Monitoring of Marine INNS using Submerged Settlement Panels

Maryport Marina - May to September 2019

Solway Firth Partnership October 2019

Maryport Marina

Solway Firth Partnership

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1. Introduction

The GB non-native species secretariat (2015a) defines an invasive non-native species (INNS) as “any non-native animal or plant that has the ability to spread causing damage to the environment, the economy, our health and the way we live.” Globally, 84% of marine ecoregions have reported marine invasion (Molnar *et al*., 2008). In the UK marine environment INNS have the potential to pose a significant threat to native marine biodiversity and commercial interests. Scottish Natural Heritage is the overarching coordinator for NNS in Scotland and lead for terrestrial habitats and wetlands, whilst Marine Scotland lead for marine habitats.

Known impacts of INNS on native biodiversity are the spread of disease, competition for habitat and food and direct predation (GB NNSS, 2015b). Direct impacts include where biological indices display lower scores where INNS are present. Indirect impacts include where INNS densities are so high that a reduction in abundance of other taxa is observed (SEPA, 2013). The major pathways by which marine INNS are introduced include shipping, recreational boating, aquaculture stock movements and natural dispersal (GB NNSS, 2015c). Once INNS have established in a marine ecoregion, they are very difficult or even impossible to eradicate as many filter-feeding marine invertebrate animals live attached to solid surfaces and, along with algae, may be spread along coastlines marina-to-marina as fouling growth on the hulls of leisure craft. For this reason, early detection and monitoring of marine INNS introduction is crucial.

2. Method

Two settlement panels (Photo 1), were attached to pontoons within Maryport Marina on 23 May 2019 by SFP staff. (Figure 1). The panels were attached to the underside of the pontoons and submerged to around one metre depth using strong paracord and weighed down with 6 oz fishing weights (Photo 2).

Photo 1 - Complex Correx panel structure

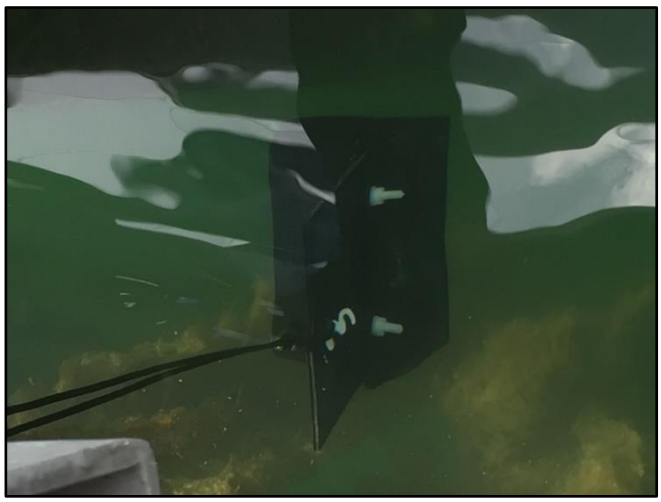

Photo 2 - Submerged complex Correx panel

Maryport was chosen as a relatively large and active but protected marina. The marina was monitored last year with limited results, possibly due to dredging that had taken place during the time the panels were in position

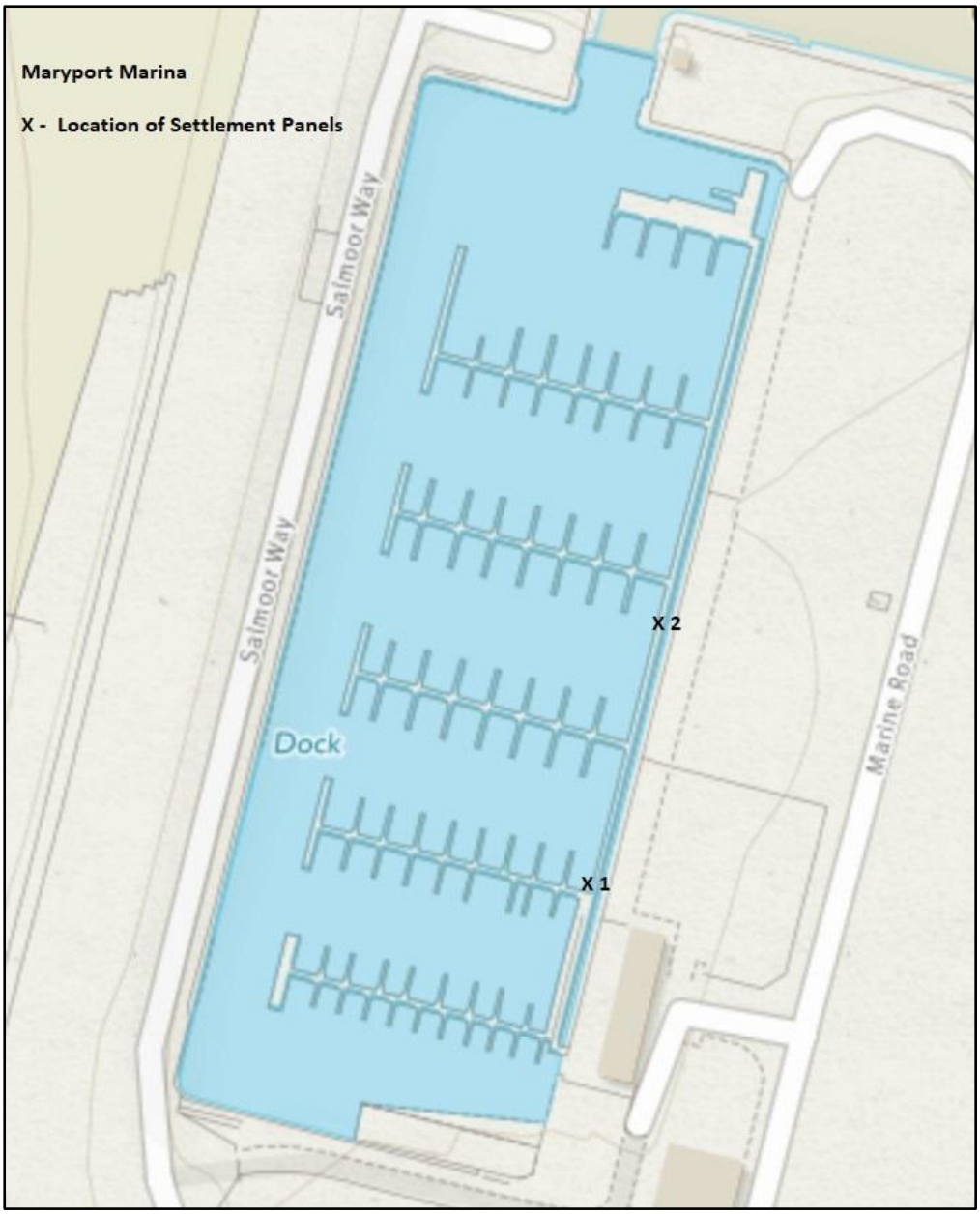

Figure 1: Maryport Marina. Location of panels 1 - 2

After nineteen weeks, at the end of the summer (3 October 2019), the panels at Maryport were collected, photographed (Photos 4, 5), scored for percentage cover of surface species and then discarded. Mobile organisms, including barnacle cyprids and crabs were counted individually.

In addition, other species present on buoys and on the marina wall and beside the slipway were recorded (Photos 6, 7, 8).

Photo 4 – Recovered Panel

Panel 5 - Opened recovered panel

Photo 6 – inspecting buoy

Photo 7 – Marina wall

Photo 8 – Adjacent to slipway

3. Results

Only one of the two panels (Panel 1) was recovered from Maryport. There had been a period of very stormy weather in late August and it is possible the panel was lost during that time.

A Rapid Assessment Survey (RAS) was attempted at Maryport but very few buoys and ropes had been submerged in the water long enough for sufficient growth of native and/or invasive species for this to be effective. The wall of the marina was checked for species and a variety of seaweeds were recorded.

The marina was more sheltered than Scottish marinas on the north side of the Solway and had a much higher volume of mud and silt on the panels and lower amounts of growth although the species assemblage was similar. The deposits of mud may have been due to the dredging occurring in the area remobilising sediment.

The green algae, *Cladophora rupestris,* appeared to dominate the only recovered panel. Other species noted on the marina walls and structures were barnacles (thought likely to be Darwin's barnacle, *Elminius modestus*; the encrusting worm, *Pomatoceros triqueter*, blue mussel, *Mytilus edulis* and a number of common seaweed species (Photos 9, 10). A full species list is found at Appendix 1.

Photo 9 – Seaweed species on wall

Photo 10 – Gut weed on wall

4. Conclusion

Although there were no INNS of importance were found at Maryport and the marina looked very clean and well maintained, it is intended to continue deploying panels there in 2020.

Continued awareness of INNS gained from the use of the panels and the rapid site assessments will allow for improved biosecurity control of invasives speices. It is recommended the use of the current 3D scratched surface panel design is continued, as this seems to encourage a representative level of growth.

It is suggested that panels should also aim to be removed prior to any major storms, as even though this may result in a reduced soak time, it could prevent the loss of panels to the environment.

5. References

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Appendix 1: Maryport settlement panel results

MARYPORT MARINA								
Panel No	**Grid Ref**	**Species - Common Name**	**Species - Latin Name**	**Abundance**	**Invasive**	**Abbrev**	**Scale**	**%**
1	NY0300636471	Green seaweed	*Cladophora rupestris*	A	N	S	Super Abudar	80 - 100
	NY0300636471	Darwins Barnacle	*Elminius modestus*	R	Y	A	Abundant	40 - 80
	NY0300636471	Tube worm	*Pomatoceros triqueter*	R	N	C	Common	20 - 40
	NY0300636471	Red seaweed	Ceramium virgatum	O	N	F	Frequent	10 - 20
						O	Occasional	5 - 10
2	NY0303036542	PANEL LOST				R	Rare	<5%
Species on Harbour Wall	NY0295436408	Sea lettuce	*Ulva lactuca*	F	N			
	NY0295436408	Bladderwrack	*Fucus vesiculosus*	F	N			
	NY0295436408	Egg wrack	*Ascophyllum nodosum*	F	N			
	NY0295436408	Green seaweed	*Cladophora rupestris*	C	N			
	NY0295436408	Twisted wrack	*Fucus spiralis*	F	N			
Species on buoy	NY0299236433	Green seaweed	*Cladophora rupestris*	F	N			
	NY0299236433	Blue mussel	*Mytilus edulis*	R	N			