Scottish Salmon Watch, 18 April 2018

Deafening Impact of Salmon Farms on Cetaceans - "Deliberate & Reckless Disturbance" by Acoustic Deterrent Devices Makes Waves?

The use of Acoustic Deterrent Devices (ADDs) on Scotland's salmon farms could take centre stage this week - with Scottish Natural Heritage (SNH) testifying to today's Scottish Parliament inquiry into salmon farming in Scotland and a Scottish Government-sponsored workshop on a new Dolphin and Porpoise Conservation Strategy held at the Royal Society of Edinburgh (19 & 20 April) **[1]**.

Scottish Salmon Watch is calling on the Scottish Government to pull the plug on the use of ADDs - so-called 'seal scarers' - due to "deliberate and reckless disturbance" of cetaceans and a breach of European law.

"Scottish salmon farms are caught between the devil and the deep blue sea," said Don Staniford, Director of Scottish Salmon Watch. "On the one hand the killing of seals is morally repugnant not to mention a total turn-off for exports of farmed salmon to the United States and on the other the use of ADDs is known to disturb cetaceans. The common sense solution - for seals, harbour porpoises as well as wild fisheries - is to relocate salmon farms away from the Scottish coast into closed containment tanks on land. It is time to stop recklessly disturbing Scotland's marine wildlife and that means turning off ADDs immediately. Since the Scottish Government appears deaf to the concerns raised by SNH and NGOs it may require direct intervention by the Scottish Parliament to force compliance with European law."

Data obtained from the Scottish Government via FOI reveals that 164 salmon farms use ADDs with 112 salmon farms where ADDs are listed as "Always On". The data reports an 'ADD Count' of 1,189 with the most popular ADD models listed as Airmar/Mohn Aqua (72), Terecos (60) and Ace Aquatec (33) . Of the 164 salmon farms using ADDs, Marine Harvest accounted for 65 followed by The Scottish Salmon Company (41), Scottish Sea Farms (35), Loch Duart (10), Kames Fish Farming (5), Cooke Aquaculture (5) and Wester Ross Fisheries (4). Hjaltland Seafarms (Grieg Seafood) reported no use of ADDs **[2]**.

The latest Scottish Government fish farm production survey 2016 - published in September 2017 - reported 253 salmon farm sites but only 136 reported production during 2016 (i.e. 117 reported zero production). Hence it seems that the majority of Scottish salmon farms use ADDs despite the known impacts on cetaceans and breach of European law via the Habitats Directive.

Documents obtained from the Scottish Government via FOI in March 2018 reveal that in July 2017 SNH advised the Scottish Government that the use of ADDs by salmon farms "can cause disturbance and displacement of cetaceans" and that "there is sound, scientific evidence to expect that hearing damage, stress and masking may also occur". "Accordingly, we believe there to be a strong case for managing ADD deployment and use," advised SNH **[3]**.

SNH advised the Scottish Government:

The acoustic signal from ADDs, particularly on the west coast of Scotland, is pervasive (Findley *et al.*, 2017). The area ensonified by ADDs has increased over time (ibid.) and is likely to continue to do so if recent trends persist. It is clear that the commonly used ADDs are well within the hearing range of cetaceans, and therefore there is overlap between this pressure and cetacean distribution, not least harbour porpoise within the Inner Hebrides and the Minches cSAC.

Potential negative ecological impacts on cetaceans from ADDs include: disturbance (leading to avoidance and habitat exclusion); hearing damage; masking of biologically significant sounds; and detrimental physiological changes (*e.g* increased stress)(Götz & Janik, 2013).

And concluded:

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

Despite SNH's advice, the Cabinet Secretary for Rural Economy & Connectivity (Fergus Ewing) told the BBC's Sunday Politics Scotland show on 25 March 2018:

"The position which we all wish to see is every method used to scare seals away from cages and as the Minister responsible I am very pleased that technology now including the use of sonar devices means that it is now proving possible to do this in increasing occasions."

BBC News reported (25 March 2018):

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

Fergus Ewing, Cabinet Secretary for Rural Economy & Connectivity, will be giving oral evidence to the RECC on 9 May 2018.

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

> **Mark Harvey:**
> I just add that the issue of ADDs was rather thrust on us in the past couple of years. My general area of work is Skye, and the waters surrounding Skye are now a candidate SAC for harbour porpoise, so it immediately became a much more important material consideration for us.
>
> Our response to that is to put a condition on any permission that is granted to require the operator to retain a log of ADD use. More importantly, as a result of discussion with SNH, which may need to look retrospectively at the existing use of ADDs on farms and potentially take action by requiring adjustments to the way in which they are used, we have been considering whether particular equipment can be tuned—obviously, we are talking about sound frequencies underwater—to affect seals but not harbour porpoise and other cetaceans, for which there is a similar problem. At the planning application stage and subsequently through the compliance with the condition, we are trying to control ADD use. Obviously, the existence of an SAC makes it a pressing issue for us.

Mark Harvey of Highland Council is also testifying to the RECC later this morning (watch live on Scottish Parliament TV from 10am in Committee Room 2 online here).

Background:

The Scottish Parliament's ECCLRC reported to the RECC in March 2018:

Current use of ADDs

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

Impact of ADDs on marine wildlife

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

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

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

Regulation, monitoring and management of ADDs

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

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

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

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

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

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

Written evidence submitted by the Hebridean Whale & Dolphin Trust to the ECCLRC's salmon farming inquiry in February 2018 included:

ADD's

Acoustic Deterrent Devices (ADDs) are widely used by the aquaculture industry in Scottish waters in an attempt to prevent seal depredation on finfish in aquaculture pens. They are powerful acoustic devices that emit loud acoustic signals. The sound output frequencies (2 – 40 kHz) for devices currently used throughout Scotland overlap the audible range of other non-target marine animals including cetaceans (Lepper et al. 2014). Cetaceans depend on sound for foraging, communication, navigation and detecting predators or threats and as a result have excellent underwater hearing. Therefore, even though cetaceans do not pose a threat to aquaculture facilities, they are at risk of disturbance and habitat exclusion from ADDs. These impacts have been shown to affect a range of species that can be found in close proximity to aquaculture facilities in Scotland and elsewhere including harbour porpoises (*Phocoena phocoena* - Johnston 2002; Olesiuk et al. 2002; Booth 2010; Northridge et al. 2010; Brandt et al. 2013; Lepper et al. 2014; Dähne et al. 2017; Mikkelsen et al. 2017), killer whales (*Orcinus orca* - Morton and Symonds 2002) and minke whales (*Balaenoptera acutorostrata* - McGarry et al. 2017). In particular, we would like to draw the committee's attention to the recently published

report by McGarry et al. (2017) on minke whale responses to Lofitech ADDs, which was not cited in the report. In the scoping reports for many salmon farm facilities, minke whales are often considered to show a limited response to ADDs. It is argued that their hearing sensitivity to high frequencies will be lower than that of dolphins and porpoises, yet this work clearly demonstrates pronounced avoidance to ADDs at considerable ranges.

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

Download a copy of McGarry et al (2017) online here

The ECCLRC's hearing on 6 February 2018 included the following exchange on ADDs:

David Sandison:

There is no real way to make it sound good if you have to shoot a seal, so we are not going to try to play the numbers game. However, we have driven the numbers down to a very low level indeed, and we have stated that we intend to continue to drive them down towards zero, by deploying whatever methodologies we can before we have to resort to using a licence to shoot a seal.

The number is very low indeed—it is in single figures per quarter. However, from time to time, a seal will be inside a cage of fish predating on the stock. In those circumstances, it is extremely difficult to do anything other than shoot it. All the measures that we are talking about, whether tension nets, predator nets or acoustic deterrent devices, are part of the canvas on which we work. In some cases, ADDs are appropriate. I refute the idea that they are left on continuously and have a massive effect on other mammals, because they are used only selectively and are not switched on willy-nilly—they are used only when there is a problem.

The Convener:

I want to pull you up on that, because information from an FOI request from 2016 indicates that 60 per cent of salmon farms using ADDs are listed as always having them on. With respect, that is surely at odds with what you just said.

David Sandison:

That does not concur with my knowledge of the situation. I would need to look at the FOI to see whether I could shed any light on it, but it does not concur with my knowledge of how industry practice operates at the moment.

The Convener:

Do you recognise that it is not appropriate to leave ADDs on permanently?

David Sandison:

We recognise that there is a potential impact on marine cetaceans in a certain zone around the farms and that, therefore, ADDs have to be used appropriately.

John Aitchison:

Stopping shooting seals would solve all these problems. The industry needs to do so anyway if it wants to sell salmon to America—that condition is coming in quite soon, because the Americans are changing the rules. It seems like a no-brainer—just do not do it anymore. If so few are being shot that it makes no difference, just stop doing it. If the number is in single figures per quarter, how many is that per year? It is nothing.

The SAMS report says that ADDs have not been proven to work. Their use is unmonitored and the council says that it cannot regulate them. Their use is expanding, because the industry is expanding, and their effect is cumulative. They exclude porpoises from a 7.5km radius around one farm. Porpoises are a protected species. ADDs are used in the special area of conservation for porpoises in the Minches and the Firth of Lorn. They are a mobile species and can swim away, so it is just nonsense.

Dr Collin:

Mr Sandison said that there is not a lot of evidence on the impact on cetaceans. There is a growing body of evidence on the impact on harbour porpoises. The devices induce stress, cause hearing damage and cause displacement—they change the behaviour of harbour porpoises by preventing them from going to certain areas. Although ADDs are not proven to be effective on seals, they have a significant impact on cetaceans.

In May 2017, the Global Alliance Against Industrial Aquaculture (GAAIA) filed a formal complaint with the European Commission against the UK and Scottish Government for the "deliberate and reckless disturbance" of cetaceans (European Protected Species) including breach of The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended in Scotland) and breach of the Inner Hebrides and the Minches candidate Special Area of Conservation (cSAC) for harbour porpoise submitted to the European Commission in 2016.

In May 2017, The Sunday Herald reported:

May 7th, 2017

Health of whales, dolphins and porpoises put at risk by underwater alarms

Rob Edwards

WHALES, dolphins and porpoises off the west coast of Scotland are being put at risk by noise alarms used by fish farms to scare off seals, scientists are warning. Underwater acoustic deterrent devices (ADDs) deployed by more than 130 fish farms can be heard at least 30 kilometres away.

As a result, lochs, bays and large areas of sea in Scotland are now polluted by noise, threatening the health of cetaceans. The marine mammals depend on sound to navigate the seas. Loud underwater noises can cause permanent hearing loss, stress and disorientation resulting in whales and dolphins beaching and dying.

The number of ADDs has greatly increased in recent years as salmon farmers try to find publicly acceptable ways of prevent seals from eating their fish. In the past hundreds of seals have been shot, but the US government is threatening to stop buying salmon from countries which permit seal shooting.

Now new evidence presented at a scientific conference in Denmark last week suggests that the noise from fish farms could harm cetaceans. A study by researchers from the Scottish Association for Marine Science and the UK Government's Joint Nature Conservation Committee revealed that ADDs caused "large-scale underwater noise pollution".

The unregulated use of the devices in Scotland "could pose unintended ecological impacts to non-target species such as the harbour porpoise", the study concluded. Saturating the Scottish coastline with noise "may pose a risk to both target and non-target species" in areas where they were meant to be protected.

According to an email released under Freedom of Information law by the government's wildlife agency, Scottish Natural Heritage (SNH), the study found that the signal from ADDs "can be detected all the way across the Minch".

The noise could be detected 20 kilometres away from the fish farms on Portree on the Isle of Skye and 30 kilometres from Lochmaddy on North Uist. "The Sound of Mull and Loch Linnhe were completely ensonified (filled with sound)," said the SNH email.

The revelations have prompted anti-fish-farming campaigners to file a formal complaint to the European Commission alleging failures to protect cetaceans from "deliberate and reckless disturbance". They are demanding an immediate ban on the use of ADDs by fish farms.

Read more via Sunday Herald: "Health of whales, dolphins and porpoises put at risk by underwater alarms"

A press release issued by GAAIA in May 2017 included:
Data disclosed by SNH 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

Read more via [Press Release: "Cetaceans Sound Alarm On Salmon Farms - new research sparks EC complaint & call to ban Acoustic Deterrent Devices"]

Contact:

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

Notes to Editors:

[1] According to the Scottish Government's web-page:

> **UK Dolphin and Porpoise Conservation Strategy**
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> A new Dolphin and Porpoise Conservation Strategy is currently being developed by Marine Scotland in collaboration with the Department for Environment, Food and Rural Affairs (Defra), the Welsh Government and UK Nature Conservation Bodies including the Joint Nature Conservation Committee (JNCC), Natural England (NE), Natural Resources Wales (NRW) and Scottish Natural Heritage (SNH).
>
> This Strategy will provide regulators, public authorities and stakeholders with a summary of the pressures that may affect dolphin and porpoise species in UK waters, with the aim of ensuring effective management to achieve and/or maintain favourable conservation status for these species. It will develop a series of actions to support a joined up approach to management with both site-specific and wider measures working together to conserve dolphin and porpoise populations.
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> **Workshop 19 & 20 April 2018**
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> As part of developing the Strategy further, a two day workshop is being held at the Royal Society of Edinburgh on 19th and 20th April.
>
> The workshop intends to give stakeholders and relevant organisations the opportunity to provide feedback on the developing Strategy.
>
> **To register your interest, please email oana.racu@gov.scot.**
>
> **Note:** the workshop has limited capacity. We would like to have a mixture of skills and expertise from NGO community, industry, nature conservation bodies, science/academia, Government Departments and other related marine stakeholders at the workshop. We therefore ask those interested in this event to carefully consider who from their organisation should attend and we ask that you propose no more than two participants. Should applications exceed maximum numbers, a filtering process will be undertaken to ensure fair and transparent representation of all interested sectors.

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

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

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

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

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

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

[3] FOI reply from the Scottish Government dated 13 March 2018 (download PDF online here)

From: Ian.Walker@gov.scot [mailto:Ian.Walker@gov.scot]
Sent: 13 March 2018 12:26
To: salmonfarmingkills@gmail.com
Subject: Response to FOI/18/00482- D Staniford - ADDs and predator control at salmon farms since 3 May 2017.

Dear Mr Staniford

Thank you for your request dated 10 February 2018 under the Freedom of Information (Scotland) Act 2002 (FOISA).

Your request

You asked for:

Information on ADDs Acoustic Deterrent Devices), predator control and salmon farms since 3 May 2017, including an updated version of the spreadsheet of 2 June 2017, and any correspondence with SNH, salmon farming companies, SMRU, St Andrews University,

RSPCA, RSPCA Assured, Freedom Food, supermarkets and any other persons in relation to the use of ADDs on Scottish salmon farm during 2017.

As the information you have requested is 'environmental information' for the purposes of the Environmental Information (Scotland) Regulations 2004 (EIRs), we are required to deal with your request under those Regulations. We are applying the exemption at section 39(2) of the Freedom of Information (Scotland) Act 2002 (FOISA), so that we do not also have to deal with your request under FOISA. This exemption is subject to the 'public interest test'. Therefore, taking account of all the circumstances of this case, we have considered if the public interest in disclosing the information outweighs the public interest in applying the exemption. We have found that, on balance, the public interest lies in favour of upholding the exemption, because there is no public interest in dealing with the same request under two different regimes. This is essentially a technical point and has no material effect on the outcome of your request.

Response to your request

We hold no updated version of the data spreadsheet referred to in your request so I am unable to provide this.

While our aim is to provide information whenever possible, in this instance, the Scottish Government does not have the information you have requested. Therefore we are refusing these aspects of your request under the exception at regulation 10(4)(a) of the EIRs for the reason explained above.

I enclose copies of all correspondence concerning the use of ADDs at fish farms during 2017 that is additional to that already provided in response to your previous request of 3 May 2017.

An exception under regulation 11(2) of the EIRs (personal information) applies to some of the information requested because it is personal data of a third party and disclosing it would contravene the data protection principles in Schedule 1 to the Data Protection Act 1998. This exception is not subject to the 'public interest test', so we are not required to consider if the public interest in disclosing the information outweighs the public interest in applying the exception.

Your right to request a review

If you are unhappy with this response to your EIRs request, you may ask us to carry out an internal review of the response, by writing to Graham Black, Director of Marine Scotland, Area 1B South, Victoria Quay, Edinburgh, EH6 6QQ, directormarinescotland@gov.scot .Your review request should explain why you are dissatisfied with this response, and should be made within 40 working days from the date when you received this letter. We will complete the review and tell you the result, within 20 working days from the date when we receive your review request.

If you are not satisfied with the result of the review, you then have the right to appeal to the Scottish Information Commissioner. More detailed information on your rights is available on the Commissioner's website at: http://www.itspublicknowledge.info/YourRights/Unhappywiththeresponse/AppealingtoCommissioner.aspx.

Best wishes

Ian Walker
Marine Scotland
Marine Planning & Policy
Area 1A- South
Victoria Quay
Edinburgh
EH6 6QQ
0131 244 6568
0131 244 7613
Ian.walker@gov.scot

The 14-page PDF includes:

From: [redacted]
Sent: 29 November 2017 15:28
To: [redacted]
Cc: [redacted]
Subject: RE: Impact of Acoustic Deterrent Device (ADD) Use on Cetaceans

Dear [redacted]

Thank you for your detailed response to the advice we submitted to you in July in connection with the above issue.

I have discussed this with colleagues in our Coastal and Marine Unit who were involved in drafting our advice and we believe that, prior to submitting anything additional, it would be beneficial if we could take up your offer to meet, in order to ensure that any further evidence we provide meets your requirements.

[redacted] will be in touch with you shortly to agree a suitable date, most probably in the new year. We would be happy to host the meeting at our Battleby office or can travel to Victoria Quay as you prefer.

I hope this is an acceptable way forward for now but please don't hesitate to get back to me if you have any concerns.

Yours sincerely,

[redacted]

[redacted]
Head of Policy & Advice
Scottish Natural Heritage
Great Glen House
Inverness
IV3 8NW

From: [redacted]
Sent: 31 October 2017 10:30
To: [redacted]
Cc: [redacted]
Subject: Impact of Acoustic Deterrent Device (ADD) Use on Cetaceans

Dear [redacted]

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Date: 28 July 2017

Dear [redacted]

IMPACT OF ACOUSTIC DETERRENT DEVICE (ADD) USE ON CETACEANS

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

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

1. There is sufficient evidence, both empirical and modelled, to show that ADDs can cause disturbance and displacement of cetaceans.

2. There is sound, scientific evidence to expect that hearing damage, stress and masking may also occur but these are difficult to demonstrate empirically and would require further assessment.

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

Should you have any questions in connection with this advice, please do not hesitate to contact [redacted]

Yours sincerely,

[redacted]
Head of Policy and Advice
Scottish Natural Heritage

cc [redacted]

Annex

Introduction

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

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

Acoustic Deterrent Devices (ADDs) used in Aquaculture

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

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

Table 1 - Source level and frequency characteristics of the main ADD types in use.

Manufacturer	Device	Source level dB re 1 µPa	Frequency
Mohn Aqua, Gaelforce, OTAQ	Airmar dB +II	192-198 dB (rms)	10 kHz (tonal with harmonics)
Ace-Aquatec[5]	US3	195 dB (rms)	10-20 kHz
	Low frequency variant	190 dB (rms)	1-4 kHz
Terecos	DSMS-4	179 dB(rms)	2-70 kHz (broadband)
Lofitech	Universal Scarer	193 dB (rms)	14 kHz (tonal with harmonics)

[1] Level of sound at source (in dB re 1µPa referred to 1m)
[2] Component frequencies used within the sound output in Hertz (Hz or kHz)
[3] E.g. on continuously
[4] The fraction of the period that the device is on in which the signal is active (*e.g.* a 60% duty cycle means the signal is active for 60% of the time, and 40% quiet)
[5] www.aceaquatec.com (US3 Spec) Web page accessed 07/06/2017

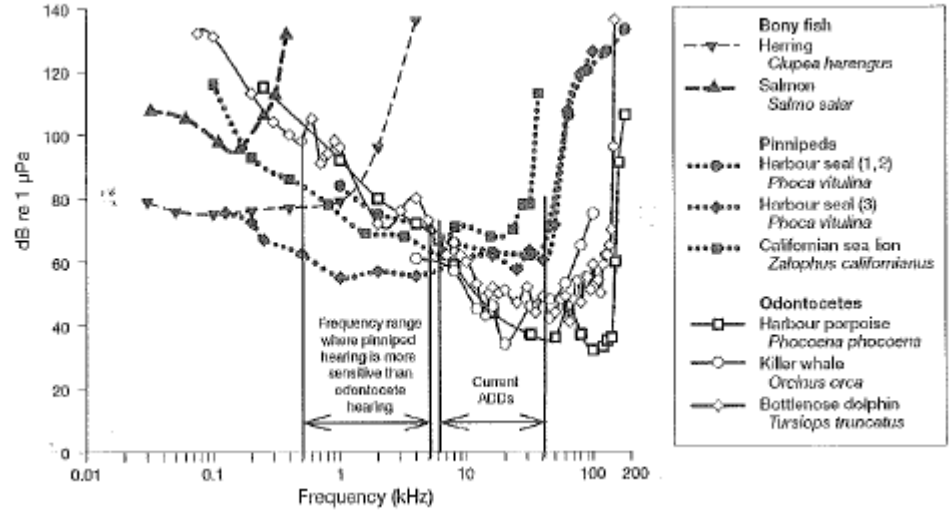

Figure 1 - Hearing thresholds for selected fish (blue dashed lines), pinnipeds (red dotted lines) and cetacean species (black solid lines) from Götz & Janik(2013). Suffixes 1-3, for Harbour seal, refer to data sources cited in Götz & Janik (ibid).

Acoustic deterrents have been used for predator control at fin-fish farms in Scotland since the mid-1980s (Coram *et al.*, 2014). During this time there have been many studies that have highlighted the potential unintended impact on cetaceans (Reviewed in - Gordon & Northridge, 2002; Gordon *et al.*, 2007; Northridge *et al.*, 2010; Götz & Janik, 2013, Coram *et al.*, 2014; Lepper *et al.*, 2014).

The acoustic signal from ADDs, particularly on the west coast of Scotland, is pervasive (Findley *et al.*, 2017). The area ensonified by ADDs has increased over time (ibid.) and is likely to continue to do so if recent trends persist. It is clear that the commonly used ADDs are well within the hearing range of cetaceans, and therefore there is overlap between this pressure and cetacean distribution, not least harbour porpoise within the Inner Hebrides and the Minches cSAC.

Potential negative ecological impacts on cetaceans from ADDs include: disturbance (leading to avoidance and habitat exclusion); hearing damage; masking of biologically significant sounds; and detrimental physiological changes (*e.g* increased stress)(Götz & Janik, 2013).

Disturbance

Avoidance responses to ADDs have been well studied for harbour porpoise and to a lesser extent on other cetacean species. Available studies are reviewed in a number of reports, for example:

- Coram *et al* (2014) Marine Scotland commissioned report – section 4.4.4 page 77; section 7.3 page 105
- Lepper *et al* (2014) SNH commissioned report – Section 3 page 42
- Götz & Janik (2013) review in Marine Ecology Progress Series – page 293
- Gordon *et al* (2007) COWRIE commissioned report – Section 5.4.1.3 page 30

These reviews all draw on the same primary literature and so are not explicitly re-reviewed here; however, key points are drawn out and detailed in Table 2. It is worth highlighting that behavioural reactions to a noise cue are highly context driven. Any response (or lack of) will depend on various factors, for example, the animal's age and previous experience of the noise, its activity when exposed to the noise and the biological value of the location to the individual.

Table 2 details some variability in terms of response distances; however, the general conclusion can be drawn that there is a zone of exclusion within a few hundred metres and a wider zone of disturbance up to several kilometres within which numbers of individuals decrease. The information also seems to suggest that different devices may stimulate different levels of response (or lack of) and this is most likely due to differing acoustic characteristics of the devices.

Table 2 - Summary of studies that have investigated disturbance effect of ADDs.

Device	Species of interest in study	Results	Source
Airmar	Harbour porpoise	When switched on abundance of HP in area (measured out to 3.5km) was less than 10% of abundance in control sessions. HP completely excluded from 400m.	Olesiuk *et al.*, 2002
Airmar	Harbour porpoise	HP excluded from 650-991m HP observed to move out of the area when ADD switched on.	Johnston, 2002
Lofitech	Harbour porpoise	HP density reduced to 1% of pre exposure within a 1km area. Avoidance responses within 1.9km	Brandt *et al.*, 2013
Lofitech	Harbour porpoise	Clear evidence of a reduction in detections, measured out to 7.5km and no indication that this was the maximum range of effect	Brandt *et al.*, 2012
Brand not specified	Killer whale	Considerable decrease in numbers on ADD activation. Recovery of sighting once deactivated. Study over 15 yrs – no habituation observed.	Morton & Symonds, 2002
Brand not specified	White sided dolphin	Abundance decreased.	Morton, 2000
Airmar	Harbour porpoise	Decreased abundance measured out to 2.5km.	Kyhn *et al.*, 2015
Lofitech	Minke whale	Clear movement away from ADD deployment site	ORJIP phase 2 project 4 – unpublished draft 2017[6]
Ace-Aquatec	Harbour porpoise	Model indicates deterrence of HP at ranges out to 1.2km, in absence of competing source of attraction	Kastelein *et al.*, 2010
Terecos	Harbour porpoise	Possible reduction in acoustic behaviour up to 1km	Northridge *et al.*, 2010
Terecos	Harbour porpoise	No significant effect	Northridge *et al.*, 2013
Genuswave[7]	Harbour porpoise	At frequencies tested (peak frequency at 1 kHz, source level 180 dB re 1µPa) - no response from HP	Götz & Janik, 2014

[6] When published will be added to https://www.carbontrust.com/client-services/programmes/offshore-wind/offshore-renewables-joint-industry-programme-orjip/

[7] New device under development using frequencies that harbour porpoise are less sensitive to.

The available literature does not provide evidence that cetaceans habituate to acoustic deterrents (Götz & Janik, 2013). However, Northridge *et al* (2010) found that harbour porpoise were more likely to react to new ADDs than those in areas where there has been ADD use previously. They also found that animals returned to the area once the ADD was de-activated.

It is often mentioned by the Aquaculture Industry that cetaceans are observed in the vicinity of fish farms using active ADDs. However, there is a behavioural context involved in any reaction. The variety of ADD acoustic characteristics, as well as the biological value of the location to the individual(s) concerned, means that the response to these devices is complex and site specific.

Consideration of evidence – We believe there is sufficient evidence to conclude that cetaceans can be disturbed and displaced by certain types of ADDs. The same evidence pool has been used to support the use of acoustic deterrents as pre-piling mitigation (European offshore wind construction, and more recently for BOWL offshore wind farm) with the intention of disturbing marine mammals out of a potential injury zone.

Effects on hearing

Hearing damage has been widely speculated[8] both for seals and cetaceans that are frequently exposed to acoustic signals (Gordon & Northridge, 2002; Coram *et al.*, 2014, Lepper *et al.*, 2014). Hearing is considered to be damaged at the onset of permanent hearing threshold shift (PTS) *i.e.* a permanent reduction in hearing ability. Exposure to noise can also result in a temporary reduction in hearing ability (TTS) which could lead to permanent damage if it occurs repeatedly. Potentially, hearing damage could affect biological fitness and/ or survival. The reduction of an individual's ability to distinguish certain sound signals could result in reduced foraging success, reduced ability to perceive predators and reduced ability to communicate.

Lepper *et al.*, 2014 considered the risk of hearing damage and concluded that the risk should not be discounted. They also concluded (based on the modelling work conducted) that hearing could be damaged if an individual (seal or cetacean) was within a few hundred metres for a few hours, and that the more ADDs deployed in one location the shorter the time-span needed before the injury threshold is breached. A cumulative dose may be received if there are a number of fish farms in the same area or along a transit route, particularly in areas that are restricted (*e.g.* straits, sounds)(also see Götz & Janik, 2013).

Given the output noise levels of ADDs used in aquaculture, it is unlikely that hearing will be damaged by instant exposure; it is more probable that the risk of hearing damage is from cumulative exposure (Götz & Janik, 2013; Coram *et al.*, 2014; Lepper *et al.*, 2014).

Consideration of evidence – Based on the available evidence, we consider that hearing damage via instant or short-term exposure is a relatively low risk. However there may be risk of damage with repeated exposure. We therefore consider there to be a risk of cumulative exposure in restricted areas (*e.g.* straits, sounds) where there are multiple ADD sources.

Masking and stress

Masking occurs when the detection of one sound signal (*e.g.* communication between marine mammals) is hidden by a second sound signal (*e.g.* an ADD). This will only occur if the frequencies of the two sound signals are similar. Although cetaceans have excellent discrimination of different sounds the potential of masking remains, which would result in missed opportunities to react to relevant noise cues. There have not been any direct studies to our knowledge, but there has been work conducted indicating a likely reduction of communication space due to vessel noise (baleen whales – Clark *et al.*, 2009; delphinids – Erbe, 2002; Jensen *et al.*, 2009). Some ADDs generate noise within a similar frequency range to small boats highlighting the potential for a similar impact (Götz & Janik, 2013).

[8] It is not possible to test hearing damage on cetaceans directly. It is inferred based on understanding of temporary hearing loss (see Southall *et al.*, 2007).

There is limited ability to study stress effects on marine mammals in the marine environment. One opportunistic study, (Rolland *et al.*, 2012) found the reduction of noise related to a temporary cessation of shipping traffic was associated with a reduction in stress hormones in right whales. We understand from terrestrial studies that individuals living in a noisy environment suffer with stress related conditions, ultimately affecting the individual's health (EU 2015). In addition there is the awareness that a lack of obvious response does not necessarily mean there is no effect.

Consideration of evidence – We consider that the possibility of masking and stress is real, but is difficult to demonstrate empirically and complicated by other noise sources in the same region (*e.g.* vessel noise). Further work would be needed to ascertain the significance of any impacts.

Conclusions

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

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

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

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

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From: Don Staniford [mailto:salmonfarmingkills@gmail.com]
Sent: 10 February 2018 08:56
To: 'ceu@scotland.gsi.gov.uk'
Cc: 'Ian.Walker@gov.scot'; 'Oana.Racu@gov.scot'
Subject: FOI re. ADD use on Scottish salmon farms since 3 May 2017

Please provide information on ADDs (Acoustic Deterrent Devices), predator control and salmon farms since 3 May 2017.

Please include an updated version of the attached Excel spreadsheet (supplied by the Scottish Government via FOI/17/01044 on 2 June 2017).

Please include any correspondence with SNH, salmon farming companies, SMRU, St. Andrews University, RSPCA, RSPCA Assured, Freedom Food, supermarkets and any other persons in relation to the use of ADDs on Scottish salmon farms during 2017.

Please consider this a request for information under the relevant Freedom of Information and Environmental Information Regulations including both the Freedom of Information (Scotland) Act 2002 and the Environmental Information (Scotland) Regulations 2004 (as well as any other new or other regulations which may be appropriate).

Please provide this information electronically via email.

Please acknowledge receipt of this FOI request.

Many thanks and I look forward to a response shortly.

Best fishes,

Don

Don Staniford

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

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

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From: Ian.Walker@gov.scot [mailto:Ian.Walker@gov.scot]
Sent: 02 June 2017 15:24
To: salmonfarmingkills@gmail.com
Subject: FOI/17/01044 - D Staniford - ADDs, predator control and salmon farms since 1 January 2016

Dear Mr Staniford

I attach an additional document which was inadvertently omitted from the original response to the above.

I had assumed that it was included in the pdf. document but apparently it was too large for that.

Best wishes

Ian Walker
Marine Scotland
Marine Planning & Policy
Area 1A- South
Victoria Quay
Edinburgh
EH6 6QQ
0131 244 6568
0131 244 7613
Ian.walker@gov.scot

Download Excel spreadsheet online here

From: Ian.Walker@gov.scot [mailto:Ian.Walker@gov.scot]
Sent: 01 June 2017 13:05
To: salmonfarmingkills@gmail.com
Subject: Response to FOI/17/01044 - D Staniford - ADDs, predator control and salmon farms since 1 January 2016

Dear Mr Staniford

Thank you for your request dated 3 May 2017 under the Freedom of Information (Scotland) Act 2002 (FOISA).

Your request

You asked for: Information on *"ADDs (Acoustic Deterrent Devices), predator control and salmon farms since 1 January 2016."*

As the information you have requested is 'environmental information' for the purposes of the Environmental Information (Scotland) Regulations 2004 (EIRs), we are required to deal with your request under those Regulations. We are applying the exemption at section 39(2) of the Freedom of Information (Scotland) Act 2002 (FOISA), so that we do not also have to deal with your request under FOISA. This exemption is subject to the 'public interest test'. Therefore, taking account of all the circumstances of this case, we have considered if the public interest in disclosing the information outweighs the public interest in applying the exemption. We have found that, on balance, the public interest lies in favour of upholding the exemption, because there is no public interest in dealing with the same request under two different regimes. This is essentially a technical point and has no material effect on the outcome of your request.

Response to your request

I enclose most of the correspondence that falls within the terms of your request (above). Some e-mail chains include duplicate e-mails which have been removed.

While our aim is to provide information whenever possible, we are unable to provide some of information you have requested because an exception under regulation 10(4)(e) of the EIRs (internal communications) applies to a small amount of the information. This exception applies because it is internal legal advice and disclosure would breach legal professional privilege.

This exception is subject to the 'public interest test'. Therefore, taking account of all the circumstances of this case, we have considered if the public interest in disclosing the information outweighs the public interest in applying the exception. We have found that, on balance, the public interest lies in favour of upholding the exception. We recognise that there is a public interest in disclosing information as part of open, transparent and accountable government, and to inform public debate. However, this is outweighed by the strong public interest in maintaining the right to confidentiality of communications between legal advisers and clients, to ensure that Ministers and officials are able to receive legal advice in confidence, like any other public or private organisation.

An exception under regulation 11(2) of the EIRs (personal information) also applies to some of the information requested because it is personal data of a third party and disclosing it would contravene the data protection principles in Schedule 1 to the Data Protection Act 1998. This exception is not subject to the 'public interest test', so we are not required to consider if the public interest in disclosing the information outweighs the public interest in applying the exception.

Your right to request a review

If you are unhappy with this response to your EIRs request, you may ask us to carry out an internal review of the response, by writing to Graham Black, Director of Marine Scotland, Area 1B South, Victoria Quay, Edinburgh, EH6 6QQ, directormarinescotland@gov.scot .Your review request should explain why you are dissatisfied with this response, and should be made within 40 working days from the date when you received this letter. We will complete the review and tell you the result, within 20 working days from the date when we receive your review request.

If you are not satisfied with the result of the review, you then have the right to appeal to the Scottish Information Commissioner. More detailed information on your rights is available on the Commissioner's website at: www.itspublicknowledge.info.

Best wishes

Ian Walker
Marine Scotland
Marine Planning & Policy
Area 1A- South
Victoria Quay
Edinburgh
EH6 6QQ
0131 244 6568
0131 244 7613
Ian.walker@gov.scot

Download 46-page PDF online here

From: Don Staniford [mailto:salmonfarmingkills@gmail.com]
Sent: 03 May 2017 10:47
To: 'ceu@scotland.gsi.gov.uk'
Cc: 'Ian.Walker@gov.scot'
Subject: FOI re. ADDs, predator control and salmon farms since 1 January 2016

Please provide information on ADDs (Acoustic Deterrent Devices), predator control and salmon farms since 1 January 2016.

Please note the same FOI request was filed with SNH on 26 February 2017.

SNH's FOI reply dated 25 April 2017 (see next email for your information) included Excel spreadsheets authored by Marine Scotland (according to a phone conversation this morning with Cathy Tilbrook of SNH - and confirmed earlier this morning by Ian Walker of Marine Scotland).

Please therefore provide an update and the latest copy of the Excel spreadsheet named Information Request - Mr Staniford - A2272012.xlsx (191 KB); . The licence status (column B) is marked "Pending" but presumably some licences may now have been issued.

Information disclosed by SNH on 25 April 2017 included:

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".

SNH / MS Discussion on ADDs and EPS – 22nd 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)
- **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 mitifgate 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 if 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...

Please therefore information any similar discussions in 2016 and 2017.

This would include any emails, briefings and correspondence relating to a meeting between SNH and Marine Scotland on 8 November 2016.

Documents disclosed by SNH 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:
  - Diversity of applications for ADDs
  - Maps illustrating the range of audibility of ADDs in NW Scotland, and increasing persistent detection over last decade
  - Areas within cSAC which recent studies have identified as being ensonified
  - 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:
  - Q1 Are EPS likely to be present? => Yes.
  - Q2 Are you planning an activity which could potentially cause injury or disturbance to marine EPS? => Yes (noting that the guidance itself indicates this, for ADDs).
  - Q3 Can the impact be fully or partially mitigated? => potentially, there being various options here (eg see Annex 2). However, any such mitigation needs to be enforceable (eg via planning conditions) to ensure delivery.
  - Q4. Will an offence be committed despite mitigation plans? Yes, in some cases – leading to requirement for EPS licence

- Q4 prompted [redacted] to outline recent legal advice received by MS on the definition of 'reckless'. The advice received was not definitive but, in case law, implied 'culpable indifference and blameless disregard'. Examples of recklessness in a driving context were also given. It was MS's opinion, on the basis of this advice that ADD use *by the aquaculture sector*, is not 'reckless', the intention of ADD use being different for aquaculture to that for other industries where ADDs may be applied to 'deliberately' scare / disturb EPS (cetaceans).

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SNH presented "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".

The Minutes 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. 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. "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 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 ([redacted] or [redacted]). To provide SNH with a copy of the legal question raised by MS and the advice received from lawyers on defining reckless behaviour and written confirmation of how MS interpret that advice (as set out in the meeting). Also in relation to Reg 39 (2) issue raised later.
Action 2. SNH (CT). To investigate the potential for SNH to obtain a separate legal opinion on defining 'reckless / deliberate behaviour' (in the context of the EPS) and perhaps also in relation to Reg 39 (2), noting that SNH lawyers may not wish to offer advice on the same question asked by MS.

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

"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.

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.

[redacted] 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. [redacted] 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.

[redacted] 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. [redacted] also indicated that any new EPS licensing regime would be a huge administrative burden for MSLOT and effectively undeliverable with current resources.

The Minutes 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).

Please therefore include any information on ongoing discussions since the 8 November 2016 meeting - including any internal briefings, emails, legal advice and other documents relating to ADDs (Acoustic Deterrent Devices), predator control and salmon farms.

In particular, please include information on any discussions relating to research presented on 1 May 2017 at the European Cetacean Society conference in Denmark. Here's the abstract of

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

Monday 1 May 2017

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

Denise Risch[3], Charlotte Rose Findlay[1,2], Hayden Ripple[2], Steven Benjamins[3], Ben Wilson[3], Frazer Coomber[4]

(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 lead 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.

Please consider this a request for information under the relevant Freedom of Information and Environmental Information Regulations including both the Freedom of Information (Scotland) Act 2002 and the Environmental Information (Scotland) Regulations 2004 (as well as any other new or other regulations which may be appropriate).

Please provide this information electronically via email.

Please acknowledge receipt of this FOI request.

Many thanks and I look forward to a response shortly.

Thanks,

Don

Don Staniford

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