Scottish Environment LINK

SNH Guidance on Survey and Monitoring for Marine Renewables

Scottish Environment LINK is the forum for Scotland's voluntary environment organisations, with over 30 member bodies representing a broad spectrum of environmental interests with the common goal of contributing to a more environmentally sustainable society.

Overarching Comments

Scottish Environment LINK's marine taskforce warmly welcomes the opportunity to comment on SNH's 'Guidance on Survey and Monitoring in Relation to Marine Renewables Deployments in Scotland'. We strongly support the creation of such guidance, and the move to a more coordinated and coherent approach to survey and monitoring methods.

We strongly support the advice contained in section 3.2.4 of the General Principles chapter that baseline monitoring to inform the consenting process for wave or tidal arrays, should be conducted for a **minimum** of two years for mobile species. As the guidance notes, this is in line with COWRIE and RSPB guidance for bird surveys in relation to offshore wind farms. We agree that in many cases two years will not enable a full consideration of annual variations in abundance. Therefore, we strongly believe two years data collection must be considered as a **minimum** requirement.

We are therefore concerned by the statement in section 7.3 of Volume 2: Cetaceans and Basking Sharks[1] and Volume 3: Seals[2] , that for characterisation surveys monitoring abundance and distribution, an initial year of baseline data should be collected prior to consent application, with the second year's data collection only *possibly* required in areas of particular importance to these species. This is not consistent with section 8.3 of Volume 4: Birds[3] which states '...assessment of baseline conditions should be based on a minimum of two years survey data...if results from year 1 and year 2 are very different from each other further survey years may be required so that a more representative averaged description of baseline conditions can be calculated'.

It is also not consistent with Volume 1 which, as stated above, advises 2 years of baseline data as a minimum for **all** mobile species. We reiterate our support for the requirement of a minimum two years baseline monitoring survey data for mobile species and request that the relevant sections of Volumes 2 and 3 be amended to ensure consistency with the general principles as contained in Volume 1.

We also note no guidance has been prepared in relation to fish or offshore cables. We believe similar guidance for these topics would be very useful, and seek assurance that this work will be carried out.

We strongly support the advice contained in Volume 2 section 7.3, that the baseline for impact monitoring must be assessed immediately prior to the installation period and believe this advice should be contained as a general principle for all species and habitats. For sites where development is phased, continued impact monitoring is crucial to understand biological changes to ensure successful adaptive management as the project progresses.

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[1] Macleod, K., Lacey, C., Quick, N., Hastie, G. and Wilson J. (2011). *Guidance on survey and monitoring in relation to marine renewables deployments in Scotland. Volume 2. Cetaceans and Basking Sharks*. Unpublished draft report to Scottish Natural Heritage and Marine Scotland

[2] Sparling, C., Grellier, K., Philpott, E., Macleod, K., and Wilson, J. (2011). *Guidance on survey and monitoring in relation to marine renewables deployments in Scotland. Volume 3. Seals*. Unpublished draft report to Scottish Natural Heritage and Marine Scotland.

[3] Jackson, D., and Whitfield, P. (2011). *Guidance on survey and monitoring in relation to marine renewables deployments in Scotland. Volume 4. Birds*. Unpublished draft report to Scottish Natural Heritage and Marine Scotland

Volume 1: Context and General Principles

Trendall, J.R., Fortune, F. and Bedford, G.S. (2011). *Guidance on survey and monitoring in relation to marine renewables deployments in Scotland. Volume 1. Context and General Principals*. Unpublished draft report to Scottish Natural Heritage and Marine Scotland

In general this is a very useful document. The format and structure is very accessible.

1.1- This is not a full summary of potential device types. Under development, among others, there are also cross-axis turbines and oscillating hydrofoils.

2.4. - National Conservation Legislation should include The Offshore Marine Conservation (Natural Habitats etc.) Regulations 2007.

3.1.3. - For many marine species our knowledge base in relation to the cause of changes to migratory routes, is poor. Therefore, a precautionary approach will be required which attributes any recorded changes (post-development) to the renewable installation until there is evidence to the contrary. There is a need for large spatial scale information on bird distributions, abundance and movement, including migration of a number of species such as birds, basking sharks and cetaceans and we would encourage the development of an at sea monitoring programme to be funded/co-funded by offshore developers, co-ordinated by or on behalf of the regulators.

3.2.7. - Whilst accepting that distributional and abundance data alone may be of limited value in impact assessment, they are an essential initial stage to provide information about the species presence and the relative numerical importance of the area for that species and therefore contributing to the identification of focal species, as well as to site selection and appropriate design of the array.

3.2.8. - We acknowledge the value of behavioural data in monitoring of impacts.

3.2.13 - We welcome the recognition of the importance of standardisation and data compatibility and would encourage such action to help gain a fuller understanding of impacts and key issues.

3.2.14 - We also warmly welcome the encouragement of data sharing collaboration and connectivity.

3.2.15 - We agree that uncertainty should be explicitly recognised at all stages and reduced as far as possible. However, we believe that where uncertainty is high and potential for adverse impacts is significant, then a precautionary approach **must** be adopted.

3.3 - Receptors subject to protection through Marine Protected Areas designated under the Marine (Scotland) Act should also be recognised as a focus for the assessment and monitoring of developments. Receptors present at nationally important numbers should also be recognised.

3.3.1. - While the connectivity corridor example is valid in principle, and a useful tool for proximate SPAs/SACs, it is likely to be more difficult to implement for distant protected sites, although collaboration would improve this. It is also based on straight-line movement between the SPA and the development site. For many species a simple linear connectivity may not occur; the connectivity could be more complex between the SPA and a development site.

Volume 2: Cetaceans and Basking Sharks

Macleod, K., Lacey, C., Quick, N., Hastie, G. and Wilson J. (2011). *Guidance on survey and monitoring in relation to marine renewables deployments in Scotland. Volume 2.*

***Cetaceans and Basking Sharks*. Unpublished draft report to Scottish Natural Heritage and Marine Scotland**

General Comment

The guidance addresses small scale surveys conducted with respect to individual developments to provide data for Environmental Impact Assessments. This is likely to result in a patchwork of intensively surveyed areas alongside areas which have received very little survey effort. In terms of effective Marine Spatial Planning, consideration needs to be given to obtaining adequate knowledge of cetaceans and basking shark distribution throughout all areas where developments may take place. This may allow sites of least importance for these species to be identified rather than just surveying small areas selected by developers. The guidance suggests that developers should collaborate but there is a need for overall strategic leadership from SNH and Marine Scotland to ensure that the surveys cover the most appropriate areas in a co-ordinated way. There have now been several years of surveys conducted by developers related to off-shore wind farm developments and lessons learnt from these surveys should be taken into account.

The current draft provides a good overall review of well documented techniques for cetacean population assessment. However, more attention should be given to some of the practicalities specific to surveys in the high energy sites most suitable for wet renewable developments. In particular, surveys in fast flowing currents require different design considerations to conventional line transects and yet these issues are not considered in the guidance.

For tidal stream areas in particular, a fine scale understanding of animal distribution in three dimensions at all states of the tide is important. This means for example, measuring dive depths and underwater behaviour for all the species of concern, ensuring that surveys are conducted throughout the tidal cycle and that methods are used that are robust to changes in detection conditions when strong currents are running.

See Gordon et al. (2011)[4] as an example of work funded by the Welsh Assembly Government which begins to address these issues.

Volume 2 provides a comprehensive review of the well documented theory underlying cetacean population assessment.

1. Whilst we note that Volume 1 states assessment and monitoring of developments should focus on key receptors with those subject to international protection legislation highlighted as being most importanance, we do not believe Volume 2 makes clear that all cetaceans are European Protected Species (EPS). Due to the focus on PMF species, it is not clear how the guidance will help to ensure non-PMF species are not subject to disturbance.

5.1 We believe some additional information is required under part A (EPS) to understand whether an EPS licence will be required. For example, once a decision has been made about what percentage of a population is using the area, and what for, how will the developer put this information into context to understand whether a licence is required? Guidance on disturbance to EPS which is currently being prepared by the Scottish Government must be completed and published as a matter of urgency.

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http://mresf.rpsgroup.com/Resources%2FDocuments%2FSPP%20and%20Public%20Documents%2FPublic%20Resources%2FStage%202%2FMRESF%20Stage%202%20-%20Phase%202%20-%20Studies%20of%20Marine%20Mammals%20in%20Welsh%20High%20Tidal%20Energy%20Waters%20Mar%202011.pdf

7.2 We support the statement that more frequent regional analysis will be required.

7.3 As stated in our overarching comments, we have serious concerns with the suggestion that one year of baseline data collection may be sufficient with a further year required only in areas of particular importance to the species. This is not consistent with the general guidance contained in Volume 1. If this approach were to proceed we request further information on how, who and when it would be decide if a second year of data would be required. However, we strongly believe that the guidance must be amended to make clear that two years of baseline data will be required as a minimum. Such clarity will also provide the developer with a higher level of certainty in survey design and implementation.

7.4 The issue of precision of density estimates needs more consideration. The analysis presented in section 7.4 just addresses precision with respect to variation in encounter rate. There are other aspects of the data which cause uncertainty which cannot be overcome by larger sample sizes. For example, measurement error is a large problem that is difficult to address but results from the SCANSII survey where distances and angles were also measured indicated that the contribution to the CV of the final abundance estimate from distance and angle estimation errors may be considerably greater than typical CVs for cetacean surveys that do not take these factors into account (Leaper et al. 2011[5]). The type of surveys for EIAs are likely to be even more prone to measurement error due to observers surveying just one or two days a month compared to dedicated line transect surveys where distance and angle training and experiments are part of the survey procedures.

7.7 We do not advocate the use of introducing more noise pollution through the use of 'active sonar' to deter cetaceans from important habitats, particularly given the early stage of development of these devices and the lack of proven efficacy.

8.3.2 The draft suggests that porpoises can only be detected by acoustic methods up to 200m. Effective strip widths from large vessels have been estimated around 200m, indicating many detections at ranges greater than 200m and detection ranges can be considerably greater from smaller quieter vessels.

9.4 Acoustic impacts may need to focus on displacement but acknowledgement should be made of other disturbance impacts.

10.3 We are supportive of exclusion of activities from core home ranges. We note the lack of actual proven mitigation techniques in the report. Use of effective mitigation measures needs to be monitored, continually reviewed and investigations undertaken.

11.1 We strongly agree that the creation of a joint database would be beneficial to allow scientists to access each other's data sets, and reaffirm our support for the principle of data sharing.

We note that the area North West of Tiree has been identified as a potential area of development. This is a known hotspot for basking shark and it is highly likely development in this area would impact on this species.

Case study Strangford Loch - whilst this is a good example, it is a very small scale development compared to some of the future ones; remote, large scale and more difficult working conditions are likely to be issues.

Surveys – there is an issue of fair weather surveys, and long observer periods. These would not be acceptable for survey work for onshore wind farms (max. recommended 3hrs) yet there do not appear to be issues with offshore surveys of 6 hours or more in this guidance.

[5] Leaper, R., Burt, L., Gillespie, D. and Macleod, K. 2011. Comparisons of measured and estimated distances and angles from sightings surveys. J. Cetacean Res. Manage. 11(3):229-238

12.1 The issue of detectability with distance needs more consideration. It may be possible to compare sightings from shore with boat based data but it is challenging to obtain sufficient data to do this, it has never been done and the methods need to be demonstrated including required sample sizes and likely amount of effort.

It should be stressed that unless shore based observations can be "calibrated" by this or other techniques, their potential value is extremely limited.

12.2 The use of static autonomous monitoring devices is proposed without any consideration of the severe problems of deploying these in areas of high tidal current. These include practical issues with mooring in currents but, most fundamentally, issues related to background noise and the effects of this and current on detection range. At the very least, these severely limit the extent to which these can be used for this application.

12.3.1 It is stated that the same set of transects should be surveyed each time, but no justification is given. There are arguments for repeating transects for comparability, but also for randomising design in order to achieve better coverage.

12.3.6 The section on effort is rather confused. With modern GPS equipment there is no reason not to record vessel location every few seconds. These data may prove valuable for environmental covariate analysis or comparison of visual and acoustic data. The guidance should recommend collection of such straightforward data even if it may not be essential to the initial analysis that is envisaged. HWDT conducts surveys from its small boat almost continuously throughout the summer months and has been using computer based data collection methods since the early 90s.

12.5 The guidance makes no mention of the use of visual and acoustic data for dual platform analysis to estimate g(0). Although methods to analyse such data are not well developed there is no reason not to collect data in a way that would facilitate such analysis which could address some of the issues related to detection probability mentioned in the guidance.

Volume 3: Seals

Sparling, C., Grellier, K., Philpott, E., Macleod, K., and Wilson, J. (2011). *Guidance on survey and monitoring in relation to marine renewables deployments in Scotland. Volume 3. Seals*. Unpublished draft report to Scottish Natural Heritage and Marine Scotland.

We reiterate our concern over the suggestion one year of baseline monitoring data may be sufficient. We strongly believe two years baseline monitoring data must be required as a minimum for all mobile species.

Deaths of seals, most likely from thrusters on associated offshore vessels has already proved to be a population level issue that is likely to be associated with the marine renewable energy industry. This suggests a high degree of inquisitiveness which should be assumed will be transferred to any inwater structures, so assessment of collision mortality is important.

8.4 sightings surveys for seals. A significant advantage of this approach that we feel should be stressed is that it provides data from the specific site of interest (which in some cases might be quite small and unusual habitats) and provides a dataset against which model based approaches using telemetry data can be tested.

Volume 4: Birds

Jackson, D., and Whitfield, P. (2011). *Guidance on survey and monitoring in relation to marine renewables deployments in Scotland. Volume 4. Birds*. Unpublished draft report to Scottish Natural Heritage and Marine Scotland.

There is some very useful material contained in Volume 4, which is a thorough report on the topic. In particular, Tables 6.1 & 6.2 condense a lot of essential material into a clear and logical sequence in a readily accessible form. The importance of clear objectives cannot be overstated and the question-led process presented here is comprehensive. The standardisation of survey methods, and emphasis on the rigour with which they are carried out is greatly welcomed.

However, we believe the introductory sections could be more concise. For example some of the introductory information about species could be tabulated, eg key species (common and Latin names), percentage UK/Scottish population, population size, conservation status eg Annex I, dive depths as appropriate.

There is also inadequate consideration given to the potential for novel monitoring technologies, in particular radar, side scan sonar and remote tracking. Chapter 9 could usefully include or at least reference these other sources of information.

In detailing the vulnerability of different species, insufficient emphasis is placed on the poor ecological knowledge base, particularly spacial and underwater ecology, for many species. It is only with the evolution of remote sensing techniques that such knowledge gaps are being filled, and the information gained is often counter-intuitive.

7.3. The COWRIE programme ended in 2010, although the website and reports remain. It would be better to say "COWRIE was a Charitable company which had a key function of prioritising and commissioning research and guidance with the aim of improving the environmental evidence base for developing offshore wind".

2.3. There should be a mention of storm-driven movements of birds.

2.4. The bird list should include red-necked phalarope, great-crested and red-necked grebe, scaup, and cliff nesting chough and raven.

2.4.5. Terns can forage considerable distances offshore.

2.4.8 While *schinzii* race dunlin are listed on Annex 1 they are not part of the coastal wintering wader population.

2.6. As well as IROPI, "no alternative solutions" should also be included. We welcome the recognition that developments outwith designated site boundaries may affect SPA qualifying bird interests.

The Offshore Marine Conservation (Natural Habitats etc.) Regulations 2007 should also be listed under relevant legislation.

Table 3.1 Conservation priority listed species should be High- Moderate not just Moderate.

5.1. 'Proximity' should be deleted in relation to designated sites (and possibly include a note to say that sites at some distance may be affected).

6.1.1 While the COWRIE guidance provides a good basis for developing CIA, it requires further development.

7.1. Existing information is often patchy as well as out of date, so whilst acknowledging there is a substantial body of existing data overall, this is not the case universally and some sites will

be more or less well-covered. This requires greater emphasis. *If available*, existing data should inform scoping stages, identification of focal species etc. In most cases new data collection will be necessary. This requires a combination of new strategic contextual data and site specific data collection.

7.2. There should be mention of seabird tracking projects, including the FAME project http://www.rspb.org.uk/ourwork/projects/details/255106-future-of-the-atlantic-marine-environment-fame-

8.1.2 Consistency is also important, so changes in study design should take account of backwards and forwards comparability. This is especially important in the case of any methodological changes made post-construction that might confound any assessment and attribution of observed changes.

8.3.1. We welcome two year minimum baseline survey period.

8.7. The BACI vs BAG section is, as noted in comments on Volume 1, a useful discussion.

8.8. The University of St Andrews CREEM advice is that minimising the time to cover the whole survey area for site characterisation purposes is more important than transect separation *per se*. So wider transect separation may be more appropriate for large development zones, with closer spacing for individual development sites. A suggested approach is to cover a large site at a wider transect spacing, then repeat, offsetting the transect lines to improve overall coverage. Transect spacing is likely to depend on spatial scale.

Sampling grids, as applied by some digital aerial surveyors, should also be considered, with images taken at internodes, and applying a grid size most suitable to achieve minimum CV = 0.16 (ie to detect halving or doubling of the population).This also applies to Table 11.1

8.9. While maximum distance out to sea for VPs is discussed later, it should also be included here.

8.11. Connectivity to SPAs has wider application than stated, covering passage periods too – see SPA Review (Stroud et al. 2001). However, it is accepted that the most relevant periods from the point of view of tracking will relate to the time periods when birds from the SPAs use the proposal area.

Thaxter *et al.* (submitted following revision, and therefore hopefully soon to be in press) will be a useful reference to cite in this guidance as it draws on the BirdLife foraging ranges database and other information to review seabird foraging ranges. Data from seabird tracking studies, such as FAME, also could be included here.

There is the possibility of inferring connectivity of birds using a site with a breeding colony, at least where they are proximate, by recording directions of flight, especially if they are seen carrying prey.

8.12. One way of addressing variability is to focus multiple surveys during the season of occurrence for key species that are highly seasonal, bearing in mind the caveat presented elsewhere in this guidance to ensure a minimum number of days elapsed between surveys to improve independence of the sampling protocol.

9.1.2. Aerial and boat-based surveys have different detection and bird species discrimination capabilities, rather than there being a clear-cut case that one method is superior to the other in these respects. Advances in aerial survey techniques using digital methods have developed rapidly and continue to do so such that it is likely that digital aerial survey will replace visual aerial survey, at least in the case of offshore wind energy developments owing to minimum flight height constraints in operational wind farms. Whilst this constraint does not apply for wave and tidal installations, technical development is likely to focus on digital methods. This point is covered in part in 9.1.3, but see also comment to 8.1.2.

9.1.4 In addition to reconnaissance visit(s), it is recommended that a pilot survey be undertaken, at least in the case of digital aerial survey, to establish the appropriate sampling protocol (transect/grid spacing, coverage), for example to address the degree of clumping in distribution by some species such as common scoter.

15.2.4. There is an ECON modification proposed to replace the 300m x 300m box with 300m radial distance to focus on recording birds within 300m, due to markedly reduced detection beyond 300m (Barbraud & Thiebot 2009). The ECON approach uses an adjusted snapshot area of 0.141 km^2 for flying birds. This has opened a debate that may or may not lead to modifications to ESAS methods.

15.2.7. It is crucial to avoid long survey periods to prevent observer fatigue. Having multiple personnel on board to change over between survey periods can help this.

15.3. As mentioned above, this is currently a difficult topic on which to provide information owing to the pace of change. There is a need for revised information, although commercial confidentiality makes this more difficult to achieve. The HiDef approach (video) already uses multiple cameras to achieve a wider transect strip coverage and the APEM approach (stills) uses a sampling grid (see earlier comment) instead of a transect method. All the digital aerial providers have upgraded their cameras so 2-3cm resolution rather than the minimum 5cm are in routine use.

15.7.1 Technological advances mean that there are more types of device, offering a range of spatial resolutions, duration of data collection, price and size/weight. The key points worth mentioning here are the importance of tag:bird weight ratio and bird welfare. Where suitable, GPS data loggers are cheap enough to deploy in decent sample sizes.

Volume 5: Benthic

Saunders, G., Bedford, G.S., Trendall, J.R., and Sotheran, I. (2011). *Guidance on survey and monitoring in relation to marine renewables deployments in Scotland. Volume 5. Benthic Habitats*. Unpublished draft report to Scottish Natural Heritage and Marine Scotland.

This volume provides an impressive amount of information, and should be a very useful document for developers.

The preparation of a new spatial plan for wave and tidal energy by Marine Scotland should be noted. It should also be recognised that this work is currently investigating the feasibility of developments out to 200nm.

We request clarification on the rationale used to develop the subset of PMFs which have been considered to be potential receptors. As noted above, Marine Scotland is currently preparing a new plan for wave and tidal energy, therefore the habitats susceptible to impact due to their

proximity to development sites may change in the near future. We suggest a comprehensive approach is taken and the report makes clear how risk was assessed in principles for **all** PMFs against the various impacts, and tables 2.1, 2.2 and 2.3 updated accordingly.

We support the call for well-planned pre-installation surveys, and support littoral survey work for shorelines where wave devices are within 2km of the shore. We request clarification on the rational behind the 2km boundary.

Table 4.1 – we warmly welcome the recognition of wave-shadow impacts.

Scottish Environment LINK's Marine Task Force is supported by:

Hebridean Whale and Dolphin Trust
Marine Conservation Society
National Trust for Scotland
RSPB Scotland
Scottish Wildlife Trust
Whale and Dolphin Conservation Society

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