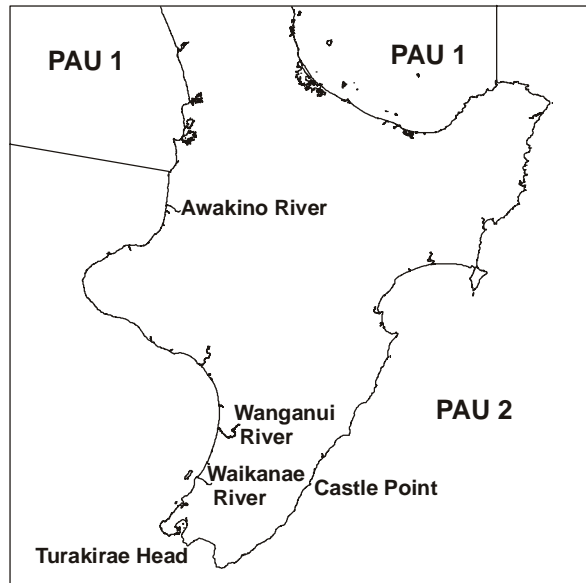


PAUA (PAU 2) – Wairarapa / Wellington / Taranaki

(Haliotis iris)
Paua



1. FISHERY SUMMARY

1.1 Commercial fisheries

PAU 2 was introduced into the Quota Management System in 1986–87 with a TACC of 100 t. The TACC has since increased to 121.19 t in 1989 as a result of the appeal process (Table 1). The fishing year runs from 1 October through 30 September. In what follows, the fishing year is referred to using the second part, *viz* 2002–03 is termed “2003”. Most of the commercial catch comes from the Wairarapa and Wellington South coasts between Castle Point and Turakirae Head. The western area between Turakirae Head and the Waikanae River is closed to commercial fishing.

Table 1: TACC and reported landings (t) of paua in PAU 2 from 1995–96 to 2008–09.

Year	Landings	TACC
1995–96	119.75	121.19
1996–97	118.86	121.19
1997–98	122.41	121.19
1998–99	115.22	121.19
1999–00	122.48	121.19
2000–01	122.92	121.19
2001–02	116.87	121.19
2002–03	121.19	121.19
2003–04	121.06	121.19
2004–05	121.19	121.19
2005–06	121.14	121.19
2006–07	121.20	121.19
2007–08	121.06	121.19
2008–09	121.18	121.19

In recent years the commercial paua fishery has implemented a number of voluntary management actions in most QMAs. Agreement to these actions has been formalised within each QMA through the development of an Annual Operational Plan (AOP) that is agreed to and signed by all Quota and ACE holders within the fishery. The plan explains the voluntary management actions that will be undertaken for the fishing year. The main actions of the AOP for PAU 2 for the 2009-10 fishing year are outlined below (Table 2).

Table 2: Summary of Annual Operating Plan for PAU 2 for the 2009-10 fishing year

Identification of vehicles	All commercial vessels and associated vehicles belonging to members of commercial harvesting crews will be identified with PauMac2 signage advertising the fact that they are legitimate harvests.
Data Collection – CATCH SAMPLING	Each fishing operation is asked to collect a minimum of 2 samples (“red bag” sample kits will be supplied) during the course of their fishing year.
Data Collection – DATA LOGGERS	Selected Dive Teams will have one diver who carries & uses a data logger.
General Operating Procedures	Details on procedures are available in the AOP.

1.2 Recreational fisheries

There is a large recreational fishery for paua. Estimated catches from telephone and diary surveys of recreational fishers for PAU 2 are available for the years 1992–93, 1995–96, 1999–2000 and 2000–2001 (Teirney *et al.* 1997, Bradford 1998, Boyd & Reilly 2004, Boyd *et al.* 2004). Estimates for these years were 37–89 t, 45–65 t, 224–606 t, and 152–248 t respectively. The Marine Recreational Fisheries Technical Working Group (RFTWG) has reviewed the harvest estimates from the national surveys and concluded that the harvest estimates for the 1999/2000 and 2000/2001 surveys may be very inaccurate and some implausibly high. This may be due to a number of factors including the accuracy of the mean weight used to derive total harvest weight from the estimated numbers of paua caught by diarists, and the small number of diarists harvesting the stock in some areas.

Because paua around Taranaki are naturally small and never reach the minimum legal size (MLS) of 125 mm, a new MLS of 85 mm was introduced for recreational fishers from 1 October 2009. The new length is on a trial basis for five years and applies between the Awakino and Wanganui rivers.

1.3 Customary non-commercial fisheries

Refer to the Paua introduction Working Group Report

1.4 Illegal catch

It is widely believed that the level of illegal harvesting is high around Wellington and on the Wairarapa coast. There are no estimates of illegal catch for PAU 2.

1.5 Other sources of mortality

Refer to the Paua introduction Working Group Report

2. BIOLOGY

Refer to Paua introduction Working Group Report

A summary of published estimates of biological parameters for PAU 2 is presented in Table 3.

Table 3: Estimates of biological parameters (*H. iris*)

	Estimate	Area	Source
1. Size at maturity (shell length)			
50% mature	71.7 mm	Wellington	Naylor <i>et al.</i> (2006)
50% mature	58.9 mm	Taranaki	Naylor & Andrew (2000)
2. Fecundity = $a(\text{length})^b$ (eggs, shell length in mm)			
	$a = 43.98$ $b = 2.07$	Taranaki	Naylor & Andrew (2000)
3. Exponential growth parameters (both sexes combined)			
g_{50}	30.58 mm	Wellington	
g_{100}	14.8 mm		Naylor <i>et al.</i> (2006)
G_{25}	18.4 mm	Taranaki	
G_{75}	2.8 mm		Naylor & Andrew (2000)

3. STOCKS AND AREAS

The present Fishstock boundaries may not represent a single discrete paua stock for PAU 2.

4. RELATIVE ABUNDANCE INDEX

A standardised CPUE index based on commercial catch was constructed covering the 1990 to 2007 fishing years (McKenzie et al. 2009). The index was based on CELR data for 1990 to 2001, and PCELR data collapsed into CELR format for 2002 to 2007, with units of kg per diver day. The index shows a decline from 1990 to 1992, increasing to 2000, then fluctuating but essentially constant since (Table 4, Figure 1). A large portion of PAU 2, including the Wellington south coast, is closed to commercial fishing. This means that the CPUE series collected from the commercial catch and effort data are exclusive of this large area. Given that it is widely believed that the level of illegal harvesting is high around Wellington, the abundance of paua in the fishery as a whole will not be captured very well by the CPUE index, which will only reflect abundance outside of the closed area. This is a cause for concern if stocks in the closed area are being depleted.

Table 4: The standardised CPUE for PAU 2 1990–2007.

Fishing year	Number of records	Standardised CPUE	cv
1990	288	111	0.11
1991	413	91	0.10
1992	320	86	0.10
1993	286	96	0.11
1994	253	92	0.10
1995	220	107	0.11
1996	230	108	0.11
1997	228	111	0.11
1998	141	139	0.12
1999	191	155	0.12
2000	188	162	0.12
2001	180	138	0.12
2002	140	149	0.12
2003	153	157	0.12
2004	148	166	0.12
2005	148	147	0.12
2006	166	156	0.12
2007	166	147	0.12

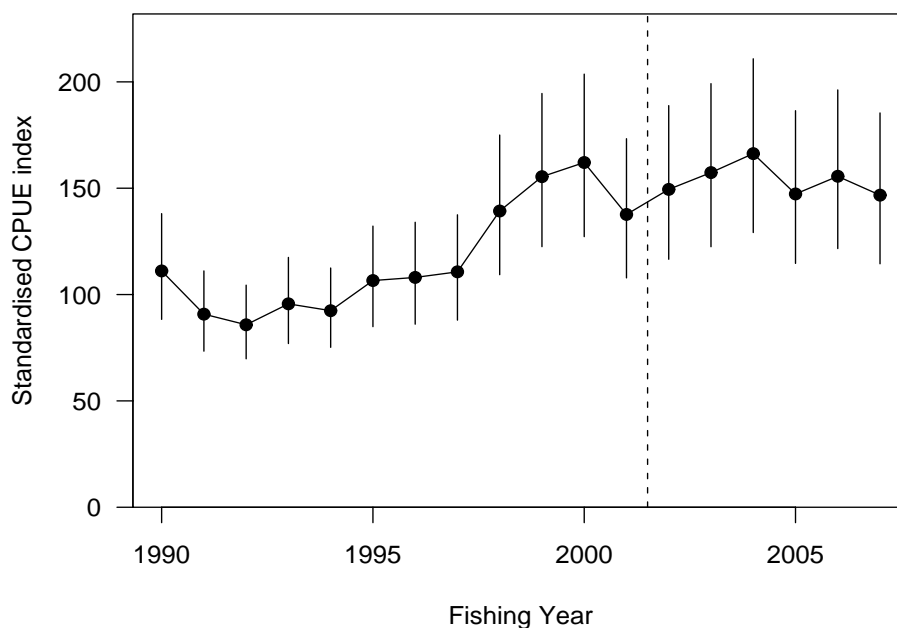


Figure 1: Standardised CPUE index for PAU 2 1990–2007 with 95% confidence intervals. The vertical line delineates between CELR and PCELR data.

5. STATUS OF THE STOCKS

Stock Structure Assumptions

Stock boundaries are unknown but for the purpose of this summary PAU 2 is considered to be a single management unit.

PAU 2

Stock Status	
Year of Most Recent Assessment	No stock assessment has been undertaken for PAU 2
Assessment Runs Presented	–
Reference Points	Target(s): Not established. Soft Limit: Not established Hard Limit: Not established
Status in relation to Target	Unknown
Status in relation to Limits	Unknown
Historical Stock Status Trajectory and Current Status	
<p>Standardised CPUE index for PAU 2 1990–2007 with 95% confidence intervals. The vertical line delineates between CELR and PCELR data.</p>	

Fishery and Stock Trends	
Recent Trend in Biomass or Proxy	–
Recent Trend in Fishing Mortality or proxy	–
Other Abundance Indices	Standardised CPUE increased between 1992 and 2000 and has since remained fairly stable.
Trends in Other Relevant Indicators or Variables	–

Projections and Prognosis	
Stock Projections or Prognosis	No stock assessment has been undertaken for this stock.
Probability of Current Catch or TACC causing decline below Limits	Soft Limit: Unknown Hard Limit: Unknown

Assessment Methodology	
Assessment Type	N/A
Assessment Method	N/A
Main data inputs	N/A
Period of Assessment	Latest assessment: N/A Next assessment: N/A

PAUA (PAU 2)

Changes to Model Structure and Assumptions	N/A
Major Sources of Uncertainty	N/A

Qualifying Comments

CPUE is not generally considered to be a reliable indicator of the status of abalone stocks and may not reflect abundance.

A large portion of PAU 2, including the Wellington south coast, is closed to commercial fishing. This means that the CPUE series collected from the commercial catch and effort data are exclusive of this large area and therefore the abundance of paua in the fishery as a whole will not be captured very well by the CPUE index.

Fishery Interactions

There are no bycatch species in this dive fishery.

6. FOR FURTHER INFORMATION

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