JNCC EIR 202005

Email correspondence regarding Acoustic Deterrent Devices (ADD) and salmon farms

Please note: emails are presented in date order.

From: Sonia Mendes
Sent: 11 September 2018 09:58
To: Elaine Tait; Caroline Carter

Hi Elaine/Caroline

You will have seen the press release and media articles on the ADD issue today. Unfortunately JNCC has made no progress in getting hold of data on ADD use for the Noise Registry. We have been so busy that we haven't been able to pick this up. One thing I did do was to transcribe some questions and answers from the inquiry below. What David Sandison said sounds promising in terms of getting the industry to collaborate. I'd welcome a quick call sometime next week or the next to find out what you guys have been doing and if you have any ideas on how to go about getting the data.

Thanks

Sonia

Environment, Climate Change and Land Reform Committee - Inquiry into the environmental impacts of salmon farming - February 06

David Sandison, General Manager, Scottish Salmon Producers' Organisation

DS: In relation to ADDs and whether they are appropriate, in some cases they are. The idea they are left on continuously and have a massive effect on other marine mammals I would refute because they are used selectively, they are not switched on willy nilly, they are used when there is a problem

MSP: an FOI request in 2016, 60% of the farms using ADDs listed as saying they're always on.

DS: Doesn't concur with my knowledge of the situation but I'd have to go and have a look at the FOI and see if I can shed any light. I recognise that ADDs have an impact on marine cetaceans around the fish farms so ADDs need to be used appropriately

MSP: How do you propose better monitoring of ADDs?(…)

DS: I will come back to you and I'm sorry if I'm not aware of that information. However, we are the best people to tell you what's happening on farms and we have absolutely no reason not to; So, whichever agency needs to know that information I think that industry would quite happily freely give that information and then we can make decisions on whether that's appropriate use of ADDs.

Dr Sónia Mendes
Senior Marine Mammal Advisor - Offshore Industries

From: Cathy Tilbrook
Sent: 31 January 2019 10:07
To: Karen Hall (JNCC)
Cc: Caroline Carter
Subject: ADD research specification

Hi Karen

As discussed in our catch-up call yesterday, I attach a copy of the MS tender spec for the ADD research project I mentioned. Caroline is our main contact for this, if you need any further info (or Elaine Tait in MS). Hopefully this work will provide a more comprehensive dataset for MSFD noise registry purposes.

Let me know if you want a further catch up sometime on the HP conservation objectives issue that we discussed last week. It would be useful to hear feedback from your discussions with colleagues.

Cheers, Cathy

Cathy Tilbrook | Sustainable Coasts & Seas Activity Manager

From: Karen Hall (Scottish Natural Heritage)
Sent: 31 January 2019 10:08
To: Karen Hall (JNCC)
Cc: Cathy Tilbrook
Subject: FW: ADD research specification

For you karen

From: Karen Hall (JNCC)
Sent: 31 January 2019 10:28
To: Sonia Mendes; Tetrienne Kerswell-Box; Sarah Canning

FYI- ADD research project that MSS are commissioning that Cathy made me aware of this week.

From: Sonia Mendes
Sent: 31 January 2019 10:37
To: Karen Hall (JNCC); Tetrienne Box; Sarah Canning

Thanks I knew about this through Ross but hadn’t seen the spec. Despite my email back in September (attached) asking to meet with Caroline and Elaine Tait I never got a reply.

Me and Tet will look at the spec and see if we think it will meet MNR requirements.

Cheers

Sonia

From: Alex Coram
Sent: 18 July 2019 16:44
To: Sonia Mendes
Subject: Re: shapefiles derived with JCP code

Hi Sonia

Sorry for the slow reply on this. I had a look back to try and work out exactly what you need but can't remember exactly where we got to. I think we removed a lot of the JCP data from the final report - but maybe that was just the winter data?

Are you available to talk tomorrow or next week?

Best,

Alex

On Mon, Jul 1, 2019 at 12:30 PM Sonia Mendes wrote:
Hi Alex
Hope you are well.
Would it be of for you to pass on the shapefiles that you had (spent ages) deriving from the JCP R code? I think it was for porpoise only. We might want to publish them alongside a new tool (which runs on shiny app) for abundance estimation (using the JCP R code in the background).
Many thanks
Sonia
Dr Sónia Mendes
Senior Marine Mammal Advisor - Offshore Industries

From: Alex Coram
Sent: 04 October 2019 13:13
To: Sonia Mendes
Subject: Re: shapefiles derived with JCP code

Hi Sonia

Sorry (again) for slow response on this. I'm pretty sure that those figures in the end were cut out of the final draft report, at JNCC's request, as there was so much uncertainty over using the JCP tool in this way.

I can supply them if you'd like anyway. Let me know.

Best,

Alex

On Tue, Sep 3, 2019 at 12:26 PM Sonia Mendes wrote:
Hi Alex, so sorry it has taken me ages to reply to your email! I hope you are well.
I'm looking for the shapefiles for these maps, would you be able to send them? We may want to publish them alongside a new user friendly tool to derive abundance estimates
Cheers

Sonia

From: Alex Coram
Sent: 18 October 2019 10:32
To: Sonia Mendes
Subject: Re: shapefiles derived with JCP code

Hi Sonia

Attached should be what you need. You can take explanatory text from previous versions of the report.

The two columns 'sc-WntTot' and 'sc-SmrTot' are scaled from the density surface layer to agree with population totals from SCANS III. I notice they are saved as strings, rather than real or doubles, which must have been a consequence of how they were transformed. That shouldn't be a problem but just wanted to point it out in case you have any issues.

On an unrelated topic... I am working on a project for Marine Scotland, collecting info on the use of acoustic deterrents in aquaculture. Caroline from SNH suggested talking to you so that we can collect and store data in a way that would be useful for the MSFD marine noise register. Maybe easiest to discuss on the phone?

Best,

Alex

On Mon, Oct 14, 2019 at 9:00 PM Sonia Mendes wrote:
Hi Alex, yes they were taken out of the report but we might want to use them. The issue with the uncertainty I think was more the winter data. The summer data is uncertain too of course, as illustrated below but as long as that uncertainty is explicitly used in any risk assessment then that should be ok.
I don’t remember too well but I think the main reason why all the maps were taken out of the bycatch report in the end was that they weren’t really needed to tell the story, but I might be wrong.
So, yes please send them to me if that’s ok
Best wishes
Sonia

From: Alex Coram
Sent: 08 November 2019 12:48
To: Sonia Mendes

Hi Sonia

You probably know that James Waggitt et al at Bangor have recently published their modelling work on porpoise distruituion, which includes monthly estimates. This might be a good alternative to using these data, if there remains uncertainty.

On ADDs, your colleague Roma has sent me the data requirements for ADDs from the noise register. I don't think I need anything from you as such, except to check that I'm not missing

anything important. I'm hoping to have quite a large number of records from this project, so if there is additional data that would be of interest, it would be good to discuss that soon.

Best,

Alex

On Fri, Nov 8, 2019 at 11:53 AM Sonia Mendes wrote:
Thanks a lot for these Alex!
It would be great to talk to you about the ADD project and noise registry. Can it wait until December or does it need to be quicker than that?
Cheers
S

From: Kate Brookes
Sent: 16 January 2020 17:37
To: Sonia Mendes
Cc: Elaine Tait
Subject: ADDs

Hi Sonia,

Marine Scotland currently have several areas of work around ADDs. One of the issues that we're facing is whether ADDs are impulsive noise or not. In several of the areas, it's clear that they are not considered to be impulsive noise. This means that we have some contradictions in terms of how ADDs are treated in relation to the noise registry.

We'd like to understand more about why ADDs are included in the noise registry and seem to be considered as impulsive noise in this context.

Are you available in the near future to have a discussion about this?

Thank you,
Kate

Dr Kate Brookes
Marine Mammals Specialist

From: Sonia Mendes
Sent: 20 January 2020 13:00
To: Kate Brookes; Elaine Tait

Hi Kate/Elaine, hope you are well,

do the following text extractions help at all? Also bearing in mind we only collect data for sources between 10Hz and 10kHz (with the exception of MBES sonar which we collect up to 12kHz). Let me know if you still wish to chat! We are of course interested in keeping abreast of the outcomes of the Marine Scotland project and also seeing how the MNR can collect any future data on ADD use as this is currently one of the largest gaps in data collection.
Cheers, Sonia

https://ec.europa.eu/jrc/sites/jrcsh/files/lb-na-26555-en-n.pdf

'The Commission Decision uses the term "impulsive" sounds. TSG Noise realised that the term "impulsive" is reserved for specific sounds that are often transient, and which are characterised by a rapid rise time and high peak pressures. The term "pulse" is sometimes also used for these sounds including in widely accepted publications [Southall et al., 2007]. The original intention of the indicator was that also other loud short-duration sounds were probably of relevance, e.g. sonar sounds [Tasker et al., 2010]. These sounds would not be included in the definition of "impulsive" (or "pulse") as used in some communities [Southall et al., 2007]. Therefore TSG Noise concluded some clarification on the (use of) the term "impulsive" is needed. The title of the indicator is "11.1. Distribution in time and place of loud, low and mid frequency impulsive sounds". This text suggests that one needs to distinguish between impulsive sounds and non-impulsive ones, and a definition of "impulsive sound" was proposed in [Van der Graaf et al., 2012]. A more careful reading of the indicator text: "[anthropogenic sounds may be of short duration (e.g. impulsive such as from seismic surveys and piling for wind farms and platforms, as well as explosions) or be long lasting (e.g. continuous such as dredging, shipping and energy installations) affecting organisms in different ways" makes clear that the emphasis is not on "impulsive sounds" as such, but on sound of "short duration", of which impulsive sounds are mentioned as an example. For Indicator 11.1.1, the TSG Noise proposal is to monitor loud sounds of short duration that are likely to cause disturbance. Impact pile driving has been shown to result in an evasive response in harbour porpoises [Dähne et al., 2013] and airguns have been shown to result in evasive reaction in many cetaceans [Stone and Tasker, 2006], and disturbance on fish may also occur [Dalen and Knudsen, 1986; Engås et al., 1996; Slotte et al., 2012]. Sonar transmissions have also been shown to cause a strong aversive reaction in beaked whales [Tyack et al., 2011, DeRuiter et al., 2013]. Therefore airguns, impact pile driving and sonar should be included in the scope of this Indicator. Most available data for explosions focuses on physical harm [e.g. Danil & St. Leger, 2011] rather than on disturbance, but these should also be included as sound levels produced by explosions are much higher than that of the above mentioned sources. Whereas sounds produced by piling, airguns and explosions typically are short (less than one second), sonar sounds may be of longer duration, i.e. several seconds. To cover all sources of concern, TSG Noise proposes that all loud sounds of duration less than 10 seconds should be included.'

And this from the first ever TSG Noise group report
https://ec.europa.eu/environment/marine/pdf/MSFD_reportTSG_Noise.pdf

6.2.5 Sound Sources

Table 4: Indicative list of activities and sources likely to generate impulsive sounds between 10 Hz and 10 kHz that may cause significant impact on marine animals.

Activity	**Type of source**	**Parameter chosen to characterise source**
Seismic survey	air gun array	Energy source level
Sonar search	low or mid-frequency search sonar	Source level
Offshore construction	pile driving	Source energy level, acoustic energy or hammer energy
Use or disposal of explosives	explosion	Equivalent TNT charge mass
Aquaculture, fisheries	Low or mid-frequency acoustic deterrents	Source level

What is "impulsive sound"?

Introduction

TSG Noise discussed the meaning of the term "impulsive sound" in the context of Descriptor 11, and concluded it to imply a sound comprising one or more pulses, each of short duration, and with long gaps of no significant sound emission between these pulses. Of particular concern to TSG Noise, because of their potential for injury or inducing strong behavioural reactions in marine animals, are sounds from airgun arrays, impact pile driving, powerful military search sonars and explosions. With the possible exception of explosions these sounds are generally repeated over many pulses. TSG Noise agreed that there might be a need to consider single explosions separately from the other sounds, partly because of the large amount of energy potentially involved in any one explosion and partly due to the likelihood of a different behavioural response to a single pulse compared to multiple pulses.

Duration of individual sound emissions

TSG Noise considers Southall *et al.*'s *pulse* (Southall *et al.* 2007) to be a good definition of some "impulsive sounds". Southall *et al.*'s definition classifies as a *pulse* all sounds for which the output of a sound level meter on (fast or slow) impulse setting exceeds that on continuous setting by at least 3 dB.

It follows from this definition that a sound whose effective duration is 125 ms (the averaging time for impulse setting) or less is likely to be classified as a *pulse*, whereas a sound of longer than 125 ms is not. Use of this definition would include emissions from airguns, pile driving and explosions as impulsive sounds, but would exclude many sonar pulses. In particular, TSG Noise felt it relevant to include emissions of military search sonar of duration between 1 s and 10 s. For this reason, sounds whose duration up to 10 s are also considered as "impulsive", provided the duration of the gaps between them exceeds the minimum described below.

Duration of gaps between sound emissions

For a sound to qualify as "impulsive", a minimum value of the gap between emissions is proposed of three times the duration of the emission, corresponding to a duty cycle of no more than 25 % (i.e., ratio of repetition time to effective pulse duration (TNO 2011) not less than 4). This factor 4 is based on the following reasoning:

- increasing the factor to (say) 10 would make it possible for sound producers operating close to a 10% duty cycle to avoid monitoring by a small adjustment to that duty cycle;
- decreasing the factor to less than 2 would make it difficult to distinguish each individual pulse from the next one, meaning that such a sound would lack an important characteristic of impulsive sound and would no longer meet the 3 dB criterion for a pulse suggested by Southall *et al.* (2007).

Proposed interpretation of "impulsive sound"

It is proposed that Member States interpret the term "impulsive sound" as a sound for which the effective time duration of individual sound pulses is less than ten seconds and whose repetition time exceeds four times this effective time duration. In this interpretation, it is proposed that all sounds of duration less than 10 s that are not repeated are also impulsive.