

Monitoring of Marine INNS using Submerged Settlement Panels

Kirkcudbright Marina - May to September 2019

Solway Firth Partnership October 2019



Kirkcudbright 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 Kirkcudbright Marina in May 2019 by Solway Firth Partnership (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 panel in river stream

Sampling had not previously been conducted at Kirkcudbright Marina by SFP as the sampling area was limited to the pontoon within the body of the River Dee to allow them to be within water at all time.



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

At the end of the summer (30 September 2019), the panels at Kirkcudbright were collected, photographed (Photos 4, 5), scored for percentage cover of surface species and then discarded. Mobile organisms, including barnacle cyprids were counted individually.



Photo 4 - Recovered panel



Photo 5 – Opened recovered panel

3. Results

Only one of the two panels (Panel 1) was recovered from Kirkcudbright. The second panel was seen but had become entangled around the leg of an escape ladder. The water flow of the river was very strong and so it was not possible to remove the panel.

A Rapid Assessment Survey (RAS) was attempted at Kirkcudbright 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.

Kirkcudbright had no time comparison, as it was the first time the survey had been conducted by SFP. The marina was more sheltered than the other marinas on the north side of the Solway and had a much faster water flow of freshwater into the main stream.

Few species were found growing on the panel. The most commonly occurring species were Darwin's barnacle, *Elminius modestus* (Photo 6) and the Green algae, *Cladophora rupestris* (Photo 7). Other species noted on the pontoon or in the water were the seaweeds - Bladderwrack, *Fucus vesiculosus*; Sea lettuce, *Ulva lactuca* (Photo 8); Egg wrack, *Ascophyllum nodosum* (Photo 9) and a red feathery seaweed. A full species list is found at Appendix 1.



Photo 6 – Darwin's barnacle



Photo 7 – Green algae



Photo 8 – Sea lettuce



Photo 9 – Egg wrack

4. Conclusion

The only INNS were found at Kirkcudbright was Darwin's barnacle with practically no growth of other species. The marina sits within a tidal but freshwater river stream which is unlikely to be suitable habitat for marine species and so it is probably not necessary to go deploy panels there in 2020.

5. References

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Appendix 1: Kirkcudbright settlement panel results

KIRKCUDBRIGHT MARINA								
Panel No	Grid Ref	Species - Common Name	Species - Latin Name	Abundance	Invasive	Abbrev	Scale	%
1	NX6792651268	Green seaweed	<i>Cladophora rupestris</i>	A	N	S	Super Abundant	80 - 100
	NX6792651268	Darwins Barnacle	<i>Elminius modestus</i>	C	Y	A	Abundant	40 - 80
	NX6792651268	Sea lettuce	<i>Ulva lactuca</i>	R	N	C	Common	20 - 40
	NX6792651268	Bladderwrack	<i>Fucus vesiculosus</i>	R	N	F	Frequent	10 - 20
	NX6792651268	Egg wrack	<i>Ascophyllum nodosum</i>	R	N	O	Occasional	5 - 10
	NX6792651268	Bryozoan	<i>Conopeum reticulum</i>	R	N	R	Rare	<5%
	NX6792651268	Red Feathery seaweed	<i>Unknown species</i>	R	N			
	NX6792651268							
2	NX6813451158	PANEL IRRETRIEVABLE						