

# Marine non-native species in the north of Scotland and implications for the marine renewable industry

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The world's largest commercial wave and tidal energy production site is planned for the Pentland Firth and Orkney waters, north Scotland (The Crown Estate, 2011). Despite the positive impacts of the wave and tidal industry, the creation of sustainable energy, there is potential for a number of environmental impacts (Boehlert & Gill, 2010). One such impact is the spread and establishment of marine non-native species as a result of increased vector activity with respect to vessel traffic and the wet movement of devices (Gollasch, 2002) and the addition of large amounts of artificial habitat (Mineur *et al.*, 2012). To monitor and potentially mitigate against this impact, it is important to determine the presence and distribution of marine non-native species prior to the development. In this study published and unpublished records of fouling marine non-native species in Scotland were centralised into a single inventory. These species were then targeted in rapid assessment surveys (Arenas *et al.*, 2006) of twenty eight harbours in the north Scottish mainland and Orkney Isles, during August and September 2012.

Collation of previous records found that twenty three fouling marine non-native species were known to be present in Scotland. Distribution of these records was uneven and largely underrepresented in the north and east of mainland Scotland, likely as result of low survey effort. In the north Scotland rapid assessment surveys, nine targeted species were found: *Austrominius modestus*, *Botrylloides violaceus*<sup>†</sup>, *Caprella mutica*, *Codium fragile ssp. fragile*, *Corella eumyota*, *Heterosiphonia japonica*, *Neosiphonia harveyi*, *Schizoporella japonica* and *Tricellaria inopinata*. The non-native bryozoan *Bugula simplex* which was not targeted was also found and this constituted the first confirmed Scottish record. The surveys provided sixty five new locality records and extended the northern UK range of the majority non-native species found. The number of non-native species was greater in busier and larger harbours and a positive association was also found between the number of non-native species and the presence of floating harbour structures. This study represents the first comprehensive survey of marine non-native species in the north of Scotland and provides a baseline dataset which can be used to help monitor the facilitation of non-native species by the wave and tidal energy industry. The findings also highlight the non-native species which could initially colonise and be spread by wave and tidal energy devices or maintenance vessels in the north of Scotland.

<sup>†</sup> = identification confirmation required

## References

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