

MARINE BIODIVERSITY AND CLIMATE CHANGE (MARCLIM)

KENDALL & LEWIS TROCHID RE-SURVEYS: FINAL REPORT

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Introduction

The 'southern' trochid gastropod *Osilinus lineatus* reaches its northern limits of distribution in Britain and Ireland. Kendall surveyed sixteen sites close to the northern range edges in 1986 (Figure 1). Population surveys of *O. lineatus* were carried out at all sixteen sites in 2002 and ten of the original sites were resurveyed again in 2003 (Table 1). Aberaeron was not resurveyed as the heavy sedimentation event observed in 2002 had rendered the habitat unsuitable for recruitment of this species. Ten of these sites will be resurveyed again in 2004. They have been selected as long-term sites for the MarClim monitoring network.

Table 1. Historical sites for *Osilinus lineatus* survey.

Site	OS Ref	Sampled			
		1986	2002	2003	2004
Aberaeron	SN457633	x	x	-	-
West Angle Bay	SM848038	x	x	x	x
Hartland Quay	SS221248	x	x	x	x
Welcombe Mouth	SS211179	x	x	x	x
Widemouth	SS197027	x	x	x	x
Crackington Haven	SX138972	x	x	x	x
Wembury	SX513483	x	x	-	x
Noss Mayo	SX537475	x	x	x	x
Prawle Point	SX776351	x	x	x	x
Churston	SX918570	x	x	x	x
Lyme Regis	SY329910	x	x	x	x
Brignogan	N/A	x	x	-	-
Roscoff	N/A	x	x	x	-
Ille Callot	N/A	x	x	-	-
Le Guersit	N/A	x	x	-	-
Locquirec	N/A	x	x	-	-

The 'southern' trochid gastropod *Gibbula umbilicalis* also reaches its northern limits of distribution in Britain and Ireland. Kendall & Lewis surveyed seven sites close to the northern range edges from 1979 to 1986 (Figure 2). Population surveys of *G. umbilicalis* were carried out at all 7 of the original sites in 2002 and at 6 of the original sites in 2003 (Table 1). All seven of these sites will be resurveyed again in 2004. They have been selected as long-term sites for the MarClim monitoring network to ensure that the time-series re-started in 2002 will continue.

Table 1. Historical sites for *Gibbula umbilicalis* re-survey.

Site	OS Ref	Number of times sampled per year											
		1977	1978	1979	1980	1981	1982	1983	1984	1985	2002	2003	2004
Skerray	NC661640	1	2	1	1	1	0	1	1	1	1	1	1
Eriboll	NC445582	1	3	4	2	2	2	2	2	0	1	0	1
Scourie	NC148449	5	0	0	0	2	0	1	1	1	1	1	1
Culkein	NC042335	0	0	5	3	3	2	0	1	1	1	0	1
Clashnessie	NC062315	0	0	0	0	1	1	0	1	0	1	0	1
Widemouth	SS191010	0	0	2	3	3	1	0	1	0	1	0	1
Osmington	SY733817	1	2	2	2	3	1	1	1	0	1	1	1

Figure 1. *Osilinus lineatus* population study sites.

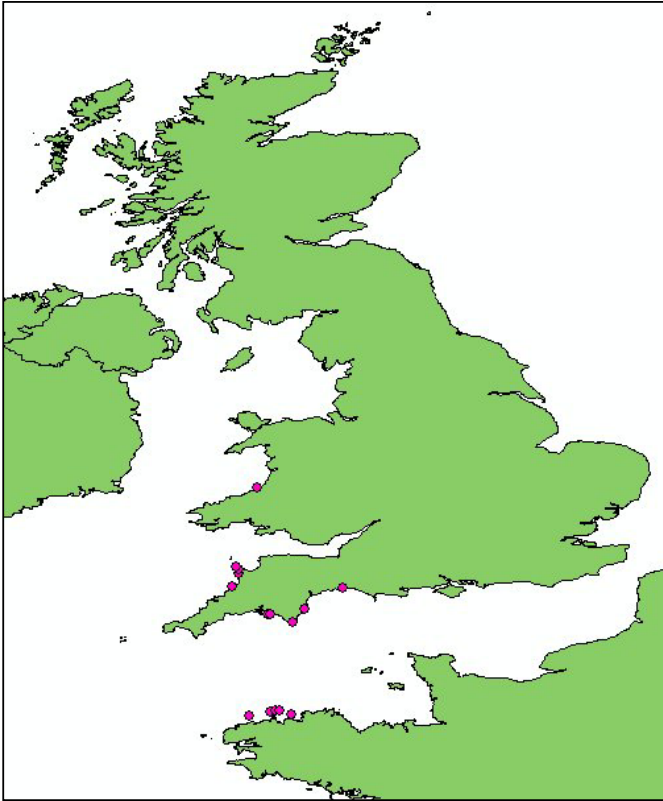
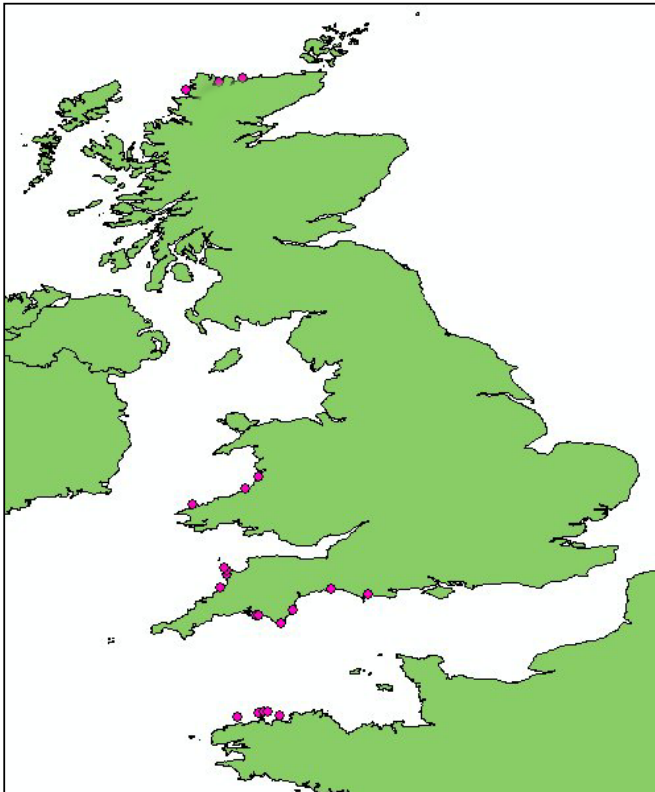


Figure 2. *Gibbula umbilicalis* population study sites.



Results to date

Analyses of the *O. lineatus* data from 2003 confirm the results from analyses of the resurveys conducted in 2002. Abundance has significantly increased in all populations studied since 1986 (Figure 3) except for Aberaeron, where a small-scale disturbance had adversely affected the population. Adult size has correspondingly increased at these sites (Figure 4). A manuscript entitled “Long-term changes in the distribution, size age and longevity of some near-limit populations of the Trochid Gastropod *Osilinus lineatus*” has been submitted to the Journal of the Marine Biological Association for publication.

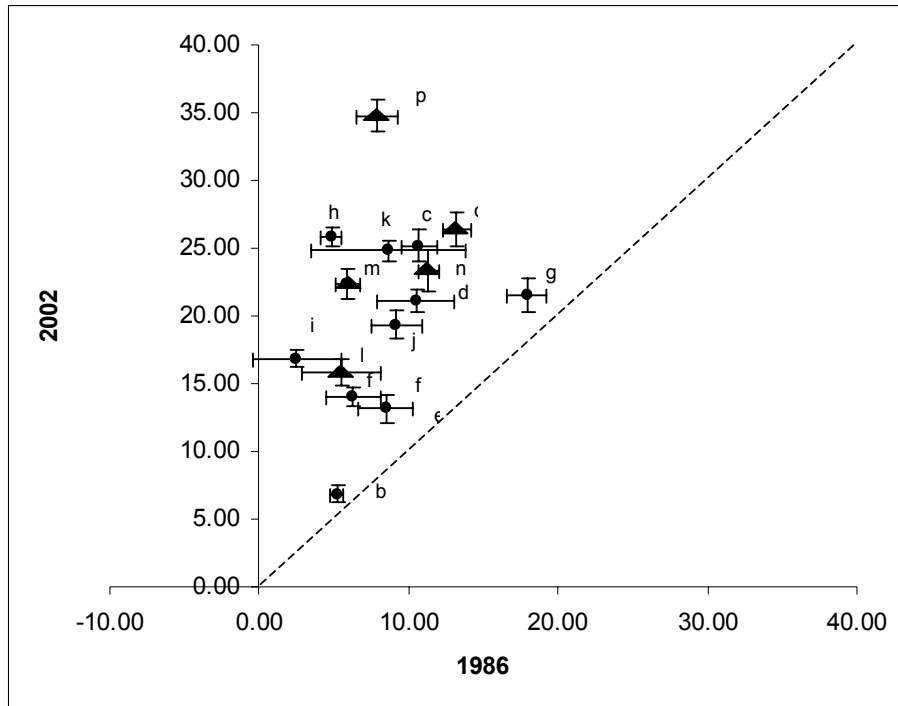


Figure 3. Abundance of *O. lineatus* in 1986 plotted against that at the same sites in 2002. Error bars are one standard error either side of the mean. If abundance had been identical in the two years then points would be distributed on the dashed line. ● = Sites in Wales or England ▲ = sites in France. Key to site names (following Kendall 1987): b; West Angle, c; Hartland Quay. d; Welcombe Mouth. e; Widemouth. f; Crackington Haven. g; Wembury. h; Noss Mayo. i; Prawle Point. j; Churston. k; Lyme Regis. l; Brignogan. m; Roscoff. n; Ille Callot. o; Le Guersit. p; Locquirec.

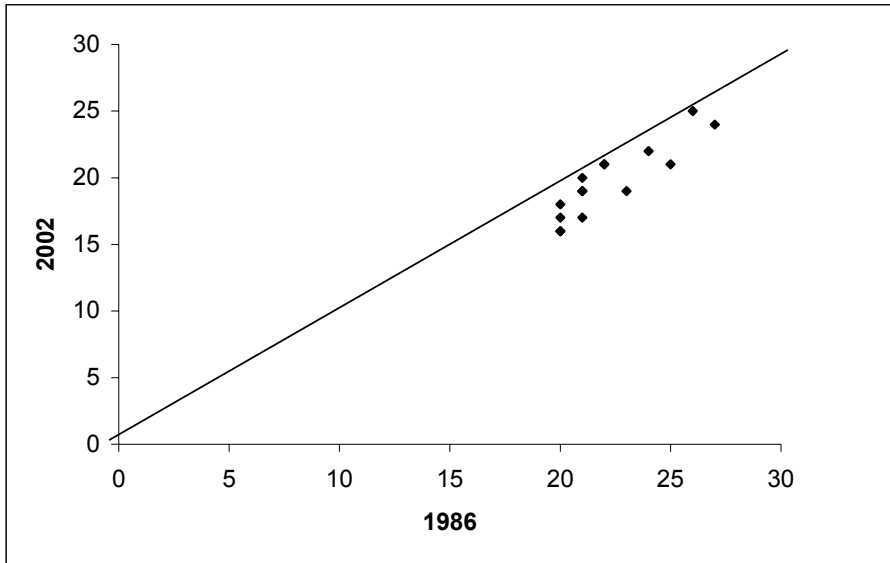


Figure 4. Plot of the diameter of *O. lineatus* shells at the 90th percentile of a cumulative frequency plot in 1986 against the same diameter in 2002. If shell diameter had been identical in the two years points would be distributed on the line.

Analyses of the data collected for *G. umbilicalis* in 2002 and 2003 also shows a significant increase in abundance at all sites except Loch Eriboll, on the north coast of Scotland (Figure 5). Loch Eriboll is the only site within the time-series to have consistently successful recruitment, which is likely to be due to the limitations of larval dispersal imposed by the low flushing rate of the Loch. At all sites, recruitment success has occurred more frequently during recent years in comparison to the late 1970s and early 1980s. A manuscript is currently in revision and will be submitted to a peer-review journal in 2004.

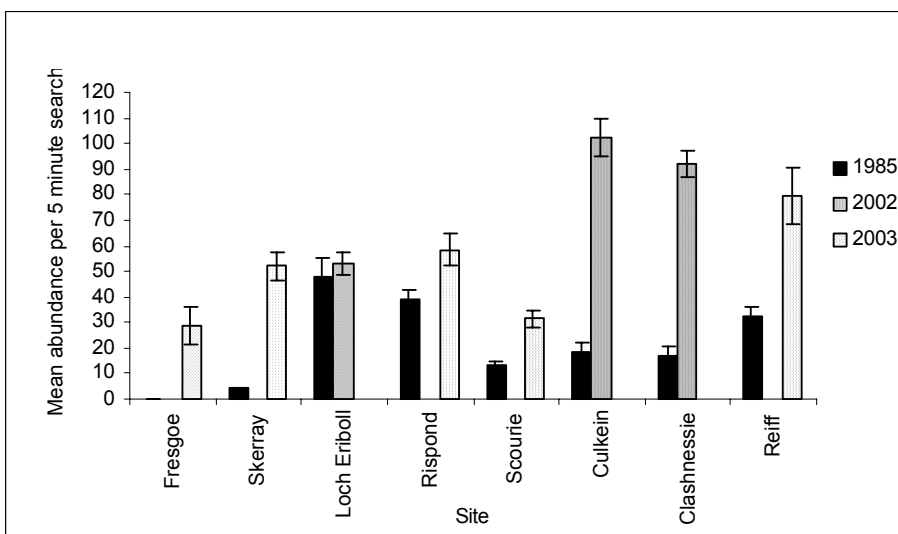


Figure 5. Mean abundance per 5-minute search for populations at Scottish sites in 1985, 2002 & 2003.

In addition, *O. lineatus* and *G. umbilicalis* abundances have been assessed as part of the broadscale re-

survey to provide context for these targeted resurveys. A paper has also been submitted to the Journal of the Marine Biological Association of the UK reporting on transplant experiments undertaken in the 1980s.