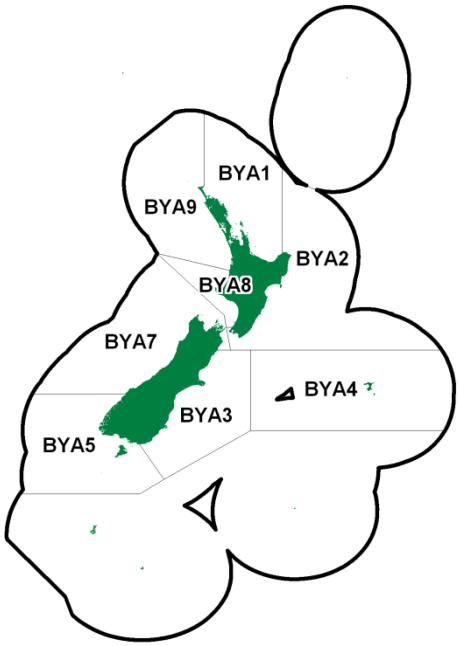
FRILLED VENUS SHELL (BYA)

(*Bassina yatei*)



1. FISHERY SUMMARY

This species is part of the surf clam fishery and the reader is guided to the Introduction – surf clam chapter for information common to all relevant species.

1.1 Commercial fisheries

The frilled venus shell (*Bassina yatei*) was introduced into the Quota Management System on 1 April 2004 with a combined TAC of 16 t and a TACC of 16 t. There were no allowances for customary, recreational, or other sources of mortality. These limits have not been changed (Table 1).

Table 1: Current Total Allowable Catches (TAC, t) and Total Allowable Commercial Catches (TACC, t) for *Bassina yatei.*

QMA	Description	TAC (t)	TACC (t)
1	Auckland	1	1
2	Central (East)	1	1
3	South East (Coast)	1	1
4	South East (Chatham Rise)	1	1
5	Southland	1	1
7	Challenger	9	9
8	Central (West)	1	1
9	Auckland (West)	1	1
Total		16	16

Small BYA 7 landings (all around 1 t or less) were reported from 1992–93 to 1994–95, 2001–02 to 2004–05, 2008–09, and 2011–12 to 2015–16, and landings of over 7 t were reported from BYA 1 in 2002–03 (Table 2). No frilled venus shell landings have been recorded since the fishing year 2015–16.

1.2 Recreational fisheries

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

1.3 Customary 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.

Table 2: TACCs and reported landings (t) of frilled venus shell by Fishstock from 1992–93 to present from CELR and CLR data. See Table 1 for TACC of stocks not landed. The fishing year is from 1 April to 31 March. Reported lndings for the 2022–23 fishing year are considered preliminary. Total Landings and TACC correspond to all BYA stocks.

	BYA 1		BYA 7		Total	
Year	Landings	TACC	Landings	TACC	Landings	TACC
1992–93	0	–	0.026	–	0.026	–
1993–94	0	–	0.007	–	0.007	–
1994–95	0	–	0.001	–	0.001	–
1995–96	0	–	0	–	0	–
1996–97	0	–	0	–	0	–
1997–98	0	–	0	–	0	–
1998–99	0	–	0	–	0	–
1999–00	0	–	0	–	0	–
2000–01	0	–	0	–	0	–
2001–02	7.473	–	0.049	–	7.522	–
2002–03	0	–	1.132	9	1.132	–
2003–04	0	1	1.295	9	1.296	–
2004–05	0	1	0.207	9	0.207	16
2005–06	0	1	0	9	0.036*	16
2006–07	0	1	0	9	0	16
2007–08	0	1	0	9	0	16
2008–09	0	1	0.003	9	0.003	16
2009–10	0	1	0	9	0	16
2010–11	0	1	0	9	0	16
2011–12	0	1	0.350	9	0.350	16
2012–13	0	1	1.174	9	1.174	16
2013–14	0	1	1.106	9	1.106	16
2014–15	0	1	0.931	9	0.931	16
2015–16	0	1	0.998	9	0.998	16
2016–17	0	1	0	9	0	16
2017–18	0	1	0	9	0	16
2018–19	0	1	0	9	0	16
2019–20	0	1	0	9	0	16
2020–21	0	1	0	9	0	16
2021–22	0	1	0	9	0	16
2022–23	0	1	0	9	0	16

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

1.4 Illegal catch

There is no documented 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 subject to localised 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

Bassina yatei is endemic to New Zealand and is found around the coast in sediments at depths between 6 m and 9 m. Maximum length is variable between areas, ranging from 48 mm to 88 mm (Cranfield & Michael 2002).The sexes are likely to be separate, and they are likely to be broadcast spawners with planktonic larvae. Anecdotal evidence suggests spawning is likely to occur in the summer months. Recruitment of surf clams is thought to be highly variable between years.

3. STOCKS AND AREAS

For management purposes stock boundaries are based on FMAs, 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). Circulation patterns may isolate surf clams genetically as well as ecologically.

4. ENVIRONMENTAL AND ECOSYSTEM CONSIDERATIONS

See the Introduction – surf clam chapter.

5. STOCK ASSESSMENT

5.1 Estimates of fishery parameters and abundance

No estimates of fisheries parameters or abundance are available for this species.

5.2 Biomass estimates

Biomass has been estimated for two sites in the Marlborough Sounds (Cloudy Bay by Cranfield et al 1994b and White et al 2015) and Clifford Bay (by Michael et al 1994)) with a stratified random survey using a hydraulic dredge. Estimates are shown in Table 3.

In 2015, White et al (2015) conducted a 2-phase stratified random sampling survey. The survey area was stratified by 4 depth strata (0–2 m, 2–4 m, 4–6 m, and 6–8 m, each with respect to Chart Datum). Each station comprised a ~50 m tow, sampling ~80 m^2 of seabed. All commercial species of subtidal surf clams caught were sorted by species. The total weight of each species was measured on board. Individuals from each species were collected and measured for shell length along the anterior-posterior axis (to the nearest millimetre). For tows with less than ~500 individuals, the maximum of either 20 individuals or 20% of the total was measured. For tows with higher than ~500 individuals, 10% with an upper limit of ~200 individuals per tow were measured. To subsample large catches and to avoid issues of size sorting inside the dredge, each of the bins was subsampled by tipping one bin into two bins and repeating until the requisite sub sample size was reached. The number and weight of the main bycatch species was also recorded. Both the biomass densities and biomass estimates were calculated for all the commercial species of subtidal surf clams caught.

Table 3: A summary of biomass estimates in tonnes greenweight (with standard deviation in parentheses) from exploratory surveys of Cloudy Bay (Cranfield et al 1994b and White et al 2015) and Clifford Bay (Michael et al 1994), both in Marlborough.

Area	Cloudy Bay (BYA 7)	Clifford Bay (BYA 7)
Length of beach (km)	11, 11	21
Biomass (t)	123 (50), 193 (72)	0.2 (0.8)

5.3 Yield estimates and projections

Growth and mortality data from Cloudy Bay in Marlborough and the Kapiti Coast in Manawatu (Cranfield et al 1993) have been used in a yield per recruit model to estimate the reference fishing mortality $F_{0.1}$ (Cranfield et al 1994b). The Shellfish Working Group (SFWG) did not accept these estimates of $F_{0.1}$ because there was considerable uncertainty in both the estimates and the method used to generate them. The *MCY* estimates of White et al (2015) used the full range of $F_{0.1}$ estimates from Cranfield et al (1993) and are shown in Table 4. Estimates of *MCY* were calculated using Method 1 for a virgin fishery (Ministry for Primary Industries 2015) with an estimate of virgin biomass B_0, where:

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

The SFWG recommended that *MCY* estimates are adequate to use to inform management decisions relevant to all surf clam fisheries, with the following caveats: 1) due to the uncertainty in $F_{0.1}$ values, for all species other than SAE, the *MCY* estimates should use the $F_{0.1}$ values toward the higher end of the range, and 2) there is a need to account for any substantial catch that has already come out of any surf clam fishery when estimating *MCY*; however there was no consensus on the best way to do this**.**

Table 4: Mean *MCY* estimates (t) for *B. yatei* from virgin biomass at Cloudy Bay (BYA 7) from White et al (2015). The two $F_{0.1}$ values, which are subsequently used to inform *MCY*, are the minimum and maximum estimates from Cranfield et al (1993).

Location	$F_{0.1}$	*MCY*
Cloudy Bay (BYA 7)	0.25/0.42	12.1/20.3

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

The SFWG recommended moving all surf clam fisheries away from an *MCY* management strategy and towards an exploitation rate management strategy. The SFWG recognised that an exploitation rate approach is more survey intensive, but better allows for the variable nature of biomass for surf clams because it allows greater flexibility in catch (to take greater landings from available biomass) whilst keeping catches sustainable.

6. STATUS OF THE STOCKS

- **BYA 7 – Marlborough Sounds**

For all other Fishstocks there is insufficient information to estimate current stock status.

Qualifying Comments
Stock size could fluctuate markedly as a result of catastrophic mortality from a number of causes. There is a need to review fishery parameters for this species. Virgin stock size in areas sampled has been small. It is not known if peak abundances may be outside the surveyed areas.

Fishery Interactions
BYA can be caught together with other surf clam species and non-QMS bivalves.

7. FOR FURTHER INFORMATION

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