Detection of marine INNS by Rapid Site Assessment

Stranraer Marina and Harbour, September 2016

Solway Firth Partnership September 2016

Japanese skeleton shrimp on buoy

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.

The major pathways by which marine INNS are introduced include shipping, recreational boating, aquaculture stock movements and natural dispersal (GB NNSS, 2015b). 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. Background

An assessment of the marine INNS species within Stranraer Marina and Harbour was made using settlement panels (SFP, 2016). Ten settlement panels were attached to pontoons within Stranraer Marina and two settlement panels attached to the pontoon within Stranraer Harbour from late May to August 2016. This assessment found only one INNS (Darwin's barnacle) although other INNS were known to inhabit the harbour waters. It was decided to re-visit Stranraer harbour in September 2016 to conduct a rapid site assessment, to allow for a more thorough INNS assessment.

Stranraer Marina

3. Methodology

Stranraer Harbour Master was contacted in advance of the site visit for permission to undertake the survey. Three staff from Solway Firth Partnership visited Stranraer Marina on 16 September 2016. The four pontoons were systematically surveyed, noting species present (both native and non-native) along with an estimate of abundance made on the ACFOR scale (Abundant; Common, Frequent, Occasional, Rare). Species identification was discussed on site and staff were able to record joint summary observations on a standard form.

Identifying and Recording Green sea fingers

4. Results

The Rapid Site Assessment Survey confirmed the presence of several marine invasive non-native species, which had not previously colonised the settlement panels. The species noted were Japanese wireweed, *Sargassum muticum*; Green sea fingers, *Codium fragile* and Japanese skeleton shrimp, *Caprella mutica*. Darwin barnacle, *Elminius modestus* was also recorded colonising the underside of pontoons and on several buoys.

Japanese wireweed and Japanese skeleton shrimp were found on pontoons two and three. Green sea fingers were apparent on the second pontoon, whilst the Darwin barnacle was recorded on pontoons one, two, three and four. Pontoon three appeared to have greatest species richness, although all four pontoons had Green Seaweed, *Codium bursa; Blue mussel, Mytilus edulis;* Common limpet*, Patella vulgate;* Green seaweed, *Cladophora rupestris;* Sugar kelp*, Saccharina latissima,* Sea lettuce, *Ulva lactuca;* Red seaweed-Irish Moss, *Chondrus crispus,* Green sea fingers, *Codium fragile*, plumose anemone, *Metridium senile* and a Bryozoan.

Green sea fingers

Plumose anemone on blue mussel

Several species of native seaweed, mollusc and anemone; including the plumose anemone were also noted during the survey; see Appendix 1 for full results.

5. Conclusion

Stranraer harbour was found to have several invasive non-native species present: Japanese wireweed, Japanese skeleton shrimp, green sea fingers and the Darwin barnacle. The Darwin barnacle was recorded most frequently and on all of the pontoons. Japanese wireweed was difficult to quantify as many strands were found floating unattached, with fewer live strands still attached and growing against the pontoons.

The rapid site assessment was far more successful than use of the settlement panels in quickly determining if there were any invasive non-native species present within Stranraer harbour. Skeleton shrimp was confined for the present to the third pontoon. However, it was found on two hulls and several buoys, suggesting that the invasive is spreading across the marina. Action needs to be taken to remove infested buoys and have hulls cleaned of the shrimp to mitigate against the spread.

5. References

GB NNSS (2015a). *Definition of Terms*. Online at http://www.nonnativespecies.org/index.cfm?pageid=64 [accessed 18/03/15]

GB NNSS (2015b). *Monitoring for NNS*. Online at http://www.nonnativespecies.org/index.cfm?pageid=477 [accessed 18/03/15]

Solway Firth Partnership (2016). Early detection of marine INNS using submerged settlement panels Stranraer Marina and Harbour, May to August 2016.
A report prepared by the Solway Firth Partnership. Available at: http://www.solwayfirthpartnership.co.uk/uploads/Marine%20Invasive%20Non-native%20Species/INNS_Report_Stranraer_Marina_Sept_2016.pdf [Accessed: 22/09/16]

Appendix 1 - Summary of Results of Stranraer Marina Rapid Site Assessment Survey

Non-native species	ACFOR	**Native species**		ACFOR
Wireweed (*Sargassum muticum*)	O	Sugar kelp: *Saccharina latissima*		C
Wakame (*Undaria pinnatifida*)		Oarweed: *Laminaria digitata*		
Devil's tongue weed (*Grateloupia turuturu*)		Sponges: all species		
Orange-striped anemone (*Haliplanella lineata*)		Plumose anemone: *Metridium senile*		O
		Dahlia anemone: Urticina felina		O
Chinese mitten crab (*Eriocheir sinensis*)		A hydroid: *Tubularia* sp.		
Japanese skeleton shrimp (*Caprella mutica*)	C	Other hydroids		
Darwin's barnacle (*Elminius modestus*)	A	Other barnacles		
Ruby bryozoan (*Bugula neritina*)		Other erect bryozoans		
An encrusting bryozoan: *Watersipora*		Other encrusting bryozoans		O
Trumpet tube-worm (*Ficopomatus enigmaticus*)		Mussels: *Mytilus* sp.		A
Slipper limpet (*Crepidula fornicata*)		Sea squirts	*Ascidiella aspersa*	
Orange-tipped sea squirt (*Corella eumyota*)			*Diplosoma listerianum*	
Leathery sea squirt (*Styela clava*)			*Clavelina lepadiformis*	
A colonial sea squirt: *Botrylloides violaceus*			*Ciona intestinalis*	
Carpet sea squirt (*Didemnum vexillum*)			*Molgula* sp.	
Additional species		Additional species		
Green sea fingers: *Codium fragile v fragile*	C	Green seaweed: *Cladophora repestris*		A
		Green seaweed: Codium bursa		R
		Bladderwrack: *Fucus vesiculosus*		C
		Sea lettuce: *Ulva lactuca*		C
		Red seaweed, Irish Moss: *Chondrus crispus*		O
		Red seaweed, Straggle weed: *Gelidium spinosum*		O
		Common limpet: *Patella vulgata*		C
		Worm: *Pomatocerus triqueter*		O

Key to the ACFOR Scale

A – The species observed is "Abundant"

C – The species observed is "Common"

F – The species observed is "Frequent"

O – The species observed is "Occasional"

R – The species observed is "Rare"