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

Northern sea fan (*Swiftia pallida*)

MarLIN – Marine Life Information Network
Marine Evidence–based Sensitivity Assessment (MarESA) Review

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The Marine Life Information Network, Marine Biological Association of the United Kingdom.

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/1276]. All terms and the MarESA methodology are outlined on the website (https://www.marlin.ac.uk)

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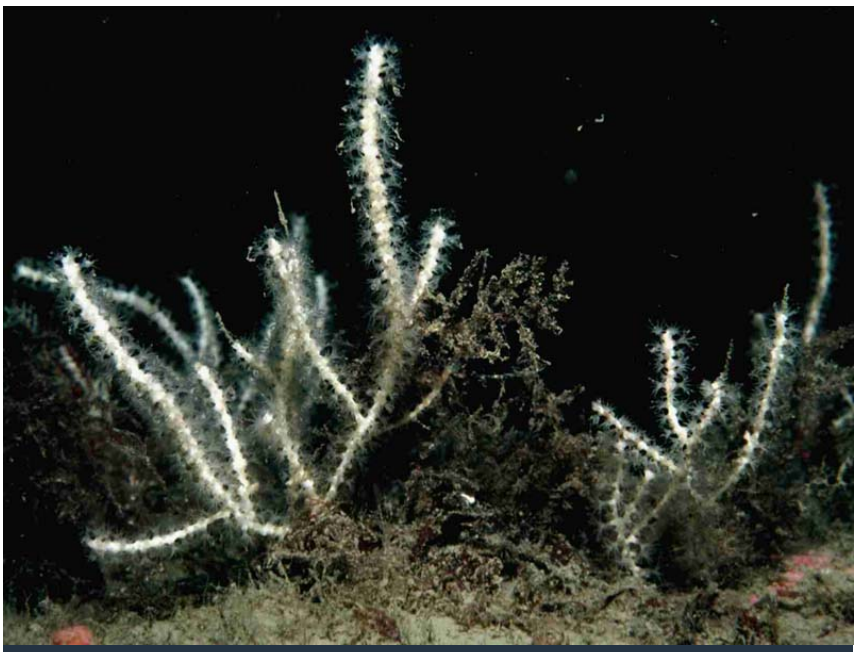

A group of sea fans.
Photographer: Anon.
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See online review for distribution map

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

Researched by	Emily Wilson	**Refereed by**	Admin
Authority	Madsen, 1970		
Other common names	-	**Synonyms**	-

Summary

Description

A small sea-fan which forms slender colonies with little branching, up to 20 cm tall but usually 7-10 cm. Colour white or greyish, sometimes with a pinkish tinge.

Recorded distribution in Britain and Ireland

West coast of Scotland and the southwest Irish coast.

Global distribution

Possibly also in deep water from the Bay of Biscay, Meditteranean, Madeira and Morocco.

Habitat

Found on rocks and boulders from depths of 15-60 m, most frequently below 20 m. Also recorded on coarse pebbles lying in coarse shell sand with silt. May occur at depths of 2380 m (see additional information).

Depth range

15-60 m

Identifying features

- Main stem with narrow basal attachment, usually with few secondary or tertiary branches but these are not invariably present.
- Polyps variably arranged: typically alternating on opposite sides of the axis with occasional ones at right angles to this plane, sometimes more densely and less regularly distributed.
- Polyps with eight distinct points of long spindle-shaped sclerites on distal part of column, running onto tentacle bases.

Additional information

It has been suggested (Manuel 1981) that *Swiftia pallida* is conspecific with *Gorgonia pinnata* Johnston 1847.

Listed by

UKBAP FOCI

Further information sources

Search on:

G G NBN WoRMS

Biology review

Taxonomy

Phylum	Cnidaria	Sea anemones, corals, sea firs & jellyfish
Class	Anthozoa	Sea anemones, soft & cup corals, sea pens & sea pansies
Order	Alcyonacea	
Family	Plexauridae	
Genus	Swiftia	
Authority	Madsen, 1970	
Recent Synonyms	-	

Biology

Typical abundance	Moderate density
Male size range	7 - 20cm
Male size at maturity	
Female size range	
Female size at maturity	
Growth form	
Growth rate	unknown
Body flexibility	No information
Mobility	
Characteristic feeding method	Passive suspension feeder
Diet/food source	
Typically feeds on	Suspended matter including plankton
Sociability	
Environmental position	
Dependency	No text entered.
Supports	Host *Amphianthus dohrnii*
Is the species harmful?	No

Biology information

Abundance may be up to 3 colonies per m (Minchin, 1987). Growth rates for this species are unknown, however the pink sea fan *Eunicella verrucosa* has highly variable growth. A population of *Eunicella verrucosa* at Lundy Island has growth rates of approximately 1 cm/year, which may possibly be similar to *Swiftia pallida*.

Sea fan anemone
This species is host to the sea fan anemone. The sea fan anemone *Amphianthus dohrnii* is found growing almost exclusively on sea fans, and in more southern lattitudes is associated with the pink sea fan *Eunicella verrucosa*.

Habitat preferences

Physiographic preferences	
Biological zone preferences	
Substratum / habitat preferences	
Tidal strength preferences	
Wave exposure preferences	
Salinity preferences	
Depth range	15-60 m
Other preferences	No text entered
Migration Pattern	

Habitat Information

Swiftia pallida has been reported from numerous locations in western Scotland, including the Minch and inner and outer Hebrides, the west coast of the Highlands and Argyll and Bute. It has been found as far north as Kinlochbervie and as far south as the Isle of Bute. This sea fan has also been recorded from Kenmare River, Ireland.

Swiftia pallida has also been recorded from the Bay of Biscay and the Meditteranean (Manuel 1988), however it is doubtful as to whether this is the same species, and Mitchell *et al.* (1983), suggests that *Swiftia pallida* is at the southern limit of its range in Scotland and Ireland.

Depth
Although most commonly recorded from depths between 18-60 m, *Swiftia pallida* has also been reported from up to 1200 m off the coast of Ireland and 2380m off Northwest Africa (Grasshoff 1977 cited in Minchin 1987c).

Life history

Adult characteristics

Reproductive type	No information
Reproductive frequency	Annual episodic
Fecundity (number of eggs)	No information
Generation time	Insufficient information
Age at maturity	Insufficient information
Season	Insufficient information
Life span	11-20 years

Larval characteristics

Larval/propagule type	-
Larval/juvenile development	Lecithotrophic
Duration of larval stage	See additional information
Larval dispersal potential	See additional information

Larval settlement period

Life history information

Populations of *Swiftia pallida* are thought to be self sustaining, with short lived larvae and limited potential for larval dispersal. It is thought that colonization of the Shetland Islands has been prevented by geographical barriers (Hiscock *et al.*, 2001). Reproduction is likely to be annual and may be triggered by either summer high or winter low temperatures (Hiscock *et al.*, 2001).

Although *Swiftia pallida* has not been specifically studied, in other gorgonians the average number of eggs per polyp increases with increasing colony size. Egg release from larger colonies can be orders of magnitude higher than for smaller colonies (Beiring & Lasker, 2000). It has been suggested that when large colony size is attained, more energy is available for reproduction because relative colony growth decreases (Beiring & Lasker, 2000).

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.

Physical Pressures

	Intolerance	Recoverability	Sensitivity	Confidence
Substratum Loss	High	Very low / none		Very low

Swiftia pallida would be removed by removal of the substratum, therefore intolerance has been assessed as high. Recovery would depend on the proximity of viable adults in the locality, as larval distribution is limited. If an entire population were removed, then recovery is unlikely. Hence recoverability is assessed as very low, resulting in a very high sensitivity assessment.

Smothering	Intermediate	Low		Low

Swiftia pallida usually grows to heights of less than 10cm, so smothering is likely to kill small colonies, and probably cause mortality of the polyps which are buried in larger colonies. Hence intolerance is assessed as intermediate. Recovery is dependant on the presence of viable adults near by, so if the entire population consists of small colonies that will be killed, recovery is very unlikely. If, however, the population contains colonies which grow above the benchmark level of 5 cm, then recovery is likely, but will probably take several years. Therefore recovery is assessed as low, resulting in a high sensitivity ranking.

Increase in suspended sediment	Tolerant	Not relevant		Moderate

Swiftia pallida is thought to be tollerant of some siltation (Mitchell *et al.*, 1983), and is found on rocks covered with a fine layer of silt. Further, while siltation may inhibit feeding, colonies of the sea fan *Eunicella verrucosa* produce mucus to clear themselves of silt (Hiscock pers comm.). Therefore *Swiftia pallida* has been assessed as tolerant to this factor, and is not sensitive.

Decrease in suspended sediment	Tolerant	Immediate		Low

It is possible that *Swiftia pallida* may feed on small particulate matter in suspended sediment, so a large reduction in this factor may result in reduced food availability for the sea fan. However at the benchmark level of a one month change, the effects are deemed unlikely to be fatal, so the species has been assessed as tolerant. Recovery is likely to be immediate on return to normal conditions, therefore not sensitive has been recorded.

Dessication	Not relevant	Not relevant		Not relevant

Sea fans are found only in the circalittoral where desiccation will not occur.

Increase in emergence regime	Not relevant	Not relevant		Not relevant

Sea fans are found only in the circalittoral and so changes in emergence are not relevant.

Decrease in emergence regime	Not relevant	Not relevant		Not relevant

Sea fans are found only in the circalittoral and so changes in emergence are not relevant.

Increase in water flow rate	Intermediate	Moderate		Very low

Sea fans are found in strong tidal streams but most likely retract their polyps when current

velocity gets too high for the polyps to retain food (Hiscock pers. comm.), leading to a reduction in viability. Tidal streams exert a steady pull on the colonies and are therefore likely to detach only very weakly attached colonies. Hence intolerance has been assessed as intermediate. Due to limited recruitment and slow growth rate, recoverability is assessed as moderate, therefore sensitivity is moderate.

Decrease in water flow rate Intermediate Moderate

Swiftia pallida is a filter feeder, so relies on high water flow rates to bring food and to remove silt. Colonies deprived of food may be adversely affected and, without significant water flow to remove silt, silt may kill tissue leaving areas bare of coenenchyme to be colonized by encrusting organisms. Due to limited recruitment and slow growth rate, recoverability is assessed as moderate, therefore sensitivity is moderate.

Increase in temperature Intermediate Low Moderate

Mitchell *et al.*, (1983) suggested that the Scottish and Irish populations of *Swiftia pallida* are at the southern limit of the species range (although this is contested by Hiscock *et al.*, 2001), all sources agree that an increase in temperature is likely to lead to reduction or loss of this sea fan (Hiscock *et al.*, 2001; Jones *et al.*, 2002). At the benchmark level of an increase of 2°C for one year, reproductive success may be impaired, leading to a loss of new recruits, but existing colonies are likely to persist. This would suggest an intolerance of intermediate, however the species had been assessed as highly intolerant, because as colonies die off populations are likely to gradually decrease in density over time after a critically high temperature threshold is reached. Hiscock *et al.* (2001) predicted the loss of all populations occurring in the Inner Hebrides and mainland western Scotland with a 2°C increase in summer surface temperatures over a 20 year period.
Temperature may also affect the incidence of disease (see Introduction of microbial pathogens/parasites).
Recovery is dependant on larval recruitment, which is thought to be local (Hiscock *et al.*, 2001), but as reproduction may be dependant on lower temperatures, warmer waters are likely to reduce reproductive viability, so new recruits are not likely. Hence recoverability has been assessed as low, resulting in a high sensitivity value. Populations are unlikely to shift to a more northern distribution because they are self sustaining, so geographical barriers are likely to prevent more northern colonization, as "illustrated by the absence of *Swiftia pallida* from the Shetland Islands (Hiscock *et al.*, 2001).

Decrease in temperature Tolerant Not relevant Low

As the species may be at the southern limit of its distribution in the UK, *Swiftia pallida* is likely to be tolerant of, or possibly even benefit from a decrease in temperature. Therefore the sea fan has been assessed as tolerant and not sensitive. However, range extensions are unlikely due to limited larval distribution and geographical barriers (Hiscock *et al.*, 2001).

Increase in turbidity Tolerant Not relevant Very low

Swiftia pallida is normally found in turbid waters at depths of 20 m or more, therefore a reduction in light penetration from increased turbidity is unlikely to affect this species. As such, *Swiftia pallida* has been assessed as tolerant, and not sensitive to this factor.

Decrease in turbidity

Swiftia pallida probably feeds primarily on plankton rather than suspended organic matter, therefore decreases in turbidity may reduce the amount of food available for the sea fan. However, due to insufficient information on the effects of this on the species, no assessment has been made.

Increase in wave exposure	Not relevant	Not relevant	Not relevant

Swiftia pallida is normally found below 18 m where strong surge does not occur, therefore this factor is no relevant. The pink sea fan *Eunicella verrucosa* has been observed to be detached by severe storms, however this species grows at shallower depths than *Swiftia pallida*.

Decrease in wave exposure	Not relevant	Not relevant	Not relevant

Swiftia pallida is normally found below 18 m where strong surge does not occur, therefore this factor is no relevant.

Noise	Not relevant	Not relevant	Not relevant

Anthozoans have no known ability to detect noise.

Visual Presence	Not relevant	Not relevant	Not relevant

Anthozoans have no known ability for visual perception.

Abrasion & physical disturbance	Intermediate	Moderate	Moderate

Entanglement in fishing nets and angling line can cause abrasion that may damage the coenenchyme and expose the gorgonin skeleton, which can facilitate the settlement of fouling epibionts, as is the case in the Pink seafan *Eunicella verrucosa* (Anonynous, 2006). Colonisation by fouling epibiota will increase drag, and may include species that bore into the skeleton and weaken the colony (impacts observed on the structurally similar sea fan *Paramuricea clavata* described by Bavestrello *et al.*, 1997). Therefore intolerance is assessed as intermediate.
Eno et al. (1996) suggested that *Eunicella verrucosa* was "remarkably resilient" to impact from lobster pots. They found that some seafan colonies returned to an upright position immediately after impact, while others were permanently bent, which would reduce feeing efficiency. However Tinsley (2006) observed flattened seafans which had continued growing, with new growth being aligned perpendicular to the current, so clearly even colonies of *Eunicella verrucosa* which are damaged can continue to survive.
Healthy *Eunicella verrucosa* are able to recover from minor damage and scratches to the coenenchyme (Tinsley, 2006), and the coenenchyme covering the axial skeleton will re-grow over scrapes on one side of the skeleton in about one week (Keith Hiscock, pers. comm.). However, where whole individuals are killed recovery is likely to be low due to slow growth and poor recruitment, therefore overall recoverability is assessed as moderate. Hence a moderate sensitivity assessment has been made.

Displacement	High		Moderate

Swiftia pallida colonies grow attached to hard substrata, often perpendicular to the current. Displacement is likely to impair feeding and cause abrasion and mortality, as colonies are unable to re-attach to the substrata following displacement. Therefore intolerance to this factor is assessed as high, and recovery very low, resulting in a very high sensitivity value.

Chemical Pressures

	Intolerance	Recoverability	Sensitivity	Confidence

Synthetic compound contamination

Insufficient information.

Heavy metal contamination

Insufficient information.

Hydrocarbon contamination

Insufficient information.

Radionuclide contamination

Insufficient information.

Changes in nutrient levels Tolerant Not relevant Very low

No information could be found on the effect of a change in nutrient levels on *Swiftia pallida*. Sea fans feed on planktonic organisms and, although abundance of those organisms might change as nutrient concentrations vary, the long term effects on food sources are not likely to be significant (Keith Hiscock per comm.). Any colonies growing at shallow depths may be smothered by ephemeral algae, as is the case with *Eunicella verrucosa*, however the majority of *Swiftia pallida* are found below the photic zone at 18 m depth, so are assessed as tolerant to this factor.

Increase in salinity Not relevant Not relevant Moderate

Swiftia pallida occurs in full salinity conditions, where hypersaline conditions are unlikely, therefore this factor is not relevant.

Decrease in salinity High

No evidence was found on the tolerance of *Swiftia pallida* to a change in salinity. However the species occurs in fully saline conditions, so is assessed as highly intolerant to a decrease in salinity. Recovery would be very low due to poor larval recruitment and slow growth, therefore *Swiftia pallida* has been assessed as highly sensitive to a decrease in salinity.

Changes in oxygenation High Very low

No information was found on the effects of hypoxia on *Swiftia pallida*. However, the species lives in fully oxygenated conditions with high water flow levels, so it is expected that the seafan would be highly intolerant of decreased oxygen levels. Recovery will depend on recruitment, but is unlikely if surviving colonies are distant due to poor larval dispersal. Therefore recoverability has been assessed as very low, resulting in a very high sensitivity value.

Biological Pressures

	Intolerance	Recoverability	Sensitivity	Confidence

Introduction of microbial pathogens/parasites

No information was found on disease in *Swiftia pallida*, however another seafan *Eunicella verrucosa*, suffers from a disease which causes necrosis of the Coenchyme tissue, allowing fouling organisms to settle on the exposed gorgonin skeleton. Diseased colonies have high concentrations of bacteria, particularly *Vibrio tasmaniensis*, which appears to induce disease at higher temperatures, as colonies became infected at 20°C but remained healthy at 15°C (Hall-Spencer *et al.*).

Introduction of non-native species

No non-native species are known to be associated with or adversely affect *Swiftia pallida*.

Extraction of this species Not relevant Not relevant Not relevant

Swiftia pallida is not known to be harvested.

Extraction of other species High Low

Seafans are vulnerable to damage by mobile fishing gear, particularly in areas where they grow on low lying reefs adjacent to scallop beds (Tinsley, 2006). Trawling is likely to remove or severely damage *Swiftia pallida*.
Eno et al. (1996) suggested that *Eunicella verrucosa* was "remarkably resilient" to impact from lobster pots. They found that some seafan colonies returned to an upright position immediately after impact, while others were permanently bent, which would reduce feeing efficiency. However Tinsley (2006) observed flattened seafans which had continued growing, with new growth being aligned perpendicular to the current, so clearly even colonies of *Eunicella verrucosa* which are damaged in this manner can continue to survive.
Despite the likelihood that *Swiftia pallida* is resilient to static fishing, it has been assessed as highly intolerant due to the effect of dredges and trawls. Recovery of dislodged seafans is unlikely, and these colonies will probably die. Settlement of new colonies is dependant on recruitment, and larval supply, which is low, therefore recoverability is assessed as very low, resulting in a very high sensitivity value.

Additional information

Recovery: Growth rates of *%Swiftia pallida%* are unknown, however the Pink sea fan *%Eunicella verrucosa%* has highly variable growth, with populations on Lundy showing a 1cm branch extension per year (Keith Hiscock pers comm.). If growth rates are similar between the two species, then recovery of *%Swiftia pallida%* to a size of 10cm is likely to take at least 10 years.
Populations of *%Swiftia pallida%* are thought to be self sustaining, so recolonisation is dependant on nearby viable adult populations.

Importance review

Policy/legislation

UK Biodiversity Action Plan Priority ☑

Features of Conservation Importance (England & Wales) ☑

Status

National (GB) importance Not rare/scarce

Global red list (IUCN) category -

Non-native

Native -

Origin -

Date Arrived -

Importance information

-none-

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