D'ENTRECASTEAUX CHANNEL SCALLOP SURVEY AND STOCK STATUS UPDATE: 2016

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Executive Summary

The recreational scallop fishery in the D'Entrecasteaux has been closed since 2011 as a consequence of heavy fishing pressure and stock depletion. A limited ROV/dive survey of sites that have previously held high densities of scallops was conducted in April 2016, the first such survey since 2012.

The survey found no evidence of any significant recovery of Commercial or Doughboy Scallop populations in the D'Entrecasteaux Channel. In accordance with national stock status definitions both species have been assessed as Overfished.

There was some evidence of recovery of Queen Scallops, with a relatively small but dense bed located in the central Channel region. There are relatively few individuals larger than 110 mm, the dominant size class being in the 75-95 mm size range. Although actual growth rates are uncertain, it is likely that the upper end of this size class will to grow to over 100 mm during the next 12 months. The species has been assessed as Transitional Recovering.

It is recommended that any consideration of opening a scallop fishery in the Channel in the future should be preceded by a dive survey to fully map the extent of the main beds and, if possible, to provide an index of abundance against which the effects of fishing could be assessed. In addition, to ensure that sufficient adult stock remains protected from fishing an appropriate minimum size limit should be set. It is also highly desirable that multiple years of successful recruitment are evident in the population as these cohorts will be required to replenish the adult population and safeguard against possible future variability in recruitment.

Contents

Background

Low stock levels and poor recruitment lead to the 2011closure of the D'Entrecasteaux Channel to recreational scallop diving. The present report summarises the findings of a survey of scallop populations conducted during April 2016 in the D'Entrecasteaux Channel.

The primary objective of the survey was to provide a preliminary assessment of the current status of the scallop stocks in the Channel and to determine whether there was evidence of recovery that would justify a more extensive survey and/or consideration of re-opening the area to fishing.

Methods

A total of 23 sites were surveyed in the D'Entrecasteaux Channel, selected from the 62 standard sites that were surveyed annually between 2006 and 2012. Sites with high scallop abundances in previous years were purposively selected to maximise the likelihood of locating scallops if present in the Channel (Fig. 1).

A remotely operated vehicle (ROV) (SEABOTIX LBV-200) was used to survey eleven sites in the northern part of the Channel, including areas that had previously supported dense beds of Commercial Scallops. At each site, video footage of the seabed was recorded for a 10 minute timed "swim" and analysed for the presence and number of scallops, providing a semi-quantitative assessment of scallop abundance.

An additional twelve sites were surveyed by divers in the central region of the Channel in areas that had previously supported dense beds of Queen Scallops. At each site a weighted 100 m strip transect was deployed in a haphazard direction (or following the depth contour on sloping bottom). Two divers swam along either side of the transect line collecting all scallops within one meter of the line, representing a total searched area of 200 m^2. For nine of these sites the scallops were brought to the surface, identified to species and shell length (SL) measured before being returned to the water. For the three remaining sites scallops were identified and counted on the sea floor but not measured. Dive surveys have the advantage of providing a quantitative assessment of scallop abundances.

Results/Discussion

The eleven sites in the northern part of the Channel surveyed by ROV yielded a combined total of just 6 Commercial, 2 Queen and less than 50 Doughboy Scallops (Table 1, Fig. 2). These results indicate that scallop densities are exceptionally low and provide no evidence of any significant recruitment or recovery since the fishery was closed in 2011.

By contrast in the central part of the Channel higher densities of Queen Scallops were observed at some sites, with four having densities of greater than one scallop per m^2 and up to a maximum of 3.8 scallops per m^2 (Fig. 3). The higher densities of Queen Scallops were distributed over an area of about 6.5 by 1.2 km in depths of 11-15 m and on coarse grain sediments with shells and shell grit. In order to map the actual extent of the bed would require a more intensive dive survey. Densities of Commercial and Doughboy Scallops were consistently low at all sites, less than 0.2 scallops per m^2 (Table 2).

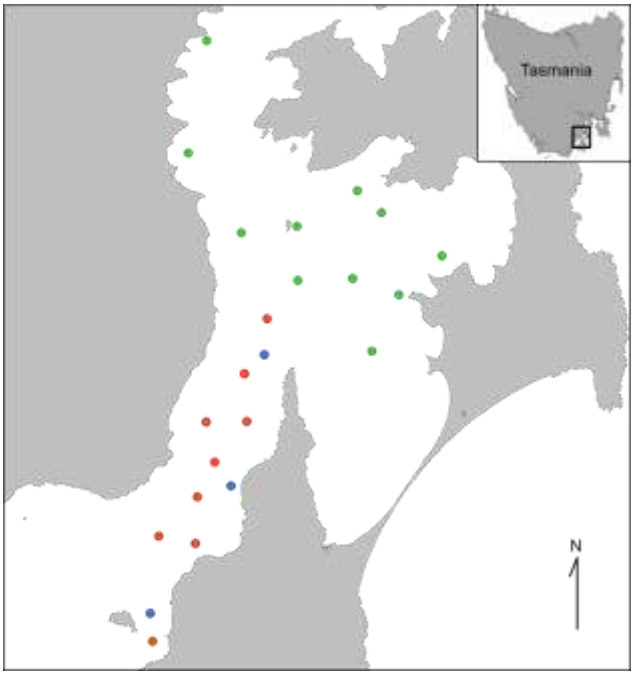

Fig. 1: D'Entrecasteaux Channel indicating survey locations. ROV sites (green), dive survey (blue) and dive survey with size structure (red)

Fig. 2: ROV images of a Commercial Scallop (upper) and Doughboy scallop (foreground, lower) and Queen Scallop (background, lower image).

Table 1: Scallops observed at ROV sites

Site	Commercial	Doughboy	Queen
1	3	10+	1
2			
3			
4		2	
5			
6			
7		2	
8	2		
9		20+	1
10		5+	
11	1		

Table 2: Dive survey scallop densities (scallops per m^2) by site.
n/a not measured

				Queen Size Structure			
Site	**Commercial**	**Doughboy**	**Queen**	**<85mm**	**>85mm**	**>100mm**	**Total**
12	0.02	0.08	1.13	n/a	n/a	n/a	1.22
13	0.00	0.00	0.04	0.03	0.01	0.00	0.04
14	0.01	0.01	0.04	0.01	0.04	0.03	0.06
15	0.05	0.01	3.80	1.69	2.11	0.75	3.86
16	0.00	0.03	0.18	n/a	n/a	n/a	0.20
17	0.02	0.01	0.30	0.23	0.07	0.02	0.32
18	0.01	0.13	0.93	0.57	0.36	0.19	1.07
19	0.03	0.12	1.54	0.95	0.59	0.22	1.68
20	0.18	0.00	2.39	1.31	1.09	0.79	2.57
21	0.00	0.01	0.09	0.08	0.02	0.00	0.10
22	0.03	0.01	0.39	n/a	n/a	n/a	0.43
23	0.01	0.07	0.67	0.64	0.03	0.00	0.74
Total	0.03	0.04	0.96	0.46	0.36	0.17	1.02

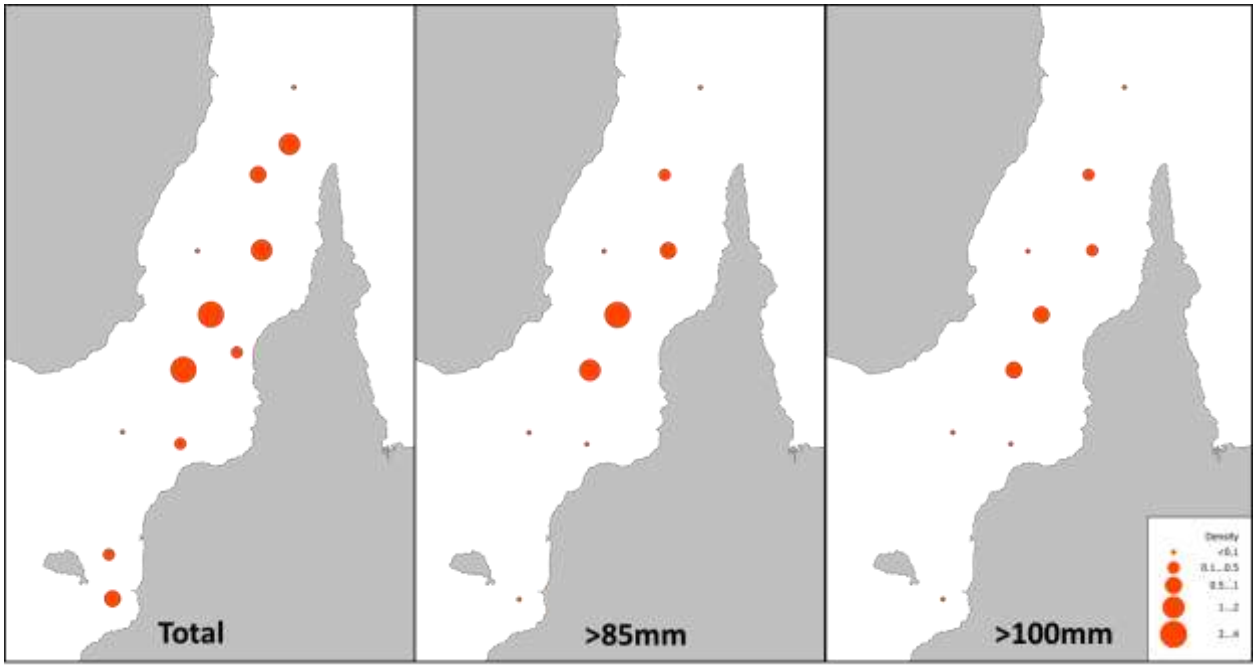

Fig. 3: Queen Scallop densities (numbers per m^2) by site and size class.

A total of 1698 scallops were measured for shell length, with Commercial Scallops ranging from 33-135 mm, Doughboys from 18-83 mm and Queen Scallops from 24-122 mm (Fig. 4).

The size distribution of Queen Scallops suggests four distinct cohorts were present, with mean shell lengths of 33, 57, 78 and 103 mm (Fig. 4). Only 19% of the Queen Scallops were above 100 mm and 41% above 85 mm.

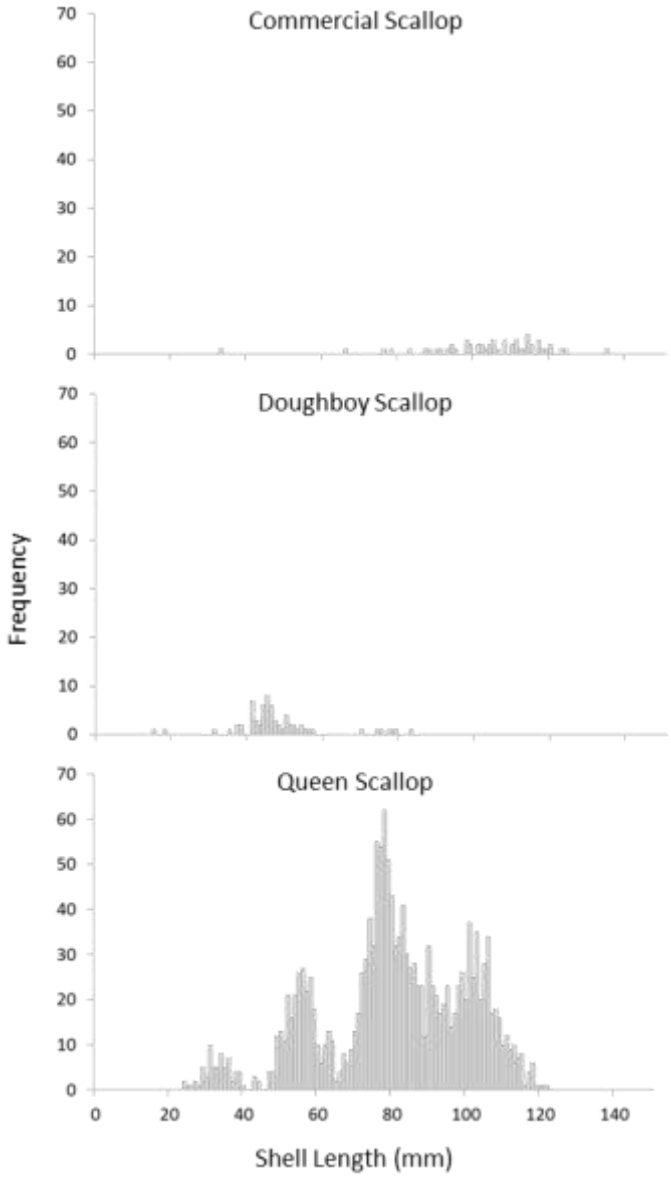

Fig. 4: The relative size composition of Commercial, Queen and Doughboy scallops

The size composition of Queen Scallops in the current survey was compared with data from surveys conducted between 2006 and 2012 (Fig. 5). For comparative purposes it should be noted that the number of surveyed sites varied over time and thus it is the shape of the distributions rather than sample sizes that is relevant.

Although several cohorts (year classes) were evident in 2016, scallops larger than 110 mm were underrepresented compared with samples from the 2006-2009 period. The sharp decline in the relative proportion of individuals larger than 110 mm is clearly evident in the time series, such by 2011 and 2012 relatively few of these larger individuals remained. The poor representation of these larger adults in the current sample suggests that the Queen Scallop population is still recovering from the impacts of heavy fishing pressure and it could take several more years for these larger individuals to accumulate to levels comparable, in relative terms, to the population present in the early to mid-2000s.

Based on the present survey it is not possible to provide an absolute assessment of stock size nor make judgements about the current stock size relative to that during the early 2000s.

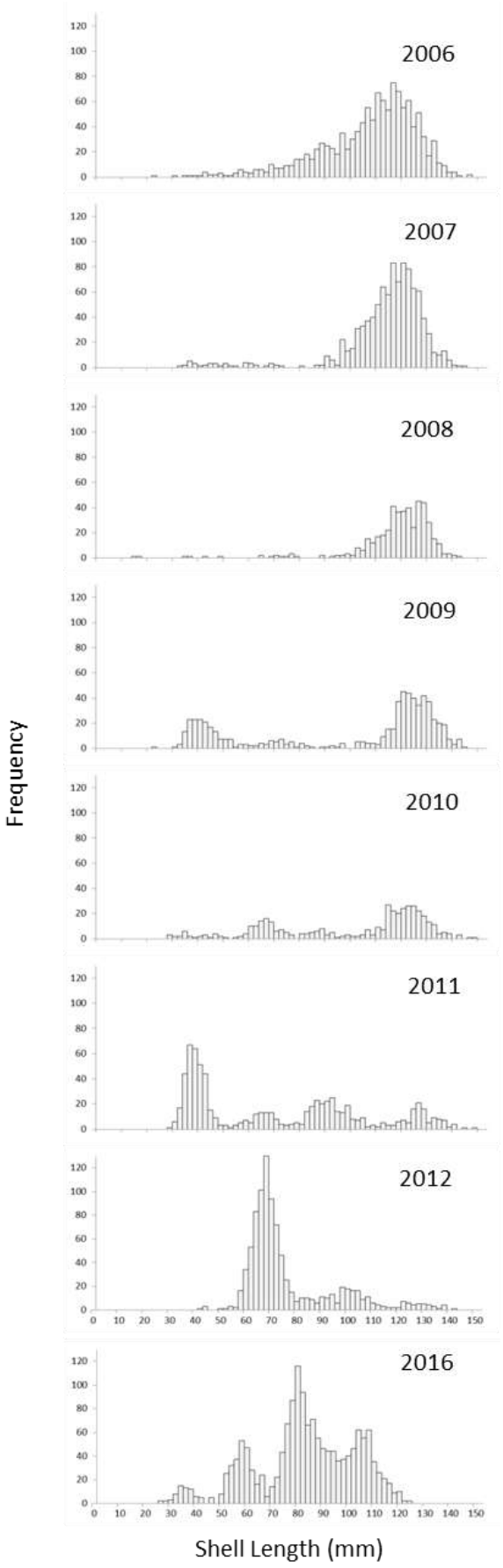

Fig. 5: The relative size composition (2 mm bins) of Queen Scallops 2006-2016

Stock status – D'Entrecasteaux Channel Scallops

The stock status of the scallop populations in the D'Entrecasteaux Channel have been assessed using national stock status categories and now applied for Tasmanian fisheries. These categories define the assessed state of stocks in terms of recruitment overfishing. Recruitment overfishing occurs when the mature adult (spawning biomass) is depleted to a level where it no longer has the reproductive capacity to replenish itself. Recruitment overfished stocks have not necessarily collapsed but do have reduced recruitment capacity.

The findings of current survey, in particular density and size composition information (indicators of adult abundance and recruitment success), and consideration of dive surveys conducted during the mid- to late-2000s, represent the key inputs into the determination of stock status.

Species	Status	Comments
Commerical Scallop *Pecten fumatus*	**OVERFISHED**	Species has a long history of boom and bust fisheries in the Channel. Heavy fishing and poor recruitment lead to the closure of the fishery in 2011. No evidence of significant recovery or recruitment since the fishery was closed.
Doughboy Scallop *Mimachlamys asperrima*	**OVERFISHED**	Species has a long history of exploitation in the Channel, although not usually a major target species. No evidence of significant recovery or recruitment since the fishery was closed in 2011.
Queen Scallop *Equichlamys bifrons*	**TRANSITIONAL RECOVERING**	Some evidence of rebuilding since the fishery was closed with several discrete cohorts (including pre-recruits) present in a relatively small, high density bed. Representation of older adult individuals (> 110 mm) low relative to the smaller size classes.

Conclusions

There is no evidence of any significant recovery of Commercial or Doughboy Scallop populations in the D'Entrecasteaux Channel. Genetic studies suggest that the Commercial Scallop population in the Channel is heavily reliant on self-recruitment and as such it will be necessary to rebuild the adult stock significantly before any fishery for the species could be justified.

It is also probable that Queen Scallops in the Channel are dependent on self-recruitment. The observed recovery may well be due to the remanent population that was left when the fishery was closed in 2011. Queen Scallops appear concentrated in a relatively small but dense bed in the central Channel region. There are relatively few individuals larger than 110 mm, the

dominant size class being in the 75-95 mm size range. Although actual growth rates are uncertain, it is likely that the upper end of this size class will to grow to over 100 mm during the next 12 months.

If the Department were to consider a scallop fishery in the Channel in the near future it is recommended that any decision be preceded by a dive survey to fully map the extent of the main beds and, if possible, to provide an index of abundance against which the effects of any fishery could be evaluated. Furthermore, it is reasonable to assume that the recreational sector has the capacity to effectively reduce the legal size biomass to very low levels within a relatively short period. As such it will be essential to ensure that sufficient adult stock remains (by setting an appropriate minimum size limit) and it is highly desirable that multiple years of successful recruitment are also present. These cohorts will be required to replenish the adult population and safeguard against possible future variability in recruitment.