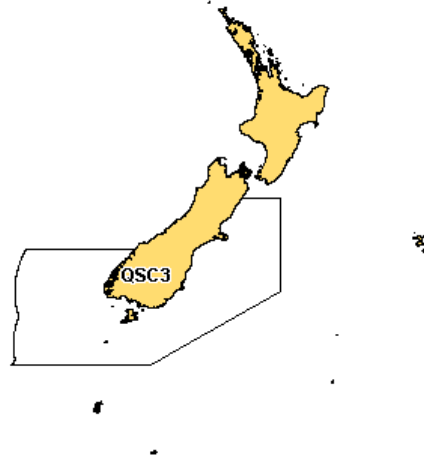


QUEEN SCALLOPS (QSC)

(*Chlamys delicatula*)



1. FISHERY SUMMARY

1.1 Commercial fisheries

The QSC 3 fishery initially developed in the 1984–85 fishing year; it is a small-scale fishery with only a few fishing vessels involved (Michael & Cranfield 2001). Queen scallops (*Zygochlamys delicatula*) (reported as *Chlamys delicatula*) are predominantly harvested commercially off the Otago coast, in depths of 130–200 m near the edge of the continental shelf. Reported landings from this fishery peaked at 711 t in the 1985–86 fishing year. Annual landings in most recent years have been less than 200 t, although this catch level is more likely associated with economic, than biological, factors. Queen scallops were introduced into the QMS in October 2002, with a TACC of 380 t and a 20 t allowance for other sources of fishing related mortality. The TACC was set slightly higher than the level of recent landings but lower than the non-QMS competitive catch limit of 750 t which applied to FMA 3 from 1990–91. Reported landings of Queen scallops are given in Table 1.

Table 1: Reported landings (t greenweight) of Queen Scallops (QSC) by FMA, QMA and fishing year by all methods (trawl and dredge) 1989–90 to 2006–07 from Quota Management Reports (QMR), Monthly Harvest Returns (MHR) and Catch Effort Landing Returns (CELR landed and CELR estimated).

Fishing year	QSC3		FMA3		FMA5	
	Catch (QMR/MHR)	TACC*	Estimated catch (TCEPR/CELR)	Landings (CELR/CLR)	Estimated catch (TCEPR/CELR)	Landings (CELR/CLR)
1989–90	11.9		288.1			
1990–91	61.8		238.3			22.9
1991–92	77.4		193.7			
1992–93	0.4		104.7			
1993–94	1.1		133.6			
1994–95	23.6		146.9			
1995–96	4.5		149.5			0.2
1996–97	20.9		118.0			6.6
1997–98	56.0		208.3			6.0
1998–99	85.9		81.7			
1999–00	180.2		176.8			
2000–01	162.2		162.1			
2001–02	223.7		168.9			
2002–03	139.0	380				
2003–04	114.0	380				
2004–05	35.1	380				
2005–06	18.6	380				
2006–07	6.5	380				

* QMS introduction 1 October 2002

QUEEN SCALLOPS (QSC)

1.2 Recreational fisheries

There is no known recreational fishery for Queen scallops.

1.3 Customary non-commercial fisheries

There is no known customary non-commercial harvest of Queen scallops.

1.4 Illegal catch

Current levels of illegal harvest are not known.

1.5 Other sources of mortality

No quantitative estimate of other sources of mortality is available. Some grading of catch may occur (queen scallops may be returned to the sea) and an allowance of 20 t for potential mortality has been set within the current TAC.

2. BIOLOGY

The New Zealand queen scallop (*Zygochlamys delicatula*) is also known as the southern queen scallop, southern fan scallop, and gem scallop. This small pectinid species is distributed on the outer continental shelf along the east coast of the South Island, from Kaikoura down to Macquarie Island. There are nine other species in the genus, none of which have attracted commercial interest, probably because of their small size. Similar species such as *Chlamys islandica* and *Chlamys varia* support important fisheries in other countries. New Zealand queen scallops are distributed from Kaikoura to the southern islands including the Snares, Bounty, Antipodes, and Macquarie Islands. There are no records of live queen scallops being caught north of Kaikoura, or on the west coast of the South Island.

A dredge survey off Otago in October 1983 showed queen scallops were distributed in long patches orientated along the slope of the continental shelf. They were most abundant in depths beyond 130 m, on the plateau between the Taiaroa and Papanui Canyons, and south. North of the Taiaroa Canyon catches diminished steadily towards the Karitane Canyon; few were caught north of the canyon. Only low numbers of queen scallops were caught in depths shallower than 110 m.

Juvenile queen scallops are frequently found attached to fragments of bryozoa and other biogenic debris, including the shells of other scallops and the dredge oyster. Height frequency distributions of samples show size composition of the population differs with area, and it is inferred that settlement probably varies spatially and temporally. The estimated 40–50 days larval life may result in queen scallop larvae being well mixed, both vertically and horizontally, in the water column. Predation of newly settled spat may also affect the pattern of recruitment and add to the variability in year class representation.

Estimates of growth for New Zealand queen scallops suggest they become sexually mature at four years for males and five years for females. As length is slightly less than height, queen scallops are estimated to reach the minimum takeable size of 50 mm at about eight years. However, growth estimates are uncertain, with information from tagging studies suggesting queen scallops enter the fishery much earlier, at three to five years.

3. STOCKS AND AREAS

Queen scallops are distributed throughout the QSC 3 area. From harvest records the scallops inhabit waters between 130 m to 200 m. The extent to which various beds or populations are separate reproductively or functionally is not known.

4. STOCK ASSESSMENT

4.1 Estimates of fishery parameters and abundance

No estimates of fishery parameters or abundance are available at present.

4.2 Biomass estimates

A trawl survey, (Jiang *et al.* 2005) carried out in February - April 2004, provided estimates of relative total and recruited biomass available from the fished area of QSC 3, from Moeraki to just north of the Nuggets within the depth range 130m to 200 m, which covers 90% of the fished area within QSC3 (Table 2). These estimates assumed that the efficiency of the survey trawl was 100%. However trawl efficiency is unlikely to be 100% and in other scallop fisheries can vary significantly depending on dredge and substrate type. Consequently estimates of current absolute biomass cannot be estimated. The Shellfish Working Group had concerns over methodology and conduct of the survey, and that the reported survey CVs may not be reliable.

Table 2: Estimated scallop biomass (recruit and pre-recruit) (t) in fished areas of QSC 3 February-April 2004.

Biomass Recruit (CV)	Biomass (CV) Pre-recruit	Total Biomass (CV)
1950.8 (18.2)	363.6 (21.48)	2314.4 (18.22)

4.3 Estimation of Maximum Constant Yield (MCY)

As absolute biomass has not been estimated, MCY cannot be estimated

4.4 Estimation of Current Annual Yield (CAY)

CAY cannot be estimated.

5. STATUS OF THE STOCKS

A relative biomass estimate for the areas fished within QSC 3 is available from a 2004 survey. The Working Group noted that this survey was not standardized and that there are no previous estimates for relative biomass to provide comparison.

TACC and reported landings, for the 2006–07 fishing year are summarised in Table 3.

Table 3: Summary of TACCs (t) and reported landings (t) of Queen scallops for the most recent fishing year.

Fishstock	2006–07 TACC	2006–07 Reported landings
QSC 3	380	6.5

6. FOR FURTHER INFORMATION

Jiang W., Gibbs M., Hatton S. 2005. Stock assessment of the queen scallop fishery in QSC3. Final Fisheries Research Report for Ministry of Fisheries project QSC2002/01: Stock assessment of the queen scallop fishery in QSC3.

Michael KP., Cranfield HJ. 2001. A summary of the fishery, commercial landings, and biology of the New Zealand queen scallop, *Zygochlamys delicatula* (Hutton, 1873). New Zealand Fisheries Assessment Report 2001/68. 25p.