Scottish Salmon Watch, 10 September 2018

Sounding Off On Salmon Farms
- Acoustic Deterrent Devices evade Marine Noise Registry
- New scientific paper reports "loud and pervasive" ADDs used on salmon farms as a "significant & chronic source of underwater noise"
- SARF report on 'low-frequency' ADDs delayed until December

Campaigners are calling on the Scottish Government and the Joint Nature Conservation Committee to capture the "loud and pervasive" noise pollution from salmon farms using Acoustic Deterrent Devices (ADDs) in the UK's Marine Noise Registry.

The latest data disclosed by Marine Scotland indicates that the vast majority of active salmon farms not only use ADDs but they also use them continuously thereby causing 'deliberate and reckless disturbance' to cetaceans including the EU-protected harbour porpoise **[1]**.

Scientific research published in the October 2018 of Marine Pollution Bulletin shows that swathes of the West coast of Scotland - including the Minch - are ensonified from ADDs used by salmon farms with 278 ADDs detected in 2015 (up from 5 in 2006) at a range of impact of up to 50km.

Developing the Marine Noise Registry was a commitment made in the UK Marine Strategy in 2012 but noise from ADDs used by salmon farms has not yet been included despite a commitment in 2008 via the EC's Marine Strategy Framework Directive to capture all impulsive noise in the marine environment by 2020 **[2]**.

"Noisy salmon farms are slipping through the net and urgently need to be captured by the Marine Noise Registry," said Don Staniford, Director of Scottish Salmon Watch. "ADDs used by salmon farms could be the loudest and most pervasive noise on the West coast of Scotland and must be turned off immediately. Scientific research has shown that salmon farms using ADDs can be heard by cetaceans such as harbour porpoises perhaps as far as 50km away. Unless ADDs are switched off completely the UK is in danger of a hefty fine from Europe for deliberately and recklessly breaching the EU Habitats Directive."

Watch a video report via "Noisy Salmon Farms - Switch Off Acoustic Deterrent Devices Now!" with Don Staniford reporting from The Scottish Salmon Company's salmon farm at Strondoir Bay in Loch Fyne on 2 September:

A new scientific paper - "Mapping widespread and increasing underwater noise pollution from acoustic deterrent devices" - published in the October 2018 issue of Marine Pollution Bulletin **[3]** includes:

"Acoustic deterrent devices (ADDs) are used in attempts to mitigate pinniped depredation on aquaculture sites through the emission of loud and pervasive noise.....Results indicated a

steady increase in ADD detections from 2006 (0.05%) to 2016 (6.8%), with the highest number of detections in 2013 (12.6%), as well as substantial geographic expansion. This study demonstrates that ADDs are a significant and chronic source of underwater noise on the Scottish west coast with potential adverse impacts on target (pinniped) and non-target (e.g. cetaceans) species, which requires further study and improved monitoring and regulatory strategies."

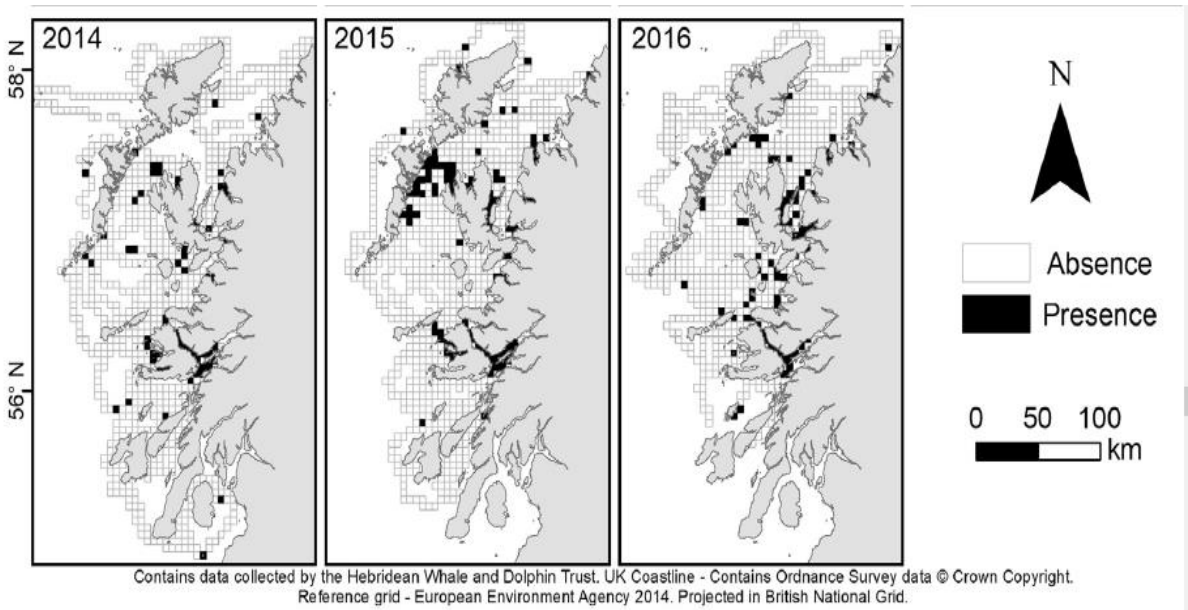


Fig. 4. Acoustic presence (solid black cells) and absence (clear cells) of acoustic deterrent device (ADD) detections on the west coast of Scotland Grid cell size = 5 × 5 km.

"When used over large areas and extended time periods, ADDs may therefore represent a source of chronic underwater noise pollution which may negatively affect animals' individual fitness, potentially with long-term population consequences," warns the scientific paper by scientists at the Scottish Association of Marine Science and Hebridean Whale & Dolphin Trust. "Using an 11-year dataset of acoustic listening events from across the west coast of Scotland, this study shows that ADDs have become a chronic and widespread source of underwater noise pollution in this region."

"Although this study was unable to accurately assess the ranges from fish farms at which ADDs could be detected above ambient noise, detections were made both inshore and offshore and at considerable distances from active fish farms (Figs. 1 and 4)," continued the scientific paper. "Previous studies showed that, under certain ambient noise conditions Airmar devices can be detected up to 20 km from the source (Jacobs and Terhune, 2002), while Olesiuk et al. (2002) suggested that in some instances Airmar signals could even be heard up to 50 km from the source."

"Given the evident pervasive presence of ADD noise along much of the west coast of Scotland, there is a clear need to improve the reporting of ADD usage, including information on ADD types, numbers, and operation schedules," concluded the scientific paper. "This information could subsequently be used to fulfil requirements under the Marine Strategy Framework Directive (MSFD) Criterion 11.1 (2008/56/EC) to record loud, low- to mid-frequency impulsive noise. ADDs are explicitly mentioned in this legislation and in the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR, 2014) but have so far not been recorded in any of the national marine registries

presently under development (Dekeling et al., 2014; Merchant et al., 2016). This omission risks ignoring a regionally significant source of chronic anthropogenic underwater noise pollution with potentially widespread negative consequences for marine wildlife."

Information disclosed by JNCC via Freedom of Information (FOI) on 21 June 2018 detailed how the noise from ADDs used by salmon farms was "still missing" from the Marine Noise Registry:

> The Marine Noise Registry does not contain any information on ADD use in salmon farms. This is a recognised gap in the data currently collected. Although there is a requirement under the MSFD to monitor impulsive noise (i.e. when and where noise occurs) and ADDs have been included in the types of noise sources to be collected, JNCC has not been able to obtain this data. We have nevertheless obtained some information on where the fish farms are and if (and what types of) ADDs are included in their suite of seal predation reduction methods. This is in the file ***ADDuseScotland.xlsx***.
>
> Currently, the Noise Registry relies entirely on data that is either collected via licence conditions or voluntarily through notification processes established with some regulators and the Ministry of Defence. Last year, JNCC started to consider how to obtain those data missing from the registry (ADDs is one amongst a series of other activities still missing) or whether it is feasible to use a proxy of the spatio-temporal extent of noise events for those missing activities. These considerations have not yet been shared with either Marine Scotland or the industry as we have yet to develop the idea fully, to a position where we can then start discussions with the relevant stakeholders. If you wish, we would be willing to hold a telephone call with you to discuss this gap in knowledge and to hear any suggestions you may have about how to obtain information on ADD use, as well as to provide any clarification on the Marine Noise Registry. Sonia Mendes, our senior marine mammal advisor, would be available for this call. Her telephone number is +44 (0) 1224 266558.

[The file ADDuseScotland.xlsx. is available online here]

An email obtained via FOI reveals that in January 2017 JNCC admitted to Scottish Natural Heritage (SNH) that they "have been unable to collect data associated with ADD use at fish farms". JNCC asked if it was possible to work with SNH and Marine Scotland "to try and find a feasible method of collecting future ADD noise data for the Marine Noise Registry":

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

Hi Caroline,

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

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

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

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

Best wishes,

[redacted]

[redacted]
JNCC, Inverdee House, Baxter Street, Aberdeen, AB11 9QA
Tel: 01224 266550, Direct Dial: [redacted] Mobile: [redacted]
Email: [redacted]@jncc.gov.uk

Information disclosed by JNCC via Freedom of Information (FOI) on 21 June 2018 included a 10-page letter from Scottish Natural Heritage to Marine Scotland dated 27 July 2017 - concluding:

"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."

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

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

Date: 28 July 2017

Dear Elaine

IMPACT OF ACOUSTIC DETERRENT DEVICE (ADD) USE ON CETACEANS

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

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

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

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

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

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

Yours sincerely,

Eileen Stuart
Head of Policy and Advice
Scottish Natural Heritage

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.

Read the letter in full online here

Video footage recorded by Scottish Salmon Watch at salmon farms in July, August and September documents continuous noise from Acoustic Deterrent Devices on salmon farms in Loch Fyne in Argyll & Bute and Loch Spelve on the Isle of Mull (the clicking noise is the ADD in operation).

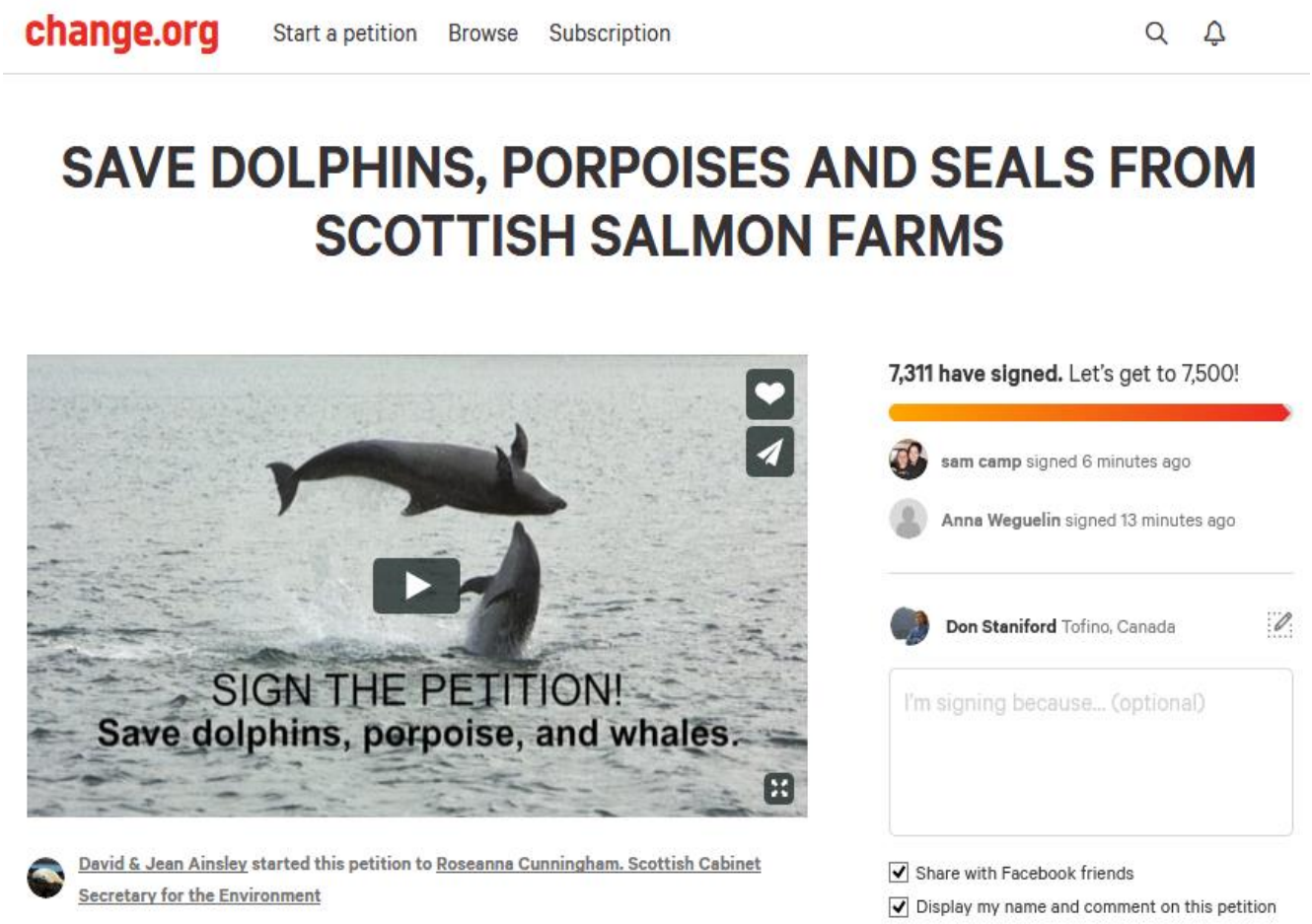
Watch via "Secret Filming Inside Scottish Salmon Farms"

A [video from diver Frank Melvin published in June] shows that the underwater noise from salmon farming operations can be significant and impact on shellfish "over a mile away".

In June, Scottish Salmon Watch [called for a ban on the use of ADDs] on salmon farms to protect cetaceans.

"The use of ADDs by salmon farms constitutes 'reckless disturbance' and is an offence under Scottish law and the EU Habitats Directive," said David Ainsley, a whale watching tourist operator [who filed a complaint with the European Commission in April 2018]. "As with the shooting of seals there must be a zero tolerance to ADDs. All current ADDs including the so-called 'cetacean friendly' models emit very loud noises well above the reported thresholds for disturbance and hearing damage to cetaceans. This is why no ADDs can comply with the requirements of the law protecting cetaceans from disturbance and injury."

Over 7,000 people have now [signed a petition calling for a ban on ADDs] used by salmon farms.

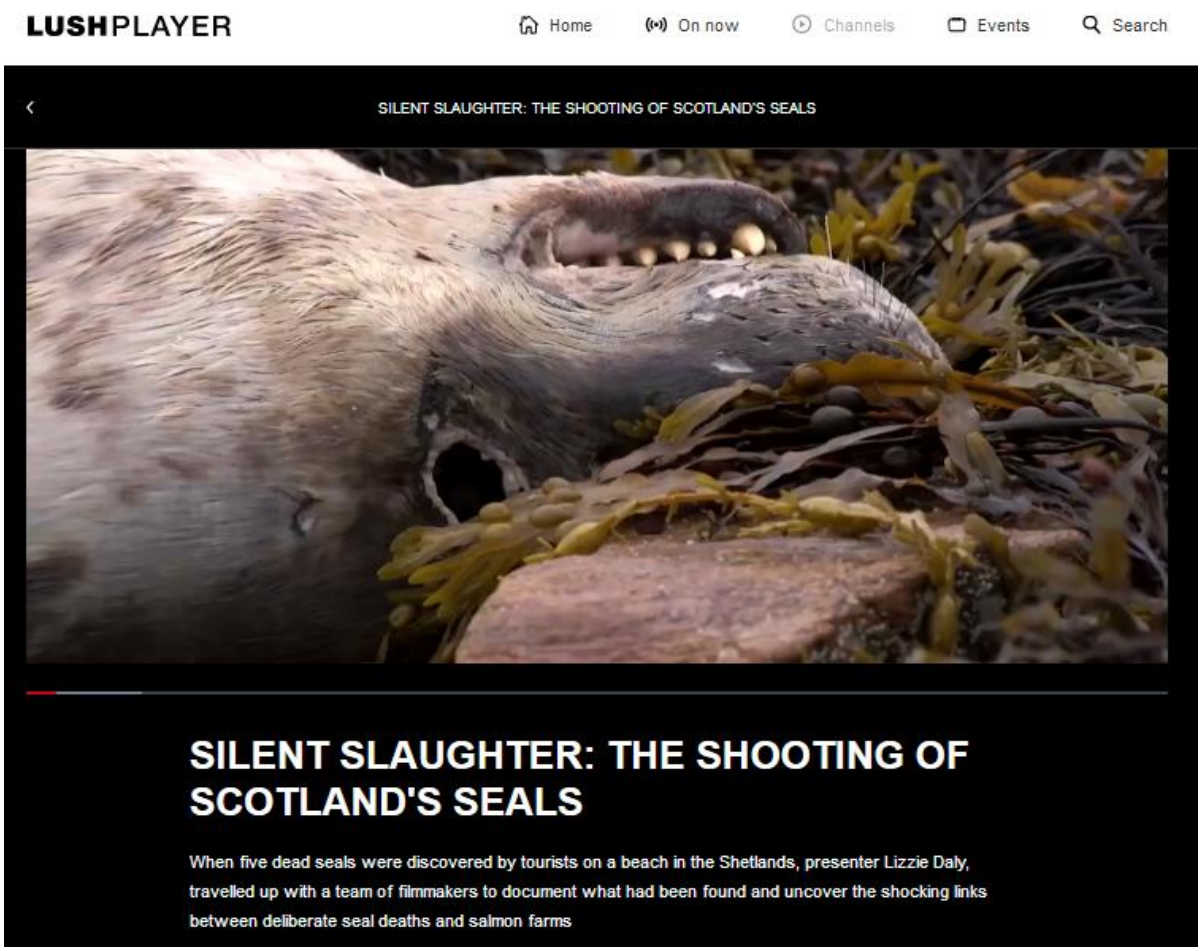


A new report - Low-frequency Acoustic Deterrent Devices and Porpoises (LEAP): Assessing potential impact of low-frequency Acoustic Deterrent Devices (ADDs) on cetaceans in Scottish coastal waters - was scheduled for publication by the Scottish Aquaculture Research Forum (SARF) in June but has been delayed until at least December.

"SARF112 is currently going through the SARF peer review process & we anticipate that a final project steering group meeting will take place at the end of October," stated SARF in an email to Scottish Salmon Watch on 24 August 2018. "Therefore, we would not expect publication before the end of November" **[4]**.

Read more via:
Media Advisory: Sounding Off About Scotland's Noisy Salmon Farms - Turn Off Acoustic Deterrent Devices to Protect Cetaceans
The Herald: "Ban fish farm sonic alarms say marine experts as dolphins and whales suffer"
Press & Journal: "Campaigners call for ban on electronic seal scarers at fish farms"
Deafening Impact of Salmon Farms on Cetaceans - "Deliberate & Reckless Disturbance" by ADDs makes waves?
Sunday Herald: "Health of whales, dolphins and porpoises put at risk by underwater alarms"
Cetaceans Sound Alarm On Salmon Farms - new research sparks EC complaint & call to ban Acoustic Deterrent Devices

In August, Lush featured the issue of seals being killed by salmon farms via "Silent Slaughter: The Shooting of Scotland's Seals":



Read more via "Time to stop the seal slaughter"

Contact:

Don Staniford (Director of Scottish Salmon Watch): 07771 541826 (dstaniford@gaaia.org)

SCOTTISH SALMON WATCH SEALS

Notes to Editors:

[1] Data obtained from the Scottish Government via FOI in 2017 revealed that 164 salmon farms use ADDs with 112 salmon farms where ADDs are listed as "Always On".

ADDuseScotland.xlsx

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.

FOI reply from the Scottish Government dated 2 June 2017:

	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)

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.

More background via: Media Advisory: Sounding Off About Scotland's Noisy Salmon Farms - Turn Off Acoustic Deterrent Devices to Protect Cetaceans (June 2018)

[2] Data published via the Marine Noise Registry for 2016 (published in April 2018) is available online here

Including:

1.1. UK Marine Strategy

The Marine Strategy Part One sets out the UK's approach on the implementation of the Marine Strategy Framework Directive (MSFD) 2008/56/EC. For impulsive noise, the UK target for Good Environmental Status (GES) requires the establishment and maintenance of a 'noise registry' which will record in space and time activities generating noise in order that they can be analysed to determine whether they may potentially compromise the achievement of GES. The Marine Noise Registry (MNR) is managed by Joint Nature Conservation Committee (JNCC) and has been developed in discussion with Government Departments and the Devolved Administrations (DAs), UK regulators and stakeholders. The MNR will form part of the UK's programme of measures which will be set out in the Marine Strategy Part Three.

The MSFD, transposed to UK legislation (the Marine Strategy Regulations 2010) in July 2010, requires all Member States to work towards achieving GES in their marine environment by 2020. The MSFD outlines 11 high level descriptors of GES. Descriptor 11 relates to underwater noise: "Introduction of energy, including underwater noise[1], is at levels that do not adversely affect the marine environment". Underwater noise generated by human activities has the potential to affect marine organisms in a variety of ways, from masking sounds used to communicate with each other and find food, to physiological injury and even death. Descriptor 11 covers both impulsive noise (seismic airguns, impact pile drivers and explosives) and anthropogenic ambient noise, dominated by shipping sound. Only data related to activities generating impulsive noise is collected within the MNR[2].

Data for 2015 (published in October 2017) is available online here

[3] Read a scientific paper - "Mapping widespread and increasing underwater noise pollution from acoustic deterrent devices" - published in Marine Pollution Bulletin in October 2018 online here

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Mapping widespread and increasing underwater noise pollution from acoustic deterrent devices

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ABSTRACT

Acoustic deterrent devices (ADDs) are used in attempts to mitigate pinniped depredation on aquaculture sites through the emission of loud and pervasive noise. This study quantified spatio-temporal changes in underwater ADD noise detections along western Scotland over 11 years. Acoustic point data ('listening events') collected during cetacean line-transect surveys were used to map ADD presence between 2006 and 2016. A total of 19,601 listening events occurred along the Scottish west coast, and ADD presence was recorded during 1371 listening events. Results indicated a steady increase in ADD detections from 2006 (0.05%) to 2016 (6.8%), with the highest number of detections in 2013 (12.6%), as well as substantial geographic expansion. This study demonstrates that ADDs are a significant and chronic source of underwater noise on the Scottish west coast with potential adverse impacts on target (pinniped) and non-target (e.g. cetaceans) species, which requires further study and improved monitoring and regulatory strategies.

Including:

Table 1
Summary of survey and listening event effort carried out by the Hebridean Whale and Dolphin Trust (HWDT) for all years included in the present analysis (2006–2016), including the year of survey, distance surveyed in kilometres, total number of listening events, the number of ADD detections, ADD detection rate (%) and median across all years.

Year	Distance surveyed (km)	Total number of listening events	Total number of ADDs detected	ADD detection rate (%)
2006	8399.8	938	5	0.53
2007	8666.5	1878	55	2.93
2008	7956.5	547	29	5.30
2009	9846.4	2508	112	4.47
2010	8427.8	1963	92	4.69
2011	8678.1	2334	183	7.84
2012	5996.0	1500	145	9.67
2013	6123.0	1645	208	12.64
2014	8566.1	1737	122	7.02
2015	8886.2	2457	278	11.31
2016	9370.5	2094	142	6.78
Median	8566.1	1878	122	6.78

Download scientific paper in full as a PDF online here

[4]

From: Richard Slaski [mailto:r.slaski@sarf.org.uk]
Sent: 24 August 2018 19:15
To: 'Don Staniford'
Cc: 'Richard Slaski'
Subject: RE: SARF 112?

Good evening.

I write on Richard's behalf as he is currently on annual leave.

SARF112 is currently going through the SARF peer review process & we anticipate that a final project steering group meeting will take place at the end of October.

Therefore, we would not expect publication before the end of November.

I hope this is helpful.

Sandra Gray
SARF

From: Don Staniford <salmonfarmingkills@gmail.com>
Sent: 23 August 2018 10:53
To: 'Richard Slaski' <r.slaski@sarf.org.uk>
Subject: SARF 112?

When will SARF 112 on ADDs be published?

Best fishes,

Don

Don Staniford

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

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