

Ramsey Stone Piers Survey Summary

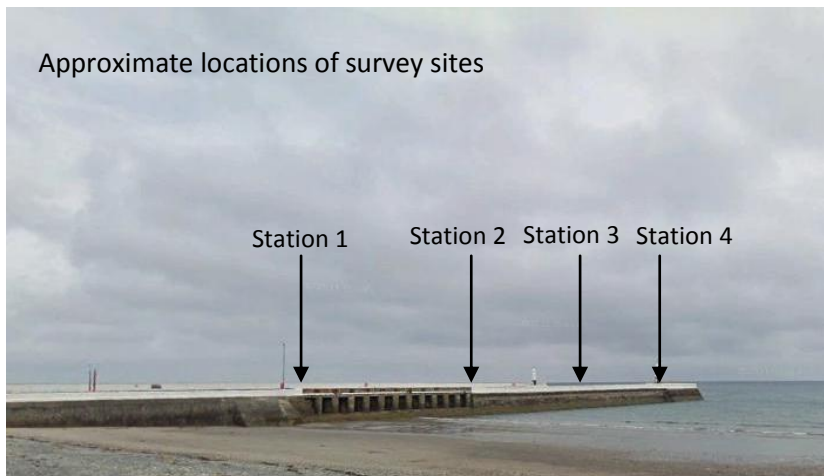
Semi-quantitative estimation of abundance of *Elminius modestus* and *Crassostrea gigas*

Survey Date: 21st September 2013, from 17:30.

Survey Area

Due to time constraints, only the south face of the south wall was surveyed. This was accomplished with the help of approximately 10 volunteers. Four survey stations were selected, approximately equally spaced down the length of the wall. For future repeat surveys, the locations of each site are as follows:

- Site 1: Top of the pier, around the 3rd pillar down
- Site 2: The promontory to the right of the last pillar
- Site 3: 20 rectangular blocks to the right of the promontory (site 2)
- Site 4: The end of the pier, immediately prior to the stepped section



Survey Methods

All 4 species that were expected were found and quantified. These were the non-native species *Elminius modestus* (Darwin's barnacle) and *Crassostrea gigas* (Pacific oyster) and two morphologically similar species which were selected as appropriate indicator proxies for assessment of the two non-native species; *Mytilus edulis* (edible mussel) and *Semibalanus balanoides* (barnacle). Survey methodology was based on the SACFOR scale, which uses several native species as representative size/morphology types for measuring abundance (Appendix 1). The scales for *Small Barnacles* and *Mussels* were used for the barnacle and oyster/mussel species respectively.

For barnacle abundance only, each survey station was divided vertically by eye according to tidal height marks on the wall associated with barnacle abundance. These 4 zones were classified as 'very high shore/intertidal', 'high shore', 'mid shore' and 'low shore'. Due to the beach gradient and reach of the tide up the pier wall, not all stations had all zones present. At each present zone at each station, a horizontal area of a few metres was examined by several teams of 2-3 individual surveyors and the abundance score determined. Subsequently, all survey teams agreed on a final abundance score for the zone, taking account of each team assessment. A tally of all *C. gigas* was kept independently by 2 different recorders and compared at the end. Data was recorded onto pre-designed recording sheets.

Survey Results

Shore Level/ Species	Site 1		Site 2			Site 3			Site 4			
	VH	H	VH	H	M	VH	H	M	VH	H	M	L
<i>E. modestus</i>	O/F	F	O	F	O	F	C	F	F	F	O	R
<i>S. balanoides</i>	F	A	F	A	A	F	A	A	F	A	A	A
<i>C. gigas</i>	N		N				O				F	
<i>M. edulis</i>	N		N				O				N	

Key:				* See Appendix 1*
VH =	Very high		A =	Abundant
H =	High		C =	Common
M =	Mid		F =	Frequent
L =	Low		O =	Occasional
			R =	Rare
			N =	Not present

Total tally of *C. gigas* = 240 individuals for the entire south face of south pier (to the very end)

Discussion

The last documented survey of this nature, for *E. modestus* at Ramsey was in 1958-9¹. It was then classified as 'common', the same classification as when it was first established in 1954-5². Although this survey has subdivided the area, it would seem that the species has not increased since this time, as no station had an abundance estimate greater than 'common' (0.1-1cm⁻²), with most sites being 'occasional' or 'frequent' (1-1000m²). The greater abundance of *S. balanoides* also suggests that the non-native species is not yet having a negative impact on the native species, especially in the high-shore zone.

There is some individual variation in the abundance at the different stations; however there is no clear pattern either by station or vertical height down the wall face (i.e. the different zones do not show a clear pattern of abundance). The only exception to this is in the 'low shore' zone, which appears to have a lower abundance of *E. modestus*; this would be expected from its preferred reported habitat. As expected, *C. gigas* and *M. edulis* only appear in Sites 3 and 4, with *C. gigas* increasing in abundance with distance down the shore.

Further surveys can be done in future to similarly quantify the abundance of these species on the other faces of the stone piers and at other sites around the Island as it is thought that the different pier faces have different abundance levels of the species, and there may be areas of increased competition between native and non-native species. Similarly, repeat surveys of Ramsey and indeed other sites should be carried out in future years to monitor the spread of the non-native species. However, this current survey, conducted 55 years since the previous one, will provide a useful baseline and methodological template for future monitoring.

References

¹ *The Further Spread of Elminius Modestus in the British Isles to 1959*; Crisp & Southward; J. Mar.Biol.Ass.UK (1959) 38, 429-437.

² *The Spread of Elminius Modestus Darwin in North-West Europe*; Crisp; J.Mar.Biol.Ass.UK (1958) 37, 483-520.

Appendix 1

Scales:	Small Barnacles	Mussels
S = Superabundant	3-5cm ⁻²	50-79% cover
A = Abundant	> 1cm ⁻²	>20% cover
C = Common	0.1-1cm ⁻²	Large patches
F = Frequent	100-1000m ⁻²	Scattered individuals/small patches
O = Occasional	1-100m ⁻²	Scattered individuals, no patches
R = Rare	Few found	Few found
N = Not found	None found	None found