

Monitoring of Marine INNS using Submerged Settlement Panels

Whitehaven Marina - May to October 2022

Solway Firth Partnership November 2022



Whitehaven 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. 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 the organisation for reporting INNS to.

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 is crucial.

2. Method

Four settlement panels (Photo 1) were attached to pontoons within Whitehaven Marina on 11 May 2022 by SFP staff, locations shown at 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 - Correx panel structure



Photo 2 – Attaching the Correx panel

Whitehaven was chosen as a relatively large and active but protected marina. This was the second year that SFP had monitored the marina. Cumbria Wildlife Trust (CWT) had also carried out monitoring using settlement panels in 2015 as part of a national monitoring project.



Figure 1: Whitehaven Marina. Location of panels

At the end of the summer (4 October 2022), the panels at Whitehaven were collected, photographed (Photos 3, 4), scored for percentage cover of surface species and then appropriately discarded. Mobile organisms, including barnacle cyprids and crabs were also noted and recorded.



Photo 3 – Collecting panels



Photo 4 – Collecting panels

3. Results

All four panels installed at Whitehaven were successfully recovered and assessed.

As this was the second year that SFP had monitored Whitehaven marina the previous year's results were consulted for comparison.

The most commonly occurring species across all panel locations was the trumpet tubeworm, *Fipimactus enigmaticus* (Photo 5) which was also the dominant species in 2021. The other dominant species was the common mussel, *Mytilus edulis* which were found in all panels in varying densities. The sea squirt *Ascidiella aspersa* was not found on any panels, despite being common in 2021. Other species noted included the bryozoan, *Conopodium reticulum* and the red seaweed, *Ceramium virgatum* (both on Photo 7 and bryozoan on Photo 8); the green algae, *Cladophora rupestris*; an unidentified marine worm (Photo 9), and various barnacles including Darwin's barnacles, *Elminius Modestus* (Photo 10).

Discussion with local boat owners at the marina confirmed that the trumpet tube worm, *Fipimactus enigmaticus* (Photo 11) continues to be an issue. Boat owners must pay to have it scraped off the bottom of their boats. The other species found commonly around the marina was the common mussel, *Mytilus edulis* (Photo 12 with trumpet tube worm) which appeared to be in higher numbers than last year.

A full species list is found at Appendix 1.



Photo 5 – Trumpet tubeworm



Photo 6 – Common Mussels



Photo 7 – Bryozoan, *Conopodium reticulum* and Red seaweed, *Ceramium virgatum*



Photo 8 – Bryozoan, *Conopodium reticulum*



Photo 9 – Unidentified marine worm



Photo 10 – Barnacles



Photo 11 - Trumpet tubeworm dominates



Photo 12 – mussels with trumpet tubeworm

4. Conclusion

The most commonly occurring species across all panel locations was the trumpet tubeworm, *Fipimactus enigmaticus*. Local evidence suggests that this species is common across the marina and is an issue to boat owners who must pay to have it scraped off the bottom of their boats. The common mussel, *Mytilus edulis* was also commonly seen around the marina in higher numbers than seen last year. Darwin's barnacle, *Elminius Modestus* was also present on site but does not appear to be causing problems on site.

The main difference from last year's results was the absence of the sea squirt *Ascidella aspersa* from the panels. Generally, there appeared to be less species diversity on the panels than last year. Further monitoring would have to take place to see whether this trend continues or was due to a specific variable such as the placement of the panels or weather.

Continued awareness of INNS gained from the use of the panels and including future 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: Whitehaven 2022 settlement panel results

WHITEHAVEN MARINA							
Panel No	Grid Ref	Species - Common Name	Species - Latin Name	Abundance	Invasive sp	Abbrev	Scale
1	NX9727718436	Green seaweed	<i>Cladophora rupestris</i>	A	N	S	Super Abundant
	NX9727718436	Darwins Barnacle	<i>Elminius modestus</i>	F	Y	A	Abundant
	NX9727718436	Trumpet Tube worm	<i>Fipimactus enigmaticus</i>	A	Y	C	Common
	NX9727718436	Bryozoan	<i>Conopeum reticulum</i>	O	N	F	Frequent
	NX9727718436	Barnacle sp	<i>Unsure of species</i>	R	N	O	Occasional
	NX9727718436	Mussel sp	<i>Unsure of species</i>	F	N	R	Rare
	NX9727718436	Shrimp	<i>Gammarus sp</i>	R	N		
	NX9727718436	Worm	<i>Unsure of species</i>	R	N		
2	NX9716018400	Green seaweed	<i>Cladophora rupestris</i>	C	N		
	NX9716018400	Trumpet Tube worm	<i>Fipimactus enigmaticus</i>	C	Y		
	NX9716018400	Common Shore Crab	<i>Carcinus maenas</i>	R	N		
	NX9716018400	Common Mussel	<i>Mytilus edulis</i>	A	N		
	NX9716018400	Shrimp sp	<i>Gammarus sp</i>	R	N		
	NX9716018400	Crab	<i>Unsure of species</i>	R	N		
	NX9716018400	Encrusting bryozoan	<i>Conopeum reticulum</i>	A	N		
	NX9716018400	Worm	<i>Unsure of species</i>	R	N		
3	NX9720018328	Green seaweed	<i>Cladophora rupestris</i>	C	N		
	NX9720018328	Darwins Barnacle	<i>Elminius modestus</i>	R	Y		
	NX9720018328	Trumpet Tube worm	<i>Fipimactus enigmaticus</i>	A	Y		

NX9720018328	Crab	<i>Unsure of species</i>	R	N
NX9720018328	Common Mussel	<i>Mytilus edulis</i>	C	N
NX9720018328	Shrimp sp	<i>Gammarus sp</i>	R	N
NX9720018328	Encrusting bryozoan	<i>Conopeum reticulum</i>	O	N

	NX9698118259	Green seaweed	<i>Cladophora rupestris</i>	O	N
	NX9698118259	Darwins Barnacle	<i>Elminius modestus</i>	R	Y
	NX9698118259	Trumpet Tube worm	<i>Fipimactus enigmaticus</i>	F	Y
4	NX9698118259	Red seaweed	<i>Ceramium virgatum</i>	F	N
	NX9698118259	Shrimp sp	<i>Gammarus sp</i>	O	N
	NX9698118259	Common Mussel	<i>Mytilus edulis</i>	R	N
	NX9698118259	Encrusting bryozoan	<i>Conopeum reticulum</i>	A	N
	NX9698118259	Barnacle sp	<i>Unsure of species</i>	O	N