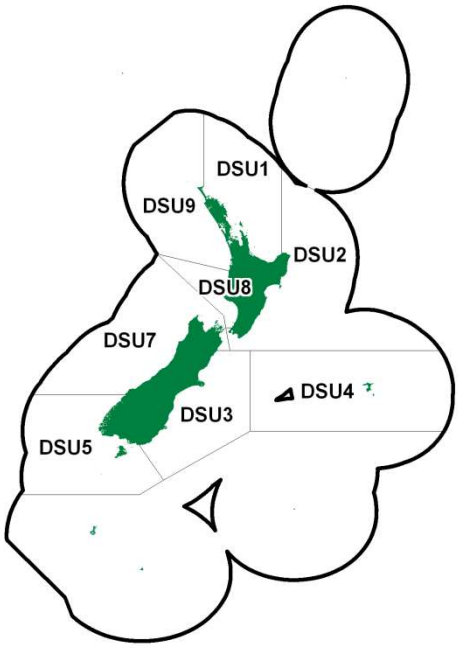
FINE (SILKY) DOSINIA (DSU)

(*Dosinia subrosea*)



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.

Fine Dosinia (*Dosinia subrosea*) were introduced into the Quota Management System on 1 April 2004 with a TAC and a TACC of 1 t in each QMA, leading to an overall TAC of 8 t and an overall TACC of 8 t for the country (Table 1). There were no allowances for customary, recreational, or other sources of mortality and no changes to any of these values have occurred since.

Table 1: Current TAC and TACC for *Dosinia subrosea*.

QMA	TAC (t)	TACC (t)
1	1	1
2	1	1
3	1	1
4	1	1
5	1	1
7	1	1
8	1	1
9	1	1
Total	8	8

1.1 Commercial fisheries

Landings have only ever been reported from DSU 1 and DSU 7. In 1993–94 total landings were 235 kg, with half originating in DSU 1, and half originating in DSU 7. In 1994–95 and 1995–96 reported landings came entirely from DSU 7, with 26 kg and 38 kg recorded respectively. No further landings were reported until after 2002–03. In 2003–04 total landings of 89 kg were recorded, which increased to 110 kg in 2004–05, and 169 kg in 2005–06. By the 2006–07 fishing year, only 3 kg of landings were reported, and after the 2008–09 fishing year landings ceased until 2019–20 (Table 2).

1.2 Recreational fisheries

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

Table 2: TACCs and reported landings (t) of *Dosinia subrosea* by Fishstock from 1993–94 to the present day from CELR and CLR data for Fishstocks where landings have been reported. See Table 1 for TACC of stocks not landed.

Fishing	DSU 1		DSU 7		Total	
year	Landings	TACC	Landings	TACC	Landings	TACC
1993–94	0.123	-	0.112	-	0.235	-
1994–95	0	-	0.026	-	0.026	-
1995–96	0	-	0.011	-	0.038	-
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	0	-	0	-	0	-
2002–03	0	-	0	-	0	-
2003–04	0	1.0	0.089	1.0	0.089	-
2004–05	0	1.0	0.078	1.0	0.110*	8.0
2005–06	0	1.0	0.061	1.0	0.169*	8.0
2006–07	0	1.0	0.003	1.0	0.003	8.0
2007–08	0	1.0	0	1.0	0	8.0
2008–09	0	1.0	0.001	1.0	0.001	8.0
2009–10	0	1.0	0	1.0	0	8.0
2010–11	0	1.0	0	1.0	0	8.0
2011–12	0	1.0	0	1.0	0	8.0
2012–13	0	1.0	0	1.0	0	8.0
2013–14	0	1.0	0	1.0	0	8.0
2014–15	0	1.0	0	1.0	0	8.0
2015–16	0	1.0	0	1.0	0	8.0
2016–17	0	1.0	0	1.0	0	8.0
2017–18	0	1.0	0	1.0	0	8.0
2018–19	0	1.0	0	1.0	0	8.0
2019–20	0	1.0	0	1.0	0.003	8.0
2020–21	0	1.0	0	1.0	0	8.0
2021–22	0	1.0	0	1.0	0	8.0

*In 2004–05 and 2005–06 32.4 and 90 kg were reported but the QMA was not recorded. This amount is included in the total landings for these years.

1.3 Customary fisheries

Offshore clams such as *D. subrosea* are likely to have been harvested for customary use only when washed ashore after storms (Carkeek 1966). 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. Surf clam populations are also 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

D. subrosea has not been found in high densities in any survey work. It is found around the New Zealand coast in deeper softer sediment habitats. Around the North Island it is found between 6 m and 10 m in depth, and around the South Island between 5 m and 8 m (Cranfield & Michael 2002). It is smaller and smoother than *D. anus* and is usually found in more stable habitats. Maximum length is variable between areas, ranging from 41 mm to 68 mm (Cranfield et al 1993). The sexes are believed to be separate, and they are likely to be broadcast spawners with planktonic larvae (Cranfield & Michael 2001). Anecdotal evidence suggests that spawning is likely to occur in the summer months. Recruitment of surf clams is thought to be highly variable between years.

For information on growth, age, and natural mortality of this species and general statements about relative biomass of all surf clam species around the country (excluding *Bassinia yatei)* see the Introduction – surf clam chapter.

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 (such as rivers and headlands). 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

All stocks are considered in effectively virgin state and an *MCY* is estimated from the survey biomass estimates. All stocks were considered in an effectively virgin state in 1993–94 when the initial biomass estimates were made (Cranfield et al 1993). Total catches of DSU have not exceeded 1 t in any Fishstock since then.

5.1 Estimates of fishery parameters and abundance

No fisheries parameters or abundance estimates are available for any DSU stocks.

5.2 Biomass estimates

Biomass has been estimated from 11 km of beach at Cloudy Bay (DSU 7) with a stratified random survey using a hydraulic dredge (Cranfield et al 1994b). The virgin biomass for this area was estimated to be 21 t. Subsequent surveys estimated biomass from one site in DSU 3 and a number of sites in DSU 2 (Table 3).

Table 3: A summary of biomass estimates greenweight (t) from the surveys in DSU 2 and 3 (Triantifillos 2008a, Triantifillos 2008b). Note: unless otherwise stated the CV is less than 0.2.

Location	Five sites (PDO 2)	Ashley River to 6 n mile south of the Waimakariri River (PDO 3)
Area surveyed (km^2)	28.0	13.4
Biomass (t)	5.9	12.2*

* CV is 0.29.

5.3 Yield estimates and projections

Estimation of Maximum Constant Yield (*MCY*)

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, Triantifillos 2008a, 2008b). 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 Triantifillos (2008b) that use the full range of $F_{0.1}$ estimates from Cranfield et al (1993) are shown in Table 4, but should be interpreted with caution.

Estimates of *MCY* were calculated using Method 1 for a virgin fishery (Annala et al 2001) with an estimate of virgin biomass B_0, where:

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

Table 4: Mean *MCY* estimates (t) for *D. subrosea* from virgin biomass at DSU 2 (Triantifillos 2008a, 2008b). The two $F_{0.1}$ values, which are subsequently used to estimate MCY, are the minimum and maximum estimates from Cranfield et al. (1993).

Location	$F_{0.1}$	*MCY*
Five sites (DSU 2)	0.27/0.54	0.4/0.8

Estimation of Current Annual Yield (*CAY*)
CAY has not been estimated for *D. subrosea*.

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

- DSU-*Dosinia subrosea*

There is no evidence of appreciable biomass of this species in any area.

7. FOR FURTHER INFORMATION

Annala, J H; Sullivan, K J; O'Brien, C J; Smith, N W McL (compilers.) (2001) Report from the fishery assessment plenary, May 2001: stock assessments and yield estimates. 515 p. (Unpublished report held in NIWA library, Wellington).

Brierley, P (Convenor) (1990) Management and development of the New Zealand sub-tidal clam fishery. Report of the surf clam working group, MAF Fisheries (Unpublished report held in NIWA library, Wellington). 57 p.

Carkeek, W C (1966) *The Kapiti coast*. Reed, Wellington. 187 p.

Cranfield, H J; Michael, K P (2001) The surf clam fishery in New Zealand: description of the fishery, its management, and the biology of surf clams. *New Zealand Fisheries Assessment Report 2001/62*. 24 p.

Cranfield, H; Michael, K (2002) Potential area boundaries and indicative TACs for the seven species of surf clam. NIWA report to the Ministry of Fisheries. (Unpublished report held by Fisheries New Zealand.)

Cranfield, H J; Michael, K P; Stotter, D R (1993) Estimates of growth, mortality, and yield per recruit for New Zealand surf clams. New Zealand Fisheries Assessment Research Document 1993/20. 26 p. (Unpublished document held by NIWA library.)

Cranfield, H J; Michael, K P; Stotter, D R; Doonan, I J (1994a) Distribution, biomass and yield estimates of surf clams off New Zealand beaches. New Zealand Fisheries Assessment Research Document 1994/1 17 p. (Unpublished document held by NIWA library.)

Cranfield, H J; Doonan, I J; Michael, K P (1994b) Dredge survey of surf clams in Cloudy Bay, Marlborough. *New Zealand Fisheries Technical Report* 39: 18 p.

Haddon, M; Willis, T J; Wear, R G; Anderlini, V C (1996) Biomass and distribution of five species of surf clam off an exposed west coast North Island beach, New Zealand. *Journal of Shellfish Research* 15: 331–339.

Triantifillos, L (2008a) Survey of subtidal surf clams in Pegasus Bay, November–December 2007. 43 p. Report prepared by NIWA for Seafood Innovations Limited and SurfCo. Limited. (Unpublished document held by Fisheries New Zealand.)

Triantifillos, L (2008b) Survey of subtidal surf clams in Quota Management Area 2, June – August 2008. 40 p. Report prepared by NIWA for Seafood Innovations Limited and SurfCo. Limited. (Unpublished document held by Fisheries New Zealand.)