Monitoring of Marine INNS Using Submerged Settlement Panels

Portpatrick Harbour

May to September 2024

Solway Firth Partnership October 2024

Portpatrick RNLI Pontoon in Harbour

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 NatureScot is the overarching coordinator for NNS in Scotland and lead for terrestrial habitats and wetlands, whilst Marine Scotland lead for marine habitats. GB NNSS (GB Non-Native Species Secretariat) is 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 biological indices displaying lower scores where INNS are present. Indirect impacts include where INNS densities are so high that there is 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, 2024)

2. Method

Two settlement panels (Photo 1) were attached to the RNLI pontoon within Portpatrick Harbour on 1 May 2024 at the same locations as previous years (Figure 1).

Photo 1– Complex Correx panel structure

Photo 2 - Attaching panels.

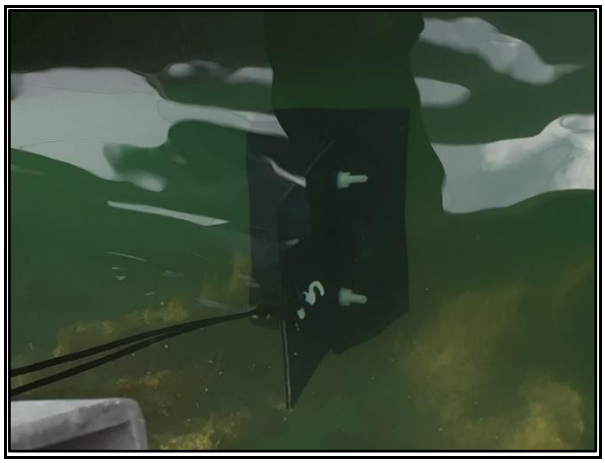

Photo 3 - Submerged complex Correx panel

Photo 4 – Colonised panel

The panels were attached to the underside of the pontoons (Photo 2) and submerged to around one metre depth using strong paracord or twine and weighed down with 6 oz fishing weights (Photo 3). The panels provided a substrate for growth (Photo 4).

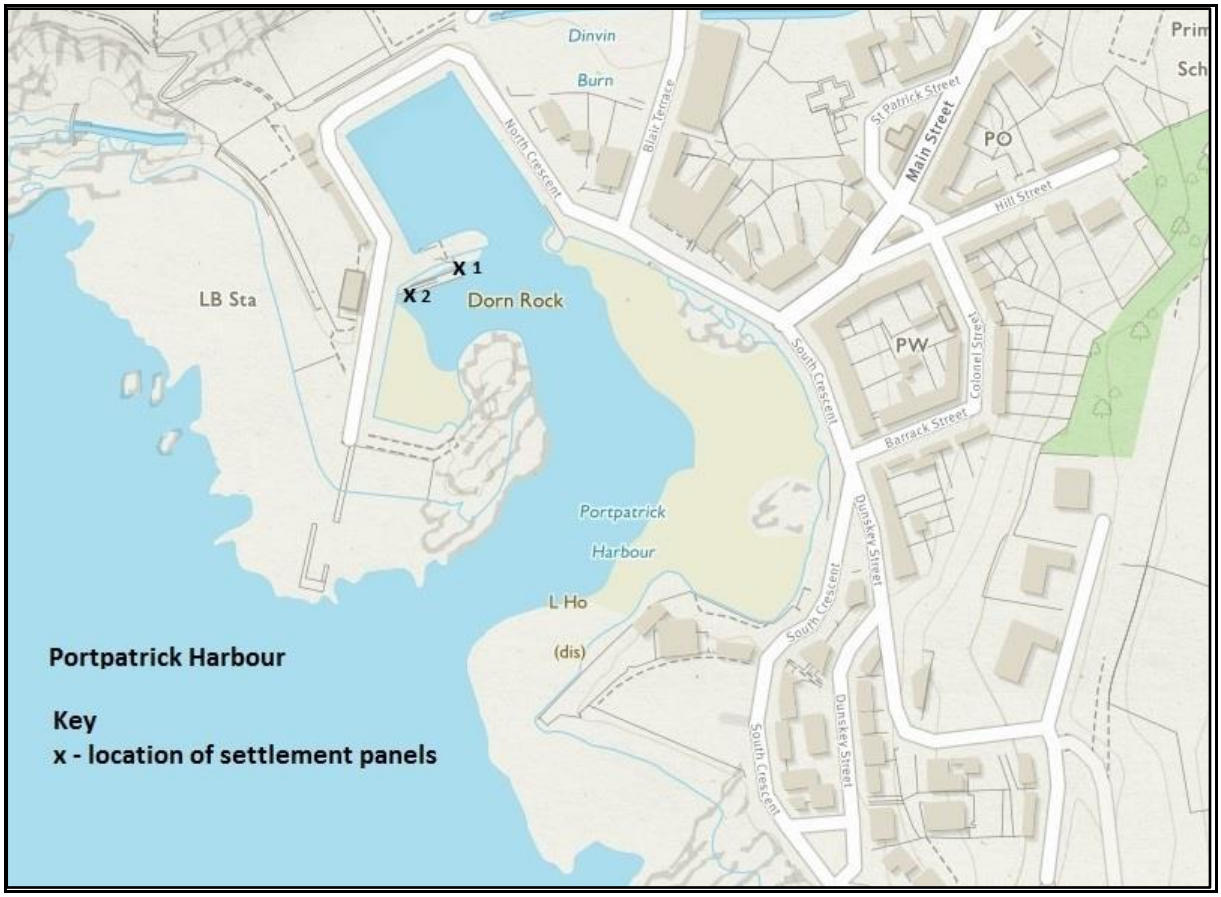

Figure 1 - Portpatrick Harbour, Location of Settlement Panels, 1 – 2

Portpatrick was also chosen as an active harbour used by mostly small recreation, tourism and fishing boats.

At the end of summer (23 September 2024) the panels at Portpatrick were collected, photographed (Photos 5, 6, 7), scored for percentage cover of surface species and then appropriately discarded. Mobile organisms such as crabs were also noted.

In addition, other species present on buoys, ropes and on the underside of the pontoon were noted.

Photo 5 – Panel removal and assessment

Photo 6 – Panel Opened Out

Photo 7 – Showing Internal Surface of Panel

3. Results

Both panels installed in Portpatrick marina were recovered and assessed.

The species diversity of the two panels at Portpatrick was similar to that recorded in the 2023 survey.

As in previous years, the two panels in Portpatrick had much less growth than in Stranraer (Photos 6 and 7) although the orange tipped sea squirt, *Corella eumyota* was recorded.

Photo 8 – Sea squirts on open panel

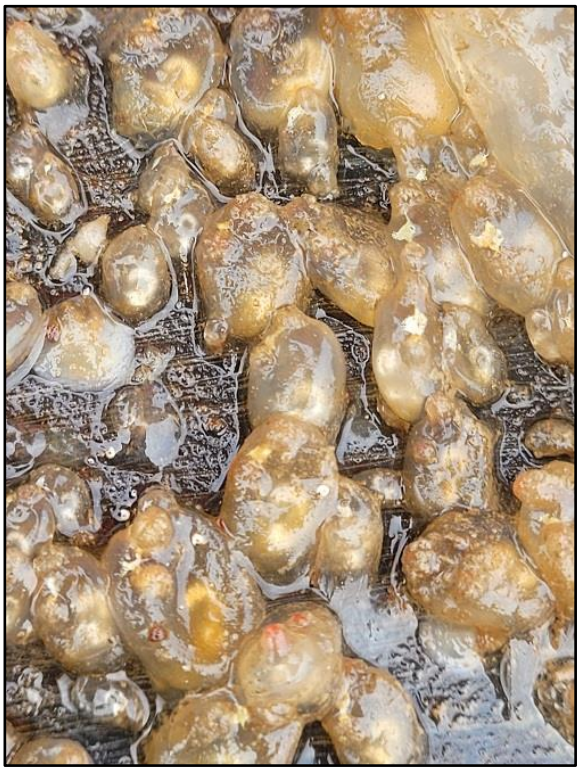

Photo 9 – Sea squirt

The panels both showed growth of several species of sea squirt including the tunicate, *Ascidiella aspersa* (Photos 8 and 9). Star Ascidian, *Botryllus shlosseri* (Photo 10) was noted on both panels with other species including the tubeworm, *Pomatoceros triqueter* (Photos 11 and 12) and the sponge, *Sycon ciliatum* (Photo 13); sea lettuce, *Ulva lactuca* (Photo 14); Velvet swimming crab, *Necora puber* (Photo 15) and the unidentified sea mat (Photo 16). Experts have been contacted to try and identify the sea mat.

Photo 10 – Star Ascidian (*Botryllus shlosseri)*, Sea lettuce (*Ulva Lactuca)* and red seaweed

Photos 11 and 12 – Tubeworm (*Pomatoceros triqueter)*

Photo 13 – Sponge (*Sycon ciliatum)*

Photo 14 - Sea lettuce (*Ulva Lactuca)*

Photo 15 – Velvet swimming crab (*Necora puber*)

Photo 16– Unidentified sea mat

4. Conclusion

The orange-tipped sea squirt, *Corella eumyota,* was found in Portpatrick but appeared in lower numbers than in previous years.

The current study suggests re-visiting the harbour again in the growing season of 2025 to see if species assemblage or if the spread of INNS has changed. The site would also benefit from another rapid site assessment, to allow for a more thorough INNS assessment, beyond the area in which the panels had been deployed.

Continued awareness of INNS gained from the use of the panels and the rapid site assessments will allow for improved biosecurity control of invasives at the two locations. 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.

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 – List of Species Recorded

PORTPATRICK MARINA **Date recovered - 23/09/2024**

Panel No	Grid Ref	Species - Common Name	Species - Latin Name	Abundance	Invasive sp
PP1	NW9979154137	Sea squirt	*Ascidiella aspersa*	C	N
	NW9979154137	Sea squirt (sea vase)	*Ciona intestinalis*	O	N
	NW9979154137	Sea squirt (pink)	*Ascidia mentula*		N
	NW9979154137	Sponge	*Sycon ciliatum*	O	N
	NW9979154137	Tube worm	*Pomatoceros triqueter*	R	N
	NW9979154137	Star ascidian	*Botryllus shlosseri*	R	N
	NW9979154137	Sea lettuce	*Ulva lactuca*	F	N
	NW9979154137	Green seaweed	*Cladophora rupestris*	R	N
	NW9979154137	Bryozoan		R	N
	NW9979154137	Fish (Rock goby?)		R	N
	NW9979154137	Prawn	*Palaemon sp*	R	N
	NW9979154137	Oysters / Saddle oysters		R	N
	NW9979154137	Orange-tipped sea squirt	*Corella eumyota*	O	Y
	NW9979154137	Velvet swimming crab	*Necora puber*	R	N
	NW9979154137	Red seaweed	*?*	O	
PP2	NW9979154137	Sea squirt	*Ascidiella aspersa*	R	N
	NW9979154137	Sea squirt (sea vase)	*Ciona intestinalis*	R	N
	NW9979154137	Sponge	*Sycon ciliatum*	R	N
	NW9979154137	Tube worm	*Pomatoceros triqueter*	R	N
	NW9979154137	Sea lettuce	*Ulva lactuca*	R	N
	NW9979154137	Green seaweed	*Cladophora rupestris*	R	N
	NW9979154137	Furrowed Crab	*Xantho hydrophilus*	R	N
	NW9979154137	Oysters / Saddle oysters		R	N
	NW9979154137	Orange-tipped sea squirt	*Corella eumyota*	C	Y

Abbrev	Scale	%
S	Super Abundant	80 - 100
A	Abundant	40 - 80
C	Common	20 - 40
F	Frequent	10 - 20
O	Occasional	5 - 10
R	Rare	<5%