



# MarLIN

## Marine Information Network

Information on the species and habitats around the coasts and sea of the British Isles

## Ross worm (*Sabellaria spinulosa*)

MarLIN – Marine Life Information Network  
Biology and Sensitivity Key Information Review

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**Please note.** This MarESA report is a dated version of the online review. Please refer to the website for the most up-to-date version [<https://www.marlin.ac.uk/species/detail/1133>]. All terms and the MarESA methodology are outlined on the website (<https://www.marlin.ac.uk>)

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*Sabellaria spinulosa* tubes.

Photographer:

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See online review for  
distribution map

Distribution data supplied by the Ocean  
Biogeographic Information System (OBIS). To  
interrogate UK data visit the NBN Atlas.

<b>Researched by</b>	Angus Jackson & Dr Keith Hiscock	<b>Refereed by</b>	Prof. Steve J. Hawkins
<b>Authority</b>	(Leuckart, 1849)		
<b>Other common names</b>	-	<b>Synonyms</b>	-

## Summary

### 🔍 Description

An occasionally gregarious segmented worm that builds tubes from sand or shell fragments. Found subtidally in exposed areas. Does not form reefs over most of its range being found mostly individually but may form thin crusts or large reefs up to several metres across and 60 cm high. Quite similar to *Sabellaria alveolata*.

### 📍 Recorded distribution in Britain and Ireland

All British and Irish coasts

### 📍 Global distribution

Arctic, North Sea, Channel, Atlantic

### 🏠 Habitat

Found on hard substrata on exposed, open coasts where sand is available for tube building. It is mainly subtidal but may be found in the low intertidal.

### ↓ Depth range

## Q Identifying features

- Inhabits a tube with round straight opening made from coarse, cemented sand or shell grains.
- Thorax with three pairs of flattened chaetal sheaths.
- Opercular chaetae in middle row point distally.
- Outer row chaetae taper with several serrations on either side.

## Additional information

At low densities, the tubes are attached to the substratum along the entire length but at greater densities competition for space results in the tubes overlapping and may cause the tubes to be built outwards, away from the substratum.

## ✓ Listed by

## Further information sources

Search on:

    NBN WoRMS

## Biology review

### ☰ Taxonomy

<b>Phylum</b>	Annelida	Segmented worms e.g. ragworms, tubeworms, fanworms and spoon worms
<b>Class</b>	Polychaeta	Bristleworms, e.g. ragworms, scaleworms, paddleworms, fanworms, tubeworms and spoon worms
<b>Family</b>	Sabellariidae	
<b>Genus</b>	Sabellaria	
<b>Authority</b>	(Leuckart, 1849)	
<b>Recent Synonyms</b>	-	

### 🌿 Biology

<b>Typical abundance</b>	High density
<b>Male size range</b>	20 - 30mm
<b>Male size at maturity</b>	
<b>Female size range</b>	Small-medium(3-10cm)
<b>Female size at maturity</b>	
<b>Growth form</b>	Tubicolous
<b>Growth rate</b>	Field unresearched
<b>Body flexibility</b>	
<b>Mobility</b>	
<b>Characteristic feeding method</b>	Active suspension feeder
<b>Diet/food source</b>	
<b>Typically feeds on</b>	Phytoplankton
<b>Sociability</b>	
<b>Environmental position</b>	Epifaunal
<b>Dependency</b>	Independent.
<b>Supports</b>	Substratum a variety of organisms. Forms a substratum for algae and shelter for small crabs etc. (particularly when forming reefs or crusts)
<b>Is the species harmful?</b>	No

### 🏛️ Biology information

Can be found in very high densities, for example when forming a reef. Typically found in lower densities as a crust or as individuals. At the Bristol Channel location studied by George & Warwick (1986), densities in excess of 4,000/m<sup>2</sup> for loosely aggregated *Sabellaria spinulosa* were recorded whilst the area sampled by Hiscock & Rostron (unpublished) on a level hard substratum had a single layer crust with 9,561 individual *Sabellaria spinulosa* in 1.4m<sup>2</sup>. There has been considerable concern about decline in *Sabellaria spinulosa* reefs and shrimp fisheries have been implicated in the decline. However, Vorberg (2000) could find no damage caused after experiments with shrimp trawls in the Wadden Sea and suggests that declines might be more associated with changing patterns of currents perhaps associated with construction, dredging and dumping.

## Habitat preferences

Physiographic preferences	Open coast, Offshore seabed
Biological zone preferences	Lower infralittoral, Upper infralittoral
Substratum / habitat preferences	Bedrock, Cobbles, Large to very large boulders, Small boulders
Tidal strength preferences	Moderately Strong 1 to 3 knots (0.5-1.5 m/sec.), Strong 3 to 6 knots (1.5-3 m/sec.)
Wave exposure preferences	Exposed, Moderately exposed, Very exposed
Salinity preferences	Full (30-40 psu)
Depth range	
Other preferences	No text entered
Migration Pattern	Non-migratory / resident

### Habitat Information

Often settles on *Pecten maximus* and *Buccinum undatum* and occasionally on *Aequipecten opercularis*. Has strong settlement preference for tubes or sites currently or previously used by the species.

## Life history

### Adult characteristics

Reproductive type	Gonochoristic (dioecious)
Reproductive frequency	Annual protracted
Fecundity (number of eggs)	No information
Generation time	Insufficient information
Age at maturity	
Season	January - March
Life span	2-5 years

### Larval characteristics

Larval/propagule type	-
Larval/juvenile development	Planktotrophic
Duration of larval stage	1-2 months
Larval dispersal potential	Greater than 10 km
Larval settlement period	March

## Life history information

Wilson (1970b) stated that the larvae spend between six weeks and two months in the plankton. Reproductive seasonality is unclear but George & Warwick (1985) and Wilson (1970) have both reported larval settlement in March in the Bristol Channel and Plymouth areas respectively. Wilson (1970) found a spawning period from January to March in Plymouth. Possibly has similar lifespan to *Sabellaria alveolata* (up to 9 years). Fecundity and recruitment may be variable (Holt *et al.*, 1998) but may be similar to *Sabellaria alveolata*.

## Sensitivity review

This MarLIN sensitivity assessment has been superseded by the MarESA approach to sensitivity assessment. MarLIN assessments used an approach that has now been modified to reflect the most recent conservation imperatives and terminology and are due to be updated by 2016/17.

### A Physical Pressures

	Intolerance	Recoverability	Sensitivity	Confidence
<b>Substratum Loss</b>	High	High	Moderate	High
The species is fixed to the substratum so substratum removal will cause mortality. Recruitment rates are high and recovery could be quite rapid (see additional information). It is often one of the first species to settle on new substrata.				
<b>Smothering</b>	Low	Immediate	Not sensitive	Moderate
Extrapolating from <i>Sabellaria alveolata</i> it is probable that <i>Sabellaria spinulosa</i> can tolerate smothering by sediment for up to several weeks. Feeding and growth will be curtailed. Depending on timing this may interfere with reproduction. Recovery would be almost immediate.				
<b>Increase in suspended sediment</b>	Low	Immediate	Not sensitive	Moderate
Tube growth is dependent on the presence of suspended particles, hence increase in suspended sediment could facilitate tube construction and may result in increased populations. However, an increase in siltation may also clog feeding apparatus - assumed here. Recovery occurs when the population is able to recommence feeding and growing.				
<b>Decrease in suspended sediment</b>	Intermediate	High	Low	Moderate
Tube growth is dependent on the presence of suspended particles, hence a reduction in siltation may hinder tube construction and/or may favour other species to compete successfully with <i>Sabellaria spinulosa</i> . Overall, a decline in population density seems likely. Recovery would be high (see additional information).				
<b>Dessication</b>	Tolerant	Not relevant	Not sensitive	Low
The species is sessile and typically subtidal but is also occasionally found intertidally and so can be exposed to drying influences. If exposed to the air the worm can retract into its tube and close the operculum over the entrance reducing evaporation.				
<b>Increase in emergence regime</b>	Intermediate	High	Low	Low
The species is sessile and typically subtidal but is also occasionally found in the low intertidal. This means the species can tolerate some emergence, however, increased emergence will reduce the amount of time available for feeding. This species is more subtidal than <i>Sabellaria alveolata</i> . Variability in recruitment (dependent on suitable environmental conditions) means that recovery could be quite rapid, say a year, or take several years. The presence of some remaining adults will assist in larval settlement as this is the preferred substratum (Wilson, 1929).				
<b>Decrease in emergence regime</b>	Tolerant*	Not relevant	Not sensitive*	High
The species is sessile and typically subtidal but is also occasionally found in the low intertidal. The species is likely to benefit from decrease in emergence.				

**Increase in water flow rate**      Intermediate      High      Low      Low

The species occurs in areas with high water flow so an increase in rate is likely to have little effect on attached individuals. However, *Sabellaria spinulosa* typically inhabits cobbles and pebbles that are likely to become mobile if water flow rate is increased and therefore result in scour and mortality of individuals. Not all individuals are likely to be killed and an intolerance of intermediate is suggested. High levels of recruitment means that recovery could be quite rapid, say within a year (see additional information). The presence of some remaining adults will assist in larval settlement as this is the preferred substratum (Wilson, 1929).

**Decrease in water flow rate**      Intermediate      High      Low      Moderate

The species inhabits areas with high water flow so an increase in rate is likely to have little effect. A reduction of water flow by two categories is likely to cause exposure to conditions outside the normal range for the species. This may be sufficient to reduce availability of suspended particles, hindering growth and repair and feeding. High levels of recruitment means that recovery could be quite rapid, say within a year (see additional information). The presence of some remaining adults will assist in larval settlement as this is the preferred substratum (Wilson, 1929).

**Increase in temperature**      Low      High      Low      Very low

The species does appear to thrive in conditions of cold water (for instance, it extends into arctic areas) and long-term increase in temperature may have a negative effect so that populations do not thrive. The species is highly fecund and likely to recover quickly from short-term declines that might be due to increased temperatures (see additional information).

**Decrease in temperature**      Tolerant      Not relevant      Not sensitive      High

*Sabellaria spinulosa* did not appear to suffer mortality during the 1963-64 winter (Crisp, 1964). The species occurs north to the arctic and is therefore considered tolerant of decrease in temperature.

**Increase in turbidity**      Tolerant      Not relevant      Not sensitive      Low

*Sabellaria spinulosa* thrives in turbid water conditions and has no reliance on visual sense for feeding, reproducing etc.

**Decrease in turbidity**      Intermediate      High      Low      Low

Decrease in turbidity may be sufficient to reduce availability of suspended particles, hindering growth, repair and feeding. Effects are likely to be sublethal in the short-term but may reduce viability of populations and result in decline if the turbidity decrease is chronic. The species is highly fecund and likely to recover quickly from short-term declines that might be due to increased temperatures (see additional information).

**Increase in wave exposure**      Intermediate      High      Low      Moderate

Where the species exists as loose crusts, death may occur through break-up due to wave action. Increased wave action may also mobilize the pebble and gravel substrata on which *Sabellaria spinulosa* often occurs resulting in abrasion and mortality. High levels of recruitment means that recovery could be quite rapid, say within a year (see additional information). The presence of some remaining adults will assist in larval settlement as this is the preferred substratum (Wilson, 1929).

**Decrease in wave exposure**      Intermediate      High      Low

Wave action may be required, in the absence of strong tidal flow, to suspend the coarse sand particles needed to build tubes. Reduced wave action may mean the population exists outside



of its preferred conditions with insufficient water action to provide sand particles or food. Some reduction in the population therefore seems likely. High levels of recruitment means that recovery could be quite rapid, say within a year (see additional information). The presence of some remaining adults will assist in larval settlement as this is the preferred substratum (Wilson, 1929).

**Noise** Tolerant Not relevant Not sensitive Low

The species is unlikely to respond to noise vibrations

**Visual Presence** Tolerant Not relevant Not sensitive Low

Most polychaetes have photoreceptors but the species is probably unable to resolve moving objects. The worms may retract into tube on disturbance. Whether this is through light detection or mechanical stimulus is uncertain.

**Abrasion & physical disturbance** Intermediate High Low Low

Extrapolating from *Sabellaria alveolata* it is probable that *Sabellaria spinulosa* is quite tolerant to abrasion resulting from trawling. The ability of *Sabellaria alveolata* to repair tubes is well developed (Cunningham *et al.*, 1984; Vorberg, 2000). However, abrasion resulting from substratum (cobbles and pebbles) becoming mobile is likely to cause significant damage. High levels of recruitment means that recovery could be quite rapid, say within a year (see additional information). The presence of some remaining adults will assist in larval settlement as this is the preferred substratum (Wilson, 1929).

**Displacement** High High Moderate Low

Worms are not able to rebuild tubes if removed from them (Wilson, 1929). High levels of recruitment means that recovery could be quite rapid, say within a year (see additional information). The presence of some remaining adults will assist in larval settlement as this is the preferred substratum (Wilson, 1929).

## Chemical Pressures

**Synthetic compound contamination** Intolerance Recoverability Sensitivity Confidence  
Tolerant\* Not relevant Not sensitive\* Moderate

Although the larvae are known to be highly intolerant of some oil dispersants, *Sabellaria spinulosa* has been found to thrive in polluted areas. In particular in an area with acidified halogenated effluent. It is found at higher densities near the effluent than elsewhere through the exclusion of other species (Hoare & Hiscock, 1974). The species has been assessed as tolerant\* by extrapolating from these observations. It may well be that *Sabellaria spinulosa* has different sensitivities to other synthetic chemicals but this information is not available.

**Heavy metal contamination** Not relevant

Insufficient information

**Hydrocarbon contamination** Not relevant

Insufficient information

**Radionuclide contamination** Not relevant

Insufficient information

**Changes in nutrient levels** Not relevant

Insufficient information

Increase in salinity Not relevant Not relevant

Decrease in salinity Intermediate High Low Moderate

The species only occurs in fully marine environment, however, as it does occasionally occur in the intertidal, it must be able to tolerate some reduced salinity caused by precipitation run off. High levels of recruitment means that recovery could be quite rapid, say within a year (see additional information). The presence of some remaining adults will assist in larval settlement as this is the preferred substratum (Wilson, 1929).

Changes in oxygenation Intermediate High Low Very low

Cole *et al.* (1999) suggest possible adverse effects on marine species below 4 mg/l and probable adverse effects below 2 mg/l. There is no information about *Sabellaria spinulosa* tolerance to changes in oxygenation. High levels of recruitment means that recovery could be quite rapid, say within a year (see additional information). The presence of some remaining adults will assist in larval settlement as this is the preferred substratum (Wilson, 1929).

## Biological Pressures

Intolerance   Recoverability   Sensitivity   Confidence

Introduction of microbial pathogens/parasites Not relevant

Insufficient information

Introduction of non-native species Not relevant

Insufficient information

Extraction of this species Not relevant Not relevant Not relevant Low

*Sabellaria spinulosa* is unlikely to be the target of extractions (for instance, for bait).

Extraction of other species Intermediate High Low Low

Fisheries for the pink shrimp *Pandalus montagui* and brown shrimps (*Crangon crangon*) (often associated with areas of *Sabellaria spinulosa* reefs) have been implicated in the loss or damage of reefs. However, Vorberg (2000) undertook experimental and observational studies that indicated only minor damage to tubes and rapid recovery as a result of shrimp fisheries. Nevertheless, populations, especially if as loose aggregations, may be displaced by mobile fishing gear and a precautionary intolerance of intermediate is suggested. High levels of recruitment means that recovery could be quite rapid, say within a year (see additional information). The presence of some remaining adults will assist in larval settlement as this is the preferred substratum (Wilson, 1929).

## Additional information

*Sabellaria spinulosa* is most frequently found in disturbed and polluted conditions and is a r-strategist (a life strategy which allows a species to deal with the vicissitudes of climate and food supply by responding to suitable conditions with a high rate of reproduction. R-strategists are continually colonizing habitats of a temporary nature (from Baretta-Bekker *et al.*, 1992)). *Sabellaria spinulosa* occurs in high densities on subtidal gravels that would be expected to be disturbed every year or perhaps once every few years due to storms and in polluted conditions. Areas where *Sabellaria spinulosa* had been lost due to winter storms appeared to recolonize up to a maximum thickness of 2.4 cm during the following summer (R. Holt, pers. comm. in Jones *et al.*, 2000).

Recoverability is therefore expected to be very high for the species.

## Importance review

### Policy/legislation

- no data -

### ★ Status

National (GB)  
importance -

Global red list  
(IUCN) category -

### Non-native

Native -

Origin -

Date Arrived -

### Importance information

UK BAP is as reefs. When found in reef or crust form the species provides structure for other organisms in the form of crevices and shelter. Some species also bore into the sandy crust. George & Warwick (1985) found that the structural complexity provided by *Sabellaria spinulosa* facilitated the development of a community with a large number of small species.

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## Datasets

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