

Mitchell Preston assisted researchers by releasing his golden perch into a floating cage during the Golden Classic at Lake Windamere.

CONSERVATION

Catch & Release Part 2



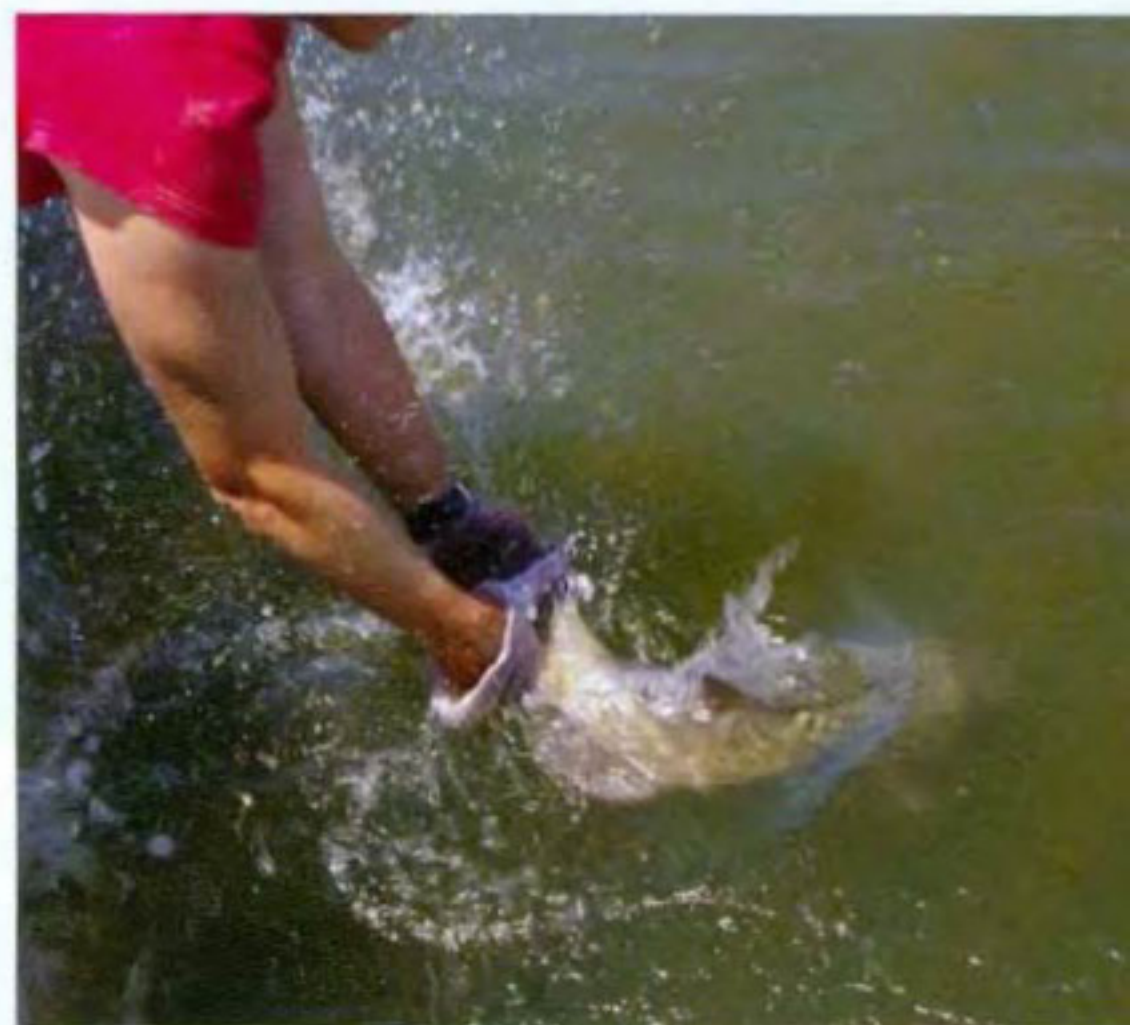
Survival of Freshwater Fish After Catch-and-Release Angling

Karina Hall, Matt Broadhurst, Paul Butcher, Craig Brand and Shane McGrath of NSW DPI report on the survival of three key freshwater fish species after catch and release by anglers.

Murray cod, golden perch and Australian bass are iconic species for freshwater anglers. A national survey in 2000-2001 estimated a combined total recreational catch of almost 3.5 million fish for these three species of which between approximately 50 and 80 per cent were released. Whilst no comprehensive, up-to-date numbers are available, current release rates are likely to be similar or higher due to tighter restrictions on legal sizes, bag limits and closed seasons, and an increasing trend toward voluntary catch-and-release fishing among anglers. These management and conservation efforts are promoted by the belief that most fish survive after catch and release with few negative impacts. Unfortunately, little research has been done to validate this assumption for

native Australian freshwater fish species, or examine ways that survival might be maximised.

To address this lack of information, in 2006, the NSW Department of Primary Industries (using money from recreational fishing licences) started a two-year project to quantify and improve the survival of Murray cod, golden perch and Australian bass after release by anglers in New South Wales. Experiments directly involve anglers to catch fish during immediate-release or live weigh-in events (using conventional fishing methods), and then release fish into research cages where their survival is monitored for up to five days. Data describing the capture and handling of each fish are recorded and used to explain any subsequent mortality. Corresponding numbers of control fish, caught by



A feisty Murray cod is released back into Lake Mulwala at the end of a four-day monitoring period.



Junior angler, Kyle Hodges, with an impressive 88 cm Murray cod that he caught and released during the Cod Classic at Lake Mulwala.

alternative methods (e.g. electrofishing), are also caged and monitored under identical conditions.

This article reports on the preliminary results of six completed experiments (Table 1). In these experiments, all control fish survived, which suggests that the methods of holding and caging fish had minimal effect on their short-term health, and that any deaths of angled fish could be directly related to the various factors associated with their catch and release.

The first three experiments were done with Australian bass in Lake Glenbawn (two live weigh-in events) and the Clarence River (one immediate-release event). A total of 302 fish were angled with a range of terminal rigs, including lures (93 per cent of fish caught) and baited hooks (7 per cent), and subjected to a wide variety of handling practices across different conditions. Survival after 5 days was estimated to be between 94 and 100 per cent (Table 1), with most of the few deaths attributed to anatomical hook location, and more specifically, the removal of swallowed hooks. Water temperature may also have had an influence on mortality, with a trend towards more deaths during fishing in warmer waters (Table 1). Similar patterns have been reported for several overseas freshwater fish species released over a range of water temperatures.

The fourth and fifth experiments focused on golden perch and were held in

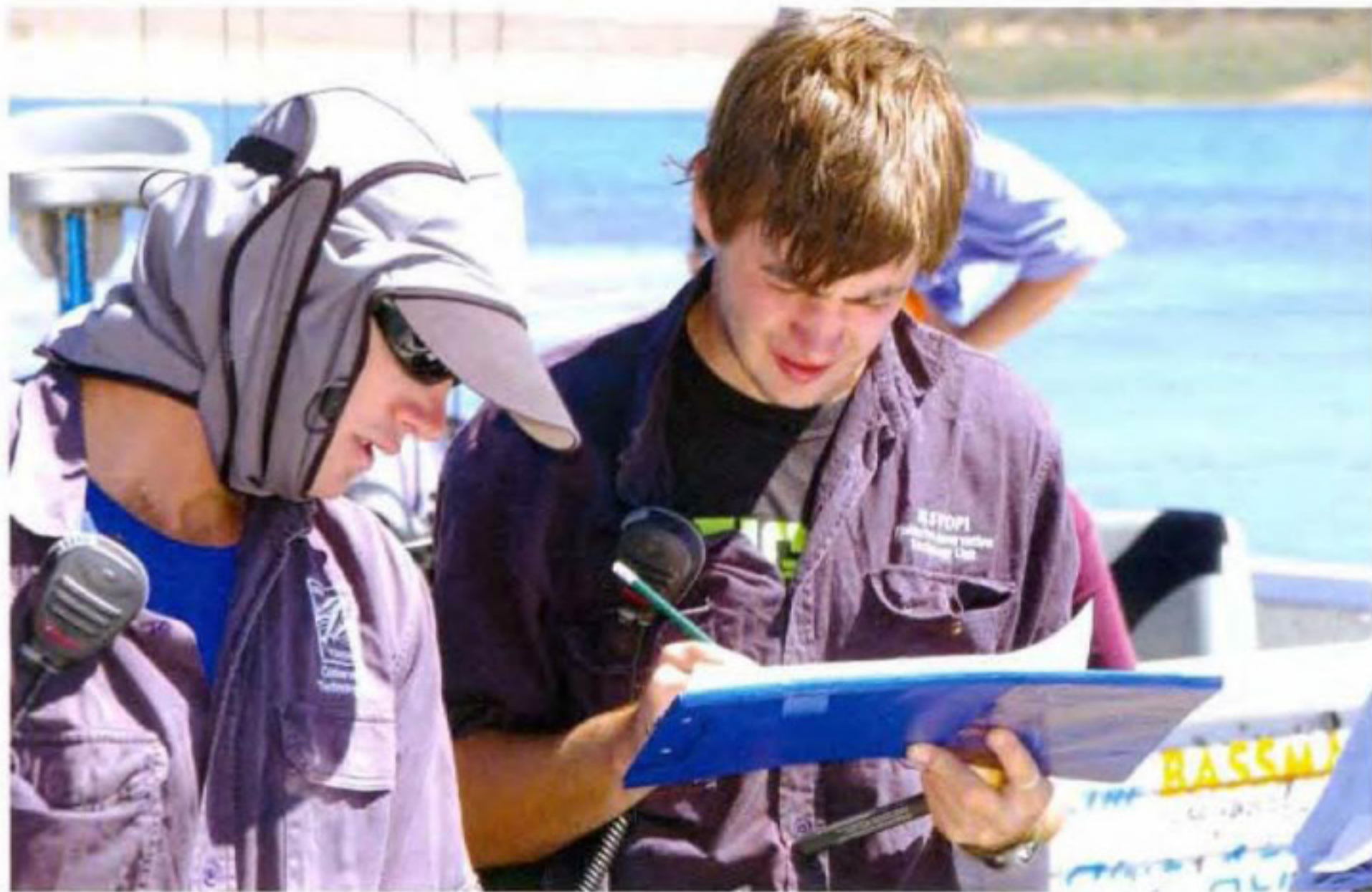
Copeton Dam and Lake Windamere (both immediate-release events) during winter and spring, respectively. As for Australian bass, fish were caught with a range of lures (89 per cent) and baited hooks (11 per cent), and a total of 60 fish were released into individual cages. All fish were hooked in the mouth, and all survived a four-day monitoring period with few negative impacts (Table 1). Although these perfect survival rates were largely due to the lack of deep hooking, which is generally considered more harmful to

fish than mouth-hooking, the cold water temperatures (15 to 19°C) may also have had a positive influence on the results, as with Australian bass above.

The sixth experiment was done in December 2007 in Lake Mulwala in conjunction with the annual Cod Classic (a live weigh-in event). This experiment was designed to compare the fate of golden perch caught and released in warm water with those above, and to provide the first estimates of post-release survival for Murray cod. Fifty two golden perch and 93 Murray cod were collected from officials at two measuring stations, and released into cages moored nearby. Seventy three percent of the golden perch and 85 per cent of the Murray cod survived a four-day monitoring period (Table 1).

These survival rates were considerably lower than those previously recorded for Australian bass angled across a range of conditions, and golden perch caught in winter. Whilst some of the deaths were related to hook-related injuries (approximately 20 per cent), there were clear cumulative effects of various handling practices, and in particular excessive exposure to air and inadequately sized live wells. Many boats (35 per cent) did not have live wells and fish were transported to measuring stations completely exposed, or wrapped in a damp towel or hessian bag. Depending on the location of capture, air exposure was often greater than five minutes, and in some extreme cases, more than 10 minutes. Where live-wells were used, some were too small for the size of the fish and severely limited their movement, adding to their stress.

Another factor that may have contributed to the higher mortalities was the warmer water temperatures in Lake Mulwala (average 25°C) during the Cod Classic compared with previous events for

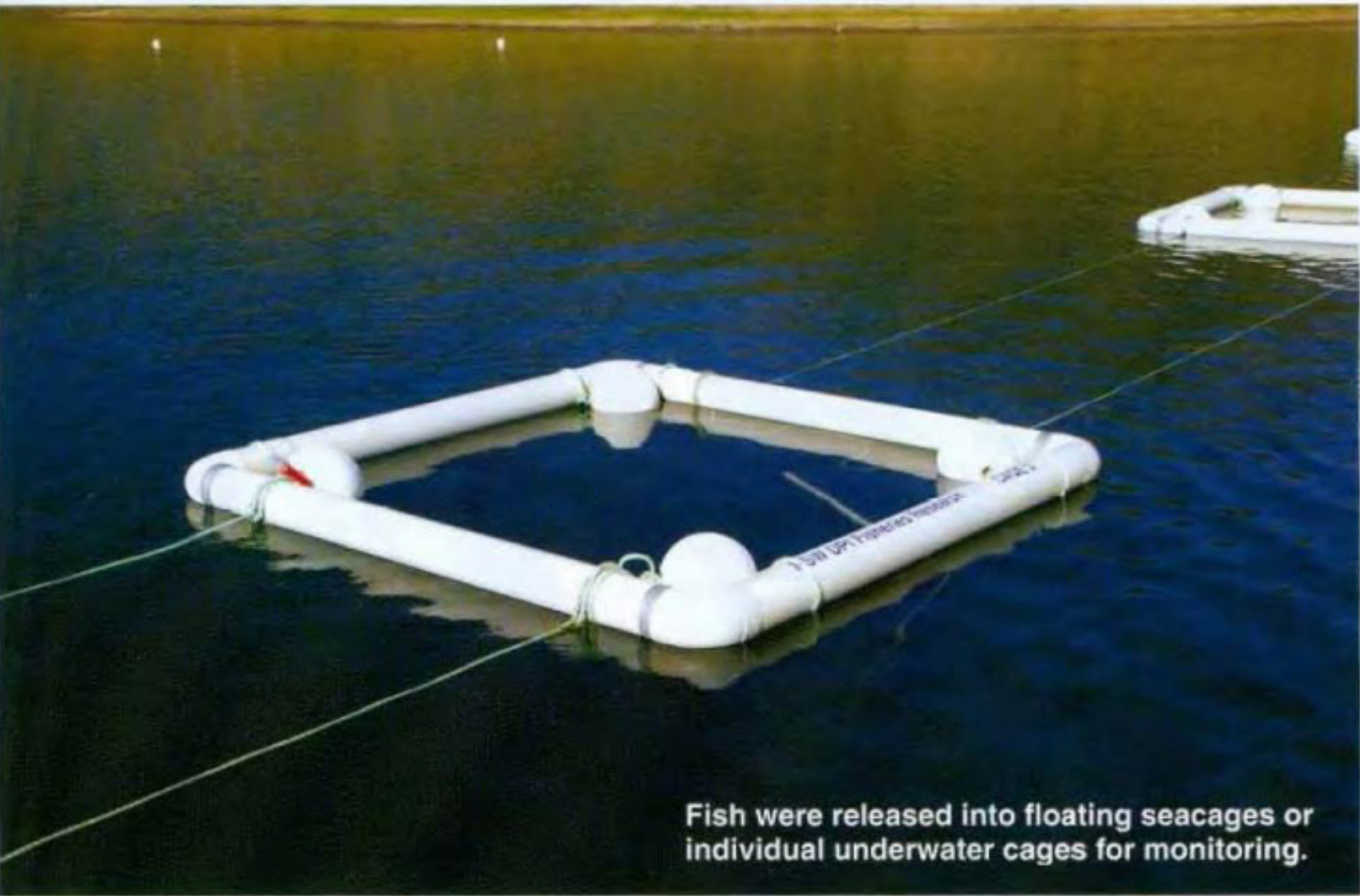


Researchers Craig Brand and Shane McGrath collect data on the water quality and dimensions of live-wells used on boats during live weigh-in tournaments.

FWF SUMMARY OF RESULTS FOR CATCH-AND-RELEASE SURVIVAL EXPERIMENTS WITH THREE FRESHWATER FISH SPECIES.

Location	Date	Average Water Temp. (°C)	Species	Number of Angled Fish	Number Caught With Bait	Number Deep Hooked	Number of Angled Deaths	Percent Post-Release Survival
Lake Glenbawn	Sep 2006	14	Australian bass	90	0	0	0	100
Clarence River	Oct 2006	23	Australian bass	80	20	8	5	94
Lake Glenbawn	Mar 2007	22	Australian bass	145	0	5	3	98
Copeton Dam	Aug-Sep 2007	15	Golden perch	30	10	0	0	100
Lake Windamere	Nov 2007	19	Golden perch	30	0	0	0	100
Lake Mulwala	Dec 2007	25	Murray cod	93	41	7	14	85
Lake Mulwala	Dec 2007	25	Golden perch	52	2	2	14	73

(TABLE 1)



Fish were released into floating seacages or individual underwater cages for monitoring.

golden perch in Copeton Dam and Lake Windermere. Although fish were also held onboard for longer, the warmer water temperatures may have further increased the negative impacts of other handling factors. Further research is required to more closely examine the extent to which differences in water and air temperatures influence the post-release survival of all three species.

Although these results are preliminary, they clearly indicate ways in which post-release survival may be improved through better handling practices. Preferably, fish should be immediately released at their location of capture (with swallowed hooks left in place and the line cut a short distance from the mouth). If fish are held on board, they should be placed in an insulated, covered live-well, large enough for the fish to avoid contact with the walls. Water should be fresh-filled from the lake at the time of capture and exchanged regularly. By implementing these simple changes to handling practices, survival rates should be dramatically improved.

While the results so far have been encouraging in terms of promoting the post-release survival of Murray cod, golden perch and Australian bass, they are limited to the events and conditions

examined. Research completed overseas suggests that there are many other factors known to influence the fate of freshwater fish after release that have not been examined for these and other Australian species. For example, one

potentially important issue identified by anglers concerning golden perch and Australian bass is barotrauma, caused when individuals are angled from deep impoundments. Unfortunately, low water levels in dams during the past 18 months prevented the assessment of this factor.

Another consideration for all three species is that in the experiments completed, fish were held in cages after release and, while this method is valid to assess immediate and short-term fate, captive fish are unlikely to experience all factors that could contribute towards longer-term mortality, including the effects of repeated catch and release. Ongoing research with anglers is required to more fully assess these longer-term effects of catch-and-release angling, and further identify methods to maximise survival that will ultimately promote more sustainable recreational fishing in freshwater habitats.

Below: Floats marked the location of individual underwater cages holding released Murray cod during the Cod Classic at Lake Mulwala.

