Licensed translocation of a Schedule 8 liverwort: monitoring the success of a Petalwort conservation project in Cornwall

Spalding Associates (Environmental) Ltd

Quay edge supporting narrow open coastal grasslands and Petalwort colonies at Hayle

Civil engineering works to stabilise the quay necessitated removal of Petalwort so the translocation schedule required close co-operation with a construction team

Background

In 2013 Natural England licensed translocation of part of a colony of Petalwort under the Wildlife and Countryside Act 1981 for the purposes of Conservation, Science and Education. The Petalwort to be translocated was part of one of the biggest colonies found in the UK, at Hayle harbour on the edges of a collapsing quay wall in the sandy St Ives Bay on the north coast of Cornwall. The species had not been translocated before so the aim was to trial methods and in doing so document successes and problems, as well as reinforce protected populations.

The donor site

The donor site was a dilapidated harbour quay where calcareous windblown sands had accumulated on the quay edges. Petalwort was scattered through the open Rabbit grazed Red Fescue turf there and on patches of near bare sandy soils with pH near neutral (6.7 – 7.1), and a depth averaging 2-3 cms overlying compacted industrial wastes and stones.

The receptor site St Gothian Sands LNR

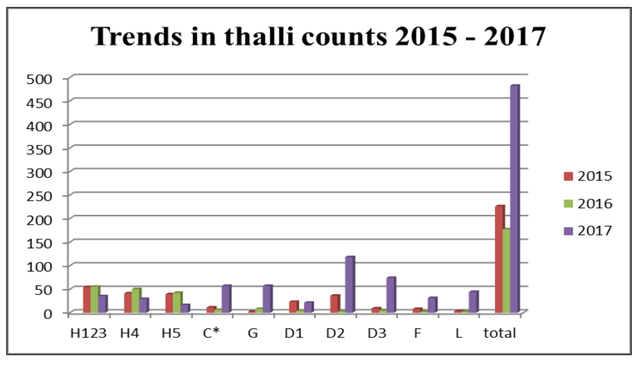
Trodden sands on track sides were selected as microhabitat for receptor plots

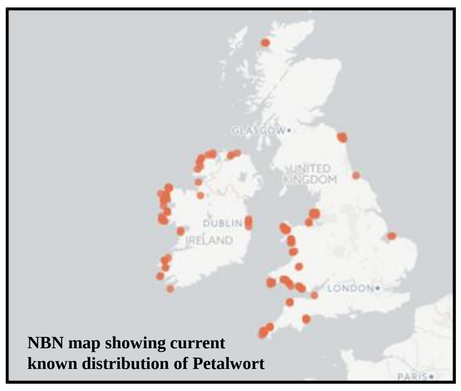
Receptor site selection and process

The selected receptor was St Gothian Sands Local Nature Reserve, created when a sand works was closed; it was re-landscaped for nature conservation benefit and had good areas of suitable open coastal grasslands, regular recreational trampling and grazing by Rabbits, and 'raw' habitat with no apparent Petalwort colonisation, where limited experimentation in creating habitat could be undertaken. Agreement to the translocation was obtained from the site owners and managers Cornwall Council as part of the licence application.

Results

November 2017 counts have recorded 482 thalli in 10 of the 11 translocation plots. In the plot shown below right conspicuous clustering of thalli (marked with yellow pegs) within the plot (indicated by the red pegs) requires investigation. An expansion of Petalwort to the right of the plot has occurred, probably by vegetative dispersal since sporophytes have not been observed on the plot.



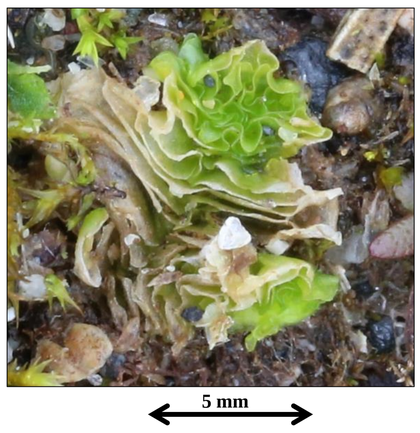


NBN map showing current known distribution of Petalwort

Petalwort ecology and status

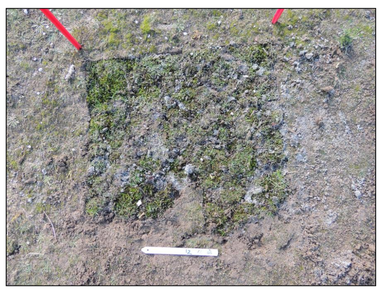
Petalwort *Petallophyllum ralfsii* (Wilson) Nees and Gottsche is a small bright green thalloid liverwort associated with open vegetation in humid calcareous dune slack habitat. In Cornwall it's often found on lithic soils with elevated heavy metal levels where rabbit grazing, low nutrient levels, light trampling and winter damp are essential factors. Distribution is mainly Mediterranean, known from Turkey to NW Scotland, declining in its range; currently Nationally Scarce in the UK and protected under the Wildlife and Countryside Act 1981 (Schedule 8), Annex II of the EC Habitats Directive and listed as Vulnerable in the IUCN Red list.

Petalwort thallus showing distinctive lamellar arrangement of green growth

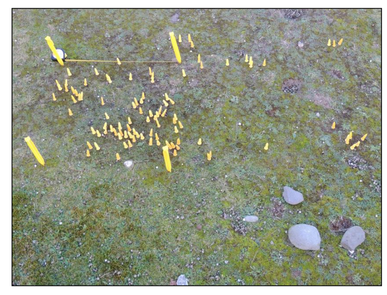


Translocation method

Petalwort thalli were lifted in sections of turf and removed from the quay in late autumn 2013. Approximately 4.5 square metres of turf containing at least 507 thalli were laid into selected microhabitat 'plots' at the receptor site. Garden netting was placed over plots to provide initial protection (from Rabbit digging in particular).



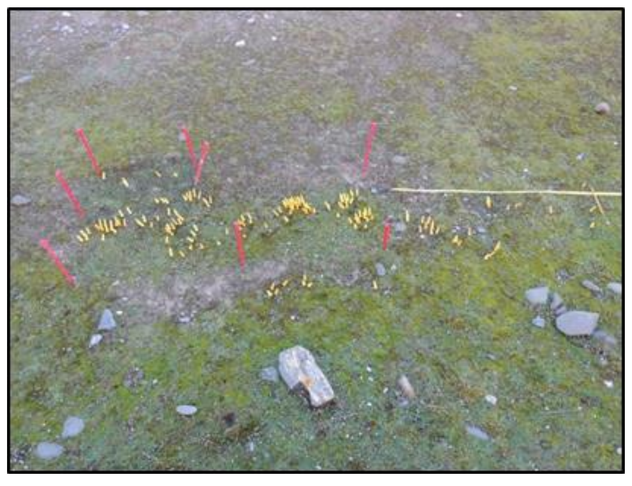
Plot D3 with 24 thalli at creation in early spring 2014 and after 3 ½ years in November 2017 with 74 thalli inside the transplanted turf and 26 'new' thalli outside the plot



Transplanted turf settled well apart from the need to relay one disturbed plot. Longer term problems have been vigorous over-growth by vascular plants on one plot, the loss of a small plot on open habitat at a slack edge, and loss of the edges of a plot making thalli counts unreliable.

Monitoring

Thallus counts, reproductive status and turf transplant condition have been used to monitor the success of the translocation. Nearby Petalwort colonies have been used as controls. Counts were by visible individual thallus. Being generally winter green with a tendency to perennate as tiny tubers during dry weather the timing of counts is critical; using control colonies on nearby habitat has been essential to check for local seasonal growth. Seven sporophytes from sexual reproduction were observed in 2016 on plot H5. Monitoring as part of the planned work for the licence continues until 2019.



Monitoring of plot D2 in 2017 with red stakes marking corners of plot and each thallus marked by a yellow marker showing spread of Petalwort beyond translocated turf

Sporophytes on plot H5

Female Petalwort thallus

Conclusion

Partially vegetated turf containing Petalwort thalli can therefore be successfully translocated particularly if vascular plant root growth is sufficient to bind the turf thus protecting the thalli. Suitable receptor sites are likely to be within the known distribution but creating microhabitat has been proven to be possible.

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