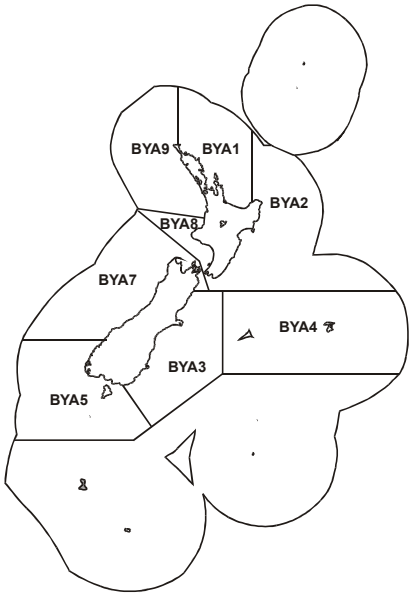
FRILLED VENUS SHELL (BYA)

(*Bassina yatei*)



1. FISHERY SUMMARY

1.1 Commercial fisheries

The frilled venus shell (*Bassina yatei*) was introduced into Quota Management System on 1 April 2004 with a combined TAC of 7.9 t and a TACC of 7.9 t. There were no allowances for customary, recreational or other sources of mortality. The fishing year is from 1 April to 31 March and commercial catches are measured in greenweight. Apart from 2002–03 and 2003–04 when about 7 and 2 t respectively were reported, landings have been very small or non-existent. A reported 11 t catch from BYA 2 in 1995–96 is thought to be a wrongly coded fish species and is not recorded in Table 1.

Table 1: TACCs and reported landings (t) of frilled venus shell by Fishstock from 1992–93 to 2006–07 from CELR and CLR data.

		BYA 1		BYA 2		BYA3		BYA 4		BYA 5
Fishstock	Landings	TACC	Landings	TACC	Landings	TACC	Landings	TACC	Landings	TACC
1992–93	0	–	0	–	0	–	0	–	0	–
1993–94	0	–	0	–	0	–	0	–	0	–
1994–95	0	–	0	–	0	–	0	–	0	–
1995–96	0	–	0	–	0	–	0	–	0	–
1996–97	0	–	0	–	0	–	0	–	0	–
1997–98	0	–	0	–	0	–	0	–	0	–
1998–99	0	–	0	–	0	–	0	–	0	–
1999–00	0	–	0	–	0	–	0	–	0	–
2000–01	0	–	0	–	0	–	0	–	0	–
2001–02	0	–	0	–	0	–	0	–	0	–
2002–03	7.473	–	0	–	0	–	0	–	0	–
2003–04	0	1	0	1	0	1	0	1	0	1
2004–05	0	1	0	1	0	1	0	1	0	1
2005–06*	0	1	0	1	0	1	0	1	0	1
2006–07	0	1	0	1	0	1	0	1	0	1

*In 2005–06 36.4 Kg were reportedly landed, but the QMA is not recorded. This amount is included in the total landings for that year.

Table 1 (*Continued*):

Fishstock		BYA 7		BYA 8		BYA 9		Total
	Landings	TACC	Landings	TACC	Landings	TACC	Landings	TACC
1993–94	0.026	–	0	–	0	–	0.026	–
1994–95	0.007		–	0	–	0	–	0.007
1995–96	0.001		–	0	–	0	–	0.001
1996–97	0		–	0	–	0	–	0
1997–98	0	–	0	–	0	–	0	–
1998–99	0	–	0	–	0	–	0	–
1999–00	0	–	0	–	0	–	0	–
2000–01	0	–	0	–	0	–	0	–
2001–02	0	–	0	–	0	–	0	–
2002–03	0.049	–	0	–	0	–	7.522	–
2003–04	1.132	0.9	0	1	0	1	1.132	7.9
2004–05	1.295	0.9	0	1	0	1	1.296	7.9
2005–06*	0.207	0.9	0	1	0	1	0.207	7.9
2006–07*	0	0.9	0	1	0	1	0	16

1.2 Recreational fisheries

There are no known records of recreational use of this surf clam.

1.3 Customary non-commercial fisheries

Offshore clams such as *B. yatei* are likely to have been harvested for customary use only when washed ashore after storms. Shells of this clam have been found irregularly, and in small numbers in a few middens. There are no estimates of current customary use of this clam.

1.4 Illegal catch

There is no known illegal catch of this clam.

1.5 Other sources of mortality

There is no quantitative information on other sources of mortality, although this clam is probably sometimes taken as a bycatch in inshore trawling. Harvesters claim that the hydraulic clam rake does not damage surf clams and minimizes damage to the few species of other macrofauna captured. Surf clam populations also are subject to localized catastrophic mortality from erosion during storms, high temperatures and low oxygen levels during calm summer periods, blooms of toxic algae and excessive freshwater outflow (Cranfield & Michael 2001).

2. BIOLOGY

B. yatei is endemic to New Zealand and is found around the coast on sandy bottoms in a distinct zone at depths between 6 and 9 m. Maximum length is variable between areas, ranging from 48 to 88 mm (Cranfield & Michael 2002).The sexes are likely to be separate, and they are likely to be broadcast spawners with planktonic larvae. Spawning is likely to occur in the summer months and spat probably recruit to the deeper water of the outer region of the surf zone. Recruitment of surfclams is thought to be highly variable between years.

3. STOCKS AND AREAS

For management purposes stock boundaries are based on QMAs, however, the boundaries of stocks of surf clams are likely to be the continuous lengths of exposed sandy beaches between geographical features (rivers, headlands etc). The circulation patterns that maintain the separation of the surf zone habitat to form a self contained ecosystem also retain planktonic larvae of surf clams probably isolating surf clams genetically as well as ecologically.

4. ENVIRONMENTAL AND ECOSYSTEM CONSIDERATIONS

4.1 Sea-bed disturbance

The immediate impact of hydraulic dredging is not discernable a few hours after dredging. The surf zone is a high-energy environment subjected to frequent natural disturbance and high sand mobility. This environment tends to recover faster from disturbance than those in deeper water. Widespread and intensive hydraulic dredging, however, has the potential to adversely modify the environment.

4.2 Incidental catch (fish and invertebrates)

The only significant bycatch associated with surf clams dredging is the echinoid *Fellaster zealandiae* (sand dollar or sea biscuit).

4.3 Incidental Catch (seabirds and mammals)

Not relevant to surf clam fisheries.

4.4 Community and trophic structure

The effects dredging for *B. yatei* on the community and trophic structure are unknown.

4.5 Spawning disruption

The effects of hydraulic dredging on spawning are unknown.

4.6 Habitats of special significance

Habitats of special significance have not been defined for this fishery.

4.7 Biodiversity

The effect of fishing for this surf clam on the maintenance and healthy functioning of the natural marine habitat and ecosystems is unknown.

4.8 Aquaculture and enhancement

Not relevant to surf clam fisheries.

5 STOCK ASSESSMENT

5.1 Estimates of fishery parameters and abundance

Biomass estimates are available from exploratory surveys of Cloudy Bay and Clifford Bay in Marlborough.

5.2 Biomass estimates

Biomass has been estimated for two sites in the Marlborough Sounds with a stratified random survey using a hydraulic dredge. Estimates are shown in Table 2.

Table 2: A summary of biomass estimates in tonnes green weight with standard deviation in parentheses from exploratory surveys of Cloudy Bay, Marlborough (Cranfield *et al.* 1994b), and Clifford Bay, Marlborough (Michael *et al.* 1994).

Area	Cloudy Bay	Clifford Bay
Length of beach	11	21
Biomass (t)	123 (50)	0.2 (0.8)

5.3 Estimation of Maximum Constant Yield (MCY)

Growth and mortality data from Cloudy Bay, Marlborough and Kapiti Coast, Manawatu have been used in a yield per recruit model to estimate the reference fishing mortality $F_{0.1}$ (Cranfield *et al*. 1994b).

Estimates of MCY are available from 8 locations (Figure 1), and were calculated using Method 1 for a virgin fishery (Annala *et al*. 2001) with an estimate of virgin biomass B_0., where

$$MCY = 0.25^* F_{0.1} B_0$$

These are shown in Table 3.

Table 3: MCY estimates (t) for *B. yatei* from virgin biomass in 450 m transects at locations sampled around New Zealand (data from Cranfield *et al.* 1994b).

Location	$F_{0.1}$	MCY
Matakana Island	0.27*	0.01
Ohope	0.27*	0.003
Waitarere	0.27*	0.009
Otaki	0.27*	0.005
Peka Peka	0.27*	0.004
Fence	0.25†	0.228
Wairau	0.25†	0.520
Leithfield	0.25†	0.002

* Assumes that $F_{0.1}$ estimated at Cloudy Bay will be the same (or similar) at all other South Island locations.

† Assumes that these species related to *D. anus* and living in the same part of the surf zone will be similar and $F_{0.1}$ can be used as a substitute.

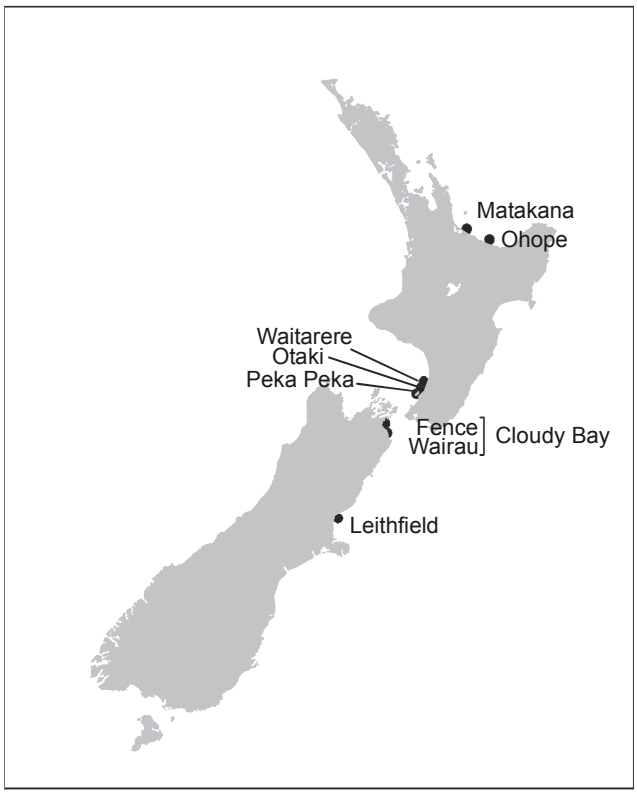


Figure 1: Location of sites surveyed.

5.4 Estimation of Current Annual Yield (CAY)

CAY has not been estimated for *B. yatei*.

6. STATUS OF THE STOCKS

Because of the relatively low levels of exploitation of *B. yatei*, it is likely that all stocks are still effectively in a virgin state. Because recruitment is variable and natural mortality caused by storm events may be high, biomass is likely to be highly variable.

7. FOR FURTHER INFORMATION

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