

Subject	Forth and Tay Regional Advisory Group – Marine Mammals Sub-Group (FTRAG-MM): FINAL				
Meeting location	Teams/Video Conference				
Meeting date	8 th Dec 2020	Minutes by	Polly Tarrant	Date issued	04 feb 2021
Attendees	Alex Brown AB SMRUC Benjamin King BK ICOL Claire Gilchrist CG NNG Cormac Booth CB SMRUC Charlotte Altass CA MSS Erica Knott EK NatureScot Fiona Manson FM NatureScot Gayle Holland GH MS-LOT Hannah Millar HM MSS Jared Wilson JW MSS (Chair) Karen Taylor KT NatureScot Kate Grellier KG NPC/ICOL Nick Brockie NB Seagreen Polly Tarrant PT NNG Ross Culloch RC MSS Sarah Arthur SA ICOL Sarah Canning SC JNCC		Apologies		Sarah Dolman Janelle Braithwaite Stuart McCallum
Distribution	Attendees + Apologies				

Meeting objectives

Meeting Objectives	
(1)	Update FTRAG on the progress of each F&T Project; and
(2)	Review monitoring proposals for F&T Projects in relation to marine mammals.

Meeting minutes

Ref	Item / Action	Who	When	Status
1	Introductions and apologies			
	All attendees introduced themselves to the group			
	Apologies - Sarah Dolman WDC, Janelle Braithwaite MS-LOT and Stuart McCallum NPC			
2	Previous meeting minutes			
2.1	<i>Developers to submit reporting strategy with analysis component including</i>			

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	<i>consideration of future development.</i> Submitted 27 th May 2020. No comments received. Closed.			Closed
2.2	<i>Meeting in April to discuss report.</i> No meeting needed as no comments needed on above report. Closed.			Closed
2.3	<i>ICOL to provide and an email update on ORJIP to the group.</i> Items have moved on in last 11 months. Attendees agreed action could be closed			Closed
3	Project updates			
	<p><u>Seagreen</u> NB</p> <p>Project reached financial close in May and is now a JV with TOTAL with a 51% stake. TOTAL have a non-controlling share with SSE Renewables still leading on delivering the Project, but with JV management.</p> <p>Onshore construction commenced in February 2020 with work at the substation in Tealing, north of Dundee, alongside onshore cable works.</p> <p>Manufacturing of jackets and offshore structures is progressing, and a number of pre-construction surveys have been undertaken including geotechnical surveys along the export cable route, and further geotechnical works have recently been completed within the wind farm area to inform final suction caisson design and layout. All in preparation for offshore construction start in 2021.</p> <p>Construction at export cable landfall is due to start later this week, with landfall works around the coastal defence, being triggered by some UXO inspection works.</p> <p>Pre-commencement activities: UXO and boulder clearance (subject to separate licences) expected to take place Q2/3 2021, alongside the establishment of the OWF site with the construction marker buoys.</p> <p>All offshore works, to go ahead from Q2 2021, to complete offshore construction under a compressed timescale for final commissioning scheduled for Q3 2023.</p> <p>Seagreen 1A. Seagreen has a 1 GW grid connection at Tealing, however this capacity is not sufficient for the 150 x 10MW WTGs. Seagreen were unable to reach agreement to increase the capacity at Tealing within an acceptable timescale and cost and thus have been awarded a second grid connection at Cockenzie. Seagreen intend to apply for the licence for this second export cable, the corridor for which closely shadows ICOL cable route through Firth of Forth. A screening report was submitted last week, with a benthic survey underway, fisheries consultation and a geophysical due to take place December 2020. A PAC event due is to take place in Jan 2021. Seagreen 1A is working to very compressed timescales and is being treated as separate Project to the wind farm to align with the overall wind farm programme.</p>			
	<p><u>NnG</u> PT</p> <p>Pre-commencement offshore works kept going despite COVID. Onshore works started last year but were paused because of COVID. They restarted in May 2020. Noise monitoring work was undertaken for UXO clearance, to be presented in more detail later in the meeting. O&M port at Eyemouth gained planning permission in Sept 2020. Construction at the O&M port due to commence in 2021. Looking to submit Marine Licence later this month for the pontoon at the O&M port.</p> <p>Received a revised Transmission Marine Licence due to slight rerouting of export cable corridor to avoid rocky outcrop and additional material deposits.</p>			

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	Offshore construction commenced in August 2020. Key activities for remainder of 2020 and early 2021 include, pile drilling and casing installation, geotechnical survey, HDD works at the landfall (which started 3 weeks ago - mainly onshore) and boulder clearance works, although this has now paused until next summer.			
	<p><u>Inch Cape BK</u></p> <p>Working towards upcoming CFD round expected to be the end of 2021. In November entered into a JV with ESB with a 50/50 split of the Project with Red Rock Power. Currently finalising board and governance structure of the project with the new JV.</p> <p>Project currently focusing on design optimisation and detailed design to ensure that project is competitive with other projects in future CfD auctions.</p> <p>Main news is that Inch Cape have had modified application approved from National Grid to increase capacity at Cockenzie. Intend to submit a S36 variation application due to align with this increase.</p>			
4	Updates on Monitoring proposals			
4.1	Bottlenose Dolphin Photo ID/ Citizen Fins (Inch Cape, NnG and Seagreen)			
	<p>Presented by CB</p> <p>Objectives of the photo ID surveys are to: continue current systematic monitoring in the Tay Estuary and adjacent waters, alongside the monitoring of the Moray Firth SAC; initiate systematic monitoring in the Firth of Forth; and to develop a citizen science collaborative project to complement the systematic surveys data on individuals from the population occurring in areas south of the Tay Estuary. The latter of which is being led by Monica Arso Civil at SMRU.</p> <p>2020 field work season had a delayed start due to Covid-19, but boat-based surveys commenced in late June with 22 trips made until end of Sept. Survey area included Tay estuary and adjacent waters (Montrose to Fife Ness) plus south and north coasts of Firth of Forth. Recorded 40 bottlenose dolphin encounters, plus harbour porpoise, minke whale and first ever basking shark.</p> <p>Intention for the 2021 field season is to start as early as possible (May)</p> <p>Over 9,000 photos taken with the team still working through them undertaking quality grading and matching of individuals. Work is being led by Emily Hague, the team have already identified 97 known individuals. SMRUC will work with the Aberdeen University Lighthouse Field Station to create final set of confirmations for 2020 field season, as part of the long-term photo-ID protocol.</p> <p>There is evidence of an ever-increasing range expansion of this population in a southward direction along the east coast. As such this expansion limits the ability to monitor the whole population under current programme, which could lead to: negative biases in future estimates of population size and survival, make it difficult / impossible to distinguish between biases and potential impacts on the population from offshore developments/ environmental change/ environmental stressors, resulting from an incomplete knowledge about movements of individuals across the population range.</p> <p>Citizen Fins was launched in Sept 2020: it invites members of the public to submit photos of bottlenose dolphins taken south of Tayside to help understand how the pattern of movements of bottlenose dolphins along the east coast of Scotland and into NE England is changing and assist population monitoring. Effort has focused on reaching out through press releases,</p>			

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	<p>webinars and social media to up the engagement and get photos submitted to the programme. Some photos already submitted have been matched.</p> <p><u>Discussion/questions</u></p> <p>EK – If the population expanding south, is anyone aware of any discussions or consideration of this in the English fourth leasing round.</p> <p>SC – has been engaging with SNCBs in England on this, acknowledging that this work needs to go beyond the political boundaries. RC stated value of this work and appreciation of the efforts for getting it happening in 2020. RC asked if there was an idea of who individuals are and if any clear splits in the population, such information is important in terms of management. RC has also spoken to Natural England (NE) about this work in the past, so they are aware, and NE have also shown in interest in extending the ECOMMAS array further south. RC also agreed that now was an opportune time for Marine Scotland (MS) and NatureScot (NS) to engage with NE and MMO.</p> <p>Discussion had over the plans to review the 2020 survey data, and the analysis being used to inform any intentions to change the coverage. However, agreed that the annual review for the current work was to inform any adjustment of the distribution of effort within the Tay and Forth regions (2020 was planned to 20/10 survey split), rather than expand the coverage south.</p> <p>EK asked if an appropriate time was now to speak to Marr Bank and Berwick Bank (MB&BB) to consider either covering more of the southern range of the population or maintaining or increasing duration/effort over the F&T.</p> <p>RC highlighted the good lessons learned from citizen science work on the west coast of Scotland where it can be used to learn and inform additional targeted effort. CB agreed that at present the Citizen Fins programme is a cost-effective way to expand effort, outcomes of which are not yet available, but at an appropriate time it could guide the southern extension of targeted survey work. But time is needed to see if the Citizen Fins programme is effective. KG asked if Citizen Fins was collecting effort data. CB unsure and would check with Monica.</p> <p>ACTIONS (resulting from the above discussion)</p> <p>NS and MS to speak to NE, MMO and The Crown Estate (TCE) about ongoing southern range expansion of the east coast bottlenose dolphin population and potential need to expand the existing monitoring programme into England</p> <p>EK to raise at tomorrows (9.12.20) FTRAG main meeting about the attendance of MB and BB into all the FTRAG groups (they are currently only attending the ornithology subgroup). [Post meeting update: this was raised and action added to the main FTRAG meeting minutes]</p> <p>SA, PT and NB agreed with the preference for MB and BB to join this marine mammal subgroup.</p> <p>MS and NS to discuss contributing to or adding to this programme with MB&BB</p> <p>CB to speak to Phil and Monica about the following and feedback to the group:</p> <ul style="list-style-type: none"> Plans for 2021 and discuss adding a high-level element to the 2020 summary report on the merits of trying to expand coverage south, or consider timelines for when a decision on this might be taken (as a trigger for the FTRAG-MM group) <p><i>[Post meeting update from Phil Hammond: Fieldwork for summer 2021 (May-Sept) is currently envisaged to replicate that originally planned for 2020, i.e. approximately 20 surveys in the Tayside + 10 surveys in</i></p>			
		GH&EK	Feb 2021	Open
		EK	9.12.20	Closed
		GH&EK	Feb 2021	Open
		CB	Jan 2021	Closed

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	<p><i>the Firth of Forth. However, once processing of 2020 photo-ID data have been finalised and IDs confirmed in the different sub-areas (Tayside, north and south side of the Firth of Forth), the number of trips in the two main areas might be adjusted.</i></p> <p><i>We currently do not have the information needed to consider whether surveys south of the Forth in 2021 should be undertaken systematically. This depends partly on results from the 2020 photo-ID surveys, but primarily on the results from Citizen Fins (which only started in late September 2020) and on discussions with other groups doing similar work along the NE coast of England, which could provide insight on the need to extend the coverage south.</i></p> <p><i>We can add a paragraph to the 2020 summary report regarding the merits of an effort extension south of the Forth based on the available information by next spring when the report is due].</i></p> <ul style="list-style-type: none"> • Confirm timelines for 2020 summary report <p><i>[Post meeting update: The summary report for the contract with SMRUC is due in the spring (current contract ends in April 2021)].</i></p> <ul style="list-style-type: none"> • Check if the Citizen Fins programme is collecting information on sightings effort <p><i>[Post meeting update from Phil Hammond: No, Citizen Fins does not collect information on sightings effort. This was never part of the objectives. Other organizations (primarily SeaWatch) collect effort and sightings information on bottlenose dolphins and other cetaceans around the UK. There is no need for us to duplicate this].</i></p>			
		CB	Jan 2021	Closed
		CB	Jan 2021	Closed
4.2	Passive Acoustic Monitoring (Seagreen and NnG sites)			
	<p>Presented by CB</p> <p>Rationale: Detection of cetacean activity in Before-After-Gradient (BAG) design to look at changes as a result of pile driving and other construction activities; fills the ‘gap’ between two existing sets of ECOMASS monitoring stations.</p> <p>Objectives: Characterise baseline levels of vocalising marine mammal activity and determine whether any change is detected between baseline, construction periods; and relate these changes to levels of underwater noise and other construction activity</p> <p>Installed moorings at NnG and Seagreen each with a CPOD for collecting continuous click trains data (which work well for porpoises but are challenging for dolphins) and a LS1 noise logger with a duty cycle (10 mins on 20 mins off) with full bandwidth (up to 36 kHz) with potential to detect noise and other cetaceans.</p> <p>Seagreen have 5 PAM stations which have been collecting data since March 2019 and NnG have 4 (which generally extend the St Andrews ECOMASS array) and have been collecting data since November 2019. For both arrays SMRUC have analysed and will present data up to August 2020.</p> <p>Over this period some moorings have been lost or data has not been collected due to malfunctioning equipment; data series are continuous and others sporadic. On this note we have been informed that of the moorings retrieved in November (covering period from Aug – Nov 2020) 2 of the NnG and 2 of the Seagreen sites had issues with data collection on the CPODs. RC explained to the group about the recent CPOD failings. Due to COVID restrictions MSS employed Moray Firth Marine (MFM) to retrieve and deploy the moorings in Aug. MSS assembled the moorings on land which were then loaded onto a vessel and deployed by MFM (usually moorings are</p>			

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	<p>assembled on deck by MSS shortly prior to deployment). After a review of when the CPODs stopped recording it is apparent that it happened around deployment so likely that the equipment took knocks (either on deck due to rough weather or being transported) and SD cards were dislodged, this wasn't unique to just the Seagreen and NnG moorings but also 3 of ECOMMAS moorings. RC highlighted that this is extremely rare and unique and hasn't happened to himself or others within MS before. RC has spoken to Tim Barton at the lighthouse station and have been working through lessons learnt to prevent this happening again, this includes taping to ensure that the SD is in place. RC happy to have call with CB or others if anyone has any lessons/feedback. JW asked about the implications of data loss for analysis: CB responded noting that hopefully this issue is a one off and would just result in a gap in time series. The study will have data from other sites for the picture of time series, which also demonstrates the value of regional data set (ECOMMAS array). Although there will be some missing windows, this will not be insurmountable.</p> <p>Data processing: Key objectives of the data processing is to develop timeseries of harbour porpoise and dolphin detections, which would then be used to help determine whether any change is detected between baseline and activity periods. The current data processing is the precursor to a larger statistical model to understand drivers to see if there are any changes.</p> <p>SMRUC have been preparing interim PAM reports for Seagreen and NnG after each data set is reviewed and processed. Following a discussion later on in the meeting it was agreed that FTRAG-MM did not need to see these interim reports. Members were content that because this is the data collection and processing phase that the group was happy to receive updates via the FTRAG-MM meetings; ensuring that the group is up to date with data collection successes or any issues arising (e.g. loss of data).</p> <p>The CPODs detect click trains, a method that is well established for porpoises but can also be used for dolphins.</p> <p>Results from the CPODs at the NnG sites show harbour porpoise having higher detection rates in winter, and a decline in in the summer months, with the pattern more marked the further offshore. Porpoises are present almost every day. The are no dolphin detections on the CPODs, but there is knowledge that they are around (such as from the bottlenose dolphin ID study). At the Seagreen sites the pattern is similar with moderate levels of porpoise detections in summer, increasing over winter and early spring and again the seasonal pattern is stronger inshore (although not at S1 as this site is very close to shore).</p> <p>SMRUC have been working on ways to improve dolphin detections using noise loggers (LS1 unit). A preliminary review of loggers showed that there were dolphin whistles in the noise loggers that were not detected by the CPODs. There is no automated process in place for this as the noise loggers detect a lot of false positives (additional noise including mooring, vessels, fishing). However, this manual approach is proving worth-while as its adding to the dolphin detections from the CPODs and over time a catalogue will be built up to make the process less manual/labour intensive. Once SMRUC added the already processed noise logger whistle detections to the clicks from the CPODs it indicates that dolphin detections are sporadic and less than that of porpoise apart from at SG1 (Seagreen very nearshore location). Intention is to combine the data sets of clicks from CPODs and whistles from noise loggers to get a good baseline of the cetacean presence: the whistle from the noise logger create a more complete picture of dolphin presence.</p>			

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	<p>RC asked if it was possible to distinguish dolphin species. CB confirmed not yet but there is chance this could be possible, although this isn't necessary for this study, but more of interest scientifically. RC also asked about the approach used in CPOD analysis, if it was following manufacture advised approach. CB confirmed they were using high and moderate filters, both CB and RC agreed that this is more of an interest academically.</p> <p>Future steps are to continue analysing the data using CPOD for clicks and loggers for dolphin whistles (including development of a tool to speed up this process) and will continue to update the FTRAG via these meetings.</p> <p>Wider / regional analysis: there is a desire (as set out in the paper submitted to the FTRAG-MM in May 2020) to integrate this data from that of the wider ECOMASS array data when it comes to the analyses. CB asked MSS about the timings of the analysis of the ECOMMAS array data to understand how the availability of that data works with the timelines for this study. RC confirmed that there are fewer noise loggers within the remaining ECOMMAS array (1 in every 3 moorings) and at times they also lose moorings. Historically resource availability has affected analyses of the data, but MS has two new positions starting in 2021 and keen to tie in with SMRUC (Ursula) to ensure consistency and knowledge exchange.</p> <p>ACTION: SMRUC and MSS to arrange a meeting to commence knowledge exchange and agree broad timescales for ECOMASS data analysis.</p> <p>Analyses: porpoise and dolphin occurrence will likely be modelled as a function of various covariates, it will use the measure of porpoise/dolphin activity at a defined temporal scale as the response variable, such as 10 min bins per day. Covariates for the model could include: locational/positional covariates (distance from shore, location ID, latitude, longitude), temporal covariates (time of day, day/week of the year, time in relation to sunset/sunrise), environmental covariates (water depth, sediment type, sea surface temperature, and any available information relating to prey abundance and distribution (e.g. prey maps generated by recent JNCC funded project, any available contemporary fish prey survey data) and anthropogenic covariates (vessel activity, received sound levels, pre-construction and "construction activity", e.g. vessel numbers and movements, location and nature of geophysical surveys, UXO detonation, cable laying activities, foundation installation).</p> <p>The proposed approach to reporting and timings does deviate from the previously submitted plan, with the proposed approach now being to wait until more is known about the baseline period and establishing that data and what covariates could be included. Although do already know that should get good construction activity covariates.</p> <p>RC happy/agreed with this approach, key activity at the moment is getting the data collected and processed</p> <p>ACTION: SMRU to update the plan that was submitted to the FTRAG in May 2020 to cover this amended approach and timelines for how the integration with the ECOMMAS array will work.</p>	RC/CB	Jan 2021	Open
	<p>ACTION: SMRU to update the plan that was submitted to the FTRAG in May 2020 to cover this amended approach and timelines for how the integration with the ECOMMAS array will work.</p>	CB	March 2021	Open
5	Strategic Monitoring Update			
	<p>RC provided an update on relevant marine mammal strategic studies. These included the ongoing ECOMMAS array; European Maritime and Fisheries Fund funded study off Lewis with the deployment of 10 broadband recorders CPODs and FPODs in deeper waters thus expanding the PAM arrays across Scotland; two new PhD students starting at SAMS one developing a click and whistle classifier (with St Andrews University) and the second working on minke whales in the MPAs (Moray Firth and Inner</p>			

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	<p>Hebrides); continuation of contract with SMRU providing marine mammals scientific support (wave energy) and marine mammals component of the Cumulative Effects Tool.</p> <p>JW also outlined the HERNOW Project and requested feedback/comments on the Project Outline that was issued prior to the meeting.</p> <p>ACTION: JW to follow up with developers on any response to the Project Outline [post meeting update: JW reissued the Project Outline document to all FTRAG members on 9th Dec 21 requesting a response by 31st Jan 2021]</p>	JW	Dec 2021	Closed
6	<p>NNG UXO Noise Monitoring</p> <p>CG</p> <p>NnG were required, as a condition of the UXO Marine Licence, to undertake noise monitoring of the UXO clearance works. With COVID and timings of the works the programme was very tight and the scope was to monitor a portion of the UXO rather than all.</p> <p>The key outputs from the monitoring were to predict the source level of UXO detonations, characterise the propagation of noise, assess variations associated with the condition, location, age, type of UXO and environmental factors, examine changes in impulsive characteristics of UXO detonation noise with increasing distance, compare the modelled impact ranges and calculate weighted sound exposure level.</p> <p>The study was undertaken by ITAP with data for this study is being delivered directly into the BEIS SEA study (called “Characterisation of Acoustic Fields Generated by UXO Removal”), being led by National Physical Laboratory (NPL) and Loughborough University, and managed by Hartley Anderson (HA) environmental consultants, where the data will undergo another stream of analysis alongside paper preparation.</p> <p>ITAP are also preparing a monitoring report which will be submitted to MSLOT at the end of this week, in line with the licence condition. NnG are pending the final comparison of predicted and modelled values which will be included in that report.</p> <p>The campaign monitored 37 UXO over 6 weeks, with depths ranges of 45-58 m, sizes ranged from 1 kg NEQ to 102 NEQ, different sized donor charges 5kg / 2.5kg (depending on the size of the UXO), use of ADD, different sized soft starts (50/100/150g). Of the 37, only four items experienced high-order detonation, largely a result of the age, condition and type of the munition (all 6 under 60 kg NEQ)</p> <p>The survey design had the deployment of monitoring equipment at four locations with hydrophone and marker buoys. Depending on the location of the UXO the range of monitoring was 1.3 – 33 km (33 km being the first detonation that was undertaken from the deployment vessel). MP1 avg. 3 – 4 km, MP2 avg. 4 – 5 km, MP3 avg. 7 km and MP4 avg. 12 km.</p> <p>The results showed recordings of the ADD, soft starts and donor charge/clearance. Collected 137 data points. Evaluation indicates transmission loss for distances higher than expected, no influence of environmental factors (although clearance does take place in calm conditions), low variety of water depths, with no significant changes between UXO sizes (although noted again that not much variation). There were indications of seismic precursor at closer distances.</p> <p>EK asked what a seismic precursor was, CG will include in the final report to MSLOT. [Post meeting note: These “seismic precursors” are waves traveling in the seabed. Since the sound velocity is slightly higher in the sediment than</p>			

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	<p><i>in water, the signal arrives earlier at the receiver than the one that travels through water only]</i></p> <p>ACTION: NnG to include description of a seismic precursor in final report to MSLOT [Post meeting update, final report was issued to MS-LOT with the description included. Closed.]</p> <p>SC asked if NnG knew why many UXO did not high order detonate. CG - age and condition of the UXO, but also following detonation of the donor charge which removed some of the encrusting growth a “p” was seen on a number of items indicating a practice round, which are not expected to contain explosives.</p> <p>NB confirmed that the process of evaluating, inspection, clearance and recovery of UXO is very thorough, such activities have high liability and HSE risks and all activities are properly covered.</p> <p>AB asked about timing of the report becoming available given the two reporting streams, noting that the BEIS project outputs are likely to be a while. GH indicated a keenness to share and thus once MSLOT are content that the report to them satisfies the consent conditions then it would be put up on the MSLOT website. EK also noted that results are also coming in from Moray East and NS will review both these reports and might come out with additional advice on UXO clearance for assessments and licence applications going forward.</p> <p>SC thanked NnG for giving HA the data to the BEIS study</p> <p>EK commented on the low-order deflagration method. These alternatives should be duly considered in applications, GH added that this method needs to be thoroughly explored in order to satisfy the alternatives EPS tests.</p>	CG	Dec 2021	Closed
7	<p>AoB and next meeting</p> <p>ACTION: Add standing “lessons learnt” item to all FTRAG agendas</p> <p>Date of next meeting agreed to be April or May 2021, unless a need for meeting comes up in relation to the BND ID and 2021 planning. This will depend on the outcomes of discussions that CB will be having (above actions). Agreed that initial feedback on CBs actions on this topic could be dealt with via email within the group.</p>	Developers	Next FTRAG meetings	Open