



# Research & Education

## Port Phillip Bay Crucial to Victoria's Western Snapper Stocks

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**Snapper spawned in Port Phillip Bay are the main stay of Victoria's western snapper fishery.**

For the past 6 years fisheries scientists from the Department of Primary Industries (DPI) have been investigating Victoria's snapper stocks (see Fisheries Notes 538, 544 and 585) to determine the significance of Port Phillip Bay to Victoria's important recreational and commercial snapper fisheries.

The results of these studies, involving natural chemical markers or 'tags' in fish earbones (otoliths), show that for the period surveyed Port Phillip Bay was crucial to the snapper fisheries in western and central Victoria.

DPI's Paul Hamer and Greg Jenkins found the majority of juvenile and young adult or 'pinkie' snapper in western and central Victorian waters spent time as small juveniles in nursery areas in Port Phillip Bay.

Young snapper (see photo over page) that spent their early life in Port Phillip Bay moved from the nursery areas in the Bay to populate coastal waters and Western Port bay.

"Snapper as young as 1 year of age moved distances of up to 200km from Port Phillip Bay. By the age of 4 years, snapper populations in western and central Victorian coastal waters and Western Port bay were dominated by fish that actually started life in Port Phillip Bay" Paul says.

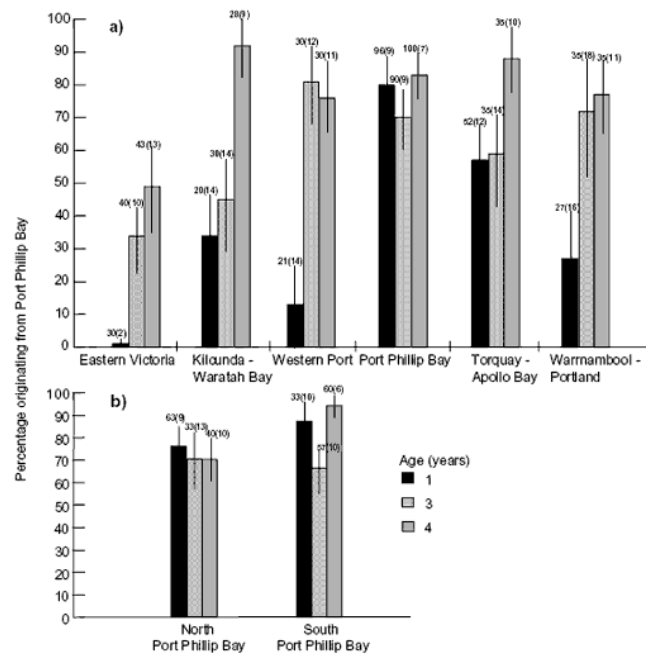
Specifically, Paul and Greg focused on two year classes of juvenile snapper originating from Port Phillip Bay in 2000/2001 and found over the next five years these young juveniles made up:

- > 80% of the young adult snapper recruiting to Victoria's major snapper fishery in Port Phillip Bay.
- > 80% of the young adult snapper recruiting to the snapper fishery in western and central Victorian coastal waters (up to 350 km west and 150 km east of Port Phillip Bay).

The snapper fishery in Western Port bay was also a major beneficiary, with about 70% of the pinkie snapper estimated to have originated from the nursery areas in Port Phillip Bay.

"The results suggest that snapper originating from Port Phillip Bay dominated the Western Port bay fishery by the time they were about three years old," Paul says. "However, for locations further to the east, such as Waratah Bay, it took a little longer before snapper from Port Phillip Bay dominated the populations."

Similar trends occurred to the west of the Bay, with movement to the west was occurring at younger ages.



Graph showing the proportion of snapper originating from Port Phillip Bay at various ages and regions of the Victorian fishery a) compared among the 6 regions of the Victorian fishery and b) compared between north and south Port Phillip Bay.



## Port Phillip Bay Crucial to Victoria's Western Snapper Stocks

Having determined that newly-settled juvenile snapper (see photos below) raised in Port Phillip Bay nursery areas were the mainstay of Victoria's western snapper stock fisheries during the survey period, Paul and Greg then turned their attention to confirming whether or not these small juveniles were derived largely from spawning within Port Phillip Bay, as opposed to coastal spawning areas.



*Snapper two to three months old (left) and a recently settled snapper (30 days, top right) and snapper larvae (15 days old) (bottom right)*

Each year since the spring of 2004, Paul and Greg have been comparing the numbers for snapper larvae in northern Port Phillip Bay, the Geelong arm, Port Phillip Heads and coastal waters in Bass Strait.

Snapper spawn in the late spring / early summer. Paul and Greg have found snapper larvae to be common during December/January in northern Port Phillip Bay. However, very few snapper larvae have been collected from Port Phillip Heads and coastal areas around the entrance to the Bay.

These results suggest that, during the survey period, snapper spawning in Port Phillip Bay supplied most of the young snapper that settled into the nursery areas in the Bay.

Greg and Paul found the number of snapper larvae varied considerably from year to year and that the abundance of the newly-settled snapper closely reflected the abundances of the larval stages several months earlier.

This research suggests that, at least in some years, local processes within Port Phillip Bay are determining the numbers of snapper larvae that survive to settle into the Bay's nursery habitats as newly-settled juveniles. These processes therefore ultimately determine the strength of the snapper fisheries in Port Phillip Bay, Western Port bay and coastal waters of western and central Victoria.

The processes that determine variation in the production and survival of snapper larvae are still poorly understood.

The results of Paul and Greg's research emphasises the critical importance of Port Phillip Bay to snapper fisheries in western and central Victoria and the importance of understanding and protecting the essential habitats and

food chains required for larval, juvenile and adult snapper in Port Phillip Bay.

This research was funded by Fisheries Victoria and the Fisheries Research and Development Corporation.

### Further Information

For more information about this project, please contact Paul Hamer at DPI Queenscliff Centre on (03) 5258 0288.

Fisheries Research and Education Notes are available on the web at the following address: [www.dpi.vic.gov.au](http://www.dpi.vic.gov.au). Follow the prompts to Fishing and Aquaculture and then to Publications and Fisheries Notes. The notes are listed under the heading Research and Education.

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