



 **Manx Wildlife Trust**  
Treisht Bea-Feie Vannin 

## Ramsey Harbour Invasive Species Survey 2015

*Semi-quantitative estimate of abundance of *Austrominius modestus* and *Crassostrea gigas**



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## Introduction

The survey was conducted on 5<sup>th</sup> September 2015 at 10:00am to coincide with low water at 11:00am. Three volunteers and two members of MWT Staff helped conduct the survey. Due to the limited number of volunteers only the south side of the south wall was surveyed, as in the previous year.

## Methods

All methods followed the previous year's survey methodologies (See Appendix).



Figure 1. Positions of the four survey points along the southern wall.

Site 1: The top of the pier, at the 3<sup>rd</sup> pillar down.

Site 2: The promontory to the right of the last pillar.

Site 3: 20 rectangular blocks to the right of site 2.

Site 4: The end of the pier, immediately prior to the stepped section.

## Results

### 2015 Results

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

Table 1. Results of invasive species survey 2015.

### 2014 Results

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

Table 2. Results of invasive species survey 2014.

### 2013 Results

Species	Site 1		Site 2			Site 3			Site 4			
	VH	H	VH	H	M	VH	H	M	VH	H	M	L
<i>A. 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		

Table 3. Results of invasive species survey 2013.

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

Table 4. Key to tables 1, 2 and 3 (see Appendix for detailed SACFOR scale).

The number of *C. gigas* counted along the entire length of the south wall has shown a decline from 240 in 2013, to 115 in 2014, and 98 this year. Shell remnants on the wall equated to 43 and the 'holes' in the barnacle cover where the oysters are likely to have previously been attached was 1. Tallying these together brings the total to 142. One individual was also seen on the sand at the base of the wall, still intact.



## Discussion

The native *M. edulis* results showed a similar pattern to the previous year, but site 4 shows a small decline in numbers. The abundance has only increased/decreased by one position on the SACFOR scale, so the variation in numbers is not dramatic and likely a result of natural fluctuations in the population.

*C. gigas* numbers have declined since the previous survey in 2014, from 115 to 98. A possible reason for the decline in the numbers this year could be due to strong winds that have hit our coast this year and created storm-like conditions. Another possible explanation could be the abundance of barnacles on the harbour walls, which makes a less stable anchoring platform for the oysters and may have led to their removal. Unlike the mussels, *C. gigas* are unable to wedge themselves into cracks in the wall and are thus more vulnerable to big waves and strong currents. This is hinted at in the previous year by the four intact oysters seen on the sand at the base of the wall whilst conducting the survey, and again this year with one individual seen on the sand. The decline could also be due to an aging population which is slowly dying off. *C. gigas* were first recorded here back in 2005, and although they can live to an age of 30, with less than optimum conditions it is possible that their life expectancy is reduced.

The native *S. balanoides* population has remained fairly stable, with only small fluctuations in abundance since last year. These small fluctuations could be due to natural fluctuations, or variance in the volunteer's opinion of what is common and what is frequent. This perception of abundance will vary from person to person, which can also be said for all species assessed in this survey. The invasive species, *A. modestus* also shows very little change in terms of abundance and it is likely that any small change is a result of natural fluctuations. Its abundance hasn't changed since the earlier surveys conducted in the 1950's (Crisp, 1958 and Crisp and Southward, 1959). This suggests that the species is not having an impact on our native barnacles. Its distribution up the shore hasn't changed much either, with its dominance remaining higher up the shore.

It is a positive sign to see that the population of *A. modestus* has remained fairly constant since the 1950's and that *C. gigas* has actually declined since the surveys began. This would suggest that the native populations are not being adversely affected by these invasive species. However, to ensure this remains the situation further monitoring will be conducted.

## References

Crisp, J. 1985. The spread of *Elminius modestus* Darwin in North-West Europe. 37: 483-520.

Crisp, J. & Southward, J. 1959. The further spread of *Elminius modestus* in the British Isles to 1959. Marine Biological Association of the U.K. 38: 429-437.

Kobayashi, M., Hofman, E.E., Powell, E.N., Klinck, J.M. and Kusaka, K. 1997. A population dynamics model for the Japanese oyster, *Crassostrea gigas*. Aquaculture 149: 285-321.

## Appendix

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

## Survey Methods

All 4 species that were expected were found and quantified. These were the non-native species *Austrominius modestus* (Australian barnacle) and *Crassostrea gigas* (Pacific oyster) and two morphologically similar species that 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 of 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.