Supplementary information for Firth et al. (2020). Specific niche requirements underpin multidecadal range edge stability, but may introduce barriers for climate change adaptation. *Diversity and Distributions.* https://doi.org/10.1111/ddi.13224

Appendix 1 – Data Sources

This document provides a summary of the sources of all of the records in Table 1 and a bibliography of all of the sources below separated into three sections:

1. Open access databases
2. Academic papers/publications
3. Reports
4. Unpublished theses

All of the 981 records of presence and absence from this study have been entered into a global database that is available at:

Curd, A., Cordier, C., Firth, L. B., Bush, L., Gruet, Y., Le Mao, P., Blaze, J. A., Board, C.., Bordeyne, F., Burrows, M. T., Cunningham, P. N., Davies, A.J., Desroy N., Edwards H., Harris D.R., Hawkins, S. J., Kerckhof, F., Lima, F. P., McGrath, D., Meneghesso, C., Mieszkowska, N., Nunn, J. D., Nunes, F. L. D., O' Connor, N. E., O' Riordan, R. M., Power, A. M., Seabra, R., Simkanin, C., & Dubois, S. F. (2020). A broad-scale long-term dataset of *Sabellaria alveolata* distribution and abundance curated through the REEHAB (REEf HABitat) Project. SEANOE. https://doi.org/10.17882/72164

Supplementary information for Firth et al. (2020). Specific niche requirements underpin multidecadal range edge stability, but may introduce barriers for climate change adaptation. *Diversity and Distributions.* https://doi.org/10.1111/ddi.13224

Data quality assurance and control

Caution had to be used in dealing with historical records and databases such as OBIS, GBIF and NBN due to potential mis-identification and data entry errors. These data points were carefully quality-controlled and duplicate and dubious records discarded.

Both *S. alveolata* and its congener *Sabellaria spinulosa* Lamarck occur in Irish waters. Whilst *S. alveolata* and *S. spinulosa* tend to be primarily found in the intertidal and subtidal zones respectively, *S. alveolata* is known to occur subtidally in Ireland (de Grave & Whittaker, 1997). *S. spinulosa* is known to co-occur subtidally with *S. alveolata* in the Mediterranean (Bertocci et al. 2017, *Marine Environmental Research*, 130: 325-337) and is occasionally found in the lower intertidal in Ireland (Nunn, pers. obs.).

The first references to *S. alveolata* in Ireland were from Belfast Lough (Templeton, 1836), where it was subsequently described as "common in some parts of Belfast Bay [Lough], between tide marks" (Thompson, 1856). Since then 22 surveys have been conducted by the authors throughout Belfast Lough with no occurrences recorded. Of the 25 records from nearby Strangford Lough, only a single positive observation was recorded in 2010 (Smyth and Roberts, 2010). In 2018, for the first time, intertidal sabellariids were observed at a number of sites in both Belfast and Strangford Loughs. Consultation with a polychaete taxonomist revealed that all 2018 specimens sampled from these locations were *S. spinulosa* and not *S. alveolata*. Therefore, we assume that all pre-existing published references to *S. alveolata* in Belfast Lough

(Templeton, 1836; Thompson, 1844, 1856) and Strangford Lough (Smyth & Roberts, 2010) were misidentified and were actually *S. spinulosa*. These records were included in the database but treated as absences and explanatory notes inserted for future researchers. Finally, samples of *S. alveolata* individuals were collected for genetic analysis from a subset of 12 locations spanning the entire coastline of Ireland. All of the individuals sampled were confirmed as *S. alveolata* and not *S. spinulosa*.

Table 1. Summary of sources of all records, presents as the total number and % of the overall dataset.

Source type	**Number**	**%**
Authors of this paper	537	54.7
Crisp/Southward	235	24.0
Scientific papers	27	2.8
National Parks and Wildlife Services Reports	8	0.8
Other reports	33	3.4
Museum specimens	5	0.5
Unpublished theses	52	5.3
Unpublished paper by Yves Gruet	9	0.9
Personal communications	16	1.6
Databases (OBIS, GBIF, NBN)	53	5.4
Irish National Biodiversity Data Centre (NBDC)	6	0.6
Total number of records	**981**	

1. Open access databases

Global Biodiversity Information Facility, GBIF. (2018). *Sabellaria alveolata*. GBIF occurrence download https://doi.org/10.15468/dl.irmzuj. Accessed 11th August 2018

National Biodiversity Data Centre, NBDC. (2018). *Sabellaria alveolata*. Occurrence download from www.obis.org. Accessed 10th August 2018

National Biodiversity Network, NBN. (2018). *Sabellaria alveolata* NBN Atlas occurrence download from http://nbnatlas.org. Accessed 11 August 2018.

Ocean Biogeographic Information System, OBIS. (2018). *Sabellaria alveolata*. OBIS occurrence download from http://www.iobis.org/explore/#/taxon/505188 Accessed 10th August 2018

2. Academic papers/publications

Boaden, P. J. S., Gotto, R. V., Hartnoll, R. G., & Williams, G. (1964). North-East Ireland. In Crisp, D. J. (1964) The effects of the severe winter of 1962-63 on marine life in Britain. *Journal of Animal Ecology*, 33, 165-210. DOI: 10.2307/2355 https://www.jstor.org/stable/2355

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Humphreys, J. D. (1845). The Mollusca, Crustacea and Echinodermata. In Contributions towards a fauna and flora of the county of Cork. George Purcell and Co., Cork, Ireland.

Keegan, B. F., O'Connor, B. D. S., McGrath, D., Könnecker, G., & Ó Foighil, D. (1987). Littoral and benthic investigations on the south coast of Ireland: II. The macrobenthic fauna off Carnsore Point. *Proceedings of the Royal Irish Academy. Section B: Biological, Geological, and Chemical Science*, 87b, 1-14. https://www.jstor.org/stable/20494465

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Annual Reports and Proceedings of the Belfast Naturalists' Field Club (1907-1913). Record is from the 1909-1910 report.

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National Parks and Wildlife Service, NPWS (2013). Site Synopsis: Tralee Bay and Magharees Peninsula, west to Cloghane SAC, site code 002070.

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4. Unpublished theses

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Patterson, F. (2015). There is no difference in the presence or abundance of the honeycomb worm *Sabellaria alveolata* on intertidal rocky shores in south west Ireland. BSc thesis submitted to the School of Biological, Earth and Environmental Sciences, University College Cork, Ireland.

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