

MORAY FIRTH RENEWABLES ADVISORY GROUP (MFRAG) ORNITHOLOGY SUB-GROUP MEETING MINUTES

Meeting	MFRAG-Ornithology (MFRAG-O)	
Date	9 th July 2020	
Location	Skype call	
Attendees	Marine Scotland Science (MSS)	Jared Wilson (JW) [Chair until disconnected], Tom Evans (TE), Julie Miller (JM)
	Scottish Natural Heritage (SNH)	Erica Knott (EK [Chair when JW disconnected]), Chris Eastham (CE), Alex Robbins (AR), Kate Thompson (KT)
	Marine Scotland Licensing and Operations Team (MSLOT)	Giulia Agnisola (GA)
	Marine Scotland – Marine Scotland Planning and Policy	Janelle Braithwaite (JB)
	Joint Nature Conservation Committee (JNCC)	Julie Black (JB)
	Royal Society for the Protection of Birds (RSPB)	Aly McCluskie (AM)
	BOWL	Joseph Deimel (JD), Heather Shaw (HS), Emma Ahart (EA)
	Moray West	Sarah Edwards (SE)
	Moray East	Chris Newman (CN), Carlotta Gradissimo (CG)
	MacArthur Green	Mark Trinder (MT)
	Apologies	Gayle Holland (GH) (MSLOT) Nikoleta Papanastasouli (NP) (MSLOT) Orea Anderson (OA) (JNCC)
Action Number	Action	Completion Date
1	JM to provide BOWL with example Risk Assessments or Health and Safety Guidance relating to seabird netting work carried out in North Atlantic.	30 th September 2020
2	<p>Developers / all to develop contingency plan(s) for managing impact of Covid on delivery of aerial surveys. Target have initial plan in place by September / October 2020 for discussion at next MFRAG-O meeting (November 2020). This to include:</p> <p>a. Identification of suitable mitigation that can be put in place to enable surveys to continue where there is potential risk of disruption from Covid;</p> <p>b. Criteria for determining cut-off for making decisions on whether surveys can go ahead or have to be delayed into 2021 or 2022 e.g. deadline based on breeding season;</p> <p>c. Scenario planning – agreement on strategy for completing surveys in 2022 if unable to survey in 2021. What these surveys need to include, how delay captured / dealt with the analysis of results etc.</p>	16 th October 2020

3	MT to revisit construction activity data provided by Moray East in relation to post-construction survey results for inclusion in BOWL 2019 post-construction aerial survey report.	BOWL to discuss feasibility and timelines with MT.
4	MT to explore option for writing a paper linking findings from BOWL post-construction monitoring with similar post construction monitoring (similar method) carried out for East Anglia One to determine if similar results .	Hopefully Summer 2021
5	MFRAG to provide comments on BOWL 2019 post-construction aerial survey report by 31st July 2020	31 st July 2020
6	BOWL to address comments (including MT review of Moray East construction activities data) and prepare updated version of report and presentation for upload to MSLOT – MFRAG website.	TBC
7	SNH and MSS to agree caveats to be included with BOWL 2019 post-construction aerial survey report before report is made available on MSLOT - MFRAG website. Timeline for this to be agreed following issuing to MFRAG of final report version (incorporating comments).	TBC
8	BOWL to contact Maarten Platteeuw - Rijkswaterstaat to request information on results from boat based gull netting carried out in The Netherlands – to understand what worked / didn't work.	30 th September 2020
9	Moray West to advise MFRAG group of appointed aerial survey contractor ASAP	31 st August 2020
10	MSS to confirm with procurement whether there is an option for the LIDAR survey work to be linked to Moray West aerial surveys and whether the tender documents can be shared with the MFRAG.	31 st August 2020
11	Moray West to acquire information on Moray East construction activities for 2021 to include in survey design for pre-construction surveys.	30 th September 2020
12	Moray West to confirm with MFRAG cut off for approval of aerial survey design prior to commencement of aerial surveys.	Next meeting (November 2020)
13	BOWL to organise next MFRAG meeting in early November 2020.	30 th September 2020
14	JW to speak to Paul Thompson and Aude Benhemma–Le Gall for information on scope of Aude's PhD studentship.	Next meeting (November 2020)
Date of Next Meeting	3 rd November 2020	

1a. Introductions and Purpose of Meeting	
Introductions made.	
1b. Review of Minutes of Meeting from previous meeting (26th September 2019)	
<p>Status of Actions from previous meeting:</p> <ol style="list-style-type: none"> Group members to send any information they have on catching/tagging at sea to MT, to assess whether at-sea work may be safe/practical. <i>Action superseded – further update on gull tagging provided under Item 2c.</i> MT to draw up an action plan for gull tagging, to include initial data gathering on techniques, and a site reconnaissance by an appropriate team in the 2020 breeding season. <i>Action superseded – further update on gull tagging provided under Item 2c.</i> MT to circulate initial feasibility paper on gull tagging before 2020 breeding season reconnaissance site visit. Discussions to be held with BTO on tag attachment methods (prior to site visit). <i>Action superseded – further update on gull tagging provided under Item 2c.</i> BOWL to submit 2019 aerial survey report (when completed) for review at next MFRAG-O meeting. <i>Action complete – discussed in Item 2b.</i> SNH to review whether camera monitoring of puffin colony at East Caithness Cliffs would provide any useful information on any potential influences from BOWL. <i>Action superseded – further information on puffin monitoring provided under Item 2d.</i> JW to speak to Paul Thompson and Aude Benhemma–Le Gall for information on scope of Aude’s PhD studentship. <i>Action to be carried over to next meeting.</i> MT to speak to CR on Moray East construction locations, to allow for in analysis of aerial survey data. <i>Data was acquired – to be revisited for inclusion in BOWL 2019 post-construction aerial survey report.</i> <p>JM – previously involved in seabird net tagging in North Atlantic – happy to share information on experience.</p> <p>AM – how manage with Health and Safety requirements? Key concern raised when discussing gull tagging methods during last MFRAG-O meeting.</p> <p>JM – Will try to look out examples of relevant Health and Safety Procedures and example Risk Assessments completed for the surveys.</p>	
Actions	1. JM to provide BOWL with example Risk Assessments or Health and Safety Guidance relating to seabird netting work carried out in North Atlantic.
2. BOWL Project	
2a BOWL project update	

JD provided project update - Covid-19 restrictions have required adaptations to Operations & Maintenance working practices at Beatrice. A tactical service approach is being followed, with only essential tasks being undertaken. Required statutory inspections are also underway.

2020 post construction ornithological monitoring aerial surveys have been postponed to 2021.

Gull tagging reconnaissance work also rescheduled for 2021 (see Item 2c) along with trials of the AI Puffin Monitoring technology (Avanade) on Isle of May (see Item 2d).

EK – concern with potential for second wave of Covid and associated restrictions (e.g. lockdown or local lockdowns). Key issue affecting survey campaigns across UK, in particular Scotland where closure of airports means planes are not able to operate. Need contingency plans in place to consider what may or may not be feasible for 2021 breeding season due to any COVID 19 potential restrictions Based on experience from this year etc.

JW – important to understand possible worst case scenarios e.g. what is the impact of missing entire breeding season from the post-construction survey campaign or if miss first 6 weeks of breeding season can surveys continue that year or do they have to be postponed?

Need to agree point or criteria against which decisions can be made on postponing surveys until the following year – for example identify a cut-off date for making such decisions e.g. April 31st 2021.

EK – important to note this affecting all surveys not just post-construction survey work – could also affect Moray West (pre-construction) plus other projects (pre-application).

KT – focus on identifying key dependencies (e.g. airport) in order to monitor situation in advance – can take more pre-emptive action through preparation of contingency plans to deal with these issues.

JW – agree need to prepare contingency plans – actions required to achieve this listed below.

EK – Action needs to be taken quickly to have plan in place before second wave of Covid. Target September / October 2020.

Actions	<p>2. Developers / all to develop contingency plan(s) for managing impact of Covid on delivery of aerial surveys. Target have initial plan in place by September / October 2020 for review and approval for discussion at next MFRAG-O meeting (November 2020). This to include:</p> <ul style="list-style-type: none"> a. Identification of suitable mitigation that can be put in place to enable surveys to continue where there is potential risk of disruption from Covid; b. Criteria for determining cut-off for making decisions on whether surveys can go ahead or have to be delayed into 2021 or 2022 e.g. deadline based on breeding season; c. Scenario planning – agreement on strategy for completing surveys in 2022 if unable to survey in 2021. What these surveys need to include, how delay captured / dealt with the analysis of results etc.
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2b BOWL review of results from 2019 post construction aerial surveys

MT ran through presentation on BOWL 2019 post construction aerial surveys.

Two survey designs:

- One standard transects covering BOWL site and extended survey area between BOWL site and East Caithness Cliffs
- Narrower transects within the BOWL site

Results from standard transects:

Gannet – results (comparing change from 2015 to 2019) provide evidence of avoidance of entire BOWL site. This is consistent with findings from monitoring of other wind farms.

Kittiwake – numbers recorded in the BOWL site post construction (2019) are similar to those recorded pre-construction (2015).

When data overlapped – appears to be an increase in numbers post construction in particular stretch between BOWL site and coastline – MT thought initially this may indicate possible barrier effect where birds travelling from the ECC offshore are converging on area between coast and BOWL site due to turbines presenting a barrier to travelling further offshore. However, the area of high density extends into a large part of the BOWL site (entire northern section of the site), rather than stopping at the site boundary, suggesting potentially not barrier effect.

AR – query whether the distribution and densities recorded indicate possible attraction effect rather than barrier effect. It appears counterintuitive that the area of high density would extend into the site if barrier effect.

TE – is there potential that the design of the survey (extending from the coast across the BOWL site) might be affecting the results (resulting in higher numbers?)

JW – interesting results – much easier to make conclusion on gannets than kittiwake.

MT agree very difficult to interpret results.

TE – could construction activities in 2019 at Moray East have influenced distribution along southern boundary of the site (adjacent to Moray East site).

MT – information on construction activities was obtained from Moray East. However, not yet incorporated into results. The BOWL 2019 post construction aerial survey report to be updated following review of this data. Chris Newman (Moray East) to check data and provide any additional data if available e.g. from weekly NtMs issued during piling as these provide detail on specific location of piling activities each week.

EK – questions for MFRAG group. Clearly noticeably different results for gannet and kittiwake. When can group start to make decisions on whether for gannet only need to consider displacement – not collision? Or kittiwake only need to assess collision and not displacement? Is there potential may also need to consider

attraction for kittiwake? This is the purpose of post consent monitoring to learn from it and to influence future application discussions.

Results from narrower site specific transects:

MT – transects designed to run along alternate turbine rows and in between (middle) of adjacent alternate turbine rows. Specific design to collect detail on distances of birds from turbines.

MT – observed survey results then modelled using random positioning to turbines to determine whether recorded location of birds was influenced by position of turbines or independent of turbines.

Results presented in series of histograms showing observed density of birds at varying distances from turbines (<100 m, <200 m, <300 m and <400 m) as a red line, overlaid on a histogram of densities for 1,000 randomised turbine locations.

If the red line is located to the left of the peak numbers presented in the histogram this indicates higher densities close to turbines than expected by chance (i.e. potential attraction to the turbines). If the red line is to the right this indicates lower densities than expected by chance (i.e. potential avoidance). If the red line is aligned with the peak in the histogram this indicates that the turbines have no apparent influence on distribution of birds within the site.

Results for guillemot and razorbill found densities higher within 100 m and 200 m of the turbines than expected by chance – i.e. apparent attraction. At 300 m and 400m observed densities similar to randomised range (i.e. neither attraction not avoidance).

Sample sizes for guillemot and razorbill are good. Based on results indicate potential attraction to turbines.

Puffin – smaller sample size. Results less clear than guillemot/razorbill although based on histogram red line indicate that they do not show attraction or avoidance.

Kittiwakes – results indicate that turbines have no influence on the distribution of kittiwake within the site.

JB – are results based on individual birds or groups / flocks of birds? Is there potential that birds may behave differently e.g. show higher attraction or increased preference for avoidance if in groups?

MT – results are for individual birds not groups. Counts based on breeding adults. Agree results might be different at other times of the year e.g. moulting when higher occurrence of groups. If groups observed in survey results would have affected histogram results (more clumpy).

KT – What is the resolution of the mapping? E.g. was a grid used to determine the distributions?

MT – The results are based on actual individual bird positions on the water at the time of survey. No grids were used to determine positions.

MT — Over-winter surveys of the East Anglia ONE wind farm have used the same survey design so it will be possible to compare results for the same species (of auks) in the nonbreeding season. Intention is to produce a paper which includes both analyses. First East Anglia ONE post-construction survey to be

conducted during winter 2020-21. MT has discussed with BOWL who are supportive, but not yet discussed with SPR (East Anglia ONE developer).

JW – Agree a paper would be a good idea for comparing differences or similarities in methods and results.

AM – Very interesting that results from the BOWL monitoring are very different to monitoring results from other operational wind farms in terms of displacement.

MT – Differences in results could be influenced by a range of factors, locations of wind farms (European North Sea), focus on wintering species, also smaller turbines and smaller spacing between turbines may influence species distributions within the sites.

AR – Could there be other factors influencing results from BOWL e.g. fact ECC populations are doing better than other SPAs (in terms of breeding successes) and whether this is attributed to factors such as prey availability which override potential effects of turbines therefore reducing displacement?

AR – Could fish aggregations around jackets be contributing to potential attraction in particular for guillemot?

MT – Important to note that most displacement monitoring to date has been based on comparing changes across years (inter-annual variability) which means that results may simply be chance. This study only requires data from within a year therefore avoiding the risk that the conclusions are compounded by natural between year variations.

JW – important to establish consistency across survey post construction methods through UK in order to be able to make better comparisons with results from different projects.

JW – links to other research and studies e.g. Paul Thompson INSITE proposal and influence of man-made structures on fish aggregations.

JD – During O&M inspections have received anecdotal evidence from inspection vessels of aggregations of guillemots around jacket legs.

AR – Does the survey record flight direction e.g. direction of travel of kittiwake to give more insight to whether the results are indicating barrier effect or possible attraction? E.g. if birds observed travelling along the coast rather than directly out to sea?

MT – Direction of travel was provided in the survey data, although the sample sizes are limited and it is difficult to reliably interpret what the data mean, especially if the aim is to try and link direction to location offshore (i.e. compare the direction of travel for birds at different distances from the wind farm etc.).

EK – What are next steps in terms of developing advice for Developers in terms of advice on displacement impacts?

JW – Need to wait to have another year of data to check have consistent results. In terms of gannet is there potential that over time they will get used to the turbines and may start to move back into the site? Is there

also potential that as fish aggregations change in a site over time – species distributions may also change in response to this – although not a result of displacement necessarily?

EK – Action for MFRAG to look at information provided and think how this will influence advice given to developers.

JD – BOWL happy to submit the report and presentation to be uploaded on the MSLOT - MFRAG website.

JW – MFRAG need to complete review before report uploaded. Comments to be provided to BOWL by 31st July 2020.

EK – Agree to include on website. However, need to include caveats that need another year of surveys to validate results / conclusions?

MT – Caveats need to come from SNH and MSS rather than BOWL?

Actions	<ol style="list-style-type: none"> 3. MT to revisit construction activity data provided by Moray East in relation to post-construction survey results for inclusion in BOWL 2019 post-construction aerial survey report. 4. MT to explore option for writing a paper linking findings from BOWL post-construction monitoring with similar post construction monitoring (similar method) carried out for East Anglia One to determine if similar results. 5. MFRAG to provide comments on BOWL 2019 post-construction aerial survey report by 31st July 2020. 6. BOWL to address comments (including MT review of Moray East construction activities data) and prepare updated version of report and presentation for upload to MSLOT – MFRAG website. 7. SNH and MSS to agree caveats to be included with BOWL 2019 post-construction aerial survey report before report is made available on MSLOT - MFRAG website. Timeline for this to be agreed following issuing to MFRAG of final report version (incorporating comments).
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2c Update on BOWL gull monitoring

JD – No field work planned for 2020. Targeting 2021 to carry out reconnaissance works for tagging cliff top nesting colonies and netting at sea.

Approach to netting at sea has been agreed internally – subject to meeting H&S requirements to enable this to be taken forward. Looking at using gun nets to reduce risk of handlers being pulled overboard and low lying vessels (RIBS) to further reduce potential for MOB incidents.

JW – who is leading on gull tagging work?

JD – Mark Trinder.

<p>JW – suggest additional research into previous gull tagging studies – what has worked / not worked. Possibly contact Maarten Platteeuw who has knowledge of at-sea gull trapping trials in Holland. Survey didn't fully go to plan – useful to understand why.</p>	
<p>Actions</p>	<p>8. BOWL to contact Maarten Platteeuw - Rijkswaterstaat to request information on results from boat based gull netting carried out in The Netherlands – to understand what worked / didn't work.</p>
<p>2d Presentation from Avanade on machine-learning image analysis for puffin monitoring</p>	
<p>Avanade presentation on image detection AI application developed specifically to detect puffins.</p> <p>JD – Question for MFRAG – will the field trials planned for Isle of May in 2021 contribute towards BOWL discharging its consent condition in relation to puffin monitoring?</p> <p>JW – Question for SNH – what do SNH want from the puffin monitoring in terms of data and will the AI puffin technology meet those requirements / provide that data?</p> <p>KT – assisted with development of the AI application and SNH are excited and impressed by what was achieved by the development team in such a short timespan. System has proven capability to collect and process data on puffin numbers over time and potential for further development e.g. to enable monitoring of breeding success</p> <p>Isle of May identified as suitable location for next stage field trials as sample plots already established and wealth of knowledge held by CEH research team on puffins on the island. Can set up equipment to test if can monitor whether burrows are occupied or not and detect if adults are carrying fish or not. Monitor breeding success from this sample plot and then apply to other sites e.g. East Caithness Cliffs (ECC). Field trials also allow further development of the technology.</p> <p>JW – Isle of May good idea as able to link to puffin monitoring work being carried out by CEH to validate results from the AI application.</p> <p>EK – in response to question from JD – may not fully be able to discharge condition at this point although development of the technology which is very good and possible revised thoughts on puffin based on results from post-construction surveys will be taken into considering when reviewing results from the field trials.</p> <p>Oliver Abell (Avanade) thanked SNH for collaborative approach to developing the AI application and asked whether any other stakeholders would want to get involved?</p> <p>EK confirmed SNH would like to stay involved with development of the technology.</p> <p>AM agrees very exciting technology. Will discuss future involvement with colleagues at RSPB.</p> <p>JW – agree very interesting technology with potential to extend to cover a wider range of other seabirds and other species and habitats (e.g. fish or marine mammals). Propose JB as main point of contact.</p> <p>KT – will speak to others to explore options of maximising benefits of field trials on Isle of May.</p>	

Actions	None
2e Discussion summary and confirmation of BOWL action timelines	
Covered in previous discussions.	
Actions	None
3. Moray East Project	
CG and CN provided a Moray East project update including photos of recently installed jacket structures.	
Actions	None
4. Moray West Project	
4a Moray West project update	
Presentation by SE on current status of Moray West project and update on progress with commencing discharge of consent conditions.	
Actions	None
4b Review of pre-construction aerial survey requirements for Moray West	
SE explained basis of document provided was to get feedback on initial scope of the Moray West pre-construction surveys in order to inform preparation of more detailed Method Statement following finalisation of contract with preferred survey contractor.	
Question 1: Request clarification on timescales for carrying out the surveys, duration of the surveys (e.g. 12 months or breeding season) and required buffer around the Moray West Site (4 km or 10 km):	
KT - SNH would prefer two breeding seasons (2021 and 2022) rather than 12 months given the main species of interest.	
AR - agree this approach is more appropriate for species of interest / concern and aligns with monitoring requirements as set out in the HRA. Important to collect data for May as this month was missing from previous surveys. Also September / October to cover moulting. Possible 7 months in total (April to October inclusive).	
KT – 4 km buffer would be sufficient as consistent with other pre-construction surveys and suitable for species of interest. No concerns regarding wintering species (divers, ducks).	

AM – Agree with two breeding seasons (extended) as suggested by SNH. Given concern with gannet displacement may need 10 km buffer.

KT – noted and agreed that the data presented earlier on gannet displacement at BOWL would merit 10km buffer

AM – important to ensure consistency of survey method to enable comparison of monitoring data. This approach taken by FTRAG – slightly harder to apply for Moray Firth due to projects being more spread out but should be considered.

TE/JM – Agree with two breeding seasons and 10 km buffer due to gannet.

Question 2: Discuss development of the Project Environmental Monitoring Programme (PEMP) and approach to incorporating the ornithological pre-construction aerial survey methodology, survey results and any subsequent analysis of survey data into the PEMP

EK - No specific requirements for survey results to be presented in the PEMP. Key requirement for the PEMP will be to demonstrate how proposed monitoring also links into other monitoring and research work being carried out elsewhere e.g. FTRAG monitoring and takes into account results/findings emerging from that monitoring work.

Question 3: Other considerations e.g. inclusion of Lidar to measure flight heights and possible links to other research programmes.

EK requested more detailed information on basis for question from MW.

SE explained Moray West in a position where about to commence aerial surveys. Given importance of ornithology with respect to Moray West project (and other projects potentially coming forward through ScotWind) and understanding current challenges with measuring flight heights and the effect of this in terms of uncertainty within the impact assessment (collision risk modelling) process, Moray West is keen to explore whether there are any options to trial technologies for measuring flight height such as Lidar, as part of aerial surveys. Moray West looking at this from a more strategic research initiative rather than specifically relating to the Moray West project.

KT – not sure LIDAR technology yet sufficiently proven. Possible option to look at alternatives e.g. use of laser rangefinders from boats to calculate flight heights; SNH would want to review any methodology proposed

AM – Agree worth looking into using LIDAR to measure flight height. Different views amongst survey contractors on the suitability and effectiveness of technology but if works will be useful for measuring flight height. The point being that the LiDAR technology itself has been demonstrated, the main issues with the MS study were around the quality of the camera data which is independent of the LiDAR technology.

TE – Noted that MS study provided demonstration of LiDAR technology (<http://doi.org/10.7489/12131-1>), but there were issues in that study with linking LiDAR observation to camera data, and noted that the cameras used in that study were not of the standard currently used by digital aerial survey providers.

TE/JM – MSS have spoken with Moray West already re possible links to MSS Lidar study. The tender for this is likely to be released in October 2020 for work to be carried out in Summer 2021 (which would coincide with Moray West first breeding season survey).

TE/JM - Main concern is in relation to procurement and fact Moray West has already appointed survey contractors. Action on MSS to progress discussions with procurement to determine potential conflicts of interest etc.

EK – Action for Moray West to check how the MSS work fits with Moray West surveys? Moray West may not need to trial the technologies for both survey seasons (just one).

EK – Would be useful for this MFRAG to see scope of the MSS Lidar work to be procured to see if anything else that could be included that would add to other wider strategic research initiatives. Would MSS be happy to share the scope of work with the MFRAG group members for discussion?

EK – MFRAG group to agree how to capture the advice provided. Does Moray West require a response / comments on the submitted report or will they be submitting a more detailed Method Statement for further review.

SE – Moray West happy to record advice provided in minutes from this meeting (these minutes) as a record of the advice. This advice will be then be incorporated into the survey method prepared by the appointed contractors. This will then be provided to the MFRAG group for review and discussion.

Consensus that MFRAG group happy with this approach.

SE – Moray West pre-construction surveys are likely to coincide with Moray East turbine installation.

EK – Important for Moray West to obtain information on planned construction activities from Moray East and incorporate how the influence of these will be taken into consideration in the survey method.

EK – Moray West to advise MFRAG group of cut off for of survey design prior to commencement of surveys.

Actions	<ol style="list-style-type: none"> 9. Moray West to advise MFRAG group of appointed aerial survey contractor ASAP 10. MSS to confirm with procurement whether there is an option for the LIDAR survey work to be linked to Moray West aerial surveys and whether the tender documents can be shared with the MFRAG. 11. Moray West to acquire information on Moray East construction activities for 2021 to include in survey design for pre-construction surveys. 12. Moray West to confirm with MFRAG cut off for approval of aerial survey design prior to commencement of aerial surveys.
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8. AOB and close

BOWL to organise next MFRAG meeting in early November 2020.

Moray West to issue minutes from this MFRAG meeting to MFRAG group for review by 23rd July 2020 (2 weeks)

Actions	13. BOWL to organise next MFRAG meeting in early November 2020.
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