

Monitoring of Marine INNS using Submerged Settlement Panels

Maryport Marina - May to September 2023

Solway Firth Partnership - September 2023



Maryport Marina

Solway Firth

Partnership

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1. Introduction

The GB non-native species secretariat defined 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.” (GB NNSS, 2023) Globally, 84% of marine ecoregions have reported marine invasion (Molnar, et al., 2008). Whilst INNS have played a key role in 60% of global plant and animal extinctions and are recognised as one of the 5 main drivers of biodiversity loss. (IPES, 2023)

In the UK marine environment INNS have the potential to pose a significant threat to native marine biodiversity and commercial interests. DEFRA (Department for Environment, Food and Rural Affairs) is the overarching coordinator for INNS in England with the GB NNSS (GB Non-Native Species Secretariat) being a focal point for communication and co-ordinating reporting of INNS. (GB NNSS , n.d.)

Known impacts of INNS on native biodiversity are the spread of disease, competition for habitat and food and direct predation. (GB NNSS, 2023) As well as these serious and potentially irreversible environmental problems, they can also interfere with recreational and commercial activities by clogging propellers, damaging boats, blocking up waterways, and increasing the risk of flooding. (GB NNSS, 2017)

Direct biological 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 is crucial.

Further details can be found in Solway Firth Partnership’s report on INNS and their impact in the Solway Firth (Solway Firth Partnership, 2021)

2. Method

Two settlement panels (Photo 1) were attached to pontoons within Maryport Marina on 17 May 2023 by SFP staff in locations highlighted in 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

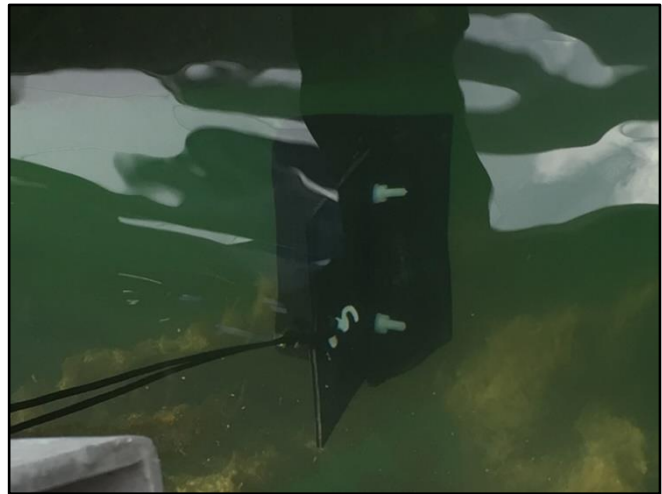


Photo 2 - Submerged complex Correx panel

Maryport was chosen as a relatively large and active but protected marina.



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

At the end of the summer (21 September 2023), the panels at Maryport were collected, photographed (Photos 4, 5), scored for percentage cover of surface species and then appropriately discarded. Mobile organisms, such as crabs were also noted and recorded.

Both panels were retrieved from Maryport Marina.



Photo 4 – Panel 1



Photo 5 – Panel 2

3. Results

The species diversity on the panels was increased from that recorded in the 2022 survey. There were several sea squirt, including *Ascidella aspersa* (Photos 6 and 7) recorded on Panel 2 which was in a more sheltered position and star ascidian, *Botryllus shlosseri* (Photo 8) on both panels. The bryozoan, *Conopeum reticulum* (Photo 9) was noted in the marina, as was the sea mat, *Membranipora membranacea* (Photo 10) which was recorded for the first time. The non-native invasive species, trumpet tubeworm, *Ficopomatus enigmaticus* (Photos 11 and 12) was recorded for the first time and may have been brought in on a boat moving from Whitehaven Marina, where it is common, to Maryport Marina. Several shore crabs, *Carcinus maenas* (Photo 13) were recorded but less than previously, one was noted with the parasite, *Sacculina carcini* attached (Photo 14).

Although there wasn't a great species diversity on the panels, there was good coverage of native species.

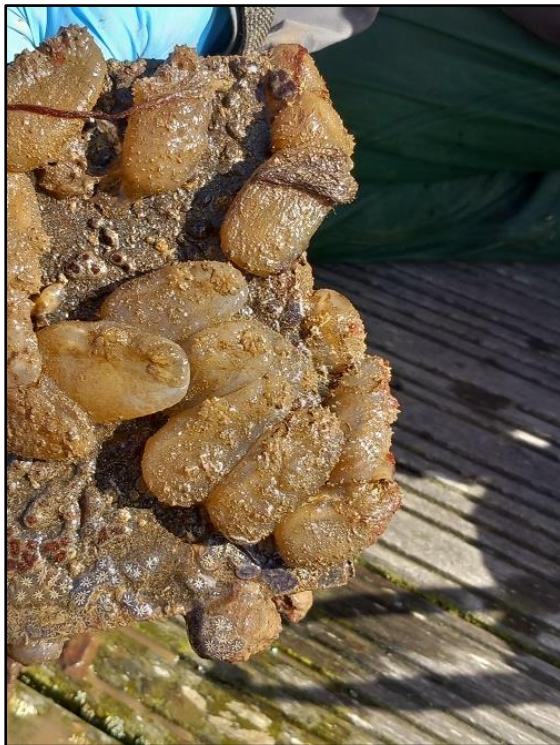


Photo 6 – Sea squirt, *Ascidella aspersa*



Photo 7 – Sea squirt, *Ascidella aspersa*



Photo 8 – Star ascidian, *Botryllus shlosseri*

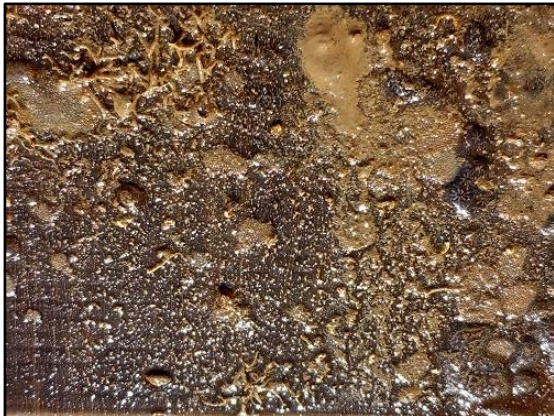
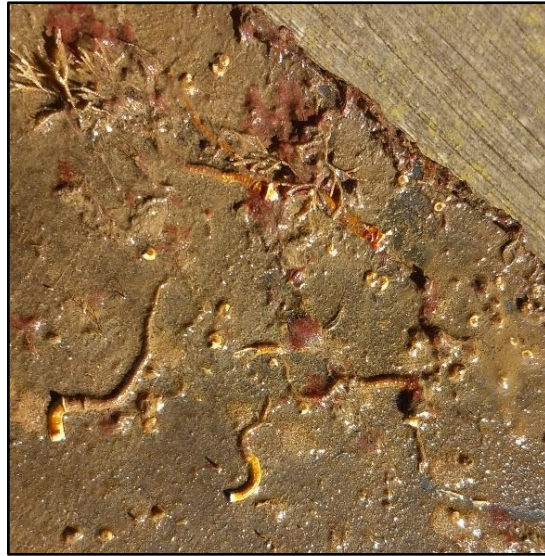


Photo 9 – Bryozoan, *Conopeum reticulum*



Photo 10 – Sea mat,
Membranipora membranacea



Photos 11 and 12 –Trumpet tubeworm, *Ficopomatus enigmaticus*



Photo 13 – Shore crab, *Carcinus maenas*



Photo 14 - Shore crab, *Carcinus maenas*
with *Sacculina carcini*

4. Conclusion

The 2023 survey of Maryport Marina recorded species not previously noted including the non-native invasive species, trumpet tubeworm, *Ficopomatus enigmaticus*. This needs to be monitored closely as it has economic consequences for users of the marina due to the cost of scraping boats. Also noted for the first time was the parasite of the shore crab, *Sacculina carcini* and the sea mat, *Membranipora membranacea*. There was also good coverage of native star ascidians and bryozoan.

Continued awareness of INNS gained from the use of the panels and the rapid site assessments will allow for improved biosecurity control of invasives species. 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 Name	Common	Species - Latin Name	Abundance	Invasive sp	Notes	Abbrev	Scale	%
1	NY0304736597	Shrimp sp		Gammarus sp	R	N		S	Super Abundant	80 - 100
	NY0304736597	Star ascidian		Botryllus shlosseri	C	N		A	Abundant	40 - 80
	NY0304736597	Bryozoan		Conopeum reticulum	O	N		C	Common	20 - 40
	NY0304736597	Trumpet Tube Worm		Ficopomatus enigmaticus	O	Y	not dense	F	Frequent	10 - 20
	NY0304736597	Green seaweed		Cladophora rupestris	O	N	small strands	O	Occasional	5 - 10
	NY0304736597	Sea mat		Membranipora membranacea	R	N		R	Rare	<5%

2	NY0298936515	Sea squirt	Ascidella aspersa	O	N	3
	NY0298936515	Barnacle sp	Unsure of species			
	NY0298936515	Star ascidian	Botryllus shlosseri	F	N	
	NY0298936515	Green seaweed	Cladophora rupestris	O	N	
	NY0298936515	Trumpet Tube Worm	Ficopomatus enigmaticus	R	Y	
	NY0298936515	Shore Crab	Carcinus maenas	R	N	
	NY0298936515	Parasite on crab	Sacculina carcini	R	N	