



**UHI | SHETLAND**

*Carpet sea squirt*



U.S. Geological Survey/photo by Dann Blackwood (USGS)

**INVASIVE NON-NATIVE SPECIES (INNS)  
AND  
CLIMATE CHANGE INDICATOR SPECIES  
AN IDENTIFICATION GUIDE FOR THE SHETLAND  
ISLANDS**



Made possible with

**Heritage**  
**Fund**

The Shetland Community Wildlife Group is a project administered by UHI Shetland with support from the National Lottery Heritage Fund.

To find out more about how to get involved with the group take a look at our website or send us an email:

**[www.shetlandcommunitywildlife.org](http://www.shetlandcommunitywildlife.org)**  
**[shetlandcommunitywildlife@outlook.com](mailto:shetlandcommunitywildlife@outlook.com)**

## WHAT ARE INVASIVE NON-NATIVE SPECIES?

Non-native species, sometimes known as marine aliens, are animals or plants that have been introduced to Scotland by man's activities, either accidentally or intentionally. Invasive non-native species, like those within this guide, have the potential to cause economic or environmental impacts in Shetland.

## WHAT ARE CLIMATE CHANGE INDICATOR SPECIES?

These are plants and animals that are spreading north as the changing climate warms the sea. If found, they may indicate that the climate is changing.

## WHERE DO THEY GROW?

The invasive non-native species shown in this guide prefer to grow on man-made surfaces and will foul boat hulls, ropes, buoys and other surfaces. Many will also grow on other plants and animals including mussels.

The climate change indicator species live along the shore and in rockpools, as well as on man-made structures.

Within this guide the term 'wild' refers to any individual living on a non-man made structure.

## HOW TO USE THIS GUIDE

Each species is marked as either an **Invasive Non-native** or an **Indicator** species.

Flags indicate the closest place they are currently found:



England



Scotland



Orkney



Shetland



Norway

## WIWEED (*Sargassum muticum*)

- A pale yellow to dark brown seaweed
- Grows near the surface in shallow water on hard surfaces. Can tolerate brackish conditions
- Can be over a metre in length
- Found growing wild in Orkney

Invasive  
Non-Native



### IMPACTS

- Entangles propellers
- Fouls harbour and marina structures
- Dense mats hinder marine recreation and rot on beaches
- Replaces native seaweeds



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## ORANGE-STRIPED ANEMONE (*Diadumene lineata*)

- The column of the anemone is up to 2cm wide and 2cm high and is a green or brown colour with orange (occasionally yellow or white) stripes
- It has up to 100, long greenish tentacles
- Found in brackish and inshore waters on hard surfaces especially around harbours and piers

Invasive  
Non-Native

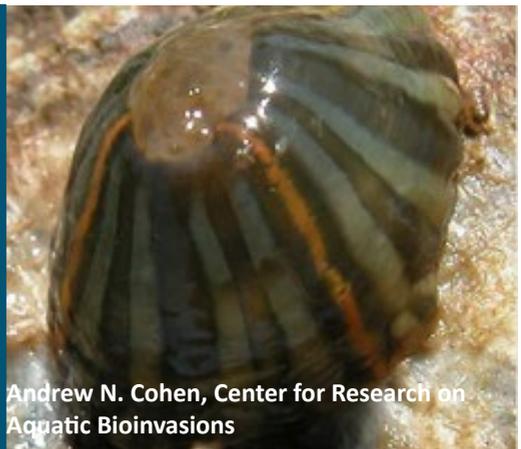


### IMPACTS

- Fouls harbour and marina structures
- Can foul boat hulls
- Fouls mussel lines and oyster beds



Mary Jo Adams © MJ Adams Copyright 2013



Andrew N. Cohen, Center for Research on Aquatic Bioinvasions



Andrew N. Cohen, Center for Research on Aquatic Bioinvasions

## JAPANESE SKELETON SHRIMP (*Caprella mutica*)

- Red to cream coloured shrimp-like animal
- Spines along their back
- Males grow up to 5cm with large claws
- Females up to 1.5cm, sometimes with a red-spotted pouch on their underside
- Widespread in Shetland, found only on man-made structures

Invasive  
Non-Native



### IMPACTS

- Unknown



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## RED RIPPLE BRYOZOAN (*Watersipora subtorquata*)

- Orange-red, rigid colonies which can grow over each other
- Colonies can be several cm across
- Individual animals are roughly rectangular, about 1mm across, each with a dark spot
- Found on the south coast of England

Invasive  
Non-Native



### IMPACTS

- Copper tolerant so can grow on some anti-fouling treated surfaces
- Can foul boat hulls and harbour and marina structures
- Fouls mussel lines and oyster beds



## INVASIVE BRYOZOAN (*Schizoporella japonica*)

- Orange-red, hard, encrusting colonies
- Can cover large areas
- Individual animals are roughly rectangular and each around 1mm long
- Widespread on man-made structures
- Found in the semi-wild on rocks around piers in Lerwick

Invasive  
Non-Native



### IMPACTS

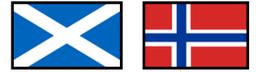
- Fouls harbour and marina structures
- Can foul boat hulls and aquaculture structures
- Fouls mussel lines and oyster beds



# CARPET SEA SQUIRT (*Didemnum vexillum*)

- Also known as Marine or Sea Vomit
- Pale orange to off-white. Firm texture, like leather
- Overgrows other plants and animals
- Forms large mats, sometimes with hanging outgrowths
- Found at Largs in the Firth of Clyde and Loch Creran in Argyll

Invasive  
Non-Native

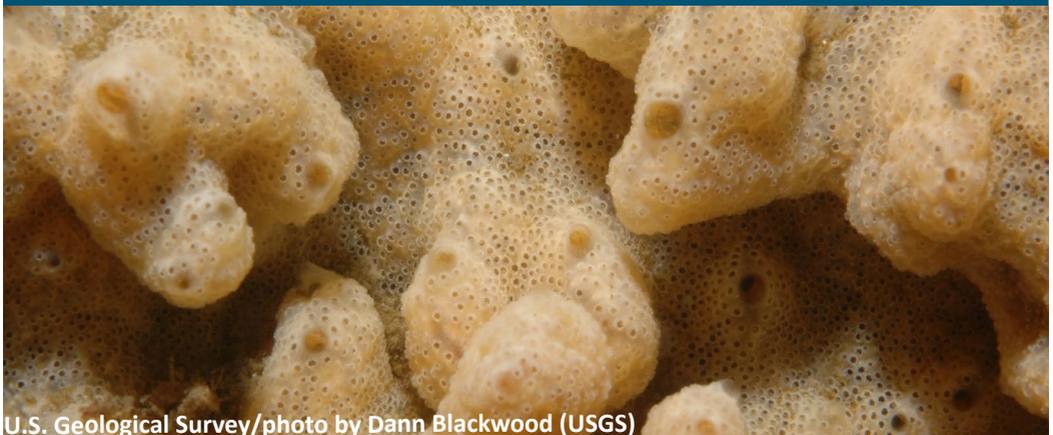


## IMPACTS

- Fouls harbour and marina structures
- Can foul boat hulls and aquaculture structures
- Fouls mussel lines and oyster beds



© Chris Beveridge (SAMS)



U.S. Geological Survey/photo by Dann Blackwood (USGS)

## ORANGE-TIPPED SEA SQUIRT (*Corella eumyota*)

- Smooth, slightly transparent body, 2-4cm long but can grow up to 8cm
- Two orange siphons, one at free end and the other lower and to the right
- Gut forms a U shape, not an S shape as in other native species
- Widespread on man-made structures and in the wild under rocks in Scalloway

Invasive  
Non-Native



### IMPACTS

- Fouls harbour and marina structures
- Can foul boat hulls and aquaculture structures



© JDD Bishop



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# LEATHERY SEA SQUIRT (*Styela clava*)

- Individuals have a club-like body up to 12cm long with a tough stalk
- Skin is yellow or brown, leathery in texture with folds and swellings
- Other plants and animals are often found growing on their bodies

Invasive  
Non-Native



## IMPACTS

- Fouls harbour and marina structures
- Can foul boat hulls and aquaculture structures

© Chris Woods (Marine Conservation Society)



## PACIFIC OYSTER (*Magallana gigas*)

- Can grow to 18cm long but generally smaller and slower growing in colder northerly waters
- Off-white, yellow or bluish grey colour with dark purple patches
- Wild populations have become established in the UK from farmed escapees
- Found on man-made structures in Shetland

Invasive  
Non-Native



### IMPACTS

- Can displace native oysters and other wildlife
- Fouls inflow and outflow pipes

Hans Braxmeier



Rosser1954 CC BY-SA 4.0

## RAINBOW WRACK (*Cystoseira tamariscifolia*)

- A bushy green/brown seaweed with a rough texture
- Blue-green iridescence underwater but black when dried out
- Usually 30-45cm in length but can reach up to 60cm
- Rockpools and lower shore on both rocky shorelines and gravelly flats

Indicator



### IMPACTS

- Indicator of changing sea temperatures



## SNAKESLOCK ANEMONE (*Anemonia viridis*)

- Long tentacles, greyish brown or bright green with purple tips
- Tentacle mass is up to 20cm across
- Column is brown and up to 7cm in diameter
- Found in pools from mid-tide downwards.
- Often seen on leaves of seagrass

Indicator



### IMPACTS

- Indicator of changing sea temperatures



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## FLAT TOP SHELL (*Steromphala* (formally *Gibbula*) *umbilicalis*)

- Broad redish-purple stripes on a greenish-grey background
- Around 1.5cm high and 2cm across
- Round hole 'umbilicus' on the underside of the shell distinguishes this species from other top shells.
- Likes sheltered rocky shores

Indicator



### IMPACTS

- Indicator of changing sea temperatures



© J.Tweddle 2013



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## PURPLE SEA URCHIN (*Paracentrotus lividus*)

- Dark purple to dark green spines
- Body 'test' greenish, up to 7cm across
- Burrows into soft rock but can also be found in seagrass beds

Indicator



### IMPACTS

- Indicator of changing sea temperatures



Fiona Crouch © MBA



Fiona Crouch © MBA

Shetland has few invasive non-native species, but many more are found elsewhere in Scotland. You can help keep Shetland this way.

**Good Practice and a fast response can limit the spread of invasive non-native species**

## GOOD PRACTICE

**DO** keep boats and structures as free of fouling as possible

**DO** check, clean and dry personal gear when moving between areas

**DON'T** throw even small pieces of invasive non-native species back into the water as some can grow back from tiny pieces.



## WHAT DO WE NEED TO KNOW?

If you think you have spotted a INNS please send us the following information:

**WHEN** did you find it?

**WHERE** did you find it? Ideally a grid reference if you have one.

**WHAT** was it attached to?

Any **PHOTOGRAPHS** you have and if possible, the **SPECIMEN**.

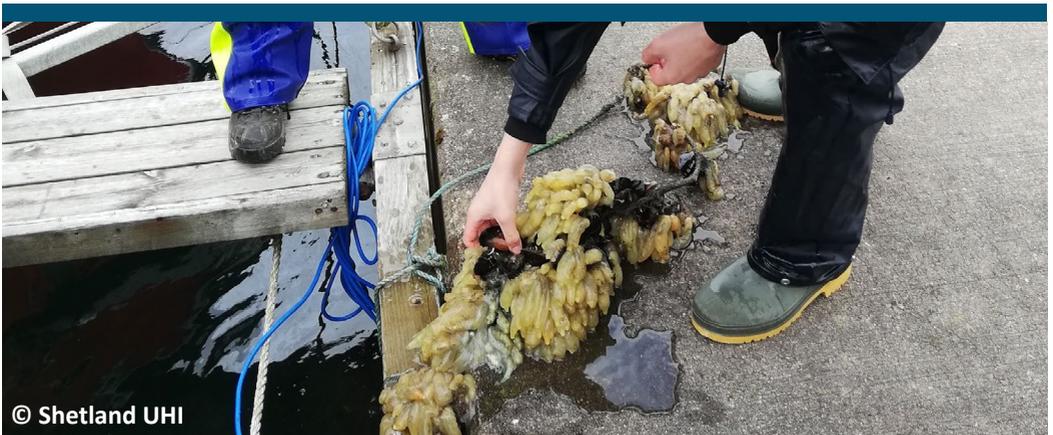
## ACT QUICKLY

Keep your eyes open for invasive non-native species. If you think you have found one please contact:

**Marine Spatial Planning Team  
UHI Shetland, Scalloway Campus**

**01595 772000**

**[marineplan.shetland@uhi.ac.uk](mailto:marineplan.shetland@uhi.ac.uk) or  
[shetlandcommunitywildlife@outlook.com](mailto:shetlandcommunitywildlife@outlook.com)**



## LINKS

**GB Non-native Species Secretariat-** provide further information and species fact sheets

[www.nonnativespecies.org](http://www.nonnativespecies.org)

**Shetland UHI Marine Spatial Planning-** information on the Shetland marine biosecurity plan and invasive non-native species monitoring

[www.shetland.uhi.ac.uk/research/marine-spatial-planning/non-native-species-and-biosecurity-planning/](http://www.shetland.uhi.ac.uk/research/marine-spatial-planning/non-native-species-and-biosecurity-planning/)

**Scottish Government Marine Environment-** invasive non-native species policies and actions.

[www.gov.scot/policies/marine-environment/invasive-non-native-species/](http://www.gov.scot/policies/marine-environment/invasive-non-native-species/)

**NatureScot-** details marine non-native species in Scotland

[www.nature.scot/professional-advice/land-and-sea-management/managing-coasts-and-seas/marine-non-native-species](http://www.nature.scot/professional-advice/land-and-sea-management/managing-coasts-and-seas/marine-non-native-species)



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