

## **Sustainable Management of UK Marine Resources Programme (SMMR)**

### **Organisation: Scottish Natural Heritage**

Scottish Natural Heritage is the statutory nature conservation body (SNCB) responsible for advising Scottish Ministers on all matters relating to the natural heritage.

Our purpose is to:

- promote, care for and improve our natural heritage
- help people to enjoy nature responsibly
- enable greater understanding and awareness of nature
- promote the sustainable use of Scotland's natural heritage

We also advise local authorities, and work with the Scottish Parliament and public, private and voluntary organisations towards shared aims.

We play a key role in influencing marine strategic planning, policy and decision-making through our work on MPAs, Priority Marine Features, marine planning and marine licences. Our work in the marine and coastal environments includes coastal and seabed habitats, marine mammals, birds and fish, marine ecosystems, nature-based solutions, blue carbon, and developing our marine biodiversity evidence-base as outlined in [SNH's Strategic Evidence Needs](#) paper.

We welcome the opportunity to feed into these discussions. Our comments below reflect our experience working at science-policy interface.

We're supportive of further development of models and other tools to help support decision-making and sustainable management of marine resources. In our view however, often the key issue holding back application of models and use of tools is significant uncertainties in underlying evidence base/understanding of systems. As an overarching comment we would support bids that addressed these fundamental uncertainties as integral part of developing new approaches.

#### **i.) Do you have any specific requirements related to the objectives and themes of the SMMR programme?**

As noted above, SNH is the statutory nature conservation adviser to Scottish Government. As such we have a broad interest in the themes of the SMMR programme. In this section we have highlighted interests relating more to social sciences, and particularly to gaining a better understanding of societal values and the benefits from marine resources on which Scotland relies. These should be viewed in conjunction with the suggestions under ii.) below. The latter relate more to research that would help to address some of the underlying uncertainties in our understanding of marine ecosystems.

- Valuation of ecosystem services (including resources and benefits) beyond the easier ones e.g. coastal defence - SEIAs from consultants still struggle to get numbers, method to articulate this. (Theme 2). Understanding better how differing components of the public value marine areas would be really helpful and to see whether this changes over time.
- Linked or separate to the above – benefits of marine nature to people, that don't necessarily have monetary value (intrinsic values), in a more useful way to draw into decision making.

- Value systems of people in different areas of Scotland and views over MPAs - why are some areas engaged/not so and how do we most effectively build on this for the different areas e.g. east coast. (*Some of this already being done through MarPAMM approaches in the Outer Hebrides*).
  - Managing ecosystems and their services when we've designated MPAs on specific features (*maybe less of an issue for the SACs with large scale physiographic features but is there work we could do for other sites beyond what we have done already in terms of Conservation Objectives etc*).
  - [Scotmer research priorities](#) - particularly the socio economic theme and overarching ecosystem services approach. Scotmer contact is [Janelle.Braithwaite@gov.scot](mailto:Janelle.Braithwaite@gov.scot) for further information.
  - A better understanding of public attitudes in Scotland to the visual and other impacts of offshore wind farm presence and operation. Does this change over time? This would embrace both inherent characteristics of the communities and landscapes/seascapes affected as well as the location and design of the wind farms themselves.
  - Informing the development of future fishery management in Scotland (and wider UK). There are two particular topics of interest:
    - a. Implementing ecosystem-based management of marine fisheries, including integration of natural capital concepts.
    - b. Ecology and conservation of fish in inshore waters: to underpin both nature conservation and fishery management.
  - Conservation of marine biodiversity (nature) in optimising resilience to climate change (but within that broad theme, with focus on shellfish species - see below).
  - Meeting the challenge of invasive non-native species - particularly prevention of spread of species that are present in UK but not in Scotland, with focus on those that are threat to MPA network or to industries.
- ii.) **Do you have areas where the development of systems, models, concepts or processes are needed to make decisions, develop policy, understand complex interactions and the implications of human behaviour in managing marine resources?**
- Developing management effectiveness/adaptive management tools that are meaningful to all stakeholders and MPA managers/regulators and allows shared understanding of how well an MPA is doing, not just ecologically but socially and economically.
  - Understanding more about connectivity in marine systems. This would include the further development of models, but also research to improve understanding of critical parameters (e.g. larval behaviour and duration, genetics). Applications include better understanding of connectivity within MPA networks but also between the MPA network and wider seas.

- Understanding and managing impacts of fish farms on benthic habitats and on wild fish. Examples of particular interest would be impacts on hard substrates and on salmonid-sea lice interactions.
  - Investigate cumulative anthropogenic noise levels in the marine environment, evaluating short and long-term effects on marine mammal populations from exposure to underwater noise (see also [Marine Mammal Scientific Support Research Programme](#)).
  - Understanding mobile predators and mobile prey interactions – prey quality, abundance and distribution as an influencing factor affecting predator populations. How do we measure quality, sufficient abundance and take account of distribution changes to inform management advice?
  - Also tagging studies to look at ‘at-sea’ foraging behaviour and range for seals and marine birds. Better understand mobile species use of marine environment, to inform management.
  - Inshore wintering waterfowl: Understanding of energetic consequences of repeated/prolonged disturbance events; potential for habituation to regular disturbance and, the (breeding site) origins and age/sex composition of wintering populations at a site level and consequences of individual mortality for wintering numbers in subsequent years – to inform management at marine SPAs.
  - Developing automated image recognition for population monitoring and behavioural categorisation of breeding seabirds. The driver behind this from an SNH perspective is twofold. First with increasing pressures on resources our monitoring of protected areas is under review. Given the changes to the climate and environment it is a key time to strengthen our monitoring rather than reduce it – therefore we would like to explore less resource intensive methods to maintain our understanding at the least of population numbers. We also want to go through a process of calibrating the methods. Second, we would like to find methods that could enable widespread monitoring of colonies with connectivity to windfarms that could be undertaken by developers with clear methodologies and analyses that could be easily replicated.
  - Implementing ecosystem-based management:
    - Fish in inshore waters (follow up from our workshop) – developing and integrating the protection of ‘critical fish habitat’ in support of fishery management, development planning, and conservation of biodiversity (i.e. birds/mammals in relation to forage fish species – see above also).
    - Mitigating risks of fisheries to large (protected) marine animals – developing solutions in entanglement / incidental catch via operational practices and management measures.
  - Marine INNS:
    - Achieving the marine INNS objectives has been particularly challenging due to the need for some fundamental change in behaviour and attitudes towards biosecurity, in the context of regulators, industries and ‘the public’. Underpinning work required includes modelling (ecological and behavioural) and social science of behavioural change and communication.
- iii.) **Do you have any potential case studies that you would like to see as part of a project?**

- Appraisal of marine planning systems and how they encompass wider management issues (e.g. relating to tourism, wildlife watching), including consideration of alternative approaches, especially those that have led/are considered likely to lead to behaviour change and buy-in from stakeholders.
- Interest in geographic areas that would be good candidates in addressing the topics identified above:
  - Clyde (in support of marine planning, sustainable marine fisheries ....other topics)
  - Orkney (in support of marine planning, sustainable marine fisheries ....other topics)

**iv.) Would you (your organisation) be interested in participating in a project as part of a project team or in advisory capacity on a relevant project steering group?**

- Yes, dependent on project relevance and time resource involved. We would like to encourage people to get in touch at an early stage to discuss proposals likely to be of mutual interest. We would be interested in discussing proposals relevant to us being an 'end-user' of outputs, as well as those in which we might have a more active role as partners.