



BTO Research Report No. 591

**The National Sea-watching Workshop
11 November 2010
Conclusions and Recommendations**

Authors

Chris B. Thaxter, Nick J. Moran, Andy J. Musgrove, Niall H.K. Burton

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SUMMARY

The United Kingdom is of international importance for its colonies of breeding seabirds, and the majority of populations at these sites are well monitored and protected. However, sea-watching, which is carried out at a great many locations around the United Kingdom, as well as in the Republic of Ireland and around the coasts of northwest Europe, has the potential to provide considerable information on the distribution and movements of seabirds away from their colonies.

This report summarises the conclusions and recommendations of a workshop, funded by The Crown Estate and held at the British Trust for Ornithology in November 2010, that brought together representatives from bird observatories and other sea-watchers from around the UK and Republic of Ireland, country agencies and academics to review the potential for setting up a national sea-watching monitoring scheme. The workshop included a number of short presentations together with round-table discussions. The morning session looked into current practices, while the afternoon session focussed on the way forward.

There was considerable enthusiasm at the workshop for the potential of a national sea-watching scheme in bringing together existing recording and, as a consequence, it was agreed that the BTO should aim to develop a proposal for developing such a scheme, and explore funding possibilities.

The following recommendations follow the conclusions of the workshop and provide an initial outline of the potential aims of the national scheme and how the scheme might be set up:

- i. The aims of collating sea-watching data within a national scheme should be made clear at the outset. These might include: determining the spatial and temporal patterns of movements of seabirds outwith the breeding season; monitoring numbers of certain species; monitoring breeding success of certain species (based on the proportion of juvenile birds recorded); providing data on otherwise infrequently recorded species; informing research, e.g. on the factors that determine species occurrence and abundance.
- ii. A steering group should be formed to oversee the scheme, and establish how it will integrate into existing monitoring and the scheme's research aims.
- iii. A wide variety of recording is currently taking place at a great many locations around the UK, and thus a national sea-watching scheme would ideally capture data at all of these levels. One approach would be to follow a two-tier system (as, for example, used for the current 2007-2011 Bird Atlas survey) that included (1) key sites utilising standardised effort-based monitoring, e.g. with pre-selected 1 hour recording slots on 'target dates' and (2) more casual recording to provide supplementary information, although still recording start and end times of watches, and some other basic information, to give an effort-based measure
- iv. At the key sites, the data collected should be standardised, though in order that as much data are captured as possible, protocols for casual recording should not be too rigid. Data requirements should be determined by the steering group but as a minimum should include: date; start time and end time; location; weather (including wind speed and direction, precipitation, cloud cover, visibility, sea-state); species (including unidentified groups); direction of flight; observer ID and the number of people who contributed to the counts.
- iv. The scheme would require a national coordinator (such as the BTO), overseeing a regional network which would oversee recording at individual sites.
- v. It would be most efficient to use an existing system to collate data and the BTO/RSPB/BWI/SOC *BirdTrack* scheme provides a suitable online platform that could be developed for this purpose. Development of the scheme within the *BirdTrack* online system

would reduce set-up costs, but nevertheless some development time would be needed once agreement was reached on the structure of the scheme and the exact data that need to be recorded. Any development through *BirdTrack* would need to be done with full consultation and agreement with all partners in the scheme.

- vi. The scheme would need separate branding, while it is also important that regular feed-back is provided on results. This will provide a profile to the scheme, that will highlight the worth of the data being collected and its outputs, and also encourage people to submit records.

The workshop recognised a number of issues that would need to be resolved, for example regarding data-sharing and data ownership. Any national scheme will only work if all parties across the country come on board and the scheme should also engage with the wider public. The BOC are extremely supportive of the idea of a national scheme, and would willingly play an integral role in the steering group that would need to exist to ensure the scheme's success. It will also be particularly important to maintain and develop relationships with *SeaWatchSW*, the Irish *Seatrack* project, and *Marinelife*. Ultimately, the input of individual sea-watchers would be vital in the development and success of a national scheme.

1. INTRODUCTION

The United Kingdom is of international importance for its colonies of breeding seabirds, and the majority of populations at these sites are well monitored (Mitchell *et al.* 2004) and protected (Stroud *et al.* 2001). Away from these sites, the distribution and movements of seabirds are less well-known. While boat and aerial surveys have revealed much about the distributions of seabirds at-sea (<http://www.jncc.gov.uk/page-1547>), there is still much to be learnt, for example on species seasonal movements and the consistency and trends in these patterns across year.

Observing and recording such movements, i.e. sea-watching, is an increasingly popular pastime. Whilst originally the preserve of the most dedicated and expert birdwatchers, in many areas sea-watching viewpoints are providing an increasing level for the general interested public. This applies to both the local public and holidaymakers; many of the key sea-watching points are situated at or near to popular holiday destinations, such as at Land's End, Beachy Head, Sheringham, Flamborough Head and South Stack. At some of these locations, the potential for seeing other marine wildlife, such as Basking Sharks or Killer Whales further increases the interest of the general public.

Moreover, whilst sea-watching is an enjoyable pastime, the observations that take place have the potential to help address many unanswered questions about the seabirds making use of our coastal waters. These include very fundamental questions concerning why certain birds are present in particular areas; what influences them to move between areas; what effect does the weather, time of day or time of year have on their movements; and many more. These questions are not just of academic interest; such information may help enhance our management and stewardship of the coastal environment, by aiding understanding of how other coastal activities (e.g. wind power, fishing, tourism, ferries, etc) may impact on these bird populations for which the UK has such a major international responsibility.

The UK already has in place monitoring schemes for many groups of birds, most of which are organised by the British Trust for Ornithology (BTO), but no such national monitoring scheme exists for collating information on the movements of seabirds. The BTO recognises that there is a great deal of expertise across the country that needed to be consulted in advance of embarking on the setup of such a scheme.

Consequently, the BTO held a workshop to collate national expertise on best practice in the design of a monitoring scheme for recording the movements of seabirds along the coast. This workshop, which was funded by The Crown Estate, sought to bring together expert observers and key users of bird data, along with experts in dissemination of results to the wider public. Thus, the workshop sought to consider the methods that should be recommended for collection of sea-watching records and what information the data could provide.

This report provides the conclusions of the workshop and recommendations for taking the proposed national monitoring scheme forward.

2. AIMS & OBJECTIVES

The key immediate aims of this project were to:

- 1 Identify key expert individuals to participate in a workshop aimed at setting up a national sea-watching scheme;
- 2 Organise and hold such a workshop;
- 3 Publicise the workshop, supported by the Crown Estate;
- 4 Report on the conclusions of the workshop, and to publicise the report.

The longer-term objectives of the workshop itself were to set in motion a national scheme to monitor seabird movements around the UK coastline. Thus the workshop aimed to discuss how to best:

- 1 Collect sea-watching data;
- 2 Support an observer network;
- 3 Analyse the observations periodically, to better understand the factors influencing seabird movements;
- 4 Make the information gathered available to enhance stewardship of the coastal environment;
- 5 Educate and enthuse the public about seabirds in UK coastal waters, and to encourage wider participation in observing seabirds and other marine wildlife.

3. METHODS

During September and October 2010, the BTO contacted a range of personnel with interest and experience in sea-watching. These included the Bird Observatories Council (BOC: <http://www.birdobsCouncil.org.uk/>), representatives from bird observatories, academics, country agencies, and other individuals with an interest in sea-watching.

The workshop was held at BTO on Thursday November 11th 2010. A list of attendees and their affiliations is provided together with a copy of the workshop agenda in the Appendix to this report.

The format of the workshop included a combination of short presentations from bird observatories and sea-watchers, and round-table discussions. A morning session looked into current practices, while the afternoon session focussed on the way forward.

During the morning (current practices), we focused on two key questions:

1. What common ground is there?
2. What do we need to record?

During the afternoon (the way forward), we focused on three key questions:

1. What is the best way forward to collate data nationally?
2. What can the data show us and what analyses are needed?
3. What issues are there? (e.g. data-sharing)

Presentations during the morning session provided background to existing schemes and approaches that are currently taken place. This session included an introductory talk from the BOC, on how sea-watching is an un-harnessed resource (Chris Waltho), and then short presentations from Holme (Fred Cooke), Scarborough (Mick Carroll), Spurn (Andy Roadhouse) and Dungeness (David Walker) Bird Observatories, on sea-watching in the Sheringham area (Moss Taylor), on a new mid-Lincolnshire Coast North Sea Bird Observatory (Mark Tarttelin), on Irish Seabird Passage Project (“*SeaTrack*”: <http://nibirds.blogspot.com/2010/07/seatrack-irish-seabird-passage-project.html>; Alan Lauder), and from Marinelife (<http://www.biscay-dolphin.org.uk/>) on recording seabirds from vessels offshore (Nigel Symes). Details of individual talks are available on request.

During the afternoon session, presentations outlined potential analyses that could be conducted using sea-watching data (Fred Cooke, Holme Bird Observatory), and a *BirdTrack* live demonstration by Nick Moran (BTO).

4. WORKSHOP CONCLUSIONS

Morning session: Current practices

Common ground

Sea-watching is carried out at a great many locations around the United Kingdom, as well as in the Republic of Ireland and around the coasts of northwest Europe (Figure 1).



Fig 1. Current locations, including Bird Observatories, where sea-watching is currently carried out (C. Waltho)

There is considerable enthusiasm for what the data being collected could show, and for the potential of a national recording scheme in bringing together existing recording. However, it was also clear that recording varies greatly between sites.

Given that recording sea-watching data is already happening widely, many observers are anxious to share their data. However, there was a recognition that this must be done in a coordinated manner. There was also recognition for a need to make use of the data to add more purpose and motivation to collecting new data, and a greater need for coordination throughout the Bird Observatories network, and the need for an unified recording system.

Currently, the way in which sea-watching data is recorded is very much site-specific. In some cases, standardised constant-effort methodology is used. The successful *SeaWatchSW* scheme (<http://www.seawatch-sw.org/>), for example, includes a main project watch-point at Gwennap Head, Porthgarra, Cornwall, and three control sites (Berry Head in Devon, Trevoze Head in Cornwall, and Strumble Head in Wales). At Porthgarra, morning (0600-1200 hrs) and afternoon (1400-2000 hrs) sea-watching sessions are undertaken throughout the key autumn period. A similar standardised set up

may be required for at least part of any future national network to enable robust scientific data to be collected.

Likewise, the Irish *Seatrack* project (<http://nibirds.blogspot.com/2010/07/seatrack-irish-seabird-passage-project.html>) also conducts increased effort at key sites, with 8 target weekends chosen between July and November, recording in four hour blocks standard information, with supplementary Sites and records allowed.

At some bird observatories, such as Holme, recording start and end times helps to provide data on the hourly numbers of birds recorded. At some sites, however, data recorded by observers may not even be sent to county bird recorders.

Therefore, while there was enthusiasm for the data currently being collected, there was a consensus that much more needed to be done to join up the network in a standardised manner. Some concern was raised in how lack of access to computers for some sea-watchers could hamper any online recording system. However, the BTO also process many paper records for its current schemes such as the Breeding Bird Survey (BBS) and Wetland Bird Survey (WeBS). Some sites also record far more information than others, thus recognition was made early on for a flexible scheme that allowed both for standardised timed counts at key sites and more casual recording. This distinction is analogous to the system that the BTO uses for the current 2007-2011 Bird Atlas survey, with Timed Tetrad Visits (TTVs) comprising the standardised measures across sites, and Roving Records, that comprise more causal observations, providing additional useful information.

What to record

There was a consensus that certain basic information must be recorded across sites. This included:

- Date;
- Start time and end time;
- Location (including site details such as 6-digit grid reference);
- Weather [including wind speed [Beaufort Scale] and direction, precipitation, cloud cover, visibility, sea-state];
- Species (including unidentified groups) and hierarchical splitting dependent upon certainty of identification (e.g. gulls, small gulls, then species);
- Direction of flight;
- Observer ID – in analyses, one needs to know who made counts to account for observer differences;
- Finally, the number of people who contributed to the counts.

In addition, certain optional extra data could be recorded including:

- Distance bands of observations, for analyses (see later);
- Age/sex breakdown (e.g. at Holme Bird Observatory scoring is given 1-4 for ages of Gannets);
- Time ‘divisions’ – it would be best to break-down observations into more limited time periods, for example, 15 or 30 minutes;
- Additional or all species (if just priority species are recorded in basic data).

Some more site-specific issues were raised – for example, at some sites, some observers may not record gulls and there is thus a need to distinguish between zero and missing counts. This is not an unusual problem, and is dealt with by schemes such as WeBS with both their online and paper recording forms.

There was also a consensus that for key sites, where the most intensive, standardised information might be collected, there was a need to identify potential ‘target dates’ to record sea-watching data.

Some scepticism, however, was expressed about defining protocols that were too rigid, especially where sea-watching activities are mainly volunteer-led (e.g. Spurn). There was also some indication that recorders may be put off by a complex “menu” of data requirements, and thus may be reluctant to change to a standardised system. Therefore, any recording form would need to be simple and developed in close collaboration with both the BOC and key observers, so as to provide minimum standards in line with the basic information above.

There was also some more detailed discussion of how exactly sea-watchers record data in the field. This included whether it would be beneficial to use digital “bleeps” to tell observer to start/stop constant-effort recording. The quality of the counts was also discussed. Clearly it is impossible to count everything accurately, and often in BTO schemes, (for instance in WeBS), the accuracy of the count can be recorded.

Afternoon session: The way forward

What is the best way forward to collate data nationally?

There was a consensus that it would be better to use existing systems to collate data rather than re-invent the wheel. A potential system could include a three-tier approach including a national coordinator (such as the BTO), overseeing a regional network which would oversee recording at individual sites. This structure is analogous to the way BTO operates the majority of its survey schemes. In addition to this tiered organisational system, the intensity of recording (scale of operations) at individual sites could also be subject to a tiered methodology. This might include (1) key sites utilising standardised effort-based monitoring, e.g. with pre-selected 1 hour recording slots on ‘target dates’; (2) more casual recording to provide supplementary information.

The BTO/RSPB/BW/SOC *BirdTrack* scheme offers a potential online platform in which to enter sea-watching data, as it is currently used to record and map migration and movements of most UK species (Fig 2). *BirdTrack* would be well-suited to both direct data entry, as well as the transfer of existing data from bird observatories. Nevertheless, a *BirdTrack*-led initiative would need to be tailored to ensure that it provides the best way of collating data. In particular a branded front end and some additional recording functionality would be desirable.

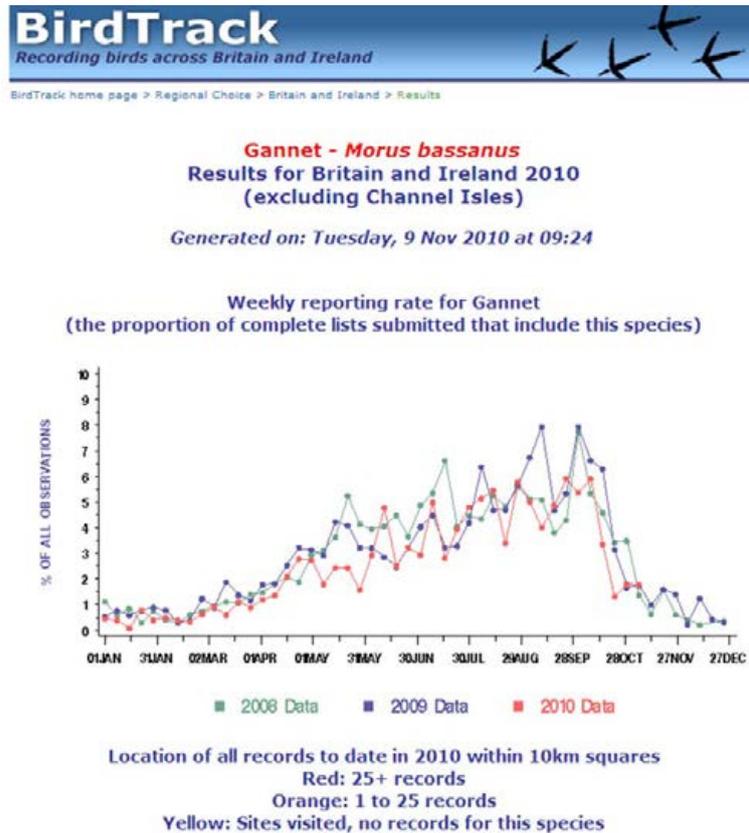


Fig 2. Example of output from *BirdTrack* for Northern Gannet

In a collaborative project between the Norfolk Ornithologists' Association (<http://www.noa.org.uk/>) and BTO, the BTO is currently entering sea-watching data from Holme Bird Observatory into *BirdTrack*. This is one of the most comprehensive UK sea-watching datasets in the UK with standardised observations undertaken since May 2005. While improvements need to be made to *BirdTrack* to capture all potential information from recording sheets (e.g. as outlined above), this project has been able to explore the potential of sea-watching data. The project aims to both demonstrate the outputs that standardised sea-watching data at bird observatories can provide on a site-level in a format that is readily accessible to both amateur and professional ornithologists alike and, through statistical modelling analyses, understand the potential of sea-watching data as a wider monitoring tool. Initial analyses have summarised seasonal and annual variation in numbers of key species recorded at Holme Bird Observatory. Statistical modelling analyses have investigated how the numbers of a subset of commonly recorded species vary in relation to environmental factors and have been used to develop preliminary annual indices of the numbers of these species at Holme Bird Observatory for comparison with existing national trends.

There was also some enthusiasm for recording other taxa such as marine mammals and Basking Sharks. Agreement would need to be reached as to which further species might be included into standardised methodologies. Collaboration with other schemes such as the Sea Watch Foundation (<http://www.seawatchfoundation.org.uk/research.php>) will also be necessary if cetaceans and marine mammals are to be incorporated in any way into a national sea-watching scheme.

Once an online data entry system is in place, an efficient system of feedback and reporting would be needed. BTO schemes and others such as *Seatrack* and *SeaWatchSW* operate continual feedback to

observers through regular email, letter correspondence, and website reporting, thus systems are in place to inform users.

What can the data show us and what analyses are needed?

At the simplest level, sea-watching data can give a better understanding of basic species information – i.e. which species are using British and Irish waters. However, the information collected through sea-watching has much more potential. The workshop highlighted a number of questions and data gaps that sea-watching could help towards answering and filling-in:

- i. There is first much to be learnt concerning the spatial and temporal patterns of movements of seabirds outwith the breeding season, and the consistency of these patterns. Sea-watching information may thus highlight important concentrations of species, diversity of species, identify simple movements and migratory routes. For instance, *SeaWatchSW* has shown how Balearic Shearwaters have increased in abundance in UK water in recent years in relation to a 0.6°C warming in sea surface (Wynn *et al.* 2007), corresponding with a more southerly decrease in numbers in northern Biscay (Yésou 2003). Likewise, the Irish *Seatrack* project has recorded peaks in abundance of Balearic Shearwaters during July and August. Data collected through a national scheme could help provide an update of the previous analysis of seabird movements around the UK undertaken by Hope-Jones & Tasker (1982).
- ii. Sea-watching data could also be used to provide annual indices of species abundance over the long-term. For most breeding seabirds in the UK, the JNCC-led Seabird Monitoring Programme (SMP) provides annual monitoring of populations and their breeding success. However, for less common species, and those that use our coastal waters during passage or in winter, sea-watching data could provide a valuable means of monitoring their populations. A national scheme should thus aim to identify which species it would most usefully providing monitoring data for, and any such monitoring should tie directly into the SMP.
- iii. Sea-watching data could further be used to assess annual changes in breeding success for certain species, by the recording of age-classes. Again, any such monitoring should tie directly into the SMP.
- iv. The data recorded by sea-watchers is also of great value due to the intensity of effort that is undertaken. Sea-watching records often reveal the presence of species that go unrecorded during aerial or boat-surveys as, for example, undertaken for environmental impact assessments for offshore windfarms or other developments. As a result of this effort, sea-watching also often captures unique events that may otherwise go unrecorded. Sea-watching data could thus be used to inform the impact assessments undertaken for developments, and also for informing on impacts once sites are developed.
- v. The data collected could also be used for a number of research purposes, for example in determining the factors influence species occurrence and abundance in offshore waters through habitat-association modelling using static or dynamic variables of oceanography, bathymetry, and sediments. Collaboration between sea-watching sites and existing or future research programmes also ought to be considered. Sea-watchers, for example, could provide useful records of colour-marked birds and so provide information on the extent and timing of movements from specific colonies (<http://www.birdguides.com/webzine/article.asp?print=1&a=2188>).

SeaWatchSW in collaboration with other European schemes, has been extremely successful in estimating the numbers of Balearic Shearwaters using UK waters during non-breeding periods, these representing, at a minimum, 1-2% of the critically endangered global population (Wynn & Yésou 2007). Nevertheless, a major criticism of sea-watching data is that is difficult to interpret absolute

numbers of birds, as the numbers of birds recorded are so dependent on weather patterns. Associations between bird numbers and weather patterns may be of scientific interest in their own right. However, in developing monitoring indices, it will be important to be able to understand how weather patterns drive species occurrence and abundance at particular sites and to be able to incorporate account for such relationships in analyses.

Sea-watchers record data from the coast as far as can be seen. However, experience in numerous avenues of ecology reveal drop of in detectability from an observer with distance (Buckland *et al.* 2004), and thus any estimate of abundance needs post-correction. In theory, such a technique can also be applied to sea-watching data; such correction would also overcome other issues, for instance it may be more likely that particular species move closer to the coast on average than others. Accounting for detectability requires separation of observations into distance bands, for instance, as used in boat-based recording of seabirds at sea (Camphuysen *et al.* 2004). Whether sea-watchers could also somehow record observations into bands from the coast is uncertain and would undoubtedly be challenging

The initial goal of this workshop was to enthuse experts and existing enthusiasts involved in seabirds, to harness and collate their knowledge and expertise. However, a second goal an ultimate aim of a subsequent monitoring scheme would be to encourage the public to observe, and appreciate seabirds (and other wildlife) in the coastal environment, as well as recording them directly. A national sea-watching scheme could thus be used as an educational tool and a way of informing the wider public on the populations of seabirds using UK waters. It would be fairly simple to distribute information on the scheme through BTO press channels and its regional network, and through its link with *BirdGuides* and, for example, the BBC *Springwatch* and *Autumnwatch* team. Bird Observatories themselves could also be encouraged to erect information boards to inform the wider public. A successful scheme may depend on this increased buy in from the wider public. Involvement of the public in such outdoor activities is clearly beneficial to the individuals concerned, but also could generate increased visitor numbers to coastal watch points.

What issues exist?

Any national scheme will only work if all parties come on board. The BOC are extremely supportive of the idea of a national scheme, and would willingly play an integral role in the steering group that would need to exist to ensure the scheme's success. It will also be particularly important to maintain and develop relationships with *SeaWatchSW*, the Irish *Seatrack* project, and *Marinelife*.

The potential for data-sharing with schemes from other coastal areas of northwest Europe (e.g. <http://www.telefonica.net/web2/redavesmarinas/>) should also be considered. While the Irish *Seatrack* scheme is supportive the new initiative, more thought would need to be given as to how a UK scheme could tie in with other schemes in countries such as the Netherlands, France, Spain, Portugal.

A further concern raised during the discussion was the issue of data ownership, as the data collected by sea-watchers may have considerable financial worth for the local bird groups (observatories, for example) which collect it. While the BTO has a commitment to make data available (e.g. through the National Biodiversity Network), the BTO also already has policies in place to guard against these issues, and has considerable experience with dealing with data-sharing issues. The provision of large amounts of data from observatories to a core system is quite an undertaking, and observatories would need to see real value from this. For WeBS, data is provided altruistically, and provision of sea-watching data would need to be met with an upfront acknowledgment of the considerable conservation value of the data.

Funding for the scheme would need to consider both the set-up and running costs. It is important, as stated above, that the scheme is branded and that regular feed-back is provided on results. This will provide a profile to the scheme, that will highlight the worth of the data being collected and its

outputs, and also encourage people to submit records. Development of the scheme within the *BirdTrack* online system would reduce set-up costs, but nevertheless some development time would be needed once agreement was reached on the structure of the scheme and the exact data that need to be recorded.

Importantly, a steering group would also need to be formed, to oversee the scheme, and establish how it will integrate into existing monitoring and the scheme's research aims.

5. RECOMMENDATIONS

There was considerable enthusiasm at the workshop for the potential of a national sea-watching scheme in bringing together existing recording and, as a consequence, it was agreed that the BTO should aim to develop a proposal for developing such a scheme, and explore funding possibilities.

The following recommendations follow the conclusions of the workshop and provide an initial outline of the potential aims of the national scheme and how the scheme might be set-up:

- i. The aims of collating sea-watching data within a national scheme should be made clear at the outset. These might include: determining the spatial and temporal patterns of movements of seabirds outwith the breeding season; monitoring numbers of certain species; monitoring breeding success of certain species; providing data on otherwise infrequently recorded species; informing research, e.g. on the factors that determine species occurrence and abundance.
- ii. A steering group should be formed to oversee the scheme, and establish how it will integrate into existing monitoring and the scheme's research aims.
- iii. A wide variety of recording is currently taking place at a great many locations around the UK, and thus a national sea-watching scheme would need to capture data at all of these levels. One approach would be to follow a two-tier system (as, for example, used for the current 2007-2011 Bird Atlas survey) that included (1) key sites utilising standardised effort-based monitoring, e.g. with pre-selected 1 hour recording slots on 'target dates' and (2) more casual recording to provide supplementary information.
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- iv. The scheme would require a national coordinator (such as the BTO), overseeing a regional network which would oversee recording at individual sites.
- v. It would be better to use an existing system to collate data and the BTO/RSPB/BW/SOC *BirdTrack* scheme provides the a suitable online platform that could be developed for this purpose. Development of the scheme within the *BirdTrack* online system would reduce set-up costs, but nevertheless some development time would be needed once agreement was reached on the structure of the scheme and the exact data that need to be recorded.
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REFERENCES

- Buckland, S.T., Anderson, D.R., Burnham, K.P., Laake, J.L., Borchers, D.L. & Thomas, L. 2004. *Advanced distance sampling: estimating abundance of biological populations*. Oxford University Press, Oxford.
- Camphuysen, C.J., Fox, A.D., Leopold, M.F. & Petersen, I.K. 2004. *Towards standardised seabirds at sea census techniques in connection with environmental impact assessments for offshore wind farms in the U.K. A comparison of ship and aerial sampling methods for marine birds, and their applicability to offshore wind farm assessments*. Koninklijk Nederlands Instituut voor Onderzoek der Zee Report commissioned by COWRIE.
- Hope-Jones, P.H. & Tasker, M.L. 1982. Seabird movements at coastal sites around Great Britain and Ireland, 1978-80. Nature Conservancy Council.
- Mitchell, I.P., Newton, S.F., Ratcliffe, N., Dunn, T.E. 2004. *Seabird populations of Britain and Ireland*. T & AD Poyser, London.
- Stroud, D.A., Chambers, D., Cook, S., Buxton, N., Fraser, B., Clement, P., Lewis, P., McLean, I., Baker, H., Whitehead, S., 2001. *The UK SPA Network: its scope and content*. JNCC, Peterborough, UK.
- Wynn, R.B., Josey, S.A., Martin, A.P., Johns, D.J. and Yésou, P. 2007. Climate-driven range expansion of a critically endangered top predator in northeast Atlantic waters. *Biology Letters*, **3**, 529-532.
- Wynn, R.B. and Yésou, P. 2007. Changing status of the Balearic Shearwater *Puffinus mauretanicus* in northwest European waters. *British Birds*, **100**, 392-406.
- Yesou, P. 2003. Recent changes in the summer distribution of the Balearic Shearwater *Puffinus mauretanicus* off western France. *Scientia Marina*, **67**, 143-148.

APPENDIX

National Sea-watching Workshop **British Trust for Ornithology, The Nunnery, Thetford** **10.00–15.30 Thursday 11 November 2010** (<http://www.bto.org>)

Agenda

Morning

10-00 *Introduction to day* (Niall Burton)

10-15 *Current practices – Introductory talks* (Chris Thaxter)

Chris Waltho – *Sea-watching: an un-harnessed data source*

Fred Cooke – *Sea-watching at Holme Bird Observatory*

Mick Carroll – *Sea-watching at Scarborough*

Moss Taylor – *40 years of sea-watching in the Sheringham area*

Andy Roadhouse - *Sea-watching at Spurn Bird Observatory*

Mark Tarttelin – *A new North Sea Bird Observatory on the mid-Lincolnshire Coast*

Alan Lauder – “*SeaTrack*” – *the Irish Seabird Passage Project*

Nigel Symes – *Marinelife*

11-15 **Coffee**

11-30 *Current practices – Round-table discussion*

Chairs: Fred Cooke, Alan Lauder; Note-takers: Nick Moran, Chris Thaxter

Questions:

What common ground is there?

What do we need to record?

12-20 Feedback

12-30 **Lunch**

Afternoon

13-15 *The way forward – Introduction to afternoon* (Chris Thaxter)

Fred Cooke – Potential analyses

Nick Moran – Recording sea-watching data through BirdTrack

13-45 *The way forward – Round-table discussion*

Chairs: Chris Waltho, Mark Grantham; Note-takers: Nick Moran, Chris Thaxter

Questions:

What is the best way forward to collate data nationally?

What can the data show us?

What issues are there? (e.g. data-sharing)

15-00 Feedback

15-15 *Round-up* (Niall Burton)

Attendees

Name	Affiliation
Niall Burton	BTO
Nick Moran	BTO
Chris Thaxter	BTO
Andy Musgrove	BTO
Clare Tallboys	The Crown Estate
Shane Wolsey	BTO/Queens University
Kerry Leonard	Copeland Bird Observatory
Neil McCulloch	Northern Ireland Environment Agency
Ian Carter	Natural England
Matt Murphy	Countryside Council for Wales
Andy Webb	Joint Nature Conservation Committee
Ian Newton	Centre for Ecology and Hydrology / Chair of BTO Council
Chris Waltho	Scottish Ornithologists' Club
Mark Grantham	BirdGuides / Bird Observatories Council
Fred Cooke	Holme Bird Observatory
Sophie Barker	Norfolk Ornithologists Association
Jed Andrews	Norfolk Ornithologists Association
Nigel Symes	Marinelife / RSPB
Moss Taylor	Weybourne
Mick Carroll	Flamborough /Filey
Alan Lauder	BirdWatch Ireland
Andy Roadhouse	Spurn Bird Observatory
Mark Tarttelin	Wild Planet
Kevin Wilson	Gibraltar Point Bird Observatory
Keith Clarkson	Filey / RSPB
Richard Baines	Flamborough Bird Observatory
Dave Walker	Dungeness Bird Observatory
Clive McKay	Scottish Ornithologists' Club
Bob Osborne	Nar Valley Ornithological Society
Dave Miller	The Crown Estate

Apologies from: Russ Wynn (SeaWatchSW), Mark Bolton (RSPB), Andy Douse (Scottish Natural Heritage), Andy Brown (Natural England).