

# The mighty whiting

**A** NGLERS target several species of whiting in coastal areas around Australia, contributing towards an estimated total catch of about 17 million fish each year. Most of this catch comprises King George (caught from Sydney, NSW, to Jurien Bay, WA) and sand whiting (caught along the entire east coast), but can include yellowfin, trumpeter, red spot, western school and stout whiting.

Owing to bag limits, legal sizes and a growing awareness by anglers of the need to conserve stocks, about 32 per cent of all angler-caught whiting in Australia are released. The fate of some of these fish is known, with a study in South Australia

*The good old sand whiting, targeted by many southern anglers during the summer months, is much tougher than we all think, write NSW Fisheries scientists PAUL BUTCHER, MATT BROADHURST and CRAIG BRAND.*

revealing post-release survival rates greater than 97 per cent for KG whiting. Although research done in NSW suggests that sand whiting sustain minimal physical damage and mortality (less than 3%) after escaping through the meshes of commercial prawn trawls and fish seines, no work has been done to examine their survival after being released by anglers. This information is required to assess the potential benefits of current C&R practices.

We aimed to estimate the post-release survival of angler-caught sand whiting as part of the recently-funded NSW Department of Primary Industries and Recreational Fishing Trust research project entitled "Estimating and maximising the survival of released line-caught fish". The work was done during a recreational fishing event held in the Woolli River in northern NSW in March 2005 and involved 32 anglers, three marshal boats and nine anchored cylindrical sea cages (2.3 x 2.5 m).

The anglers were given aerated fish-holding tanks, long-shank J-hooks (Mustad Bloodworm size 2) and bait (yabbies or beach worms) and were asked to target sand whiting (between 6am and 2pm on Saturday, March 5). As soon as an angler caught a fish, they placed it into their fish-holding tank and recorded data on the time of capture, anatomical hook location, duration of exposure to air, playing time, presence or absence of blood and the amount of scale loss. Researchers removed each fish from the holding tank, measured their total length (TL) and then tagged about half with anchor t-tags (so the progress of some individual fish could be tracked). Data was also collected on the water temperature and levels of dissolved oxygen in the holding tank. All fish were then transported by the marshal boats and released into the appropriate sea cages. Two days after the event, similar-sized sand whiting were caught using seine nets. Some of these fish were tagged, before all were released into the sea cages for use as controls. All fish were monitored for seven days.

A total of 124 sand whiting were hooked and released into the sea cages (60 were tagged). Nearly all fish were landed in less than 30 seconds after being hooked, exposed to air for less than a minute and had no visible scale or blood loss. Forty six percent of fish were hooked in the roof of the mouth or upper jaw, while 3.2 per cent swallowed hooks and 9.7 per cent were body hooked. The average size of fish was 20.5 cm, with the largest and smallest individuals 36.8 and 17 cm, respectively. Only 8



Fishos helped the scientists' whiting research.



**ABOVE:** Angler Cristiana Damiano took out the “best angler” award on the day with 15 whiting.

per cent of fish were longer than legal size (27cm). One hundred and nine similar-sized control fish were caught using the seine (54 of these fish were tagged).

Ten hooked-and-released (four non-tagged and six tagged) and two control (both tagged) sand whiting died during the work, providing survival rates for tagged and non-tagged, hooked-and-released fish of 93.7 and 93.8 per cent, respectively. These results demonstrate that the tagging process contributed

towards at least some mortalities. Of the six tagged hooked-and-released fish that died, two had swallowed hooks, while the remaining four were hooked in the mouth, gill arch, or body. The temperatures and oxygen levels in the fish-holding tanks were similar to those in the estuary.

While the effect of tagging appears to have contributed slightly towards the mortalities of some hooked-and-released sand whiting, the observed survival of more than 93 per cent of the non-tagged, hooked-and-released individuals is comparable to estimates for King George whiting in South Australia and may be attributed to the low number of fish that swallowed hooks.

Hook ingestion has been demonstrated to be an important predictor of mortality in other species such as yellowfin bream and is related to a range of technical and biological factors that include the design and size of hooks, size of fish, type of bait, behaviour of the target species, and angler technique and experience.

Because our study was restricted to common tackle configurations (i.e. a long-shank J-hook and two bait types) used to target sand whiting in one estuary and during a single event, the results may not

represent the fate of all sand whiting released in eastern Australia. Further work is required to determine the rates of ingestion of other tackle configurations at different places and times.

Notwithstanding the above, the results support some existing catch-and-release practices for sand whiting, and in particular the use of long-shank J-hooks (size 2) with yabbies or worms for bait. Providing sand whiting caught using such configurations are landed quickly and exposed to air for less than 1 minute during hook removal, the majority of released individuals should survive.



**ABOVE:** Fisheries technician Craig Brand collects fish from NSW DPI Fishcare volunteer Richard McCabe.