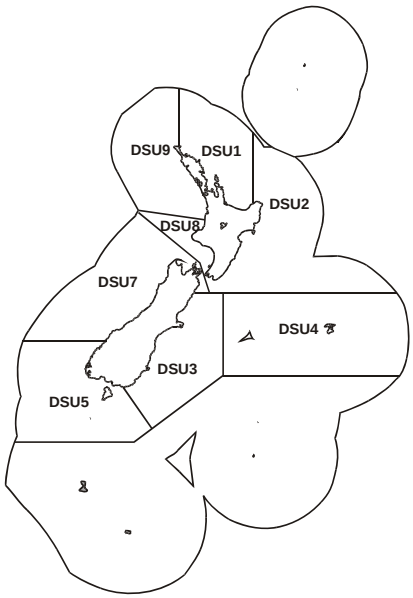
FINE (SILKY) DOSINIA (DSU)

(*Dosinia subrosea*)



1. FISHERY SUMMARY

(a) Commercial fisheries

Fine Dosinia (*Dosinia subrosea*) were introduced into Quota Management System on 1 April 2004 with a combined TAC of 8 t and TACC of 8 t. There are 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. Landings have only been reported from DSU 1 and DSU 7, where in 1993-94 landings were 235 kg, and between years 1994-95 and 1995-96 the total reported catch was only a few kg. From 2003-04, landings have been only been reported from DSU 7, and all were less than 100 kg.

Table 1: TACCs and reported landings (t) of Fine Dosinia by Fishstock from 1992–93 to 2005–06 from CELR and CLR data.

	DSU 1		DSU 2		DSU3		DSU 4		DSU 5	
Fishstock	**Landings**	**TACC**	**Landings**	**TACC**	**Landings**	**TACC**	**Landings**	**TACC**	**Landings**	**TACC**
1993–94	0	–	0	–	0	–	0	–	0	–
1994–95	0.123	–	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	0	–	0	–	0	–	0	–	0	–
2003–04	0	1.0	0	1.0	0	1.0	0	1.0	0	1.0
2004–05	0	1.0	0	1.0	0	1.0	0	1.0	0	1.0
2005–06	0	1.0	0	1.0	0	1.0	0	1.0	0	1.0

Fishstock	DSU 7		DSU 8		DSU 9		Total	
	Landings	**TACC**	**Landings**	**TACC**	**Landings**	**TACC**	**Landings**	**TACC**
1993–94	0.112	–	0	–	0	–	0.235	–
1994–95	0.026	–	0	–	0	–	0.026	–
1995–96	0.011	–	0	–	0	–	0.038	–
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	–	0	–	0	–	0	–
2003–04	0.089	1.0	0	1.0	0	1.0	0.089	8.0
2004–05	0.078	1.0	0	1.0	0	1.0	0.078	8.0
2005–06*	0.036	1.0	0	1.0	0	1.0	0.054	8.0

* In 2005-06 18.6 kg were reported landed, but the QMA is not recoded. This amount is included in the total landings for that year.

(b) Recreational fisheries

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

(c) Maori customary fisheries

Offshore clams such as *D. subrosea* are likely to have been harvested for customary use only when washed ashore after storms. There are no estimates of current customary use of this clam.

(d) Illegal catch

There is no known illegal catch of this clam.

(e) 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 minimises damage to the few species of other macrofauna captured. Surf clam populations also are 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 is found around the New Zealand coast on sandy bottoms. It is more common in the North Island than in the South Island, where it is respectively found between 6 and 10 m., and 5 and 8 m. It is smaller and smoother than *D.* anus, and is usually found on more protected beaches deeper in the substrate. Maximum length is variable between areas, ranging from 41 to 68 mm (Cranfield et al., 1993). The sexes are likely to be separate, and they are likely to be broadcast spawners with planktonic larvae (Cranfield & Michael, 2001). 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

(a) 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.

(b) Incidental catch (fish and invertebrates)

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

(c) Incidental Catch (seabirds and mammals)

Not relevant to surf clam fisheries.

(d) Community and trophic structure

The effects dredging for *D. subrosea* on the community and trophic structure are unknown.

(e) Spawning disruption

The effects of hydraulic dredging on spawning are unknown.

(f) Habitats of special significance

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

(g) Biodiversity

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

(h) Aquaculture and enhancement

Not relevant to surf clam fisheries.

5 STOCK ASSESSMENT

(a) Estimates of fishery parameters and abundance

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

(b) Biomass estimates

Biomass has been estimated at Cloudy Bay with a stratified random survey using a hydraulic dredge. The virgin biomass for this area was estimated to be 21 t.

(d) 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 11 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 Table2.

Table 2: MCY estimates (t) for *D. subrosea* from virgin biomass in 450 m transects at locations sampled around New Zealand (data from Cranfield et al., 1994b).

Location	$F_{0.1}$	MCY
Great Exhibition	0.27*	0.031
Te Arai	0.27*	0.050
Matakana Island	0.27*	0.13
Ohope	0.27*	0.034
Nuhaka	0.27*	0.036
Waitarere	0.27*	0.025
Otaki	0.27*	0.009
Fence	0.25†	0.055
Wairau	0.25†	0.038
Leithfield	0.25†	0.040
Kainga	0.25†	0.008

* 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.

(e) Estimation of Current Annual Yield (CAY)

CAY has not been estimated for *D. subrosea*.

6. STATUS OF THE STOCKS

Because of the relatively low levels of exploitation of *D. subrosea*, 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.

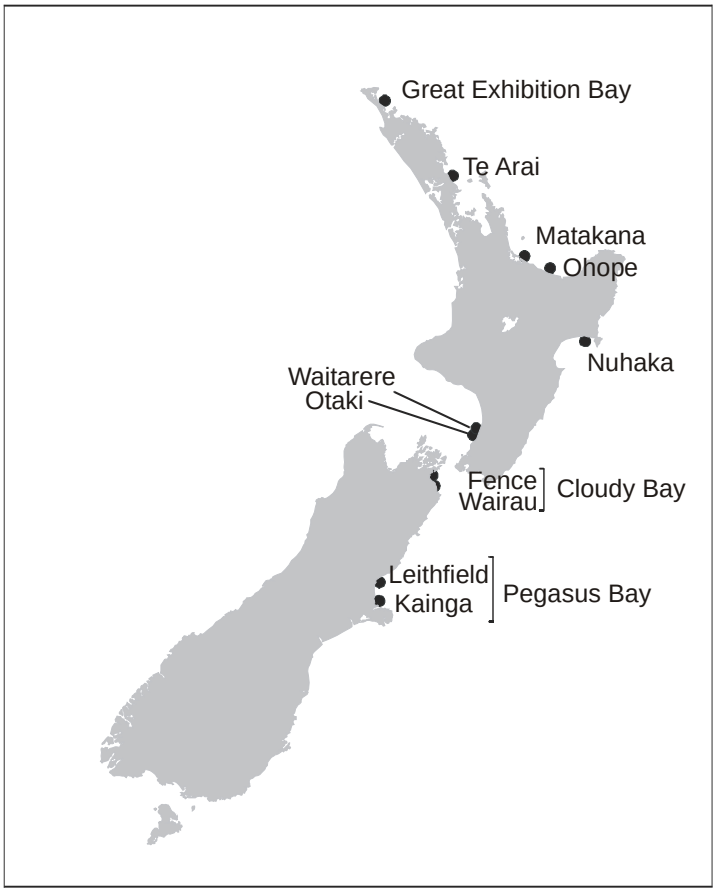


Figure 1: Location of sites surveyed

7. FOR FURTHER INFORMATION

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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.

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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.