Duskies are TOUGH

Recent research suggests that dusky flathead have high survival rates after being hooked on lures, held in live wells, weighed in and then released as part C&R tournaments, writes NSW DPI fisheries scientists PAUL BUTCHER, MATT BROADHURST, SHANE McGRATH and CRAIG BRAND.

FLATHEAD (*Platycephalus spp.*) are among the most targeted groups of species by recreational anglers in Australia, with about 13 million individual fish caught each year. This total catch comprises sand flathead (*P. bassensis*) from Tasmania and Victoria, dusky flathead (*P. fuscus*) from NSW and Queensland and tiger flathead (*P. richardsoni*) from NSW, Victoria and Tasmania.

More than 97 per cent of all flathead are caught in estuaries or bays using hook and line and either natural or artificial baits. Owing to bag limits, legal sizes, and/or catch & release practices, about six million individual flathead are released each year. Experiments done in Tasmania and Queensland have revealed the short-term fate of some of these fish, with more than 95 per cent of sand and dusky flathead surviving after being hooked (using baits and lures), held in tanks and monitored for up to 48 hours. The few mortalities observed during these studies were attributed to gut hooking and subsequent handling by the anglers.

Although some research has been done to determine the survival of flathead after being hooked and immediately released, there are no such estimates for lure-caught fish that are held in live wells as part of weigh-in tournaments. The popularity of this type of fishing is growing throughout Australia and there are already several established tournaments targeting iconic saltwater and freshwater species such as bream, flathead, bass and golden perch.

Typically these fish are caught on lures and held in live wells for several hours before being weighed on shore and then released. There are several potential factors associated with this type of tournament that may have negative effects on the health of fish. First, studies done during weigh-in tournaments in the US suggest the methods used to hook, play and land fish strongly affect their post-release survival. Second, owing to poor water quality, and especially changes in water temperature and the accumulation of ammonia, some onboard live-well systems may contribute towards mortalities. Ideally, all live wells should be aerated and have adequate water exchange using flow-through pumps.

A lizard is tagged before being transferred to the 3000-L tanks.

Given the above, as part of a broader research project to maximise the post-release survival of line-caught fish in NSW (funded by the NSW Department of Primary Industries and Recreational Fishing Trusts), we aimed to quantify some of the factors influencing the survival of dusky flathead after being released during a live weigh-in tournament. This work was done in the Wallis Lake system as part of the NSW Pro Flathead Tournament Series at Forster in February 2006. It involved 53 anglers (on 24 boats), six researchers and six 3000-L tanks configured in a flow-through aquaria system and located next to the Forster boat ramp. On the day before the tournament, 42 dusky flathead were transported from the National Marine Science Centre aquaria at Coffs Harbour to Forster, where about half were tagged (using t-bar anchor tags) before all had their fins clipped (for identification) and were distributed in groups of eight among the six 3000-L tanks. These fish were used as controls for the dusky flathead caught during the tournament.

Prior to fishing, all anglers were informed of the guidelines set by the NSW Pro Tournament Series (www.nswptf.com), of which *Fishing World* magazine is a major sponsor. The three major restrictions were that (i) all boats had to be equipped with an adequate live well (inboard or external), and all fish had to be (ii) caught on barbless hooks rigged with either lures, flies, jigs or soft plastics (bait and berley was strictly forbidden) and (iii) handled using wet gloves. Fishing was split into three 1.5 hour sessions that ended with a 30-minute weigh-in period at the boat ramp. After catching a dusky flathead, anglers measured their total length before placing them into their live wells and recording information on the playing time, hook location and types of terminal rigs and landing nets used. At the end of each fishing session, all dusky flathead were removed from the live wells, placed in a wet synthetic bag and weighed by the tournament director. While the fish was being weighed, researchers recorded data on the volume and quality of water in each angler's live well. All fish were observed for damage to their body or fins and about 50 per cent were tagged with numbered t-bar anchor tags before being released into the six 3000-L tanks. The released flathead were fed live mullet and saltwater yabbies

The tank set-up where the fish were studied for five days.

(nippers) and monitored for mortalities every 12 hours over five days. Any dead fish were removed and replaced with live fish (hooked from Wallis Lake) to maintain stocking densities.

A total of 84 dusky flathead were hooked (using 22 different designs and colours of lures), weighed and then released into the 3000-L tanks during the tournament (48 were tagged). The average total length of the hooked fish was 44cm, while the largest and smallest individuals were 36 and 78cm. All fish actively fed 24 hours after being released into the tanks. One fish was hooked in the gut, and 69 per cent were hooked in the upper jaw or corner of the mouth. Most fish were played for about one minute, exposed to air for less than one minute during capture and subsequent weighing, and had no visible scale or blood loss. However, of three different types of landing nets ("knotted", "knotless large mesh" and "knotless fine mesh"), the knotted landing nets caused damage to the fins of 58 per cent of fish, while only 11 per cent were damaged using knotless fine-mesh nets. Water quality varied among the live wells, but 71 per cent had concentrations of ammonia that were likely to be harmful to the fish.

Five hooked-and-released (one non-tagged and four tagged) and one tagged control dusky flathead died during the five days of monitoring, providing an overall adjusted survival rate of 96.43 per cent for the hooked-and-released fish. All of the hooked fish died within 24 hours, while the one control fish died 96 hours after release. Of the five hooked-and-released fish that died, four either had some damage to their bodies, which included a frayed tail (from a knotted landing net), and bruising in the mouth where the hook penetrated, or old injures such as an ulcer in the head of one fish.

Although very few dusky flathead died during this experiment, some aspects of future weigh-in tournaments could be improved to lower the potential for damage to fish. First, the damage to fins could be significantly reduced by using knotless fine-meshed landing nets, rather than knotted designs. Second, while the size and design of live wells varied considerably among boats, water conditions could be standardised via flow-through systems and aerators. Such configurations are cheap to buy and can help ensure water quality remains similar (or even better) to that of a fish's habitat. The effects of these sorts of simple changes to handling techniques, as well as other factors influencing the survival of hooked-and-released dusky flathead, will be examined during future research. In particular, an event is planned for the Clarence River at Yamba or Iluka in December this year. If you're interested in participating in this event, you can contact the NSW DPI on (02) 6648 3910. It's hoped that the results from this ongoing work will contribute towards further minimising those few unwanted mortalities of dusky flathead released by recreational anglers in NSW.