

Written evidence from Rick Stafford (BES) (PAE0004)

Data collection and gaps in data for UK protected areas

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Data gaps

A major failure in our understanding of nature protection within protected areas in the UK is a lack of monitoring data and condition assessment. In the 2022 review of protected areas by the British Ecological Society (Bailey et al. 2022; <https://www.britishecologicalsociety.org/policy/protected-areas/read-the-report/>), we report that almost 80% of SSSIs have not been monitored in the last six years. However, these figures are hard to obtain and not routinely in the public domain; this figure is from an online response to a question by Rebecca Pow (<https://www.theyworkforyou.com/wrans/?id=2021-02-09.151834.h&s=%27SSSI%27#g151834.r0>)

It is good to see that Defra's Environmental Improvement Plan (2023) includes interim targets for monitoring the condition of SSSIs, that all SSSIs have an up-to-date condition assessment, and 50% of SSSIs with actions on track to achieve favourable condition by 31 January 2028 (EIP p 31). However, it is important to highlight that having actions in place does not necessarily ensure the achievement of favourable condition. Outcome-based targets should gradually replace action-based ones to make sure that conservation objectives are achieved.

We were unable to find details of monitoring frequency for marine protected areas in the public realm. For offshore sites (> 12 nm miles off the coast) the JNCC website lists 32 surveys since 2014 and 19 in the last 6 years, although these reports do not directly conclude whether protected features are in favourable condition or not. Haphazard sampling of MPAs on the Natural England Designated Sites webpage indicates no condition assessments have been undertaken for the 20 sites checked. While this is not a comprehensive assessment of monitoring data and condition assessment in MPAs, it can be concluded that there is a clear lack of monitoring data and condition assessments in the marine environment.

Across both marine and terrestrial PAs, there are differences in how devolved nations store monitoring and condition data, with some devolved administrations storing historic assessments, and others only storing the current assessment. The latter approach makes it hard to study changes in status of individual sites over time.

Condition Assessment

Starnes et al (2021; <https://doi.org/10.1016/j.gecco.2021.e01745>) report that standardised assessments of the effectiveness of protected areas were available for SSSI/ASSI, SAC and SPA designations only. The percentage of areas reported by JNCC to be in 'favourable' condition, and hence assumed to be effectively protected, in March 2020 was 50.17% for SSSIs/ASSIs, 42.84% for SACs and 51.48% for SPAs. These figures do not account for overlap between designations, and so are not necessarily independent. Extrapolation of these condition assessments across the whole UK protected area estate (categories Ia-VI) suggests that 12.52%, 10.69% or 12.85% (based on SSSI/ASSI, SAC or SPA figures respectively) of UK land area is effectively protected. Extrapolation of the favourable condition figures for SSSI/ASSIs, SACs and SPAs only to sites in the stricter protection categories (categories Ia-IV) would further

reduce these estimates to 5.69%, 4.86% or 5.84% of UK land effectively protected. It is important to highlight that it is not clear whether the figures on condition refer to a percentage of sites, or a percentage of features (many sites have multiple features).

Other Data Sources

Irrespective of the status of monitoring of SSSIs, the UK is one of the best surveyed countries globally for biodiversity, especially for certain groups such as birds, butterflies & moths, and plants (<https://nbn.org.uk/>). Survey data generally fall into two types: structured and unstructured. Structured data involves constant monitoring schemes using standardised methods at sites on a regular basis e.g. UK Butterfly Monitoring Scheme (UKBMS) started in 1976, and data are used to report changes in species abundance trends (<https://ukbms.org/official-statistics>). Unstructured data generally comprise *ad hoc* citizen science records of occurrence and are used to report changes in species ranges (e.g. recent BSBI Plant Atlas 2020). However, these long-term recording schemes were not set up specifically to monitor species within Protected Areas, and many of the study sites include land both inside and outside PAs. This makes it difficult to use these data to monitor Protected Areas. Such data have nonetheless revealed the benefits of PAs for facilitating range expansions (Thomas et al. 2012; <https://doi.org/10.1073/pnas.1210251109>) and for slowing up local extinctions (Gillingham et al. 2015; <https://doi.org/10.1111/bij.12506>), and the benefits of PA management (Waucope et al. 2022; <https://doi.org/10.1038/s41586-022-04617-0>). Barnes et al. (2023; <https://doi.org/10.1038/s41559-022-01927-4>) used data from three large-scale citizen science programmes to assess biodiversity impacts of UK statutory protected sites and found positive associations between UK's SSSIs, SPAs and SACs and avifauna's occurrence and abundance. Similarly, Cooke et al. (2023; <https://doi.org/10.1016/j.biocon.2022.109884>) reported higher invertebrate species richness inside than outside PAs. Of course biodiversity is a complex metric – measures of species, habitats, genes, biomass, community change etc. - and data from these different components may not necessarily be in agreement or respond similarly to the same stressors.

Combining monitoring approaches

The monitoring approach of UK protected areas is largely feature-based, meaning that data are collected for the endangered species/habitats for which the protected areas have been designated. This approach has advantages, as it allows the assessment of population trends of important species, and it is more cost-effective than monitoring ecological functions or a wider range of species.

However, feature-based monitoring needs to be complemented with a whole-ecosystem approach, which can provide more accurate information on the overall condition of ecosystems (see e.g. Solandt et al., 2020; in Humphreys and Clark (Eds), *Marine Protected Areas*. Elsevier). This ecosystem approach will become increasingly important in the future, because climate change will cause species range shifts, which may result in the same ecosystem functions being provided by different species than in the past in a given protected area.

Solutions

There are opportunities to leverage local wildlife groups and citizen scientists to augment statutory monitoring by conservation agencies to better understand current ecological conditions, and track change. Standardised monitoring protocols would be needed and may be best focussed on key taxonomic groups (e.g flowering plants, birds, bees, butterflies) with high levels of public interest, for which standardised or

semi-standardised methods already exist (e.g. UKBMS transect; Pollinator Monitoring scheme; <https://ukpoms.org.uk/>), or groups such as Seasearch in shallow marine environments where scuba diving is possible. Mobile phone apps to log species records could also be mobilised for monitoring PAs (e.g. iRecord; iNaturalist, eBird - combined with apps that provide identification from images and calls). There are also opportunities to embrace new technologies such as bioacoustics and eDNA. Nature is dynamic and there are changes to species ranges and reshuffling of communities due to climate change, which are important to incorporate in assessments of nature improvements at sites, where comparisons with, or return to, historical baselines may not be appropriate or possible. Features that led to an SSSI being protected originally may not be possible to conserve long term under climate change, but PAs are likely to support other species, and provide opportunities for new arrivals (Thomas et al. 2022; <https://doi.org/10.1002/2688-8319.12188>).

These monitoring approaches would tend to collect species presence and species abundance, or relative abundance data, and protocols would be needed to determine how to best convert some of these metrics into favourable condition status for habitat level protected features.

These new monitoring approaches should add to, and not replace, monitoring of the features for which the site is protected. However, citizen science approaches could provide valuable data at more regular time intervals than statutory monitoring programmes.