	FS1290	Kames Fish Farming Ltd	TRUE	2	Terecos DSMS 4	9.3	135 – 178	TRUE
110	Sian Bay	FS0361	Scottish Sea Farms Orkney and E	TRUE	10	Airmar dbII	10.3	192	TRUE
111	Slocka Ronas Voe	FS1018	Scottish Sea Farms Ltd	TRUE	14	Mohn aqua MAG	10	198	TRUE
112	Snarraness	FS0400	Scottish Sea Farms Ltd	TRUE	8	Ace Aquatec US3	12	195 to 197	TRUE
113	Sound of Harris	FS1260	Loch Duart Ltd	TRUE	14	AIRMAR / MAG - MC	10	198	TRUE
114	South Sound	FS0183	Scottish Sea Farms Ltd	TRUE	14	Mohn Aqua Mag	10	198	TRUE
115	Strome	FS0570	The Scottish Salmon Company	TRUE	4	ACE AQUATEC US3	12	195 to 197	FALSE
116	Strone	FS1056	The Scottish Salmon Company	TRUE	2	ACE Aquatec US3	16	194 to 197	FALSE
117	STULAIGH	FS1259	Marine Harvest (Scotland) Ltd	TRUE	16	Airmar	10	135-178	TRUE
118	Tabhaigh	FS1297	Marine Harvest (Scotland) Ltd	TRUE	4	Terecos DSMS-4	9.3	135-178	TRUE
119	Tanera	FS0549	Scottish Sea Farms Ltd	TRUE	24	Mohn Aqua MAG Se	10	197	TRUE
120	Taranaish	FS0752	The Scottish Salmon Company	TRUE	4	Airmar dB Plus 11	12	195 to 198	TRUE
121	Tarbert South	FS0767	The Scottish Salmon Company	TRUE	2	ACE Aquatec	12	195 to 197	FALSE
122	Teisti Geo	FS1093	Scottish Sea Farms Ltd	TRUE	14	Mohn aqua MAG	10	198	TRUE
123	TORRIDON	FS0234	Marine Harvest (Scotland) Ltd	TRUE	10	Terecos DSMS4	9.3	135-178	TRUE
124	Trenay	FS0796	The Scottish Salmon Company	TRUE	2	Airmar db 11 plus	6.5	198	FALSE
125	Trilleachan Mor	FS1118	The Scottish Salmon Company	TRUE	3	Airmar dB Plus 11	6.5	194 to 198	FALSE
126	Tuath	FS0617	The Scottish Salmon Company	TRUE	12	OTAQ SF3	10	196	FALSE
127	Uiskevagh	FS1255	The Scottish Salmon Company	TRUE	4	Airmar db11 plus	6.5	198	FALSE
128	Vacasay	FS1091	The Scottish Salmon Company	TRUE	4	Airmar dB Plus 11	12	195 to 198	FALSE
129	Vidlin North	FS0608	Scottish Sea Farms Ltd	TRUE	20	Mohn Aqua MAG	10	198	TRUE
130	Vuia Beag	FS0411	The Scottish Salmon Company	TRUE	2	Airmar dB Plus 11	6.5	195 to 198	FALSE
131	Vuia Mor	FS1103	The Scottish Salmon Company	TRUE	4	Airmar dB Plus 11	6.5	195 to 198	FALSE
132	Walters (East Lismor	FS0875	Scottish Sea Farms Ltd	TRUE	11	Mohn Aqua Airmar	10	197	TRUE
133	Wester Ross Fisherie	FS0057	Northern Salmon Management (	TRUE	12	Airmaar Db Plus 11	1	198	TRUE
134	Wester Ross Fisherie	FS0517	Northern Salmon Management (	TRUE	8	Airmaar Db Plus 11	10	198	TRUE
135	Wester Ross Fisherie	FS0675	Northern Salmon Management (	TRUE	8	Airmaar Db Plus 11			
136	Wester Ross Fisherie	FS0056	Northern Salmon Management (	TRUE	14	Airmar Db Plus 11	10	198	TRUE

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## Background Context:

- Special Area of Conservation for harbour porpoise (Inner Hebrides & the Minches) submitted to EC in 2016:

Here's SNH's [web-site](#):

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**Protected areas**

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- ▶ Site condition monitoring
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- ▶ Harbour porpoise candidate SAC
  - ▶ Harbour porpoise in Scotland
- ▶ 2016-17 Marine bird pSPAs consultation - closed
- ▶ Notices
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- ▶ Non-native species
- ▶ Reintroducing native species
- ▶ Beavers
- ▶ Looking after our landscapes

### Harbour porpoise candidate SAC

Following on from the public consultation led by Scottish Natural Heritage, the Scottish Government have now confirmed that the Inner Hebrides and Minches candidate Special Area of Conservation (cSAC) for harbour porpoise has been submitted to the European Commission.

The cSAC is the largest protected area in Europe for harbour porpoise and covers over 13,800 km<sup>2</sup> and supports over 5000 individuals.

The protected area will help maintain the favourable conservation status of harbour porpoise by providing protection to them and the habitats that support them in Scottish waters.

Links to the consultation reports and responses are available:

[Consultation report](#) 

[Consultation process report](#) 

[Consultation responses](#) 

[Selection assessment document](#) 

Please contact [porpoiseSAC@snh.gov.uk](mailto:porpoiseSAC@snh.gov.uk) if you have any queries.

**Related links**

- ▶ [Gaelic webpage](#) 
- ▶ [Marine Scotland](#) 

**Supporting Documents**

- ▶ [Boundary map](#) 
- ▶ [Overview](#) 
- ▶ [Advice to Support Management \(update coming soon\)](#) 
- ▶ [Site summary](#) 
- ▶ [Business and Regulatory Impact Assessment](#) 
- ▶ [Proposed Conservation Plan](#) 
- ▶ [Questions & Answers](#) 



- The SSPO oppose the SAC as it "could significantly affect our sector in the future":

The Scottish Salmon Producers Organisation (SSPO) do not support the SAC:

Response #	Name	Question 1: Do you support the designation of the Inner Hebrides and the Minches proposed Special Area of Conservation?
38561986	Scottish Salmon Producers' Organisation	<p><b>Answer</b>      <b>Comments:</b></p> <p>SCROLL &gt;&gt;&gt;&gt;</p> <p>No      We accept the proposed designation but to support it would mean our sector supported increased bureaucracy, regulation, cost and administration, which we do not. It is difficult to see how the designation will ultimately lead to a better outcome for Harbour Porpoise when there are so many other influencing factors.</p>

Here's further responses by the SSPO to [SNH's consultation](#):

Q3. Do you have any comments to make on the proposal to develop a harbour porpoise conservation strategy for Scottish waters?	
<b>Answer</b>	<b>Comments:</b>
SCROLL >>>>	
Yes	As a sector representative we would like to be informed of work in this area as it could significantly affect our sector in the future.

**Q4. Do you have any comments on the Advice to Support Management document for the Inner Hebrides and the Minches proposed Special Area of Conservation?** If your comments on the Advice to Support Management document relate to specific activities or industries please select from the list below. *Acoustic survey, Aquaculture, Cables and pipelines, Commercial shipping, Fishing (all forms), Marine renewable developments, Ports and harbours, Recreational activity, Scientific research, Wildlife tourism, other.*

Activities	Comments:
Yes	Aquaculture
	Aquaculture farms have been situated in the proposed areas for over 30 years and ADDs have been used for 20 years. The scientific opinion and evidence for the designation of the area has been gathered over the last few years and this has shown to be the best place to designate, therefore current activities in the area should not be further restricted. As a sector, we have concerns about the impact on farms adjacent to the area which may be impacted even though they are not in the designated area. Regarding the recommended management options, we would propose that in areas which SNH deem to be higher cumulative risk, we assess and focus on what the current situation is prior to any restrictions being placed on existing or new farms. The industry has agreed to work with SNH as a proposed way forward to dealing with any impact. It should be noted that developing guidance on cumulative impact, including the ability to measure this impact will be an important aspect of managing this proposed SAC.

- European Protected Species via the Habitats Regulations 1994 and "deliberate and reckless" disturbance of cetaceans:

SNH's [web-site](#) includes:

## European protected species

### Introduction

The [Habitats Regulations 1994](#) (as amended in Scotland) provide the protection afforded to European protected species (EPS) of animals and plants (those species listed on Annex IV of the Habitats Directive whose natural range includes Great Britain). These Regulations apply across the terrestrial environment and Scottish inshore waters (up to 12nm from the shore).

- EPS are listed on Schedules [2 \(animals\)](#) and [4 \(plants\)](#) of the Habitats Regulations 1994 (as amended). These Regulations have been amended many times since 1994 including in 2007, 2008(a), 2008(b), 2009, 2011 and 2012. Only some of the species listed on Schedules 2 and 4 are found in Scotland. Please go to our [protected species table](#) to identify which. The Scottish Government produced explanatory guidance on the 2007 amendments which introduced key changes to the law.

The following notes give some guidance on the current protection given to EPS. This summary is not a legal document. If legal detail is what you require, you should check the actual text of the [Habitats Regulations 1994](#) (as amended in Scotland).

**For animals:**

It is an offence to deliberately or recklessly:

- capture, injure or kill such an animal;
- harass an animal or group of animals;
- disturb an animal while it is occupying a structure or place used for shelter or protection;
- disturb an animal while it is rearing or otherwise caring for its young;
- obstruct access to a breeding site or resting place, or otherwise deny the animal use of the breeding site or resting place;
- disturb an animal in a manner that is, or in circumstances which are, likely to significantly affect the local distribution or abundance of the species to which it belongs;
- disturb an animal in a manner that is, or in circumstances which are, likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young;
- disturb an animal while it is migrating or hibernating;
- deliberately or recklessly take or destroy its eggs (in Scotland this would be only relevant to great crested newt and natterjack toad);
- disturb any dolphin, porpoise or whale (cetacean).

The Scottish Government advises on their [web-site](#):



- ▼ Marine and Fisheries
- ▼ Marine Environment
- ▼ Species
- ▼ Marine Mammals
  - ▶ Cetaceans: Whales, Dolphins & Porpoises
  - ▶ Royal Fish

#### Useful links

- [National Marine Plan Interactive](#)
- [Natura](#)
- [OSPAR](#)
- [Ramsar](#)
- [Scotland's Marine Atlas](#)
- [Protected Nature Sites](#)

#### Cetaceans: Whales, Dolphins & Porpoises

The Scottish Government has responsibility for the conservation and protection of all cetaceans (whales, dolphins and porpoises) within Scottish waters.



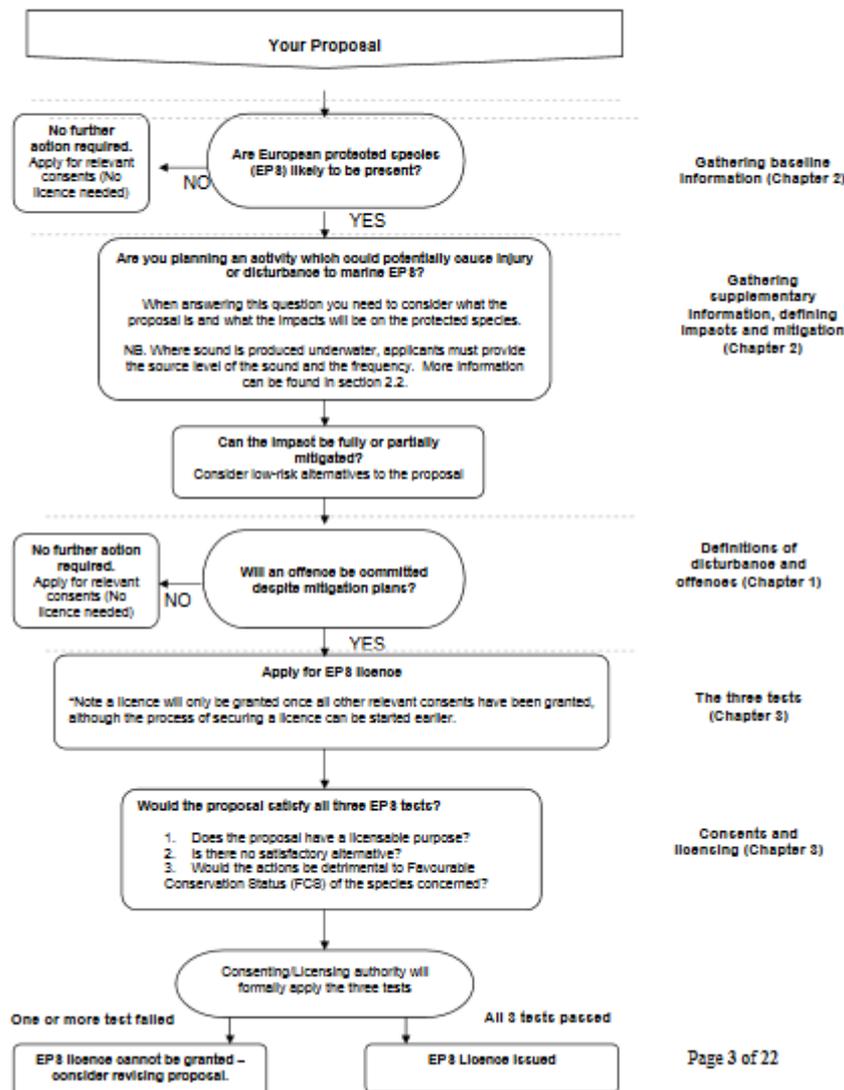
All [cetaceans](#) are protected under the EU Habitats Directive, which makes it an offence to deliberately capture, kill or recklessly disturb cetaceans. A Special Area of Conservation (SAC)

has been established in the Moray Firth to protect the local population of bottlenose dolphins. A [consultation on an SAC for Harbour Porpoise](#) is currently under way.

The Scottish Government has produced guidance for marine users on the [Protection of European Protected Species from injury and disturbance for Scottish Inshore Waters](#).

A Marine Scotland report - "[The protection of Marine European Protected Species from injury and disturbance: guidance for Scottish inshore waters](#)" - published in 2014 included:

Flowchart showing the decision-making process  
Please refer to the relevant chapter of the guidance



### Why do we require guidance for Scottish inshore waters?

In Scottish inshore waters (within 12 nm of the coast), offences relating to the protection of marine EPS are provided for under the Habitats Regulations (please refer to Box 1) which prohibits the *deliberate* and *reckless* capture, injury, killing and disturbance of marine EPS. The guidance in this document relates to these regulations.

Regulation 39 (1) (a) of the aforementioned regulations sets out offences that relate to a number of specific circumstances in which EPS are injured/disturbed and include an offence of harassment of EPS. Furthermore, due to the differing strategies of cetaceans and the small amount we know about them, Regulation 39 (2) gives them additional protection from disturbance by providing that it is an offence to '*deliberately or recklessly disturb any dolphin, porpoise or whale (cetacean).*' This offence only applies in Scottish waters. (See Box 1 in Section 1).

## 1.1. The Habitats Regulations in relation to marine EPS in Scotland

The Habitats Regulations 1994 implement certain requirements of the European Habitats Directive (Council Directive 92/43/EEC on the conservation of natural habitats and of wild flora and fauna) in Great Britain. Animals listed in Annex IV(a) of the Habitats Directive, whose natural range includes any area in Great Britain, are also listed in Schedule 2 of the Habitats Regulations as European protected species (EPS) of animals. They are species of European Community interest in need of strict protection (refer to the introduction for the definition of marine EPS).

### Box 1 – Legislation in Scottish inshore waters

The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended)

**Regulation 39 (1)** makes it an offence —

*(a) deliberately or recklessly to capture, injure, or kill a wild animal of a European protected species;*

*(b) deliberately or recklessly –*

*(i) to harass a wild animal or group of wild animals of a European protected species;*

*(ii) to disturb such an animal while it is occupying a structure or place which it uses for shelter or protection;*

*(iii) to disturb such an animal while it is rearing or otherwise caring for its young;*

*(iv) to obstruct access to a breeding site or resting place of such an animal, or otherwise to deny the animal use of the breeding site or resting place;*

*(v) to disturb such an animal in a manner that is, or in circumstances which are, likely to significantly affect the local distribution or abundance of the species to which it belongs;*

*(vi) to disturb such an animal in a manner that is, or in circumstances which are, likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young; or*

*(vii) to disturb such an animal while it is migrating or hibernating.*

Due to the differing lifestyles of cetaceans and the small amount we know about them, the law gives them further protection through an additional disturbance offence.

**Regulation 39(2)** provides that it is an offence to –

*deliberately or recklessly disturb any dolphin, porpoise or whale (cetacean).*

Considerations to exempt from the requirement of these species protection provisions are available in certain specified circumstances, provided that:

- there is a licensable purpose;
- there are no satisfactory alternatives;
- the actions authorised will not be detrimental to the maintenance of the population of the species concerned at favourable conservation status in their natural range.

**An application for a licence will fail unless all of the three tests are satisfied.**

Moreover:

### **1.2.5 What constitutes *deliberate* disturbance?**

Article 12(1)(b) of the Habitats Directive has been considered by the European Court of Justice. The Commission Guidance (paragraph 33) therefore proposes the following definition:

*'Deliberate' actions are to be understood as actions by a person who knows, in light of the relevant legislation that applies to the species involved, and the general information delivered to the public, that his action will most likely lead to an offence against a species, but intends this offence or, if not, consciously accepts the foreseeable results of his action. It goes without saying that negligence is not included in the meaning of 'deliberate'.*

Put more simply, a deliberate disturbance is an intentional act knowing that it will or may have a particular consequence, namely disturbance of the relevant protected species. So, anyone carrying out certain activities which they consider likely to cause disturbance of cetaceans could very well be committing an offence under the Habitats Regulations.

### **1.2.6 What constitutes *reckless* disturbance?**

There is considerable case law on what constitutes 'recklessness' and ultimately only a court can definitively decide whether a particular action was reckless. Recklessness would appear to arise:

- if a person was aware of the likelihood that disturbance would result from his actions, but proceeded with the action with gross indifference as to its consequences; or
- if a person undertook an action in circumstances where any reasonable person could be expected to have foreseen the potential for disturbance but proceeded without regard to the consequences.

**The definitions of 'deliberate' and 'reckless' outlined here apply equally to the offences of deliberate and reckless injury and deliberate and reckless killing of EPS.**

### **Challenged in Court:**

A report to Marine Scotland - "[Investigations on Seal Depredation at Scottish Fish Farms](#)" - published in 2013 stated:

Under EU and domestic legislation, the deliberate or reckless disturbance of cetaceans (and other European Protected Species) in Scotland is prohibited. At present Scottish Natural Heritage (SNH), as the statutory nature conservation body, is consulted on fish farm site licence applications in Scotland. SNH policy towards the use of ADDs used at new sites is currently based on whether or not the site is considered important for cetaceans. However, it is still unclear whether or not the use of ADDs more widely might be construed as the deliberate or reckless disturbance of cetaceans, and the uncertainty seems unlikely to be clarified until the current interpretation is challenged in court. This means that it is conceivable that the existing permitted use of ADDs in Scotland could be challenged, perhaps leading to more widespread restrictions on their use. Furthermore, under recently agreed Global Standards for Salmon Aquaculture, initiated by the WWF and agreed by over 500 international stakeholders, ADDs are intended to be phased out in salmon aquaculture within three years of the publication of the Salmon Aquaculture Dialogue<sup>13</sup> (SAD) by those companies that sign up to the Standards. The SAD proscription of ADDs appears to be based on the assumption that all such deterrents are inimical to cetacean conservation. An exception to this may be granted where new technologies can be shown to present less risk to non-target populations.

- ADDs = Acoustic Deterrent Devices (or 'seal scammers'):

According to [Ocean Science Consulting's web-site](#):

## **WHAT ARE ACOUSTIC DETERRENT DEVICES?**

Acoustic Deterrent Devices (ADDs), or 'pingers', emit aversive sounds into the marine environment, and were developed originally to deter small cetaceans such as harbour porpoises (*Phocoena phocoena*) from approaching fishing gear, thus reducing entanglements. Acoustic Harassment Devices (AHDs) or 'seal scarers' are similar, but emit higher-intensity sounds, intended to prevent seals from approaching (and damaging) commercially important fish stocks. Both ADDs and AHDs, collectively known as Acoustic Mitigation Devices (AMD), can be used to deter marine mammals from industrial operations. The term Acoustic Harassment Device is generally discouraged these days, although the term is still used (Tixier *et al.* 2015).

According to [Whale & Dolphin Conservation's web-site](#):

# 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 scramblers' 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 16km<sup>2</sup> of coastal waters and that porpoise abundance would be significantly reduced over an area of 1187km<sup>2</sup> 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.

## - ADDs used in Scotland (2016-2017):

ADDs reported as being used in Scotland include:

[Airmar's db Plus II \(Mohn Aqua\):](#)

## dB Plus II™



### Your Best Protection Against Losses

Airmar's dB Plus II™ Acoustic Deterrent System is a proven method of controlling seal predation ever since its introduction in 1993. Our innovative approach of combining a high-powered transmitter with four underwater projectors creates an acoustic barrier that causes significant discomfort to any approaching seal.

The dB Plus II deterrent is the system of choice in North America. This system is the cornerstone of North America's seal exclusion program, with over two hundred currently in use.

Take advantage of the latest seal deterrent technology. Experience the benefits of eliminating seal attacks with no physical damage, reduced stress, and increased fish growth rates.

### Optimum Performance

The key to optimal performance is the proper selection and maintenance of batteries and a reliable power source. In remote locations, a wind generator or regulated, four-panel, solar array is the recommended power supply. Locations with shore power can utilize AC mains with a 24 Volt battery charger.



## Acoustic Deterrent System

### Features

- Up to 3,000 square meters (32,291 square feet) of protection
- Standard system has four underwater sound projectors to create overlapping sound fields
- Self-diagnostic lights on front panel indicate battery status and transmitting mode
- Four independent power amplifiers for measured system reliability
- Transmitter power switch is lockable in the "OFF" position, preventing accidental activation when a diver is in the water
- High-visibility nylon cover for transmitter to warn that a diver is in the water
- Unique "Soft Start" feature with 70 second ramp up to full-power when transmitter is first switched "ON". This feature provides warning to divers and eliminates chance of hearing loss in seals and sea lions.
- External triggering capability allows system to be activated when predators are detected
- Sound projectors are designed to withstand the harsh marine environment

[www.airmar.com](http://www.airmar.com)



# dB Plus II™

## Technical Information

### SPECIFICATIONS

**Maximum Coverage:** 3,000 square meters (32,291 square feet)

**Battery Status and Transmitting Mode:**

- Normal Mode—Operates when the battery voltage is above 22 VDC
- Power Save Mode—Automatically activated when the battery voltage drops below 22 VDC. It extends time between pulses without decreasing sound output. Power consumption is reduced by 50%
- Shut Down Mode—Activated whenever the battery voltage drops below 20 VDC
- Audible "Insufficient Power" Alarm—Sounds when the transmitter shuts down

**Sound Projectors Withstand Harsh Marine Environments:**

- Provided with weatherproof connectors allowing ease of installation and repositioning
- Cable can be lengthened or shortened with minimal loss of performance
- High visibility cable jacket with excellent abrasion resistance

**Supply Voltage:** 24 VDC

**Output Power:** 1.8 kW RMS pulse power output per transmitter

**Audible "Insufficient Power" Alarm:** 97 dB

**Standard Cable Length:** 60 m (200')

**Power Consumption:**

- 1.7 Amps at 100% power
- 0.9 Amps in power save mode is factory preset for 50% reduction

**System Coverage\*:**

3,000 square meters (32,291 square feet) for typical aquaculture application

**Patent Information:**

- U.S. Patent Number 5,610,876
- Norwegian Patent Number 304001
- European Patent Number EP 0 706 317 131

**Warranty:**

- The dB Plus II system is backed by a full 12 month U.S. Manufacturer's Limited Warranty covering defects in manufacture.\*\*
- This system is designed to deter seals. Effectiveness with other species or with hearing impaired seals is neither insured nor implied.

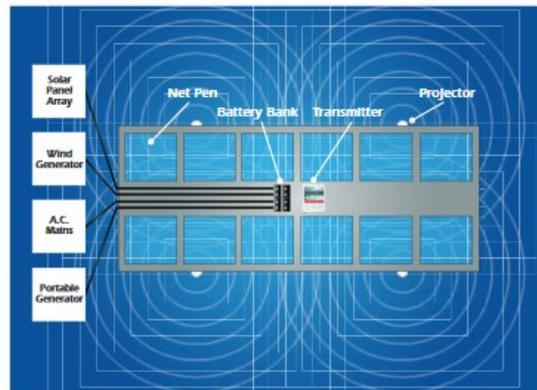
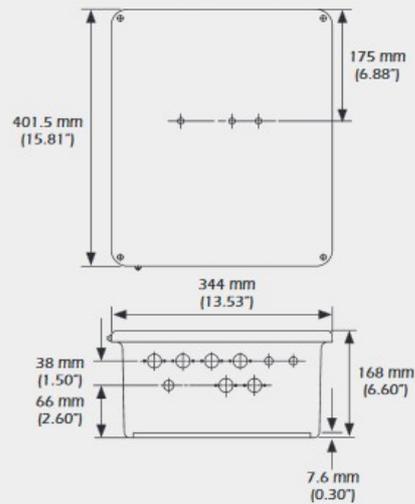
**Safety Notes:**

- To ensure safe operating practices, the transmitter cover label carries the following warnings for divers and operators:
- DANGER—Temporary or permanent hearing loss may result from underwater exposure to high-intensity sound generated by this equipment. This transmitter's "On-Off" switch must be locked in the "Off" position whenever a person is underwater and within 150 m (492') of a transducer
  - NOTICE TO DIVERS—This transmitter's "On-Off" switch must be locked in the "Off" position and the diver's safety cover put in place over the transmitter box before entering the water. If the system is switched on accidentally, immediately surface at the normal ascent rate.

\*This may vary for different species and sites.

\*\*Breach of transmitter box seal voids warranty.

### DIMENSIONS



### Options

- Power splitters allow the dB Plus II system to use up to eight sound projectors
- Customized transducer cable length up to 150 m (500')
- Cable splice kit





## Airmar dB Plus II™ Acoustic Deterrent System

- Unique patented system uses low frequency sound to cause discomfort to approaching seals
- Sound projectors (transducers) placed around the farm to create perimeter or protection
- Each projector has 40m range
- Range of power solutions
- 100s of systems in use worldwide
- Extensive reference list

# AIRMAR dB PLUS II HAS BECOME THE INDUSTRY STANDARD METHOD OF DETERRING SEALS AND SEA LIONS FROM ATTACKING AQUACULTURE SITES



The Airmar dB Plus II™ acoustic deterrent system has proven to be an extremely effective method of controlling seal predation ever since its introduction in 1993. This patented system uses an innovative and unique approach of combining a high powered transmitter with multiple underwater projectors to create an acoustic barrier that causes significant discomfort to any approaching seal.

### Long term success around the world

The dB Plus II™ deterrent has become the system of choice in key farming markets such as Scotland, Canada and Chile with literally hundreds of systems in operation. To many, the Airmar dB Plus II™ system has become the cornerstone of their seal exclusion program as it is the one system that seals can never "get used to".

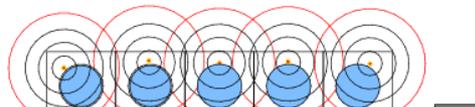
### Optimum Performance

The key to optimum performance lies with the correct positioning of sound projectors to create overlapping sound fields. A high performance battery charging and power distribution system is also key to its success. We specify advanced charging solutions along with our own cage side DC/DC converters and subsea cable infrastructure. We can also specify wind and solar based solutions for sites with no on site mains power.

### Specifications

System supply voltage	24 VDC
Output power:	1.8 kW RMS pulse power output per transmitter
Power consumption	- 1.7 Amps at 100% power. - 0.9 Amps in Power Save mode is factory preset for 50% reduction
System coverage	Normally 40m radius from each sound projector Note: This may vary for different species and sites

This system is designed to deter seals. Effectiveness with other species or with hearing impaired seals is neither insured nor implied.



[Ace Aquatec:](#)

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#### TRANSDUCERS

- Standard randomized dual noise in frequencies from 10-20 khz
- Low frequency 2-5khz variant in the sensitive hearing range of seals but outside the sensitive hearing range of porpoises

# US3

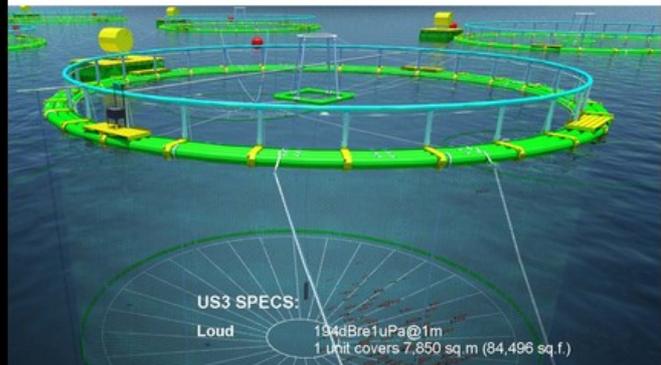
## PREDATOR DETERRENT

#### TRIGGERS

- Seal sonar detection triggers and fish motion triggers detect the approaching predator and scam in response
- Triggers limit noise pollution, increasing effectiveness of scamming and decreasing chances of habituation

#### CONTROLS

- User-friendly interface with touchpad & backlit display
- Fault warning & low battery beacon
- Optional laptop operation from shore-base
- Battery and AC mains



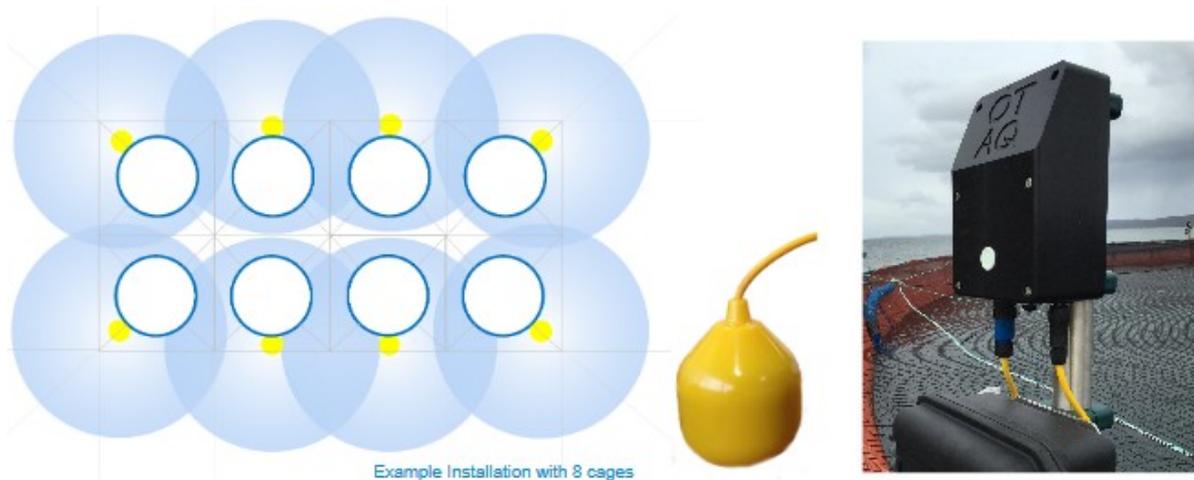
[OTAQ:](#)

## SeaFENCE™

Acoustic Seal & Sea Lion Deterrent with Active Condition Monitoring



- **Proven method** for long term deterrence of seals and sea lions
- **Verify correct performance** with Active Condition Monitoring
- **High Specification Projector** manufactured for OTAQ by Airmar® Technology
- **Modular system** easy to install, minimal maintenance, reduced cable damage
- **Wireless Network** Integrated wireless networking from each unit
- **OceanTALK™ compatible** Future proof networking for aquaculture



Example Installation with 8 cages

#### Overview

SealFENCE™ is a unique system designed to deter seals and sea lions from underwater areas. It uses a proven acoustic deterrent method with an effective range of 45m from each projector.

The system is modular and very easy to install - we will recommend locations for your SealFENCE modules depending on site configuration.

The SealFENCE System has been engineered for long term deployment on exposed marine aquaculture sites. Using our standard rechargeable battery pack, the system stores charge during the day when AC power is available then runs for up to 50 hours on battery power alone; other power solutions are also available.

Using a bespoke underwater ultrasonic projector (usually installed at a water depth of 10-20m) SealFENCE creates a sound that will cause an approaching seal significant discomfort if it enters the effective range of the system. Outwith this range, the animal will be unaffected.

#### Active Condition Monitoring (ACM)

ACM gives you complete confidence that your system is working correctly 24 hours a day. Using our innovative Smart Projector technology a wireless network from each module communicates with a PC on your barge running SealFENCE Monitor software to provide live and historical performance data.

#### Modular System

Our system is modular and very easy to deploy. As each unit is self contained, no additional cables between cages are required delivering a more reliable system that is easy to expand or repair.

#### OceanTALK™

SealFENCE 1C can connect to other devices using OceanTALK™, our system for connecting and controlling multiple devices of different types. Learn more about the power of OceanTALK at [www.otaq.co.uk](http://www.otaq.co.uk)

### Terecos:

#### 2.2.3 Terecos (Type DSMS-4)

Based on data from calibration trials by Lepper *et al.* (2004) the Terecos system deploys a complex series of multi-frequency components with a high degree of randomness in the sequence timing. The system operates in four different programmes or combination of programmes. These programmes can be broken down into a number of key features. These include a sequence of 5 segment (16 ms duration) continuous tonal blocks forming an up and down frequency sweep (labelled Seq.1), randomly timed sequence of continuous and time variant multi-component tonal blocks and sequences (Seq.2) of eight segment (8 ms duration) continuous tonal blocks forming an up and down frequency sweep. Each programme either uses a signal type in isolation or combination. Figure 10 shows an

example of a programme 4 sequence containing seq.1 signals, seq. 2 signals, continuous and time variant signals.

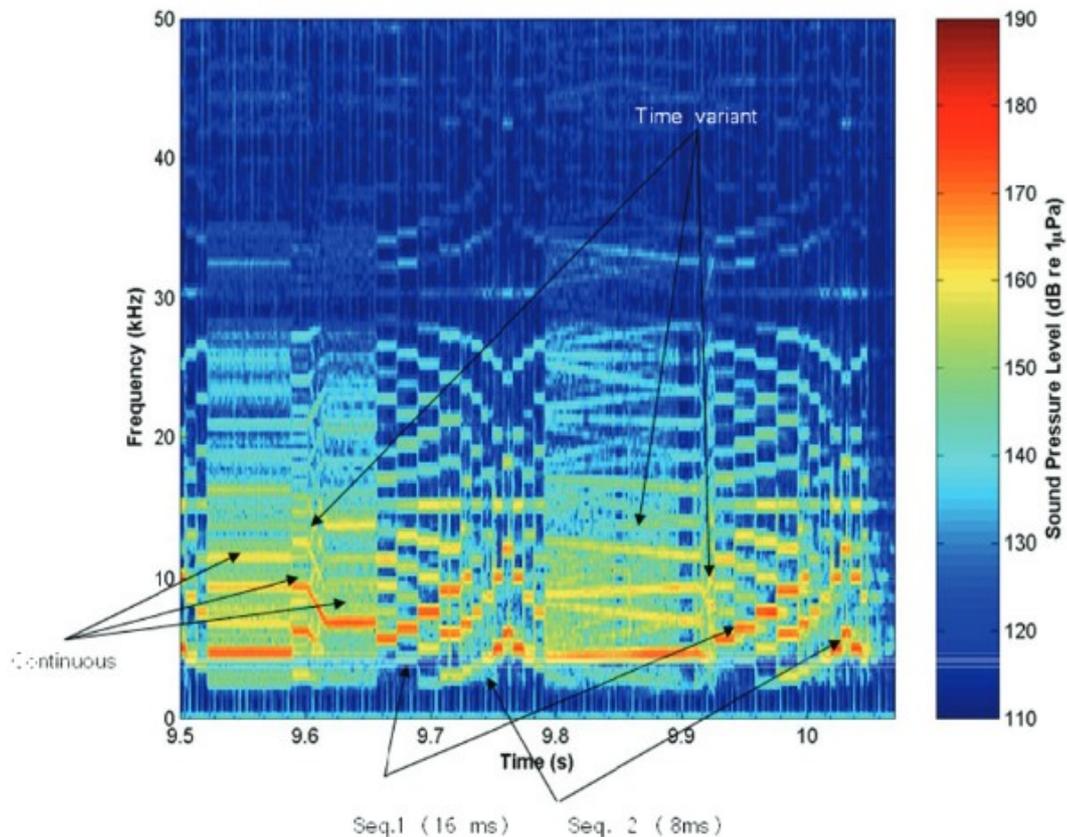


Figure 16: Terecos type DSMS-4 transducer.

Figure 17: Terecos type DSMS-4 controller unit.

**- ADDs can be detected by harbour porpoises over 14 km away:**

Read more on the Scottish study which reported that an ADD could be detected at a distance of 14km away via the Scottish Aquaculture Research Forum report "[Assessment of the impacts and utility of acoustic deterrent devices](#)" (December 2010).

The Executive Summary 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.**

### **Porpoise reactions to ADDs in the longer term and at a wider spatial scale**

Standardised calibrated acoustic recordings made routinely by the Hebridean Whale and Dolphin Trust and collected between 2006 and 2008 were analysed to determine sound levels associated with ADDs over a wide survey area on the west coast of Scotland. Custom software allowed an automated analysis to identify ADD sound sources; a smoothed surface of ADD received levels was calculated by interpolation between values over a 1km spatial scale to produce "sound maps" of ADD received levels for the Sound of Mull and Loch Linne. ADDs could be detected up to 14.7 km from the sound source and were detected throughout most of the Sound of Mull. Propagation losses were also plotted and showed considerable variability between sites, though generally, propagation loss was found to be similar to or greater than the rate of 20 Log (Range) expected with spherical spreading

**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.**

The report stated:

## **1. Introduction**

This project investigated two parallel questions: firstly to what extent do the Acoustic Deterrent Devices (ADDs) most frequently used in Scottish fish farms exclude or affect the distribution of cetaceans, especially harbour porpoises, and secondly, how effective are ADDs in preventing seals from damaging fish pens and damaging farmed fish or allowing fish to escape? A more general question was to investigate the management of interactions between seals and salmon farms.

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.

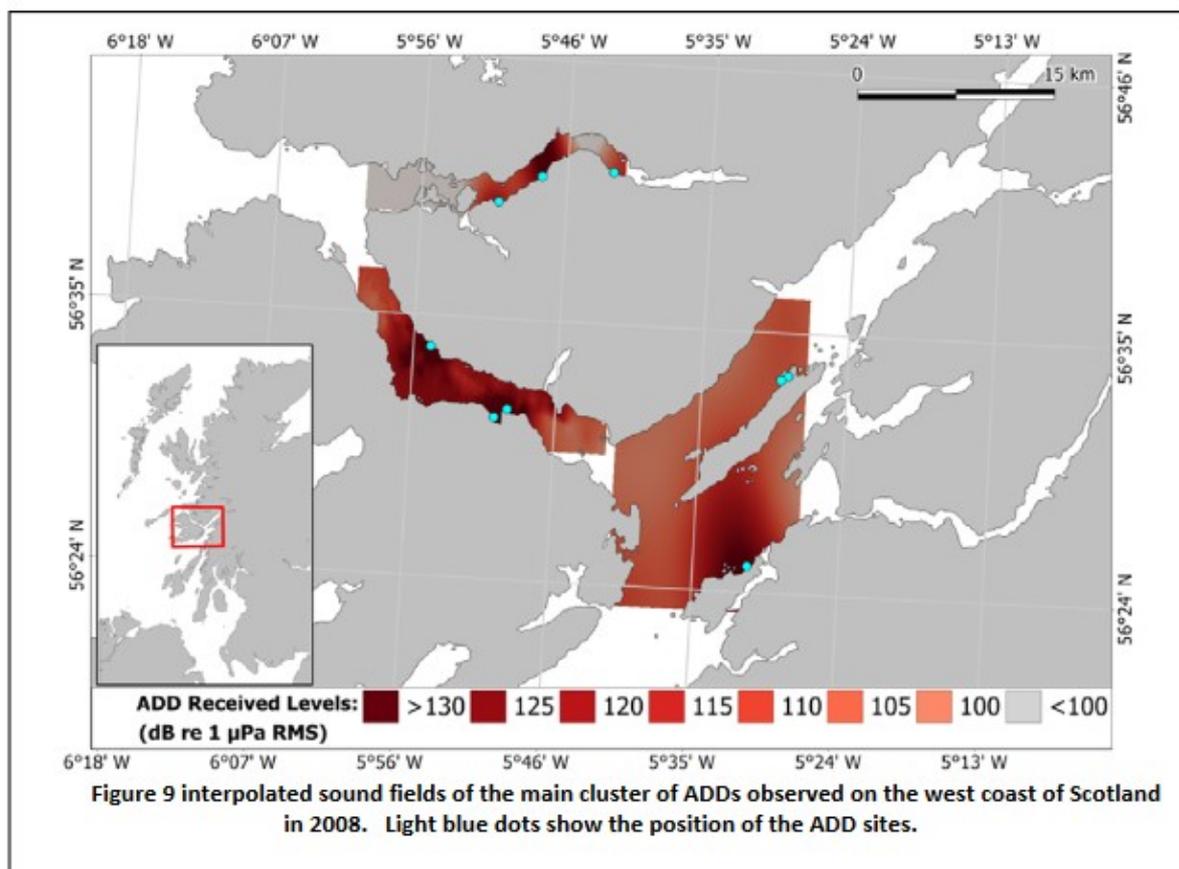
And:

This project did demonstrate effects on harbour porpoise distribution, though less dramatic than those shown by previous Canadian studies. As European Protected Species all cetaceans are protected under national and EU wildlife legislation. Specifically, deliberate or reckless disturbance of any cetacean could constitute an offence under The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended in Scotland). Advice on licensing requirements can be obtained from local Scottish Natural Heritage (SNH) offices. Licensing requirements may be influenced by the fact that SNH considers some sites to be more important to cetaceans than others. Specifically, these might include Special Areas of Conservation (SACs) with a cetacean interest; straits, sounds, and embayment's where cetaceans are frequently observed and where the presence of ADDs may cause a barrier to passage, and finally headlands and tidal upwelling areas that may be important for cetaceans' feeding.

The report stated:

### 2.3.2.1 Sound Fields

Figure 9 shows a map of ADD received levels in the Sound of Mull in 2008. It is clear that received levels were elevated well above background at ranges of many km from fish farm sites. From this and from Figure 9 it's clear that ADDs can be detected at ranges of up to 14.7 km and that with several fish farms using ADDs there, ADDs can be detected through most of the Sound of Mull. Previous studies of the effects of ADDs on porpoise distributions have not measured received levels directly however research in the Bay of Fundy (Johnston, 2002) estimated that porpoises would be excluded from an ADD at received levels of 125dB.



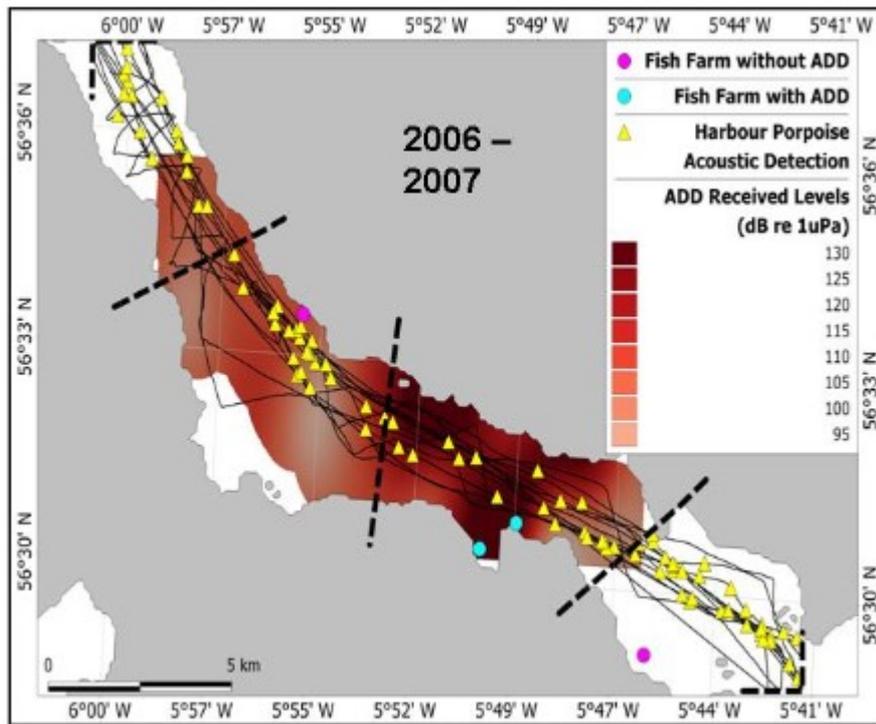
Moreover:

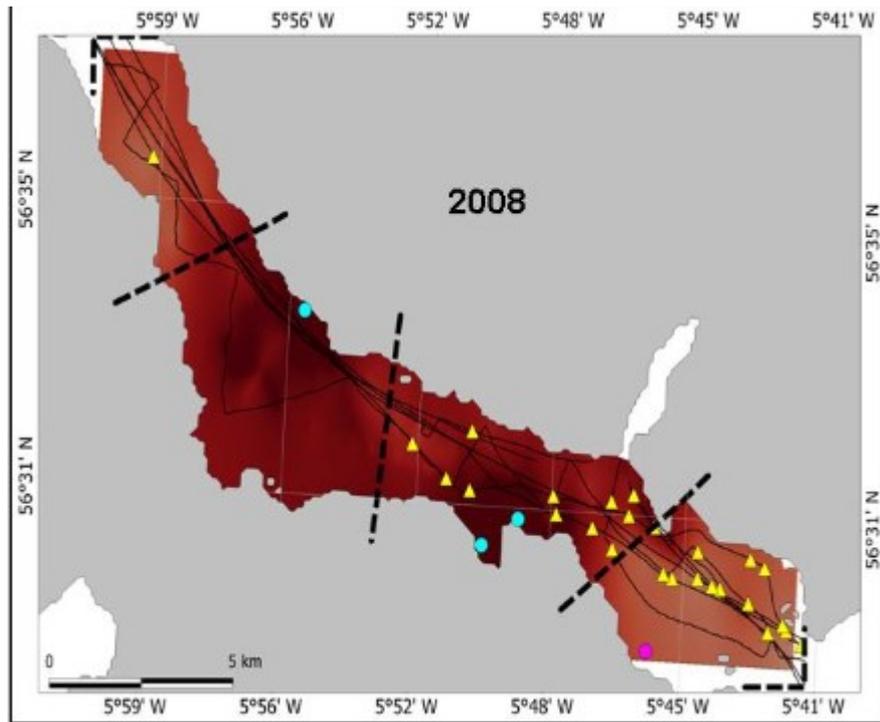
## 2.4 Effects of ADDs on Porpoise Distribution

Two approaches to investigating effects on porpoise distributions have been explored using the data collected on the HWDT survey vessel. The first was a case study involving a comparison of distributions and densities in years before and after a new ADD was introduced in the Sound of Mull. The second is an investigation of whether ADD levels were a significant predictor within a spatial model of relative porpoise densities incorporating a variety of habitat and environmental parameters.

### 2.4.1 Case Study: Before and After ADD Introduction

Detailed and consistent data on porpoise densities and ADD received levels were collected in the north western section of the Sound of Mull between 2006 and 2008 with some 801kms of acoustic survey completed. Over this period, Airmar ADD devices were operating at two adjacent fish farm sites, Fishnish A and B, while at a third site, Fiunary, a new Airmar ADD system was fitted for the first time in 2008 (Figure 11). Based on this pattern of ADD use, the sound of Mull was divided into four subareas which experienced different levels and histories of ADD exposure (Figure 11). These survey blocks, interpolated sound fields and the vessels survey tracks and the locations of porpoise detections are shown for 2006,7 and for 2008 in Figure 13 and monitoring effort and detection numbers are broken down by year and areas in Table 4. A reduced detection rate is evident in 2008 in the survey blocks close to and to the north of Fiunary, the site at which the new ADD equipment was installed. The number of acoustic encounters was significantly lower in the Fiunary area in 2008 than expected ( $p < 0.05$ ,  $\chi^2 = 4.82$ ,  $df = 1$ ) and no porpoises were detected within 4300m of the ADD site during that period.





**Figure 11- Distribution of acoustic survey effort (black lines) and acoustic detections of harbour porpoise (yellow triangles) in 2006-7 and 2008. Locations of active ADDs are shown as pink dots, farms without active ADDs are shown as blue dots. The boundaries of the areas considered in the analysis are shown. Sound field levels are shown in legend.**

A Scottish Government report - "[Evaluating and Assessing the Relative Effectiveness of Acoustic Deterrent Devices and other Non-Lethal Measures on Marine Mammals](#)" - published in 2014 included:

At least five different types of ADD are used in Scotland, but many more devices are available and may be marketed for other purposes. We have tabulated all devices that we are aware of as of 2013 within this review.

About half of all fish farm sites appear to use ADDs, but there is no register of which sites are using what devices, and little information on their effectiveness. Source levels, signal characteristics, duty cycles and modes of operation are all likely to have significant bearings on how effective they are and also on the extent to which they have an impact on non-target species such as cetaceans. Harbour porpoises are known to avoid areas where Airmar and Lofitech ADDs are being used, but the maximum range that cetaceans are likely to be impacted by these or other ADDs is not currently known.

Table 2 Acoustic Characteristics of Acoustic Deterrent Devices Used at Scottish Aquaculture Sites

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 <i>et al.</i> (2004)
Lofitech	Universal Scarer	193 (RMS)	189 (Unknown)	14 (tonal – with harmonics)	Shapiro <i>et al.</i> (2009)
Ace Aquatec	Universal Scrammer 3	193 (RMS)	194 (Unknown)	10 – 65 (broadband)	Lepper <i>et al.</i> (2004)
Terecos	DSMS-4	179 (RMS)	None given	2 – 70 (broadband)	Lepper <i>et al.</i> (2004)
Ferranti-Thomson	4X	166 (Unknown)	200 (Unknown)	7 – 95 (broadband)	Terhune <i>et al.</i> (2002)

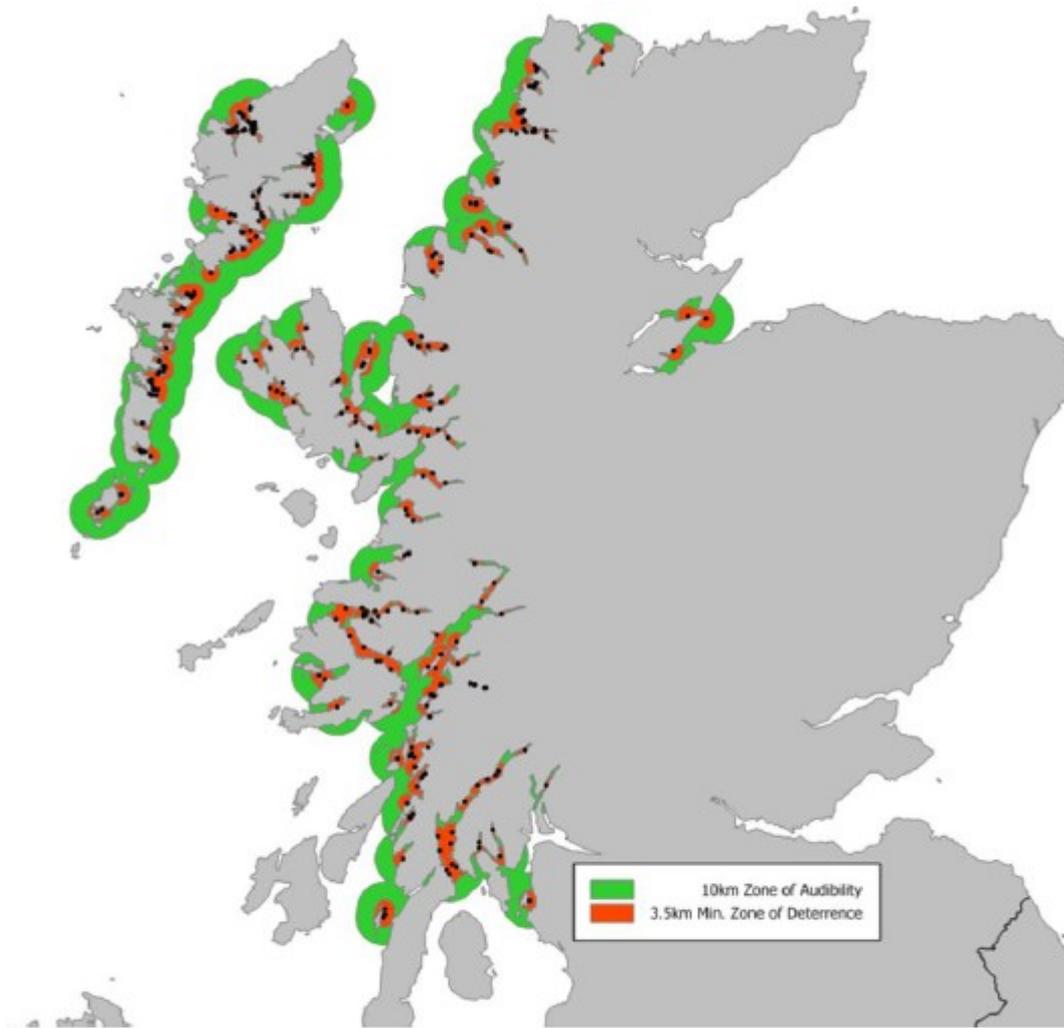


Figure 5 Map of Potential Extent of ADD Audibility to Harbour Porpoise (Mainland and Hebrides)

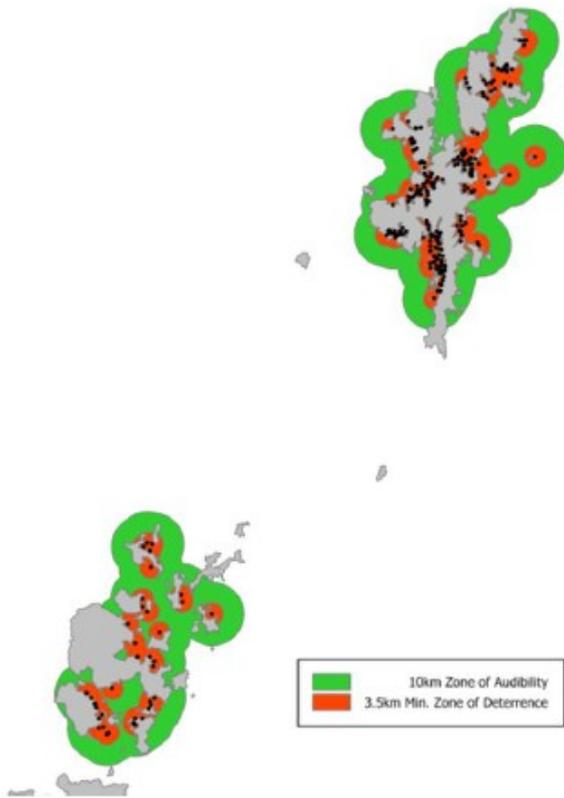


Figure 6 Map of Potential Extent of ADD Audibility to Harbour Porpoise (Northern

And:

Lepper *et al.* (In Review) provides an exhaustive analysis of the source levels of ADDs used at Scottish salmon farms and the propagation losses (especially within 500m) predicted by appropriate propagation models for a range of typical Scottish salmon farm sites. They compared the “sound fields” that would be expected from these with the thresholds for auditory damage sound exposure from Southall *et al.* (2007) and from the more recent findings of Lucke *et al.* (2009).

Moreover:

### 7.3.1 Harbour Porpoises

One of the earliest, and still one of the most comprehensive investigations on the effects of ADDs on harbour porpoises was carried out in 1994 by the Department of Fisheries and Oceans, Canada, in British Columbia. Results were presented in both a research report (Olesiuk et al., 1995) and a peer reviewed paper (Olesiuk *et al.*, 2002). The field site for this study was in the Broughton Archipelago, an area of sheltered and enclosed deep water, not unlike many fish farm sites on the west coast of Scotland. Olesiuk and colleagues used a floating platform to establish an observation position with a 6.4 m eye-height close to an existing salmon farm site. The study took place over an 18 week period (29<sup>th</sup> June to 31<sup>st</sup> October 1994) during which observers made systematic scans with the naked eye and binoculars and measured ranges to sighted porpoises using a combination of reticule binoculars and known land marks. An Airmar ADD array was established about 80m offshore from the observation station and could be turned on or off under the control of the research team. The study period was divided into three six week sampling periods. In each of these the first three week period was a control, with no ADD, while for the second three weeks the Airmar ADD was active. This design, with its repeated alternating trials, helped to control for seasonal changes in porpoise density and sighting conditions.

The results were clear and striking. As soon as the ADD was activated a substantial and significant decline in porpoise sighting rates was evident. The mean sightings per scan fell to between 1.7% and 3.7% of control values for scans with the naked eye and binoculars respectively. Porpoises were also visible for shorter periods with the number of sightings during the tracking of a porpoise pod falling from around 13 per track to around 1.5, suggesting that animals that were in the area were spending less time there. No porpoises were seen within 200 m of the device when it was active and the proportion seen at ranges of 200 to 399, 500 to 599 m, 600 to 2499 m and 2500, 3500 m were 0.2%, 1.4%, 2.5%, 3.3% and 8.1% respectively of those seen in the same zones during control periods. The local topography meant that 3500 m was the maximum range at which observations could be made and it is clear that this is unlikely to represent the full extent of these effects. There was no sign of habituation or a reduction in the size of effects over the three week duration of any of the trials. However, sighting rates recovered within a few days of the ADD being switched off.

And:

## 7.4 Summary

Most published reports have shown significant and long lasting behavioural responses from cetaceans to ADDs. Harbour porpoises seem to be particularly vulnerable, with good evidence that densities can be reduced substantially at ranges of many kilometres for at least two devices types in multiple locations. The majority of studies have investigated responses of animals to one particular type of ADD, the Airmar dB Plus II. Responses to other devices may be quite different. There are indications that harbour porpoises may respond even more strongly to the Lofitech seal scarer while the Terecos ADD may have much smaller impacts. From a Scottish perspective, there is an obvious requirement to measure responses to the range of devices available to Scottish salmon farms including the newly developed "cetacean friendly" ADD (Götz, 2008).

It is clear that some, if not all, of the ADDs currently being used on Scottish salmon farms have an effect on local densities of porpoises (and possibly some other species). This raises two questions: is this likely to be of any biological significance for local cetacean populations, and how should these devices be managed and permitted under existing regulations?

And:

For coastal locations, such as most current aquaculture sites, another situation in which displacement might be particularly harmful would be if animals were excluded from 'movement corridors' required to access large areas of suitable habitat, for example exclusion from the mouth of a sea loch might exclude access to the whole of the loch itself. Similarly, disruption in channels or at headlands might make it difficult for animals to move between habitats at either side of them.

The Habitats Directive prohibits reckless disturbance of individuals of Annex II species (which includes all cetaceans). However, derogation can be granted provided this disturbance at the individual level does not affect the status of the species concerned, does not affect local populations and it can be shown that there are no feasible alternatives to the activity of concern.

And:

### 8.2.1.5 Anti-Predator Nets

This project has highlighted that while anti-predator nets are rarely deployed in Scotland, they are routinely used in other salmon-producing countries. The reasons for this difference are not clear and should be investigated (R5).

**Research approaches:** Dialogue with salmon producers and researchers working with anti-predator nets (and related techniques) in other countries, for example, in Canada, Chile and Australia into the effectiveness of these nets. A critical comparison of anti-predator net structure used abroad with those (previously) used in Scotland, followed by controlled trials of any promising modifications or new devices at one or more appropriate sites in Scotland.

And:

From a legislative perspective, deliberate disturbance of European Protected Species, such as cetaceans, contravenes the Habitats Directive (Conservation (Natural Habitats, &c.) Regulations 1994 as amended in Scotland). The question of whether and in what circumstances the use of ADDs will need to be licenced is still being deliberated by regulators such as Marine Scotland and SNH. If the use of ADD's in particular circumstances requires a licence, it will be important to demonstrate the efficacy of ADDs. At present there is evidence that ADDs can work, at least for short periods of time, in deterring some seals from the proximity of river mouths and from salmon trap-net fisheries and that the use of ADDs at salmon trap net fisheries can reduce the amount of damage to fish that are caught, but these results cannot necessarily be extrapolated to infer anything about long-term use of such devices at salmon farm sites. There is anecdotal evidence to suggest that ADDs can reduce seal depredation at aquaculture sites but there has as yet been no independent and objective assessment of how effective ADDs are in managing seal depredation at Scottish aquaculture sites. Such information would greatly facilitate an objective assessment of the costs and benefits of ADD use.

A report - "[Establishing the sensitivity of cetaceans and seals to acoustic deterrent devices in Scotland](#)" - published by SNH in 2014 included:

#### **Main findings**

- A survey of the status of aquaculture sites in Scotland has been conducted indicating that the majority of ADD systems in use are from three manufacturers (Terecos, Ace Aquatec and Airmar).
- 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. Thus the risk that ADDs at Scottish aquaculture site is causing permanent hearing damage to marine mammals cannot be discounted.

The report stated:

Most studies on the effects of ADDs have collected data from harbour porpoises, and the largest concerted effort was a series of experimental exposures reported by (Olesiuk *et al.*, 2002). This research team established an observation station overlooking an area of

protected waters close to a fish farm site in a region of high porpoise density on Canada's west coast. A team of visual observers recorded porpoise sightings in the observation area over an 18 week period during which an Airmar ADD was alternately active or inactive for blocks of three weeks at a time. Comparison between active and inactive periods revealed striking differences. During active periods, porpoises were completely excluded within 400m of the ADD and densities between 2,500 and 3,500 m were less than 1/10th of those observed in the same areas during non-active periods. The maximum range observed was 3.5 km and there is no reason to expect that responses did not occur at greater distances than this. In a complimentary study, Johnston (2002) tracked individual porpoises from a cliff top in the Bay of Fundy using a theodolite. Johnston showed that animals swam away from ADDs when they were activated and no individuals were ever seen closer than 645 m (at which SPL received levels were estimated to be 128 dB re 1µPa) when the ADD was active. Research in Scotland using passive acoustic porpoise logging devices (PODs) to measure porpoise presence and relative abundance around operating fish farms has generally supported this (Northridge *et al.*, 2010). For example, at a monitoring site 4km from a fish farm, porpoise detection rates were nine times higher when ADDs were inactive at the farm site than when they were active. Northridge *et al.* (2010) observations are particularly pertinent here in that they are from the west coast of Scotland, the core area for fish farming in Scotland. This is also an area where ADDs are almost continuously active at many sites. Booth (2010), for example, mapped extensive ADD noise fields around several sites in the region. Thus, these results show a lack of habituation and an indication that habitat exclusion from ADDs is a long term phenomenon.

The report concluded:

Porpoises are more vulnerable to auditory damage than seals and other small cetaceans. They seem to show strong avoidance (of Airmar devices at least). If this holds generally then concerns for porpoises may focus on longer term exposures at greater ranges (which are not covered by the propagation models predicted here) and of course the long range disturbance and habitat exclusion that has already been shown for this species.

There is insufficient data to inform the extent to which behavioural change is affected by received noise level, or for the use of sound fields from this report to provide reliable predictions of ranges for behavioural effects at specific Scottish fish farm sites. However, sufficient data does exist for responses to one ADD type, for regulators to be able to move forward in assessing whether this level of habitat exclusion and disturbance of a European Protected Species is of concern. Further field studies should be undertaken to measure the extent of responses to other ADD types used in Scotland.

A report - "[The necessity of Management Options for effective harbour porpoise conservation in the UK: Case studies of emerging Areas of Concern](#)" - published by Whale & Dolphin Conservation in 2015 stated:

#### **4.2.3.1 Current management: Acoustic Deterrent Devices (ADDs)**

ADDs are frequently used in fish farms to prevent seals from damaging pens leading to fish escaping or being damaged or removed, rather than more benign and robust solutions such as tension nets.

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) (Lepper *et al.*, 2014), i.e. to deter non-target species such as porpoises from their natural habitat; and entanglement in anti-predator nets. 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).

Northridge *et al.* (2010) noted that acoustic signals from ADDs can be detected at more than 14km from the sound source. However, acoustic propagation losses are site specific and quite variable, and it appears that porpoises can become desensitized or accustomed to ADDs over time (e.g. porpoises appeared to avoid one area where ADDs had recently been installed, but to be less averse to other areas where ADDs had been used for several years). This may be influenced by environmental factors such as the situation of a fish farm in a preferred habitat, i.e. habitat modelling links porpoise distribution most closely to water depth and seabed slope. In addition, the authors noted that it is possible that fish farm sites are in fact attractive to wild porpoises in that they are thought to aggregate wild fish species. The extent to which this degree of exclusion may have significant effects on the foraging success or the conservation status of porpoises remains a question to be answered. Consequently, these risks are increased where fish farms are located in harbour porpoise AoC.

Current commercially available ADDs emit sound at high duty cycles and high source levels, and long-term and large-scale habitat exclusion has been found for odontocetes around operating ADDs at relatively low received levels (e.g. Morton and Symonds 2002; Olesiuk *et al.*, 2002)). More recently, research studies (Janik and Gotz, 2013) have utilised a startle ADD prototype<sup>22</sup> showing that this was successful at preventing seal predation without affecting the distribution of harbour porpoises in the area. The advantage of these devices is they can be tuned to affect only certain species in the

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<sup>22</sup> Sounds produced by current ADDs are not based on biological concepts of aversiveness, but aim to transmit loud sound to the target animal, whereas the startle ADD prototype uses an autonomous, acoustic startle reflex (ASR) to induce controlled and sustained flight responses.

*environment, and they have significantly less impact on wildlife than other tested devices. The fact that brief, isolated pulses were emitted at only moderate levels means that noise pollution was greatly reduced, and the potential for masking of communication signals or hearing damage is low. Janik and Gotz (2013) recommended the use of this novel technology at fish farms.*

*Under the Nature Conservation (Scotland) Act of 2004, and under 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.*

*To reduce the risk of predator attacks to fish stocks, e.g. seal attacks, recommendations are to use modern tensioned nets for pen construction, where appropriate and effective, plus additional netting or screening systems where they are effective.*

*In some parts of Scotland, current types of ADD are 'not permitted' as a condition on planning consent because of their potential disturbance to cetaceans. In these areas, farmers are recommended to keep a watching brief on ADD development, and to seek to have the planning condition lifted if an appropriate ADD comes onto the market (Code of Good Practice Management Group, 2010).*

*The use of ADD in fish farm installations is discretionary, and there is currently no intention by the Scottish government to license them (Letter from Minister, 2013). As outlined above, current AAD represent a potential risk to harbour porpoise conservation, primarily in terms of a potential barrier to movement/exclusion from preferred habitat but they can also cause injury.*

#### **4.2.3.1.1 Further management required to reduce pressure**

*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.*

*There should be a presumption against the use of ADDs in favour of more robust and benign solutions. However, should ADDs be maintained, there should be strict adherence to the Code of Conduct for the Good Practice of Aquaculture (fin fish).*

*There is the potential for disturbance to EPS so 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 e.g. headlands and tidal upwellings (Northridge *et al.*, 2010).*

A report to Marine Scotland - "[Investigations on Seal Depredation at Scottish Fish Farms](#)" - published in 2013 stated:

## 7. Acoustic Deterrent Devices – impacts on porpoises

### 7.1 Introduction

It is well known that Acoustic Deterrent Devices (ADDs) can have a significant impact on cetacean distribution, and several studies have shown that harbour porpoises in particular seem to avoid areas where ADDs are in use. Studies by Olesiuk *et al* (2002), Johnston (2002) and Northridge *et al* (2010) have shown greatly reduced porpoise detections within several kilometres of active ADDs. However, all of these studies have used the same type of ADD made by a single manufacturer (Airmar). We are aware that several other devices are in use in Scotland, made by at least three other manufacturers, namely Ace Aquatec, Lofitech and Terecos. A

previous study suggested that about half the sites surveyed during the study were using Terecos devices (Northridge *et al* 2010) but no studies to date have examined how cetaceans react to Ace Aquatec, Lofitech or Terecos ADDs.

A scientific paper - "[Effect of the sound generated by an acoustic harassment device on the relative abundance and distribution of harbour porpoises in Retreat Passage, British Columbia](#)" - published in 2002 concluded:

Our study has indicated that the sounds generated by the powerful AHDs now commercially available and in widespread use can have far-ranging effects on the behavior of non-target species such as the harbor porpoise. Since we were unable to recognize individual animals and little is known concerning porpoise movements or turnover rates in the study area, it is impossible to assess what effect AHDs might have on distribution and ultimately population productivity. However, avoidance within a radius of several kilometres of salmon farms operating AHDs could represent appreciable habitat loss for these animals, and might also impede normal movements through the many narrow channels and passages that characterize this region. Similar concerns have been raised over the utilization of AHDs on the east coast and Europe (Strong *et al.* 1995, Taylor *et al* 1997, Johnston and Woodley 1998). Johnston (2002) also reported a strong avoidance response by harbor porpoises in the Bay of Fundy to an AHD when it was activated. Moreover, there is nothing unique about the hearing capabilities of harbor porpoise to suggest that the effects would be limited to this species. For example, the hearing of killer whales (*Orcinus orca*), another cetacean that commonly occurs in the Broughton Archipelago (Morton 1990), at 10 kHz is about 5 dB more sensitive than that of harbor porpoise (Anderson 1970, Hall and Johnson 1972), and there is some evidence this species was also displaced from the Broughton Archipelago when the AHDs were deployed (Morton and Symonds 2001). A decline in sightings of white-sided dolphin (*Lagenorhynchus obliquidens*) in the Broughton Archipelago may also have been associated with the deployment of AHDs (Morton 2002). The development and uncontrolled proliferation of these powerful AHDs may represent a potentially important source of

noise pollution, and further research is required on their short- and long-term impacts on marine fauna.

**- "Commerically Confidential" Information Withheld:**

SNH's [FOI reply of 25 April 2017](#) included:

We have redacted some information in the documents, and we have not provided some of the information we hold. We have not provided a copy of a presentation made to a meeting of the Salmon Aquaculture and Seal Working Group (SASWG) and references to it, or copies of correspondence relating to a proposed device trial/application for a European Protected Species (EPS) licence.

The information noted above is commercially confidential. It was provided to SNH in confidence, and this duty of confidence relates to a number of legitimate economic interests. Disclosing the information into the public domain in response to an access to information request would be likely to cause substantial harm to those legitimate economic interests. We are therefore withholding the information under EIRs Regulation 10(5)(e) (Confidentiality of commercial or industrial information).

We have concluded that, in this case, it is not in the public interest for SNH to release information that would harm legitimate economic interests; it is in the public interest for us to maintain the confidentiality in which the information was provided to us.

**- Alternatives to ADDs:**

There exist a raft of alternatives to ADDs - including anti-predator nets such as [Eco-Nets](#); relocation to land via closed containment; and startle devices. The latter is detailed in a scientific paper - "[Target-specific acoustic predator deterrence in the marine environment](#)" - published in 2014:

## Target-specific acoustic predator deterrence in the marine environment

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### Keywords

acoustic deterrent device (ADD); pinnipeds predation; seal scarer; startle response; harbour porpoise; aquaculture; fish farm; habitat exclusion.

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### Abstract

Acoustic deterrent devices (ADDs) have often been considered a benign solution to managing pinniped predation. However, ADDs have also been highlighted as a conservation concern since they can inflict large-scale habitat exclusion in toothed whales (odontocetes). We tested a new method that selectively inflicted startle responses in harbour seals (*Phoca vitulina*) at close ranges to the loud-speaker but not in a non-target species, the harbour porpoise (*Phocoena phocoena*), by using a frequency range where porpoise hearing was less sensitive than that of phocid seals. The sound exposure consisted of isolated 200 ms long, 2–3 octave-band noise pulses with a peak frequency of 1 kHz, which were presented at a source level of ~180 dB re 1  $\mu$ Pa. Field tests were carried out within a 2-month period on a fish farm on the west coast of Scotland where marine mammal behaviour was observed within three distance categories. Seal numbers dropped sharply during sound exposure compared with control observation periods within 250 m of the sound source but were unaffected at distances further away from the farm. A Poisson regression model revealed that the number of seal tracks within 250 m of the device decreased by ~91% during sound exposure and was primarily influenced by sound exposure with no evidence for a change in the effect of treatment such as habituation, throughout the experiment. In contrast to seals, there was no shift in the number of porpoise groups in each distance category as a result of sound exposure and porpoises were regularly seen close to the device. We also sighted six common minke whales during sound exposure while only one was seen during control periods. Our data demonstrate that the startle method can be used to selectively deter seals without affecting porpoises.

The study concluded:

## **Conclusions**

Our study demonstrated that startling noise pulses presented at low duty cycles are effective in reducing the number of seals in an area up to 250 m around a transducer. The advantages of using the startle reflex in acoustic deterrence are that short isolated pulses can be used, avoidance responses are limited to a defined area and noise pollution can be minimized by using a low duty cycle (0.8%). Additional applications include temporary exclusion of animals from marine installations (e.g. tidal turbines) or industrial activities which may cause hearing damage (pile driving). In these applications, the startle pulse could be centred within a different frequency band depending on the auditory sensitivity of the species that have to be deterred.

We showed that inter-species differences in frequency-dependent hearing sensitivity hold some potential for developing deterrent devices, which target one taxon while not affecting others. Adverse impacts of current acoustic deterrent devices on harbour porpoise, such as prolonged habitat exclusion shown in previous studies can be mitigated. Future studies will have to test whether startle stimuli are capable of reducing predation losses. Our data showed that the described method has the potential to address conservation concerns related to acoustic deterrent devices and therefore extend the range of management tools available to the industry.

Another scientific paper - "[Non-lethal management of carnivore predation: long-term tests with a startle reflex-based deterrence system on a fish farm](#)" - published in 2016 reported:

## FEATURE PAPER

# Non-lethal management of carnivore predation: long-term tests with a startle reflex-based deterrence system on a fish farm

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### Keywords

predation management; carnivore; acoustic deterrent device; startle response; aquaculture; *phocid* seal; porpoise; pinniped.

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### Abstract

Carnivore depredation on human livestock is a worldwide problem with few viable solutions. Non-lethal management tools such as acoustic devices show highly varying success and often pose a conservation risk due to noise pollution and habitat degradation. We tested the long-term effectiveness of a deterrence system which harnesses an autonomous reflex (startle) to selectively inflict avoidance responses in a target species (*phocid* seals) by emitting band-limited noise pulses with sharp onset times. Seal predation was monitored at a marine salmon farm (test site) over a full production cycle (19 months) with a multi-transducer deterrent system deployed for the final year. Predation was also monitored for several months at two control sites and additional short-term tests were carried out at sites which suffered higher predation rates. Generalized linear (mixed) models revealed that sound exposure caused a 91% reduction in lost fish when comparing predation levels within the test site and 97% when comparing the test site against both control sites. Similarly, sound exposure led to a 93% reduction in the number of fish lost due to seal damage at a short-term test site. Visual monitoring of marine mammals around the long-term test site showed that the number of seal surfacings within 100 m from the loudspeakers was only slightly lower during sound exposure. Harbour porpoise and otter distribution around the farm was not affected by sound exposure. By adjusting the frequency composition of startle stimuli, our method has the potential to provide solutions for managing human-wildlife conflicts in terrestrial and marine habitats by selectively deterring target species.

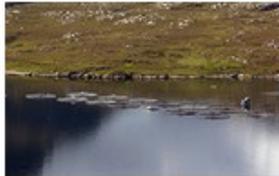
## - Salmon Aquaculture & Seal Working Group:

Here's the [membership of the SASWG](#):



We are keen to identify any ongoing or past industry trials to reduce any seal depredation, without harming seals or other wildlife. We would welcome input from individuals, businesses or organisations in this area.

Please email [enquiries@SASWG.co.uk](mailto:enquiries@SASWG.co.uk)



## SASWG MEMBERSHIP

- [The Born Free Foundation](#)
- [The Crown Estate](#)
- [Freedom Food](#)
- [International Animal Rescue](#)
- [Marine Harvest Scotland](#)
- [Marine Scotland](#)
- [RSPCA](#)
- [Sainsbury's](#)
- [Scottish Natural Heritage](#) (in the role of observers)
- [Scottish Salmon Company](#)
- [Scottish Salmon Producers Organisation](#)
- [Sea Mammal Research Unit](#)
- [Seal Protection Action Group](#)



The [web-site](#) also includes:



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## REGULATORY ENVIRONMENT

### GOVERNMENT LEGISLATION

On 31 January 2011, Part 6 of the Marine (Scotland) Act 2010 came into force. It seeks to balance seal conservation and welfare concerns, with sustainable fisheries and aquaculture. Its introduction means:

- It is an offence to kill or injure a seal except under licence or on welfare grounds, outlawing unregulated seal shooting that was permitted under previous legislation
- A Seal Licencing system for seal management in Scotland was introduced in 2011
- A number of seal conservation areas around Scotland are being introduced, designed to protect vulnerable, declining common seal populations

For further info please visit: [www.scotland.gov.uk](http://www.scotland.gov.uk)

### THE RSPCA'S FREEDOM FOOD

Freedom Food is the RSPCA's Farm Animal Welfare Scheme. It assesses farms to strict welfare standards set by the RSPCA. The welfare standards for farmed salmon focus on non-lethal and humane control of predators on salmon farms. Notably, this includes adequately tensioned nets, the use of top nets, the regular removal of any dead fish and the use of Acoustic Deterrent Devices. Shooting of a seal must only be carried out under licence and as a last resort, and only when *all other methods of deterrence have been deployed and have demonstrably failed*. Inability to demonstrate full adherence to the welfare standards can lead to withdrawal of Freedom Food membership.

All Freedom Food salmon farming members are required to report any shooting within 72 hours of the incident occurring. This allows for swift analysis of the incident, further investigation and remedial action where required.

Over 70% of all Scottish salmon aquaculture production in seawater is covered by RSPCA welfare standards.

For further information please visit: [www.rspca.org.uk](http://www.rspca.org.uk)

And [the web-site lists the following activities](#):

## RESEARCH

The Group is supporting and promoting:

- The development of a prototype testing device to measure source level (output) volume for each transducer, to ensure that Acoustic Deterrent Devices are fully functional according to manufacturer specifications
- Trials to determine if low intensity electric fields have the potential to act as seal deterrents – an initial project was funded by SARF. [www.sarf.org.uk](http://www.sarf.org.uk)
- New acoustic devices that offer a significant reduction in the total amount of sound energy emitted, compared to conventional Acoustic Deterrent devices. In trials such devices have proven effective in discouraging seals, whilst the possibility of causing hearing damage in seals or collateral damage to other wildlife appears to be minimised. [www.scotland.gov.uk](http://www.scotland.gov.uk)
- Analysis of the Seal Mammal Research Unit (SMRU) data on seal distribution, together with industry data on seal damage levels, under contract to the Scottish Government. [www.smru.st-and.ac.uk](http://www.smru.st-and.ac.uk)

## ENGAGEMENT

The Group:

- Has pressed for more timely reporting under the Seal Licence scheme and for more information to be collected on the licence returns. Information such as the numbers of fish damaged or killed, whether ADDs were in use, what type was in use, whether they were working correctly, what methods of net tensioning and what cage type was deployed, should all be required as part of the seal licence returns
- Has been in dialogue with Scottish Natural Heritage (SNH) – who now sit on the SASWG in an observer capacity - and the Aquaculture Stewardship Council (ASC), with regard to potential restrictions on ADD use in specific areas. SNH and ASC have concerns about disturbance to whales and dolphins – also European protected species - under the Habitats Regulations 1994 (as amended in Scotland). There is concern that curtailment without alternative methods of seal deterrent in place will result in increased levels of seal shooting. Dialogue continues on this subject
- Has raised concerns over the lack of clarity in the wording of the Marine (Scotland) Act 2010 that might imply that a seal can be shot under licence on fish health and welfare grounds alone and without any seal attack on the fish taking place
- Is currently assessing what critical information is required to be reported each time a seal is shot - and how best to encourage the collation of that information
- Has engaged with manufacturers of Acoustic Deterrent Devices to ensure that systems are in place to check that such devices are functioning correctly, as faulty devices can go unnoticed and increase the risk of seal damage and the risk of shooting. Several manufacturers have responded with new designs.

### - Translocation of seals:

A Scottish Government report - "[Evaluating and Assessing the Relative Effectiveness of Acoustic Deterrent Devices and other Non-Lethal Measures on Marine Mammals](#)" - published in 2014 included:

Capture and translocation has been used extensively in the Tasmanian aquaculture industry, where 4517 translocations of Australian and New Zealand fur seals were made between 1990 and 2005 (Robinson *et al.*, 2008b). This was done as a commercial enterprise with some cost absorbed by the Government Department of Primary Industries, Water and Environment. Seals were moved approximately 400km along the coast before being released, but a high number of animals found their way back to the original sites. In 2001, 38% of those animals captured had previously been translocated. The average interval between recaptures was calculated as 38 days for NZ fur seals and 30 days for Australian fur seals, showing that a short-term respite from attacks can be achieved (Robinson *et al.*, 2008a).

Where this approach has been applied it has often provided only short term relief due to animals returning (Anon., 2002a). In Scotland, there is such a high density of aquaculture sites on the west coast and Western and Northern Isles that it would seem likely that a "problem animal" might also soon find an alternative farm and translocation might be a case of moving a problem rather than solving it. Moving animals from the west coast to the east (where salmon farms are absent) could lead to concerns amongst wild salmon fishermen and sportsmen who also experience seal depredation. Brown *et al.* (2008) reported that in the US some trapped animals

**- Humpback whale mortality in Sound of Mull at salmon farm:**

In 2014, it was [revealed](#) that "Scottish Rural College vets believe that a young humpback whale found drowned off the coast of Mull died after swimming into a fish farm".

The image is a screenshot of the SRUC (Scotland's Rural College) website. At the top left is the SRUC logo, and at the top right is the text 'Scotland's Rural College'. Below this is a navigation bar with buttons for Home, SRUC, Research, Education, SAC Consulting, Rural Policy Centre, and Carbon & Climate. A breadcrumb trail reads: 'You are in > Home > Latest news > Humpback Whale Post Mortem Suggests Entanglement in Salmon Farm'. The main content area features a 'Categories' sidebar on the left with links to SRUC, Research, Education, SAC Consulting, Rural Policy Centre, and Carbon & Climate. The main article title is 'Humpback Whale Post Mortem Suggests Entanglement in Salmon Farm', published on Friday, 4th July 2014 in SAC Consulting news. The article text states: 'SRUC vets believe that a young humpback whale found drowned off the coast of Mull died after swimming into a fish farm. The post mortem results suggest the animal became trapped under a salmon pen and subsequently drowned. Aided by staff from the Hebridean Whale and Dolphin Trust and Aberdeen University's Lighthouse Field Station, the post mortem was carried out by Dr Andrew Brownlow from Scotland's Rural College, which coordinates the Scottish Marine Animal Stranding Scheme. Every year over 400 marine mammals are stranded around the coast of Scotland and any cases suitable for post mortem are examined by the project. There have only been six recorded humpback whale strandings in Scotland since 1992 (17 in the UK) and this is the first where a post mortem has been carried out. The whale was a juvenile male, almost 7m long (23ft) and weighing just under seven tonnes (6900kg). The stomach lining suggested little solid food had been ingested in the past so it is possible that the whale was still receiving milk from his mother. The animal was found dead beneath the nets of a salmon pen. Due to the logistics involved in recovery it was around 36 hours after discovery before the animal could be post mortemed, however it was still in relatively fresh condition and therefore a reasonably confident diagnosis could be reached. The post mortem findings are consistent with a peri-weaning, maternally-attached animal which underwent an acute death. The observed pathology and stranding history would be consistent with the whale becoming trapped beneath a salmon pen and subsequently drowning. The report also notes that young humpback whales are very inquisitive creatures which could explain why the animal was attracted to the salmon farm located at Fainish on Mull.'

"The observed pathology and stranding history would be consistent with the whale becoming trapped beneath a salmon pen and subsequently drowning," [reported](#) the Press & Journal (5 July 2014). "The report also notes that young humpback whales are very inquisitive creatures which could explain why the animal was attracted to the salmon farm located at Fishnish on Mull".

**NEWS**  
5 July 2014

## Humpback Whale died after swimming into fish farm

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The humpback whale died after swimming into a fish farm

By [Rita Campbell](#) A young humpback whale found drowned off the coast of Mull died after swimming into a fish farm, vets believe.

Tags

- Hebridean W...
- Humpback W...
- Islands
- Mull
- SRUC

Scotland's first post-mortem of a humpback whale was carried out by Dr Andrew Brownlow from Scotland's Rural College (SRUC). The results suggest the animal became trapped under a salmon pen and subsequently drowned.

BBC News [reported](#) (4 July 2014):

4 July 2014 Last updated at 15:38



## Humpback whale drowned off Mull 'after getting trapped'



The young whale was examined in Scotland's first post-mortem on a humpback

A young humpback whale found dead in the sea off Mull may have drowned after it got trapped under a fish farm pen, the results of a post-mortem suggest.

Related Stories

The Herald [reported](#) (4 July 2014):

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## Whale trapped in salmon nets dies

kathleen nutt

Saturday 5 July 2014

A YOUNG humpback whale found drowned off the coast died after swimming into a fish farm and becoming trapped, a post mortem examination has suggested.

The 22ft long, eight-tonne male calf, which was probably under a year old and still suckling, was examined by vets from the Hebridean Whale and Dolphin Trust (HWDT) and Scotland's Rural College.

It was the first time a post-mortem examination had been carried out on a humpback in Scotland. HWDT said the results pointed to the animal being entangled underneath the salmon pen nets at Fishnish off Mull and drowned.

The post mortem was carried out on 26 June 2014 - here's a photo courtesy of the [Hebridean Whale & Dolphin Trust](#):



Read more via "[Salmon Farming Kills Whales!](#)"

**- HWDT research:**

A report - "[Cetacean conservation in North-West Scotland: perceived threats to cetaceans](#)" - presented by HWDT in 2000 stated:

**Fish-farms** The fish-farm industry has already been highlighted above as a major source of pollution and degradation within cetacean habitats. Another area in which fish farms cause an impact on coastal cetaceans is the use of acoustic harassment devices to scare seals away from fish farm cages ("seal scrammers"). The acoustic devices would not only deter seals from fish-farm sites, but also could exclude cetaceans species from breeding, feeding or resting sites.

A HWDT report - "[Cetacean Conservation in Scotland](#)" - published in 2000 included:

#### 4.6.5. Acoustic deterrents

The fish farm industry suffers to a large extent from predation by seals. In response to this, 'seal scarers' have been developed to deter

seals from fish farming areas. The devices are designed to frighten and induce pain to seals in order to permanently displace them from fish farming areas and have become known as Acoustic Harassment Devices (AHDs). There is growing concern over the effect of AHDs on non-target species such as cetaceans. The hearing of many odontocetes species is believed to be more sensitive than pinnipeds (Richardson *et al.*, 1995). The level of noise pollution associated with AHDs may negatively impact cetaceans especially coastal species of harbour porpoise and bottlenose dolphin which utilise coastal areas where fish farms are located (Johnston & Woodley, 1998). It is suggested that harbour porpoises are excluded within 400m of an AHD, and abundance is significantly reduced within 3.5 km of the device (Olesiuk *et al.*, 1996). A study of AHD's in Canada observed a decline in a range of cetacean species, including killer whales, minke whales and harbour porpoise using areas where AHD's are deployed (Morton, undated).

There are 211 (SEPA, pers. comm) fish farm licenses in the Hebrides and an unknown number of these farms utilise AHDs. Evidence from local fish farm managers suggests that AHDs are used routinely even if the area does not have seal predation problems or if AHDs are ineffective. The reason for this unwarranted use is for insurance purposes, so that fish farms are seen to be taking action to protect stocks in the event of predation occurring. If this is the prevailing view, it is feasible that many of the West Scotland fish farms will use AHDs. Extrapolating from data presented by Olesiuk (1996), that AHDs would exclude cetaceans from an area of 50,2654 m<sup>2</sup> around each fish farm and would have acoustic impacts over an area of 38.4 km<sup>2</sup> around each site, if all the fish farms in West Scotland used AHDs the area affected by AHDs would total 8,102 km<sup>2</sup>. This would represent a major loss of cetacean habitat.

Read more via:

Shrimpton, J. 2001. The Impacts of Fish Farming on the Harbour Porpoise. Hebridean Whale and Dolphin Trust, Tobermory, Mull. 1-23.

[GAAIA has asked HWDT for a copy of this report]

**Certification via Freedom Foods (now called RSPCA Assured) promotes marine mammal disturbance (e.g. harbour porpoises via ADD noise) and killing (e.g. seals):**

Notes from a [liaison meeting in May 2016](#) between SNH and the salmon farming industry included:

It was highlighted by industry that the requirements of some accreditation schemes such as freedom foods require operators to undertake certain management measures in order to retain accreditation. Concerns were raised that if a seal attack takes place and ADDs were not used as a form of defence that this could risk accreditation being lost.

Retaining Freedom Foods accreditation is deemed by industry to be a major barrier in reducing ADD use.