

Evidence for damage to marine habitats: a literature review.

Gaping File Shell Nests (*Limaria hians*)

Introduction:

It has long been recognised that reef-forming organisms such as beds of oysters and mussels and tubeworms represent keystone species, which form complex structural habitats of high biodiversity (Holt et al., 1998; Moore et al., 1998; Hall-Spencer & Moore, 2000). The biogenic reef associated with the gaping file shell, also known as the flame shell, (*Limaria hians*) has so far received very little attention in the scientific literature (Hall-Spencer & Moore, 2000). Holt et al. (1998) defined biogenic reefs as 'solid, massive structures which are created by accumulations of organisms, usually arising from the seabed, or at least clearly forming a substantial, discrete community or habitat which is very different from the surrounding seabed. The structure of the reef may be composed almost entirely of the reef building organism and its tubes or shells, or it may to some degree be composed of sediments, stones and shells bound together by the organisms'. The authors stated that *Limaria hians* beds, although capable of binding sediment with their byssus threads, are probably best regarded as semi-infaunal bivalve beds. However, Hall-Spencer & Moore (2000) suggest that *L. hians* beds can meet all of the criteria of the above definition and argue that these beds should be accorded a greater conservation priority. *Limaria hians* beds were listed as a UK Biodiversity Action Plan (UK BAP) habitat in February 2007.

The importance of *Limaria hians*:

One of the most striking features of *L. hians* is the array of organisms that are associated with the physical structure provided by the nests. The nests are encrusted by a number of sessile organisms, such as macroalgae, hydroids and barnacles, which use the nests as a surface for attachment in an otherwise sedimentary habitat (Hall-Spencer & Moore, 2000). These authors recorded a further 265 invertebrate macrofauna species associated with six *L. hians* nests in Creag Gobhainn, Loch Fyne. One of the finest examples in Scotland of a dense *L. hians* bed is located in Laudale Narrows, Loch Sunart. *L. hians* was found to occupy an area of at least 87 ha on sediments from coarse sand to muddy sand at depths of 2–47m, although dense *L. hians* (>50% nest cover) was restricted to coarse sediments in the strongest tidal currents at 3–30m (Bates et al., 2004a). Other good examples of *L. hians* nests are also found in Loch Teacus, Loch Laxford and Loch Alsh (Bates et al., 2004a; Bates et al., 2004b; Mair et al., 1998).

Evidence of damage to *Limaria hians*:

Records prior to the 1970's show that *L. hians* was once widespread and common on sublittoral gravel, but that they have now disappeared from previous strongholds in Bute and Great Cumbrae, where only their dead shells now remain (Hall-Spencer & Moore, 2000). Possible causes of this apparent decline in *L. hians* include physical damage from scallop dredging and/or mooring chains and the past use of tributyl tin (TBT) as an antifouling agent.

Conclusion:

Hall-Spencer & Moore (2000) concluded that the patchy distribution and apparent declines in the numbers of *L. hians* around the British Isles indicates that this species should be allocated a conservation status that is equivalent to that accorded to other biogenic reef-forming organisms. In the longer term, the best remaining examples of these reefs should be surveyed and afforded protection within the network of SACs or as species/habitats of national importance designated as Nationally Important Marine Areas under a Scottish Marine Bill.

References:

- Bates, C. R., Moore, C. G., Harries, D. B., Austin, W. and Lyndon, A. R. (2004). Broad scale mapping of sublittoral habitats in Loch Sunart, Scotland. *Scottish Natural Heritage Commissioned Report No. 006* (ROAME No. F01AA401C).
- Bates, C. R., Moore, C. G., Harries, D. B., Austin, W. and Mair, J. (2004). Broad scale mapping of sublittoral habitats in Loch Laxford, Scotland. *Scottish Natural Heritage Commissioned Report No. 004* (ROAME No. F01AA401A).
- Hall-Spencer, J. M. and Moore, P. G. (2000). *Limaria hians* (Mollusca : Limacea): a neglected reef-forming keystone species. *Aquatic Conservation-Marine and Freshwater Ecosystems* **10**, 267-277.
- Holt, T.J., Rees, E.I., Hawkins, S.J. and Seed, R. (1998) Biogenic Reefs (volume iX). An overview of dynamic and sensitivity characteristics for conservation management of marine SACs. Scottish Association for Marine Science (UK Marine SACs Project). 170 pp.
- Mair, J.M., Moore, C.G., Kingston, P.F. & Harries, D.B. (2000) A review of the status, ecology and conservation of horse mussel *Modiols* *modiolus* beds in Scotland. *Scottish Natural Heritage Commissioned Report F99PA08*.
- Moore, C. G., Saunders, G. R. and Harries, D. B. (1998). The status and ecology of reefs of *Serpula vermicularis* L-(Polychaeta : Serpulidae) in Scotland. *Aquatic Conservation-Marine and Freshwater Ecosystems* **8**, 645-656.

For further information please contact.

Alan Wells

Marine Bill Research Officer, Scottish Environment LINK

Tel: 01350 728200, Mobile: 07920 287086, Email: alan@scotlink.org