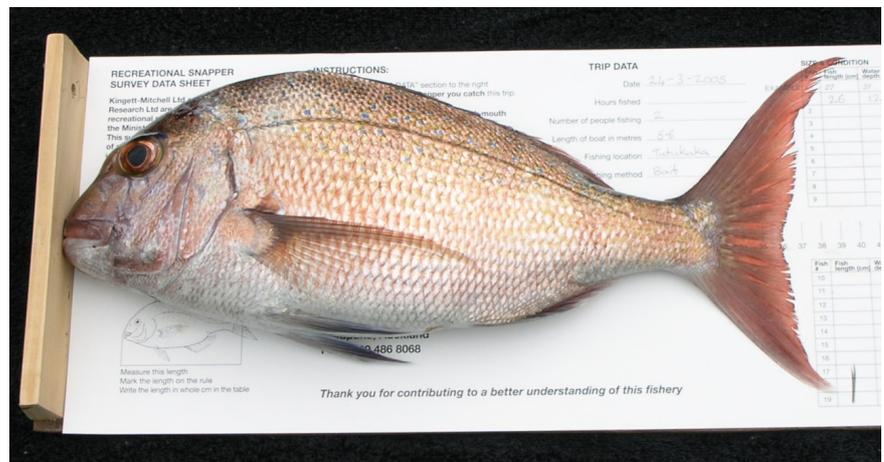


# Size and Condition of Snapper Caught by Amateur Fishers in SNA1

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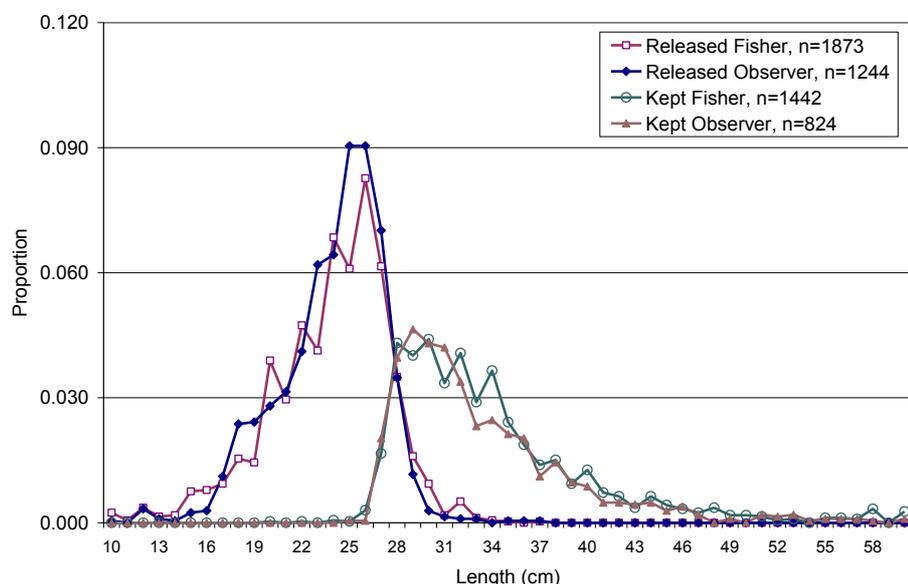
Regional and national marine recreational fishing surveys conducted since the early 1990s indicate that the snapper (*Pagrus auratus*) stock in the area SNA1 supports the largest recreational fishery in New Zealand, both in numbers of participants and numbers of fish harvested. The SNA1 fishery, located between North Cape and Cape Runaway, is one of the few New Zealand fisheries where the recreational harvest forms a significant proportion of total fishing mortality. At the time this project was run the amateur snapper fishery in SNA1 was regulated by method restrictions, a minimum legal size (MLS) of 27 cm and daily bag limits of 9 fish per person per day.

Recreational snapper length and other data were collected from the boat-based hook and line fishery by observers on recreational charter vessels ('Observer' in the plots below) and by recruiting recreational fishers leaving boat ramps to measure their own catch ('Fisher' in the plots below). This included data on the size of all fish caught and the condition of snapper returned to the sea.

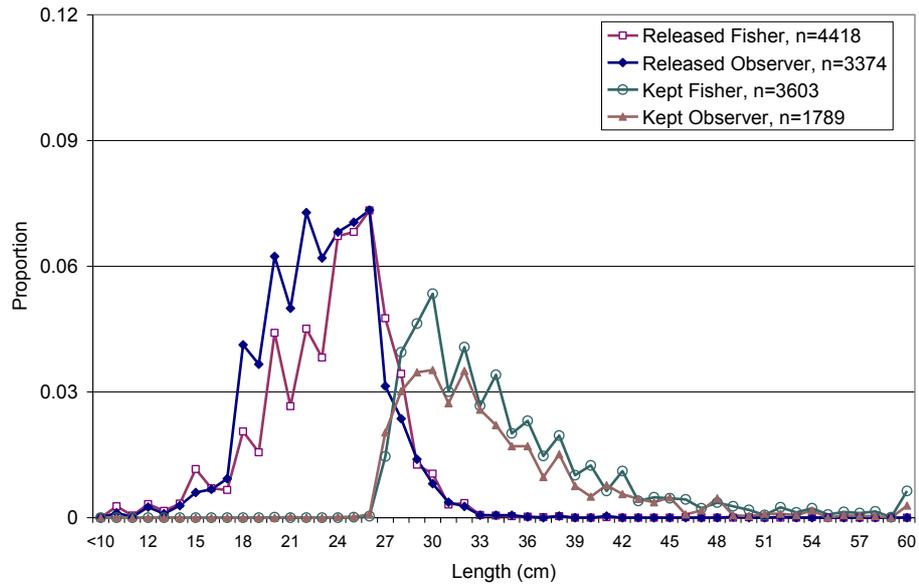


More than 19,000 recreationally caught snapper were measured at sea throughout SNA1 in 2004–05 and 2005–06. Recreational fishers generally were cooperative and did a good job measuring their catch at sea. The size of fish recorded by private fishers was very similar to that recorded by observers in the graphs below. Released snapper comprised 58% of the total snapper catch sampled in 2004–05 and 59% in 2005–06. Most of the released snapper were smaller than the minimum legal size of 27 cm. The high proportion of small snapper in the recreational catch probably reflects the large number young fish currently in the SNA1 snapper population. Data from other projects show that the 1999 and 2001 snapper spawning were very successful.

A plot of the proportion of released and kept snapper by length and by sample method in 2004–05. A lot of 25 and 26 cm fish were caught this year and released. Almost all fish over 32 cm were kept.

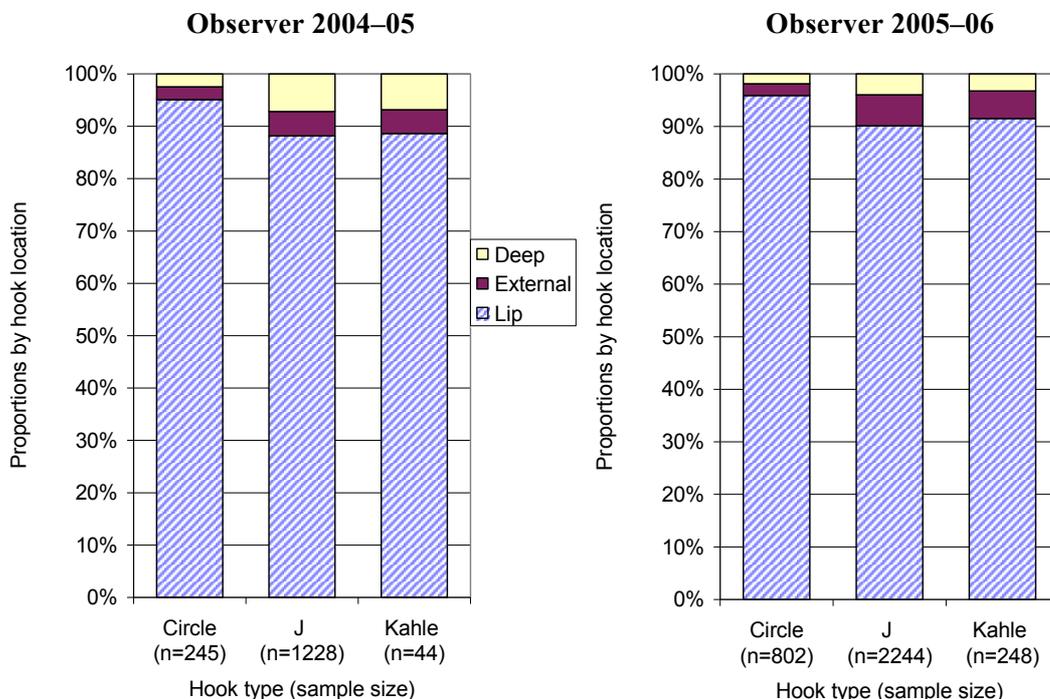


A plot from 2005–06 of the proportion of released and kept snapper by length and sample method. There was a wider spread of sizes this year. The “saw tooth” pattern (high, low, high) shows that some people tend to round off to even numbers.



Data on fish condition, hook type, hook size, where the fish was hooked, and water depth were also collected. Of the nearly 10,000 released snapper where comments on condition were recorded, 95% were reported as swimming away with 5% recorded as either floating (3%) or dying (2%). Some of the fish that swam away had visible injuries. About 20% showed signs of damage caused by air from a burst swim bladder (barotrauma) or bleeding and 6% were gut hooked or foul hooked.

Numerous studies around the world show that fish that are hooked in the throat or gut are much less likely to survive than lip hooked fish following release.



Above are the proportions of released snapper by hook location for different hook styles recorded by observers on charter vessels in the 2004–05 (left) and 2005–06 (right) surveys. Far fewer circle hook caught fish are gut hooked (Deep) or foul hooked (external). Therefore, J hooks and Kahle hooks kill a higher proportion of released fish than circle hooks. If there are small fish around change your hooks to circle hooks and use bigger baits. This project was repeated in SNA 1 in 2006–07. A further 9400 fish were sampled with similar results.

## Estimates of release mortality

A pilot study to investigate the survival rate of recreationally caught and released snapper was conducted in 1995 by NIWA (McKenzie & Holdsworth 1997). A total of 216 fish between 17 and 33 cm were tagged and held in a net at Moturekareka Island in the Hauraki Gulf for 15 days. These snapper were caught in water depths between 14 and 20 m and the assumption was made that no additional mortality was induced by the holding net or tagging. The mortality of “lip hooked” fish which had the hook removed immediately was in the order of 5–10%. It was also estimated from the 41 “gut hooked” fish caught that mortality of these fish was 75–90% (McKenzie & Holdsworth 1997).

Because a high proportion of the recreational catch that is released there is potential for significant release mortality in SNA 1 in this fishery. We were asked to try and quantify this. Pulling together results from this and other studies can give a range of values based on the assumptions used (Holdsworth & Boyd 2008a).

Assuming that the estimated harvest of snapper from the 2004–05 aerial overflight survey is also a reasonable prediction of the landed recreational catch in 2005–06, then the data from the present survey can be used to estimate the potential release mortality in the SNA 1 recreational fishery. We estimate that between 273 000 and 560 000 snapper die after release in addition to the fish that were kept by recreational fishers. The additional mortality by weight is 87–182 t which is 3.6% to 7.5% of additional mortality on top of the estimated 2004–05 recreational snapper harvest of 2420 t.

However, these estimates involve a number of untested assumptions and should be considered as preliminary. We suggest recreational fishers should be encouraged to reduce the fishing induced mortality of small fish they catch by using larger hooks and bait, using circle hooks, and moving away from locations where small fish are prevalent.

## Further Reading

- Holdsworth, J.C.; Boyd, R.O. (2008a). Size, condition and estimated release mortality of snapper (*Pagrus auratus*) caught in the SNA1 recreational fishery, 2004–05 and 2005–06. New Zealand Fisheries Assessment Report 2008/45. 45 p.  
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- Holdsworth, J.C.; Boyd, R.O. (2008b). Size, condition and estimated release mortality of snapper (*Pagrus auratus*) caught in the SNA1 recreational fishery, 2006–07. New Zealand Fisheries Assessment Report 2008/53. 37 p.  
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- McKenzie, J.; Holdsworth, J.C. (1997). Investigation of snapper (*Pagrus auratus*) release mortality from recreational line. Contract report for the Ministry of Fisheries (ISN717), (Unpublished report held at the Ministry of Fisheries, Wellington.)
- Muoneke, M. I.; Childress, W. M. (1994). Hooking mortality: A review for recreational fisheries. *Reviews in Fisheries Science* 2 (2): 123–156.
- Stewart, J. (2008). Capture depth related mortality of discarded snapper (*Pagrus auratus*) and implications for management *Fisheries Research* 90. pp 289–295.