Appendix 12. Guidance for Data Researchers

Biology & Sensitivity Key Information reviews aim to "support marine environmental management, protection and education". Therefore, they target the information required to achieve that aim. The reviews are designed to be read by a wide audience, from environmental managers and statutory agency staff to marine scientists and members of the public. Therefore, the writing style should be concise, yet accurate and the text kept to a minimum. It should be remembered that many environmental and coastal managers are not marine biologists. The defined categories used in the Key Information template and Web pages present large amounts of information in a short, concise manner.

Full Key Information reviews will, once refereed and updated, be cited as peer reviewed publications.

Time constraints

Due to the nature of our deadlines, it is important to be conscious of our time constraints. We aim to complete a species review (from literature review to completed draft review) within **3-5 days** and a biotope review within **<5 days.** However, the level of information that needs to be collated and read through varies with the species or biotope. Therefore, following guidelines are given to minimise data research time. Suggested time and text limits are given.

Literature retrieval (0.5 -1 day)

Keep the literature search targeted on the information and categories covered by the Key Information template, sensitivity, and recoverability.

- Begin by using the NMBL database and ASFA. Only if few references are found should the search be expanded to Web of Science and NISC.
- Examine the *MarLIN* bibliography and our stock of photocopies and reprints for relevant general information. Members of the *MarLIN* team can advise on relevant information sources.
- Search by species name and common name in the first instance. If large numbers of references are found the following keywords can be used to focus the literature review of species:
    - growth and reproduction;
    - recruitment and mortality;
    - impacts and pollution;
    - each environmental factor, e.g. siltation, suspended sediment, wave exposure, diseases;
    - harvesting and fisheries.
- Biotope literature reviews should focus on general material on the relevant dominant functional groups (e.g. fucoids, sponges, burrowing infauna, etc) and intertidal or subtidal ecology. If large numbers of references are found the following keywords can be used to focus the literature review of biotopes:
    - community;
    - productivity;
    - impacts and pollution;
    - each environmental factor, e.g. siltation, suspended sediment, water flow etc.;
    - exploitation (harvesting and fisheries);
- Prioritise review papers and reports.
- Avoid information that is not directly relevant to environmental management, conservation, and protection or the assessment of sensitivity and recoverability. The reader should be directed to sources of this information if important, i.e.; the species /biotope is well studied and the review would appear to be remiss if the information is not mentioned. For example the following information is not relevant:
    - genetic and biomedical information, except where harvesting for biomedical or pharmaceutical products may be a threat to the population / community;
    - evolution and phylo-genetics, except where pertinent to taxonomy;

- molecular and cellular biochemistry and physiology, unless directly relevant to sensitivity, e.g. anaerobic metabolism and tolerance of anoxia; and
- neuro-physiology.

Writing style

- Key Information reviews should be written in the style of scientific reports or reviews. Detailed aspects are covered under the house-style guidelines.
- Text should be concise, as short as possible without losing detail.
- Technical terminology and jargon should be kept to a minimum or explained in the text. Where necessary scientific terms should be added to the relevant glossary.
- Avoid extrapolation from the available information. Where the information does not support a decision or does not provide adequate detail insert 'data deficient' or 'insufficient information', as appropriate. Where the available information on a subject area is missing, insert 'no information found'.
- References should be given in the text, in short format, as they are mentioned (e.g. Jones, 1997; Jones & Jones, 1998; Jones *et al.*, 1999). Wherever possible the original source reference should be cited, even if the information is retrieved from a review paper or report.

Completing the species Key Information *pro forma* (2-4 days)

General

- Pay particular attention to information required for the management or conservation of the species and the assessment of its sensitivity and recoverability.
- Keep to the Key Information template categories (and automated glossaries).
- Add "additional information" where aspects of a species or biotopes ecology do not fit neatly within the defined categories. "Additional information" is also used to clarify ambiguous material or to add Key Information that would be omitted otherwise.
- Keep the writing style short, concise and use bullet points wherever possible.
- Keep "additional information" to a minimum, **no more than 3 paragraphs (max. 300 words).**
- Point the reader to sources of detailed information rather than re-iterate the information.
- **You should aim to spend about 1 day reading, <1 day on the biology Key Information, and 1-2 days on sensitivity and recoverability.**
- Where a biotope or species has been poorly studied only readily available information should be used. Information that can not be obtained within **<3 days** should be ignored in the draft review and not subject to further research. Our referees or outside experts may add relevant material in due course.

Basic information

- The "basic information" page is likely to be read by the widest audience, including members of the public and school children.
- Keep jargon and technical terms to a minimum and/or explain terms where possible.
- The description should be no more than a single paragraph. Exceptions and similar or confused species can be mentioned in additional information.

Taxonomy and Identification

- Taxonomic information is supplied by the MCS Species Directory and no further research is required.
- List key identification features as single line bullet points to allow the user to distinguish between species but do not try to duplicate the detail of an identification key.

General biology

- Most fields can be completed using the pull down fields.
- Add additional information to clarify ambiguous points or exceptions to the general biology fields. Emphasize seasonal and temporal changes.
- Do not complete larval general biology.

Habitat preferences and distribution

- Distribution maps are based, primarily, on readily available survey information gleaned from the MNCR database (via MERMAID or searchnbn.net), published flora and fauna, identification guides (e.g. Linnean Society Synopses of British Fauna), and other survey data from papers, reports or held within the *MarLIN* Data Access Sub-programme.
- Do not complete larval distribution.

Reproduction and longevity

- Pay particular attention to factors that affect mortality (larval, juvenile and adult) or reproductive success.
- Factors affecting reproductive success, larval mortality and recruitment inform our decisions on recoverability.
- Note that modes of reproduction are highly variable and several of the Key Information template categories may need clarification in additional information.

Sensitivity and recoverability

Sensitivity and recoverability rationale must be able to justify the assessments. In many cases this function requires a high level of detail, so that the user can compare the presented data with our benchmarks or a predicted impact or proposed activity. It is important to present both information demonstrating impacts, and information demonstrating no effect. The opinion given in the sensitivity assessment must be seen to be transparent, balanced, and impartial. **However, text should be kept to a minimum, no more than two paragraphs, bulleted where possible (about 200 words, with a maximum of about 300 words).**

- The flow charts presented in *MarLIN* Report no. 4 should consulted when assessing sensitivity or recoverability.
- The flow charts ensure that assessments are made in a systematic manner. The flow charts are particularly useful for making 'common sense' assessments when little information is available.
- The assessment should be included in the text, for example; "…therefore, a sensitivity of high has been recorded." A similar statement should be made for recoverability. Each rationale should be written to 'stand alone' as the user may only read the rationale for the factor of interest.
- To avoid repetition, general background information on recoverability may be placed under "additional information." Any information placed in " additional information" should be referred to with the phrase 'see additional information below'.
- Do not complete larval sensitivity and recoverability. Insert 'Not researched' and 'Not relevant' as appropriate. Point the reader to surrogate species, where the research has already been undertaken, e.g. *Mytilus edulis* for bivalves, *Hediste diversicolor* for annelids and *Asterias rubens* for echinoderms.

Importance

Include information to clarify the "commercial importance" fields. Pay attention to information on important communities or species supported by the species (e.g. wildfowl are dependant on inter-tidal mudflat communities) and the species importance to man, if any (e.g. the species importance in stabilising sediment and, hence, coastal defence). Additional information should be kept to a minimum (see above).

Completing the biotope Key Information *pro forma* (2-4 days)

General

- Pay particular attention to information required for the management or conservation of the biotope and the assessment of its sensitivity and recoverability.
- Keep to the Key Information template categories (and automated glossaries).
- Keep the writing style short, concise and use bullet points wherever possible.
- Keep "additional information" to a minimum, **no more than a paragraph (less than 150 words).**
- Point the reader to sources of detailed information rather than re-iterate the information.
- **You should aim to spend about 1 day reading, 1 day on the ecology Key Information, and 1-2 days on sensitivity and recoverability.**
- Where a biotope or species has been poorly studied only readily available information should be used. Information that can not be obtained within **<3 days** should be omitted in the draft review. Our referees or outside experts may add relevant material in due course.

Basic Information

- Automatically brought in from the Biotope dictionary (Connor *et al.*, 1997a,b).
- National status, as stated in the biotope manual or 'Not available'.

Biotope classification - automated

- Add information on other classification schemes where available, e.g. EUNIS.

Ecology and additional ecology

- Include key points about the ecology of the biotope that are of particular relevance to environmental management, conservation or protection.
    - Ecological relationships – a statement of the major relationships and interactions between species within the biotope e.g. food web, primary and secondary producers, predators and competition (for space, light or resources).
    - Habitat complexity – a description of the structure and diversity (physical and community) of the biotope.
    - Productivity – a description of the relative primary and secondary productivity of the biotope.
    - Temporal and seasonal change – a description of seasonal, annual or other temporal changes within the biotope, especially dynamic cyclic changes in the community (e.g. Kelp –urchin interactions and fucoid-barnacle dominance).
    - Recruitment processes – a description of the processes involved in the recruitment of the key and characterising species within the biotope, together with the biotopes role in the recruitment of other species, e.g. nurseries.
    - Time to reach maturity – a description of the time and processes required for a community to reach maturity, together with the factors likely to affect the time required. Maturity is pragmatically defined as the fully diverse, or complex community exemplified by the biotope.
- Biotope ecology provides space for considerable amounts of information. However, most users, especially rushed consultants and statutory agency staff, will not read large volumes of information. Therefore, keep the text to a minimum, e.g.:
    - no more that two paragraphs per section, up to 300 words;
    - no more than one bullet per tropic level under "ecological relationships", up to 400 words (500 max.); and
    - no more than one bullet point per level of complexity within "habitat complexity", up to 400 words (500 max.).

Habitat preferences and distribution

- Distribution maps of biotopes should be based on the MNCR database (via MERMAID or searchnbn.net) and the MNCR area summaries.
- In the short term, ignore the discrepancies between the MNCR database, MNCR biotope manual, MNCR area summaries and Reg. 33 guidance notes. Biotope distribution maps may be updated as additional staff resources become available.

Species composition

- 'Species indicative of biotope sensitivity' are chosen using the criteria laid down in *MarLIN* Report no. 4.
- Where possible species important or key to the ecology of the community are chosen. Where the ecology is poorly understood characterising species are chosen as surrogates. The reasons for choosing each species should be detailed in the following explanation. Information concerning species richness and survey data should be included under " additional information".

Sensitivity and recoverability

- The writing style follows the same criteria as for species above.

The "species indicative of biotope sensitivity" are used to derive sensitivity and recoverability assessments for each factor using the rationale and flow charts laid out in *MarLIN* Report no. 4. The assessments should take into account the general ecology of the biotope, including the other species within the biotope, and the sensitivity and recoverability assessments modified accordingly. **However, text should be kept to a minimum, no more than three paragraphs, bulleted where possible (about 300 words, with a maximum of about 400 words).**

- Species richness – potential effects on species richness have proven difficult to assess, and are often subjective. The likely effect of a change in an environmental factor on species richness as a result of its sensitivity is recorded, e.g. 'high' sensitivity is likely to cause a major decline in species richness. Recoverability is not taken into account. This is a change from the original rationale (see *MarLIN* Report no. 4).

Importance

- pay particular attention to information concerning the importance of the biotope for other species, not included within the biotope such as predatory or herbivorous fish, wildfowl or man.
- Do not research or complete information concerning potential management measures or practice for biotopes. This is beyond the scope of the programme.