

# SENDING FISH BACK *To* SCHOOL

*to increase survival*

**If recreational fishing is Australia's favourite pastime, then fish stocking would have to come a close second.**

More than 35 million native fish were stocked into waterways in the Murray-Darling Basin since 2001, and over 22 million fish were stocked throughout New South Wales alone since 2006. And it's not just us; many billions of fish from more than 300 species are stocked world-wide.

For as long as people have been releasing fish into waterways, we have also been wondering whether it makes a difference. Do these fish survive? And do they enhance our fisheries, or do they just become an expensive snack for resident fish and birds?

At the most recent "Fishers for Fish Habitat" forum held in Tamworth in May 2011, Senior Research Officer with Inland Fisheries Ireland Dr Martin O'Grady explained that in Europe, stocking is largely a thing of the past, and that habitat enhancement had largely replaced stocking as a fishery enhancement tool since 1995. He went on to cite a number of studies and examples from the northern hemisphere in which hatchery-reared fish were found to be of poor fitness (basically, poorly adapted to local conditions), resulting in their low level of survivorship in the wild. He also explored examples from Japan, Montana



► It is hoped that the results of this research will help to provide the average angler with more opportunities to encounter beautiful fish like this one (Photo by Matt Daniels)

and the Mediterranean where stocking had resulted in extinction of native strains of different species, followed by a decline in the fishery as stocked individuals reduced in abundance, for various reasons relating to their poor fitness.

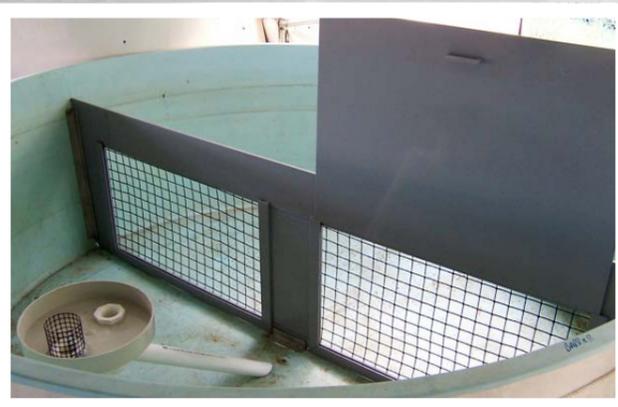
An Australian study funded by the Fisheries Research and Development Corporation also points towards stocked fish being well equipped to survive than their wild brethren. In comparing the dispersal and survival of hatchery-reared and wild Trout cod following release in the Murrumbidgee catchment, staff from ACT Government observed that only 9% of hatchery reared fish were thought to have survived after 13 months, compared to 95% of wild fish. These results make you wonder: does this happen with other fish species as well? And is there anything we can do to help give stocked fish a fighting chance?

A project recently completed by a team from the Department of Employment, Economic Development and Innovation, with funding from the Murray-Darling Basin Authority's Native Fish Strategy has been looking into whether we can teach hatchery-reared stocked fish to avoid predators and recognise natural food sources to increase survival.

The project team, led by Dr Michael Hutchison, has been training fingerlings to recognise predators, putting them in enclosures containing predatory fish (in which they are separated from fingerlings by mesh panels). They also tried scaring fingerlings with fake predatory birds, whilst exposing them to alarm signals from fish skin extract. Hatchery fish were also introduced to natural food sources (live shrimp) during separate trials to see if they could be trained to hunt for natural food sources.



► **Murray cod fingerling, ready for release, Note green plastic elasmomer tag need anal fin to enable identification** (Photo by M. Hutchison)



► **Predator recognition and avoidance training tank. The mesh screen is permeable to fingerlings but not predators.** (Photo by M. Hutchison)

All of this was to try and make hatchery-reared fish less naïve, and better equipped to survive in the wild.

The results? Highly successful. All three species examined (Murray cod, Silver perch and Freshwater catfish) were found to quickly learn to avoid predatory fish within 72 hours.

When released into the wild in areas of high predator abundance, trained Murray cod were found to be up to four times more likely to survive, compared to their untrained brethren.

Trained and untrained Silver perch were more similar in their survival, however it appears this might be because Silver perch are a social, schooling fish, and when released, untrained fish may have learned from trained fish, making them equally capable of avoiding predators.

Slightly older Silver perch and Murray cod were also put through training, and it seems that you can't teach an old cod new tricks... Whilst sub adult (~30cm long) Silver perch were able to be trained to avoid fake predatory birds and take live food, trained sub adult Murray cod showed no behavioural change to untrained fish. These results suggest that stocking fish at larger sizes may not help to increase survival of some species.

The implications of this research are exciting: imagine gaining up to four times more catchable fish from each stocking event! Some hatcheries have already shown an interest in adopting the findings of this study to produce better adapted fingerlings for their customers.



► **Video snapshot of silver perch fingerlings in training tank. Note large numbers on the left or predator free side of the barrier.** (Photo by M. Hutchison)



► **Video snapshot of predator side of the training tank. Note mesh barrier, Murray cod pipe, and lack of fingerlings!** (Photo by M. Hutchison)

For more information on the latest science relating to recreational fishing visit the Recfishing Research website: [www.recfishingresearch.org](http://www.recfishingresearch.org)

Recfishing Research is a national group established to improve investment and the return on investment in recreational fishing research, development and extension at a national scale.

If you would like to have input into the identification of important research priorities for the recreational sector nationally, or you would like to be kept informed on important research developments relating to recreational fishing, contact Recfishing Research's Extension Manager: [matt.barwick@recfishingresearch.org](mailto:matt.barwick@recfishingresearch.org)

