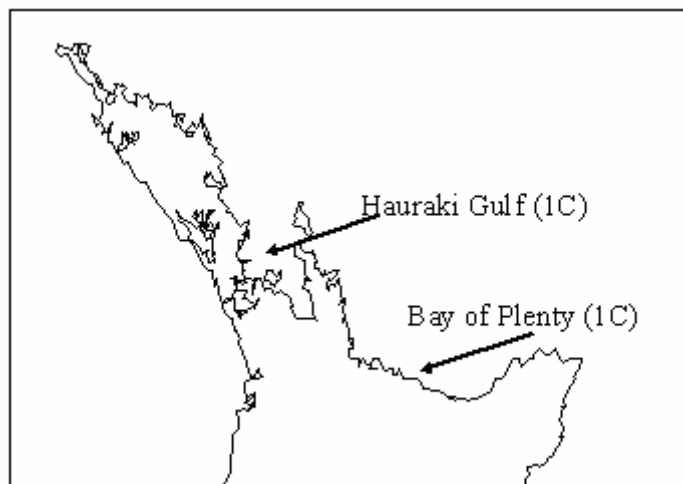


PPI 1B (Northland), PPI 1C (Hauraki Gulf and Bay of Plenty), PPI 2 (central east), PPI 3 (south east coast), PPI 4 (south east Chatham Rise), PPI 5 (Southland and sub-Antarctic), PPI 7 (Challenger / Central Plateau).

(*Paphies australis*)
Pipi



1. FISHERY SUMMARY

1.1 Commercial fisheries

FMA's PPI 1B (Northland), PPI 1C (Hauraki Gulf and Bay of Plenty), PPI 2 (Central east), PPI 3 (south east coast), PPI 4 (south east Chatham Rise), PPI 5 (southland and sub-Antarctic), and PPI 7 (Challenger/ Central Plateau) were introduced into the QMS 1 October 2005 with the TACs and allowances in Table 1 (NB. PPI 1A was introduced into the QMS 1 October 2004, for further information please refer to the following plenary report, PPI 1A). Only PPI 1A, PPI 1C and PPI 7 have allocated commercial catches (TACC's) under the set TACC's (Table 1).

Table 1: TACs, TACCs, Recreational and Customary non commercial allocations (t) for pipi .

Fishstock	Recreational Allowance	Customary non-commercial allowance	Other sources of mortality	TACC	TAC
PPI 1A*	25	25	0	200	250
PPI 1B	76	76	8	0	160
PPI 1C	115	115	10	3	243
PPI 2	3	3	1	0	7
PPI 3	9	9	1	0	19
PPI 4	1	1	1	0	3
PPI 5	1	1	1	0	3
PPI 7	1	1	1	1	4

* For information on PPI 1A see the following plenary report

Regulations require that all gathering is to be done by hand. Fishers typically use a mask and snorkel. There is no minimum legal size (MLS) for pipi, although fishers probably favor larger pipi (> 60 mm shell length). There is no apparent seasonality in the pipi fishery, as pipi are available for harvest year-round.

Over 99% of the total commercial landings of pipi in New Zealand have been from general statistical area 003 and PPI 1. Only a very small proportion of all the landings have been from PPI 1C (Hauraki Gulf and Bay of Plenty), the majority is taken from PPI 1A (Table 2). Despite a TACC to 1 t, no landings have been recorded for PPI 7.

Table 2: Reported commercial landings (from Licensed Fish Receiver Returns; LFRR) of pipi (t greenweight) in New Zealand since 1986–87¹.

Year	Reported landings (t)	Limit (t)	Year	Reported landings (t)	Limit (t)
1986–87	131	657	1997–98	122	657
1987–88	133	657	1998–99	130	657
1988–89	134	657	1999–00	143	657
1989–90	222	657	2000–01	184	657
1990–91	285	657	2001–02	191	657
1991–92	326	657	2002–03	191	657
1992–93	184	657	2003–04	266	657
1993–94	258	657	2004–05*	0	3
1994–95	172	657	2005–06*	0.86	3
1995–96	135	657	2006–07*	1.69	3
1996–97	146	657			

¹Prior to the introduction of PPI 1C to the QMS on 1 October 2005, the fishery was limited by daily limits which summed to 657 t greenweight in a 365 day year, but there was no explicit annual restriction.

* A TACC of 3 t was set for PPI 1C on 1 October 2005.

1.2 Recreational fisheries

The recreational fishery is harvested entirely by hand digging. Large pipi 50 mm (maximum shell length) or greater are probably preferred. Although pipi attract intense recreational interest, no quantitative information on the level of recreational harvest exists. Compared with commercial landings the recreational take of pipi is likely to be small. The 1996, 1999–00, and 2000–01 National Marine Recreational Fishing Surveys recorded recreational harvests for pipi in FMA 1. The estimated numbers of pipi harvested were 2.1, 6.6, and 7.2 million respectively. The Marine Recreational Fisheries Technical Working Group (RFTWG) has reviewed harvest estimates from the national surveys and concluded that the 1996 estimates are unreliable due to a methodological error. Estimates from the 1999–00 and 2000–01 surveys for some fishstocks were unbelievably high. No mean harvest weight was available. No recreational harvest estimates specific to the Mair Bank pipi fishery are available.

1.3 Customary non-commercial fisheries

In common with many other intertidal shellfish, pipi are very important to Maori as a traditional food. However, no quantitative information on the level of customary take is available.

1.4 Illegal catch

No quantitative information on the level of illegal catch is available.

1.5 Other sources of mortality

No quantitative information on the level of other sources of mortality is available.

2. BIOLOGY

The pipi (*Paphies australis*) is a common burrowing bivalve mollusc of the family Mesodesmatidae. Pipi are distributed around the New Zealand coastline, including the Chatham and Auckland Islands (Powell 1979), and are characteristic of sheltered beaches, bays and estuaries (Morton & Miller 1968). Pipi are tolerant of moderate wave action, and commonly inhabit coarse shell sand substrata in bays and at the mouths of estuaries where silt has been removed by waves and currents (Morton & Miller 1968). They have a broad tidal range, occurring intertidally and subtidally in high-current harbour channels to water depths of at least 7 m (Dickie 1986a, Hooker 1995a), and are locally abundant, with densities greater than 1000 m² in certain areas (Grace 1972).

Pipi reproduce by free-spawning, and most individuals are sexually mature at about 40 mm shell length (SL) (Hooker & Creese 1995a). Gametogenesis begins in autumn, and by late winter many pipi have mature, ready-to-spawn gonads (Hooker & Creese 1995a). Pipi have an extended breeding

period from late winter to late summer, with greatest spawning activity occurring in spring and early summer. Fertilised eggs develop into planktotrophic larvae, and settlement and metamorphosis occur about three weeks after spawning (Hooker 1997). In general, pipi have been considered sedentary when settled, although Hooker (1995b) found that pipi may utilise water currents to disperse actively within a harbour. The trigger for movement is unknown, but this ability to migrate may have important implications to their population dynamics.

Pipi growth dynamics are not well known. Growth appears to be fairly rapid, at least in dynamic, high-current environments such as harbour channels. Hooker (1995a) showed that pipi at Whangateau Harbour (northeastern New Zealand) grew to about 30 mm in just over one year (16–17 months), reached 50 mm after about three years, and grew very slowly after attaining 50 mm. There was a strong seasonal component to growth, with rapid growth occurring in spring and summer, and little growth in autumn and winter. Williams *et al.* (2006) used Hooker's (1995a) tag-recapture and length frequency time series data to generate formal growth estimates for Whangateau Harbour pipi (Table 3). Estimates are available also from time series of size frequencies on sheltered Auckland beaches (Table 3; Morrison & Browne 1999, Morrison *et al.* 1999), although these estimates were likely to have been poorly estimated due to variability in the length data.

Little is known about the natural mortality or maximum longevity of pipi. Haddon (1989) suggested pipi are unlikely to live much more than 10 years, and used assumed maximum ages of 10, 15 and 20 years old to estimate maximum constant yield for Mair Bank pipi in 1989. The estimation of the rate of instantaneous natural mortality (M) is difficult for pipi owing to the immigration and emigration of individuals from different areas. As the timing and frequency of these movements are largely unknown, the separation of mortality from movement effects is likely to be problematic. Williams *et al.* (2006) assumed values of $M = 0.3, 0.4,$ and 0.5 to estimate yields for Mair Bank in 2005–06.

Table 3: Estimates of biological parameters for pipi.

Growth		Location	Year	Source
L_{∞} (mm SL)	K			
57.3	0.46	inner Whangateau Harbour site	1992–93	Williams <i>et al.</i> (2006)
63.9	0.57	Whangateau Harbour entrance	1992–93	Williams <i>et al.</i> (2006)
41.1	0.48	Cheltenham Beach, North Shore	1997–98	Morrison <i>et al.</i> (1999)
58.9	0.15	Mill Bay, Manukau Harbour	1997–98	Morrison <i>et al.</i> (1999)
84.6	0.09	Mill Bay, Manukau Harbour	1998–99	Morrison & Browne (1999)
Natural mortality				
$M = 0.3–0.5$ (assumed values)		-	-	Williams <i>et al.</i> (2006)
Size at maturity				
40 mm SL		Whangateau Harbour	-	Hooker & Creese (1995a)

3. STOCKS AND AREAS

Little is known of the stock structure of pipi. There have been no biological studies directly relevant to the identification of separate stocks of pipi around New Zealand, although pipi “stocks” are likely to be linked by larval dispersal.

4. STOCK ASSESSMENT

There is no stock assessment for any of these pipi stocks.

5. STATUS OF THE STOCKS

There were no reported landings in 2006–07 for any PPI stocks except PPI 1A. The status of all PPI stocks other than PPI 1A are unknown.

TACCs and reported landings are summarized in Table 4.

Table 4: Summary of TACCs (t) and reported landings (t) of pipis for the most recent fishing year.

Fishstock	2006–07 Actual TACC	2006–07 Reported landings
PPI 1C	3	1.693
PPI 7	1	0

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