INSTITUTE FOR MARINE AND ANTARCTIC STUDIES
UNIVERSITY OF TASMANIA

SMALL BIVALVE FISHERY – 2012

Venerupis largillierti - Northern Zone, Georges Bay

Katelysia scalarina - Ansons Bay

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1. Georges Bay North Zone *Venerupis* Fishery Assessment, 2012

Summary

Following a survey of stocks in the Georges Bay north zone in March 2012, it was estimated that the biomass of *Venerupis largillierti* was 537.4 tonnes, with 95% confidence limits at 419.4 t and 655.4 t. A TAC for the fishery based on 10% of estimated biomass equates to 53.74 t. The fishery extended beyond areas previously mapped by industry, and consequently this estimate probably underestimated the size of the biomass.

There was evidence of recruitment into smaller size classes which would be expected to recruit to the fishery in future years. Modal shell-length was unusually large, which assuming correlation with age and increased mortality, may cause substantial reductions in biomass.

Survey results

The fished area of the Georges Bay *Venerupis* dive fishery was estimated to be 121,111 metres^2 (approximately 0.1km^2). This estimate was based on the location of four clam beds shown to D. Tarbath (IMAS) by G. Forsyth and D. Allen (industry) in 2008. Since then, fished areas have changed, and the 2008 estimate is no longer appropriate.

Figure 1 shows the position of the 2008 clam beds with respect to recent effort. The northern-most (yellow polygon) clam bed is no longer used while fishing has spread outside the other beds. The location of samples from the March 2012 survey showed that the area fished by both divers was greater than that indicated by the single diver's GPS tracks, and that using one diver's fished area could not adequately represent the combined area used by both divers. This meant that the area currently fished is likely to be greater than the 2008 estimate, but in the absence of a more accurate map of the fishery, this assessment continued to use the areas mapped in 2008.

During the sampling process, 5,024 clams were collected and measured from 100 quadrats of 0.25m^2, i.e. total sampling area was 25 m^2. Using the length-weight relationship ($W=0.0001*L^{3.153}$) derived from 250 clams collected during the survey, it was estimated that the total biomass for the area was 537.4 tonnes, with 95% confidence limits at 419.4 t and 655.4 t. This contrasts with a biomass estimate of 284.7 t in 2009, when 3,284 clams were collected from 98 quadrats, i.e. there were approximately 50% more clams caught in the most recent survey.

The length-frequency distribution was modal at 52 mm (Figure 2). This is unusually large, previously observed only in 2001. There was evidence of recruitment with clams ranging in size from 4 - 28 mm with a minor mode at 22 mm. Catchability of these small clams diminishes with size, so their relative abundance is probably under-represented. Comparison of frequency by length of clams from the 2009 survey shows that the modal length of the stock has increased by approximately 10 mm, and that the stock is now comprised predominately of larger (and almost certainly older) fish.

Divers reported much improved fishing through increased catch rates, consistent with increased stock size (Figure 3).

The following observations are made:

- Clam beds appeared to be spatially dynamic. GPS loggers used by one diver showed fishing outside the areas mapped in 2008.
- Divers reported that they no longer fish the northern patch because adequate catch rates can be maintained on the main beds.
- The biomass has almost doubled in size since the 2009 assessment.
- Fishing at current levels appears to have little effect on stock size.
- The larger size of shellfish indicates that the stock has aged since the last survey. The age (size) at which substantial mortality of larger fish occurs is not known, but unless recruitment is occurring at a rate at least proportional to stock size, any die-off of larger fish may be rapid and would impact heavily on stock levels. For this reason, it would be prudent to reduce survey intervals to no more than two years.
- A GPS logger will be provided to the second licensee to provide better estimates of the fished area for future surveys.

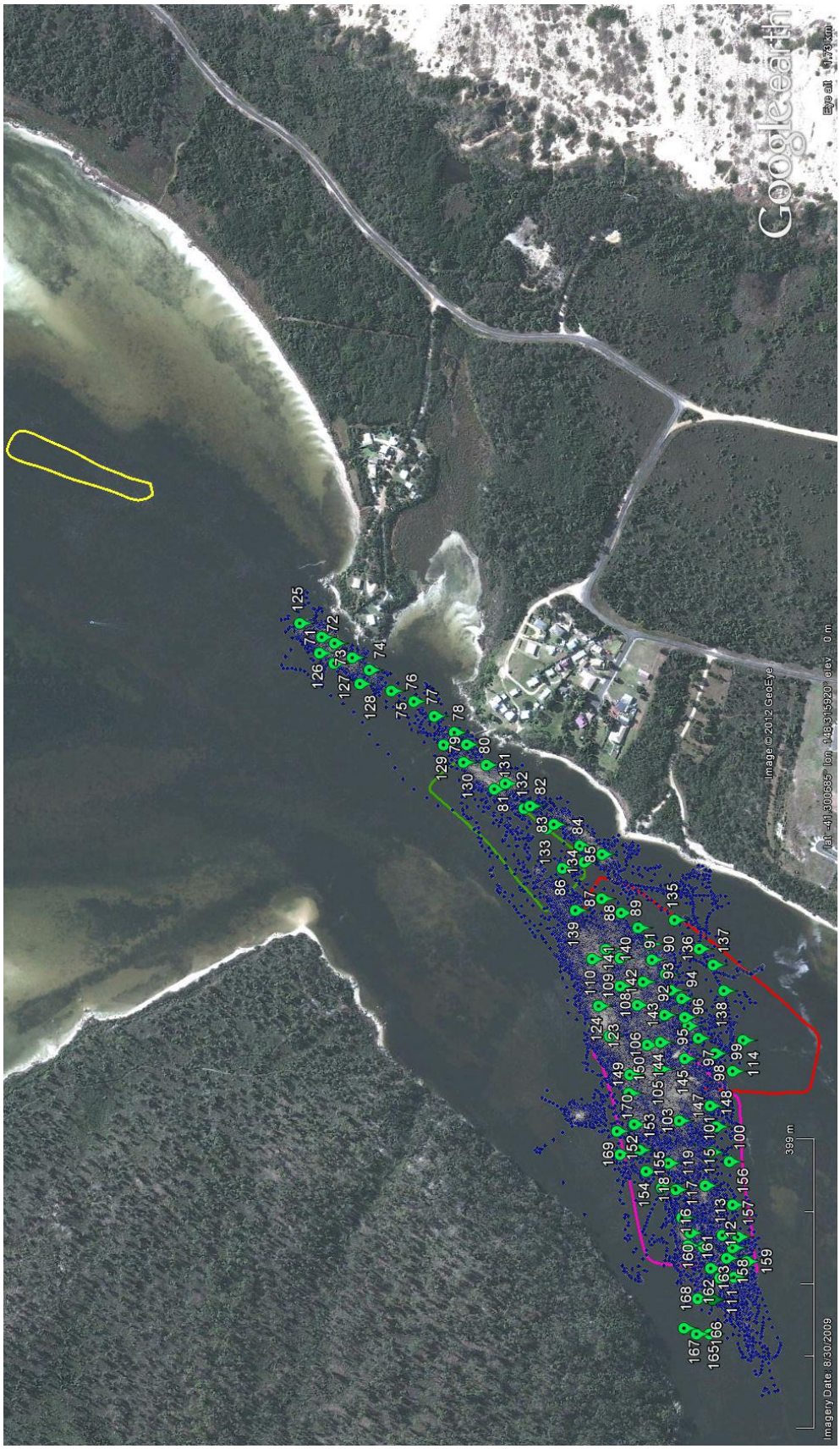

Figure 1. Georges Bay, showing the position of the four clam beds as mapped in 2008 (maroon, red, green and yellow polygons), the position of each of the 100 sample quadrats (green markers), and the GPS tracks of one diver's boat (dark blue dots).

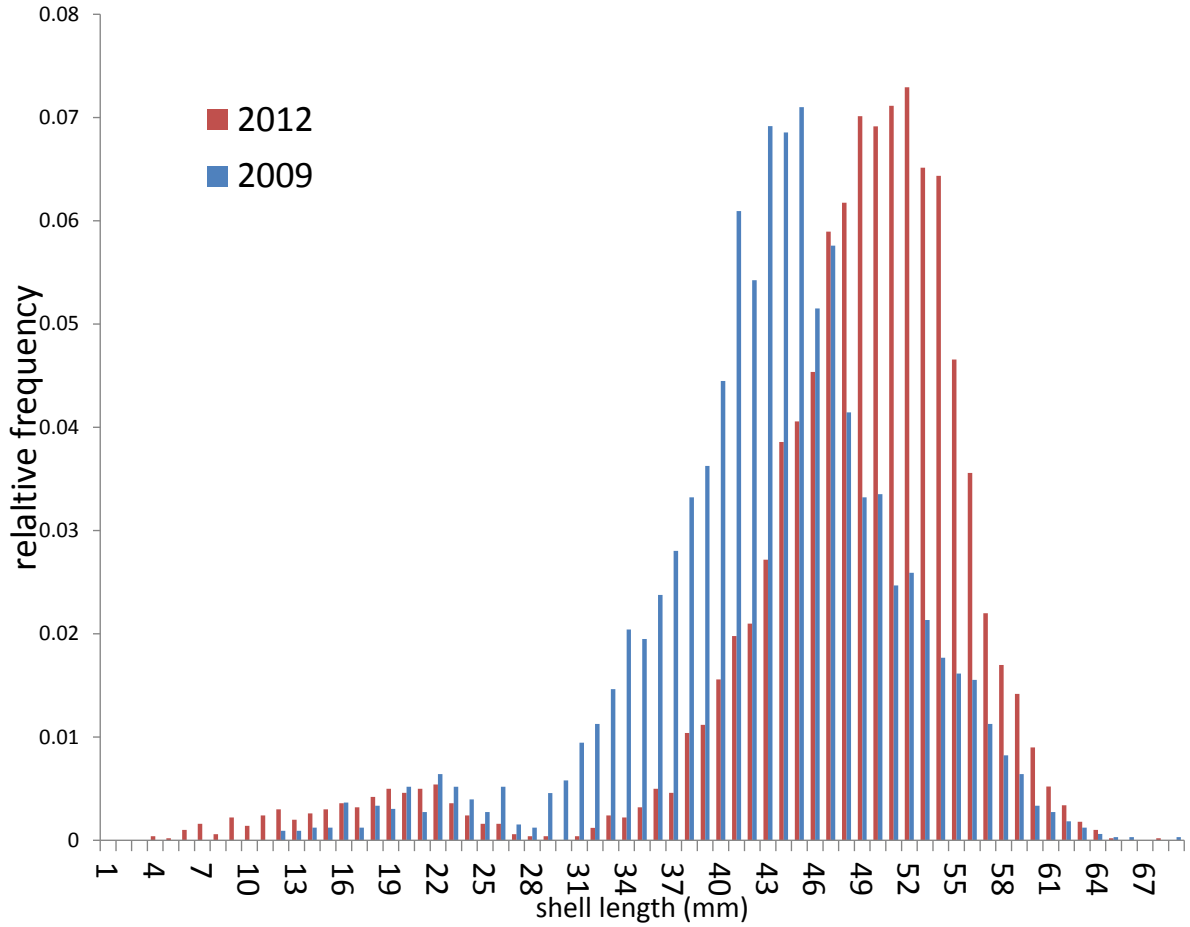

Figure 2. Length frequency distribution of the shell length of *Venerupis* clams collected from within the quadrats.

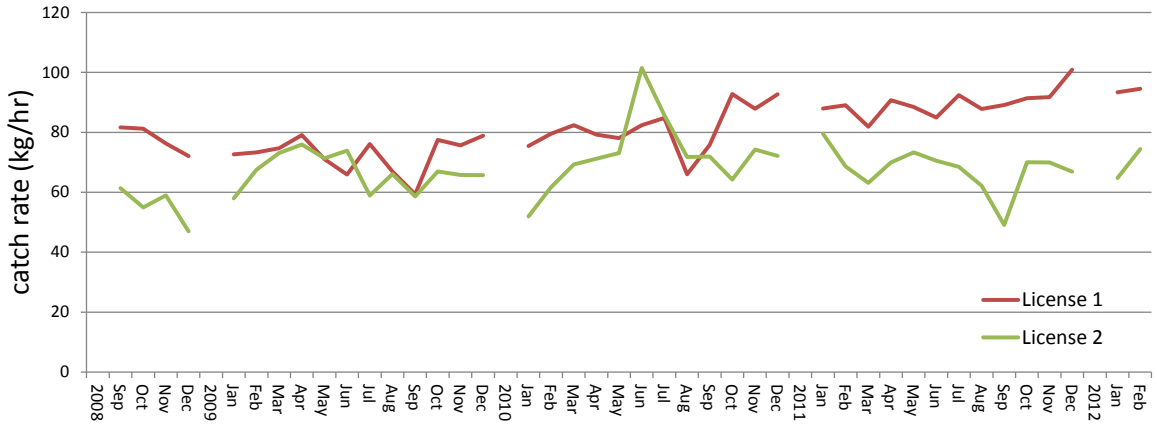

Figure 3. Catch rates for the period September 2008 – February 2012. License 1 was used by the same diver continuously, while License 2 has been used by several divers over the period. Differences between divers in levels of experience or market demand may account for variability in catch rates in License 2. License 1 shows a continual increase in catch rates since 2009 from 60-80 kg/hr to 90-100 kg/hr in recent months, consistent with increased levels of production within the stock.

2. Ansons Bay *Katelysia* Fishery Assessment, 2012

Summary

The survey conducted by IMAS in March 2012 resulted in a biomass estimate of 132 tonnes of *Katelysia scalarina* of all sizes present in the fished area (95% confidence limits of 105.6 – 161.0 tonnes). A TAC of 10% of biomass would therefore be 13.2 tonnes. The number of smaller pre-recruits was noticeably lower than previous years.

Survey results

The 2012 biomass estimate is presented below with the results from previous surveys for comparison (Table 1). The 2012 biomass estimate was very similar to the previous (2009) estimate. The average weight of clams per quadrat has remained relatively unchanged in recent surveys. The difference in biomass estimates between 2009 and earlier years depended upon the size of the fished area. The boundary of the main fishing area was mapped in December 2008, and its area precisely estimated (149,049m^2). The purpose of this was to better define the fishing area and exclude sampling from areas which were not fished. In 2009, the fished area was 80% of the area fished in previous surveys.

This survey was conducted by sampling from quadrats placed at regular (approx. 40 m) intervals over the fished area (Figure 4). The position of each quadrat was recorded using a GPS receiver.

In contrast with 2009 and earlier years, there were very low numbers of pre-recruits (<32mm), suggesting weak recruitment and a smaller future biomass (Figure 5).

Table 1. Comparison of results obtained from surveys of *Katelysia* beds at Ansons Bay: 1997 to 2012. The fished area has been reduced since 2009.

	1997	**1998**	**2000**	**2001**	**2002**	**2006**	**2009**	**2012**
Total area of fishery (m^2)	185,800	185,800	185,800	185,800	185,800	185,500	149,049	149,049
Area surveyed (m^2)	125,650	90,000	85,000	90,000	80,000	80,000	149,049	149,049
Avg. no. per quadrat (S.E.)	2.24 (1.20)	4.00 (1.57)	3.79 (1.94)	4.98 (1.35)	3.56 (2.57)	3.195 (2.60)	3.26 (2.47)	4.44 (3.31)
Population Size ('000s)	6,671	11,890	11,261	14,811	10,598	9,483	7,783	10,517
Avg. wt. per quadrat (g) (S.E.	25.5 (3.9)	33.2 (3.8)	50.0 (2.3)	52.61	53.78 (1.99)	53.0294	53.28 (2.82)	55.91 (0.66)
Biomass (T) fished area	75.8	98.7	148.6	202.25	159.87	157.64	127.07	133.32 (105.62 - 161.03)

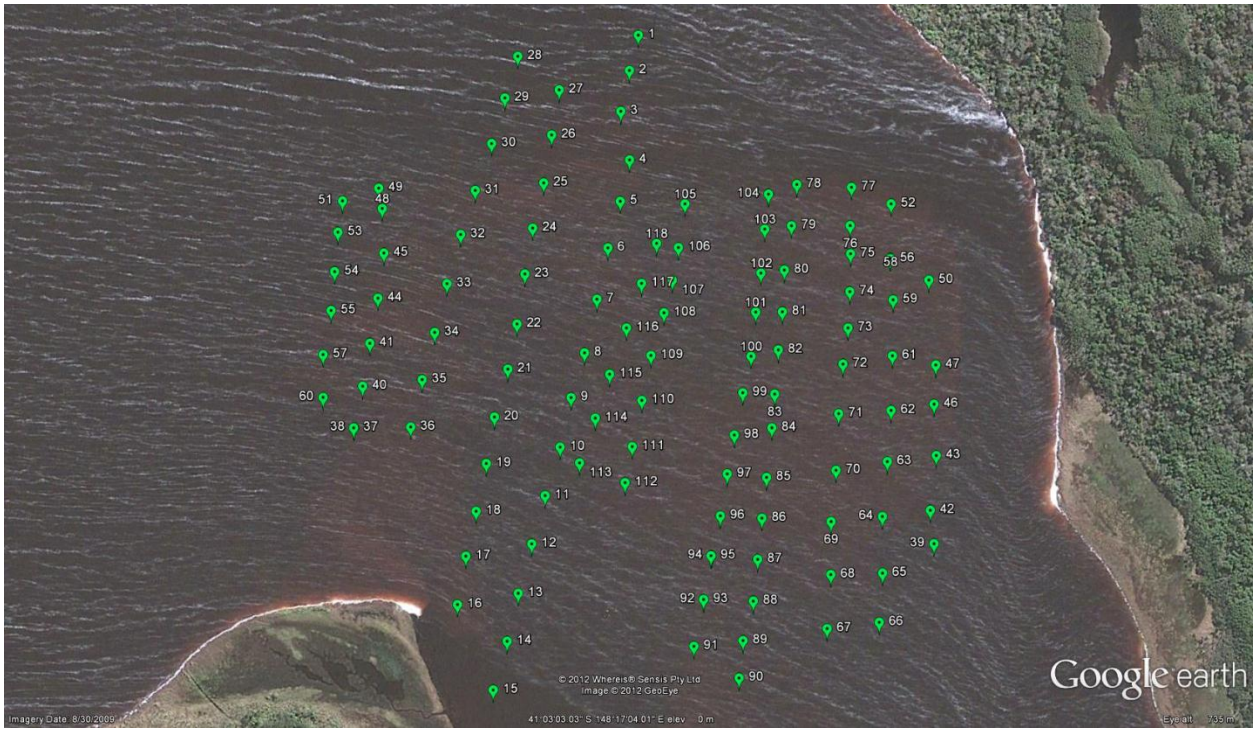

Figure 4. Position of sampling quadrats, Arsons Bay, 2012.

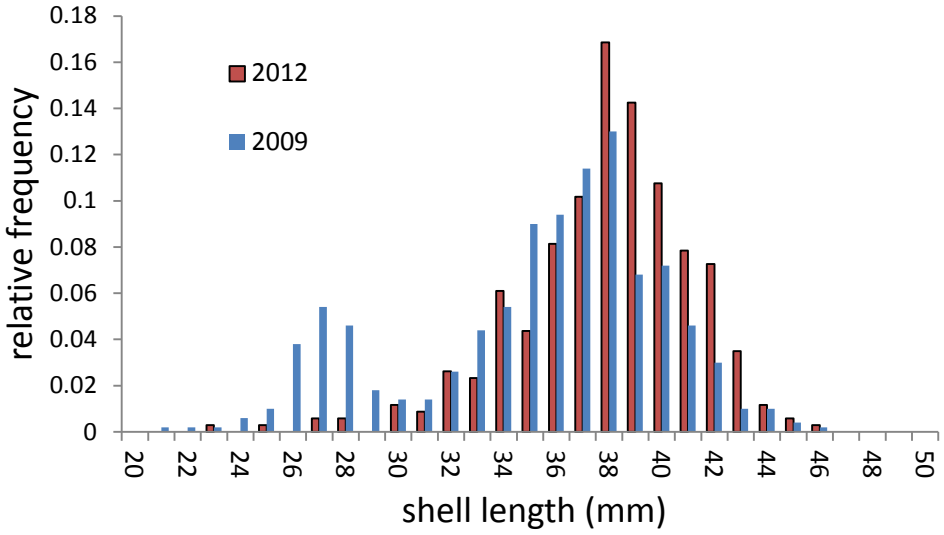

Figure 5. Size distribution of *Katelysia* taken on the main bed at Ansons Bay in March 2012 (red columns), compared with those taken during the March 2009 survey (blue columns).

The Institute for Marine and Antarctic Studies (IMAS), established in 2010, comprises the University of Tasmania's internationally recognised expertise across the full spectrum of temperate marine, Southern Ocean, and Antarctic research and education.

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