Manx Wildlife Trust
Treisht Bea-Feie Vannin

Ramsey Harbour
Invasive Species Survey 2016

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

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Introduction

The survey was conducted on 10th September 2016 at 11:00am to coincide with low water at 12:00pm. Two 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 3rd 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

2016 Results

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

Table 1. Results of invasive species survey 2016.

2015 Results

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

Table 2. Results of invasive species survey 2015.

2014 Results

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

Table 3. Results of invasive species survey 2014.

2013 Results

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

Table 4. 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 5. Key to tables 1-4 (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, 98 in 2015 and 34 this year. Shell remnants on the wall equated to 57

and the 'holes' in the barnacle cover where the oysters are likely to have previously been attached was 13. Tallying these together brings the total to 104.

Discussion

The native *M. edulis* results showed a similar pattern to the previous year. 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 98 to 34. A possible reason for the decline in the numbers this year could be due to strong winds that have hit our coast this year. 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 two years with intact oysters seen on the sand at the base of the wall. The decline is most likely due to an aging population, which is slowly dying off. As stated in the previous year report, *C. gigas* was first reported on Ramsey harbour in 2005 and is capable of living to an age of 30 but with the less than optimum conditions this could be reduced.

The native *S. balanoides* population has remained fairly stable, with only small fluctuations in abundance since last year, with a slight one point increase at Sites 1 and 2. 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*, however shows an increase in abundance across all sites. Sites 1,3 and 4 are only an increase of one point on the SACFOR scale, but Site 2 shows an increase of 2 points. This change could be a result of volunteer opinion as to which abundance scale to place *A. modestus* in at that location or it could be a reflection of an increase in abundance. This is clearly something to focus on next year.

Although *A. modestus* has increased in abundance since the last survey its increase it still relatively small and our native species (*S. Balanoides*) is still doing well and does not seem to be impacted by the abundance changes with *A. modestus*. *C. gigas* is still declining. 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, particularly of *A. modestus*, will continue next year.

References

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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^{-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

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 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 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.