

The loss of valuable Murray cod in fish kills: a community and conservation perspective

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Introduction

The Goulburn River Fish Kill

In January 2004 a major fish kill occurred on the Goulburn River in Victoria. Murray cod and Trout cod, along with several thousand 'minnows and fingerlings' were found floating on the surface of the river by holiday makers and anglers. (EPA 2004). Fish and mussel deaths were also recorded in the channel systems that distribute water from the Goulburn Weir pool, and Murray cod and golden perch had been killed in Murray Valley 20/6 Channel due to the use of weedicide. Reports of dead turtles were made in the Catanagh Channel in mid January, and hundreds of dead mussels found in the same channel later that month. Fish kills were also reported in the Loddon and Campaspe Rivers in January and February 2004.

The public reaction

Fish kills are often very 'visible' events and cause considerable public interest and concern (Lugg 2000). Illustrations of the loss of such large, old, valued fish (*Figure 1*) have caused distress for many anglers, local landholders and other concerned citizens. Public reaction to the Goulburn River fish kill was loud and widespread. News of this fish kill and follow up stories appeared *The Age*, *Herald Sun*, Win TV, ABC Regional Radio, *Shepparton News* and *Country News*.¹ Kelvin Thomson, the then Shadow Environment Minister in the Federal Opposition also made comment on the kill in the national media and met with local anglers and environmentalists to discuss the kill and broader river health issues. This media coverage was important in drawing the attention of the Victorian Government to the kill, and building pressure for an investigation into the management of Goulburn River.

Aub Reddrop, a local angler wrote to the editor of the *Shepparton News* and explained that:

we have environmentalists claiming that Murray cod is an endangered species and we have others who put chemicals in the water and kill them under the outdated mentality of 'we are here to supply water, not fish'.... Everyone including a lot of farmers who have to put up with the stench of rotten fish for days plus the waste of a resource that all taxpayers pay for...².

He and other local anglers who had witnessed a number of fish deaths in channel systems caused by the weedicide Acrolein, were quick to also attribute the Goulburn fish kill to the release of chemicals.

Fish kills are not isolated events and are usually transient, with cause and effect often difficult to definitively determine. The widespread use of biocides can lead the public to blame chemical poisoning as a readily understandable cause, for many fish kills. Scientific assessment of the Goulburn River fish kill concluded that 'the discharge of an unidentified chemical...cannot

- 1 'Report unable to explain fish kills', *Shepparton News*, 21 April 2004; 'Goulburn river fish kills under investigation', ABC News Online, 2 April 2004; 'Scientists baffled by fish deaths', *The Age*, 9 February 2004; 'Fish death river probe urged', *Shepparton News*, 2 February 2004; 'Mussels found dead near weir', *Shepparton News*, 2 February 2004; 'Questions still asked about fish kill', *Shepparton News*, 29 January 2004; 'Dead fish baffle water authority', *Shepparton News*, 16 January 2004; 'Fish deaths prompt river water alert' *Shepparton News*, 19 January 2004; 'Fishing for an explanation', *Shepparton News*, 20 January 2004; 'Tourist alert as fish die', *Herald Sun*, 17 January 2004; 'Tests continue as alert withdraw', *Shepparton News*, January 21 2004.
- 2 Aub Reddrop, letter to editor of the *Shepparton News* 3 February, 2004.





Figure 1. Dead cod from recent fish kills: (Clockwise from top left) Goulburn River, Broken Creek, Darling River, Darling River

be excluded, but must be regarded as unlikely' as a cause (EPA 2004). Biocide use is however, widespread, with a conservative estimate of 45 biocides, possibly involving the use of up to 77 active ingredients, likely to be used in the Goulburn-Broken catchment (Ecos 2004). Herbicides are routinely applied to Goulburn-Murray Water channels (more than one application per year) and drains (up to 3 applications per year), to control weeds. Members of the public also often requested 'weed' control in natural waterways and these requests are assessed on an individual basis (Ecos 2004). Brown *et al.* (2003) reported extensive mortality of carp as a side effect of herbicide use in channel management. In January 2004, fish and mussel deaths were recorded in the channel systems that distribute water from the Goulburn Weir pool; Murray cod and golden perch were killed in Murray Valley 20/6 Channel due to the use of weedicide; reports of dead turtles were made in the Cattnach Channel and hundreds of dead mussels were later found in the same channel³ (EPA 2004).

Public outrage and frustration at the Goulburn fish kill was also exacerbated by concern at the steady decline of native fish populations in the Goulburn River. Fred Bloetz and Wally Cubbin, office bearers at the Nagambie Angling Club,

stated that they had 'seen one of the State's best freshwater fishing spots degraded by irrigation needs'. They say the river system began to degrade in 1990, it 'is not getting enough environmental flows and proper flushes' and 'every year the water deteriorates and deteriorates. What they've got is the longest drain in Victoria.'⁴ The Goulburn River fish kill was described as an 'environmental disaster' by senior Goulburn Murray Water staff, with many native fish biologists, anglers and community members supporting this view. Fish kills such as these are now generally viewed by the public as symptoms of rivers under stress from competing interests, and an overall decline in river health. Indeed, 'there is substantial evidence that the Goulburn River downstream of Lake Eildon is highly stressed' (EPA 2004).

The public reaction to these fish kills show that public concern for the health of native fish populations has moved beyond local anglers into the broader community. Interest from metropolitan media indicates there is now also a broader popular understanding that native fish are an important indicator of overall river health (EPA 2004). Frustration has been expressed at the lack of public access to information regarding these fish kills, including details of fish numbers, progress and results of investigations, and subsequent management actions.

³ Correspondence between Environment Victoria and Goulburn Murray Water.

⁴ Fred Bloetz and Wally Cubbin, *The Age*, 9 February, 2004.

Environment Victoria (EV), a non-government organisation that campaigns on river health issues, drew local and metropolitan media attention to the Goulburn kill in 2004 after becoming frustrated with the response to a previous kill of about 200 mature Murray cod in the Broken Creek in 2002. Despite claims that the Broken Creek kill was 'a terrible loss of native fish and we need to understand the reasons why this has occurred and how we can reduce the chance of this happening again'⁶ the promised investigation was never established. There was also concern that agencies were actively ignoring or were ignorant of the significance of the Broken Creek fish kill. Illustration of a failure to grasp its significance was highlighted by the response of the Victorian Dry Seasonal Conditions Taskforce to concerns raised about the Broken Creek fish kill. In response to the question: 'Does drought pose a risk to the survival of our freshwater species?', the former Executive Director of the Fisheries Division concluded that 'for Murray cod and golden perch, the answer is a definite no and it is difficult to foresee even a minor loss of genetic diversity' (McLoughlin, 2002). This was despite the fact that a scientific report on Murray cod commissioned by Environment Australia concluded 'the integrity of wild populations (genetic biodiversity) and of the ecosystems which support them (ecological biodiversity) are seriously threatened' (Kearney & Kildea 2001). It was also suggested by the Fisheries Division that current water management regimes benefited Murray cod because 'we do not see the low levels in our rivers that would have been experienced prior to river regulation' and that 'native fish were adapted to drought'. Regulation of the Goulburn-Broken River system has in fact caused large increases in the duration of low flows (Cottingham *et al.* 2003).

The Broken Creek fish kill had shown that key management agencies appeared predisposed to consider fish kills as naturally occurring events, rather than accepting that they may be, at least in part, a consequence of river regulation and an over-allocation of water resources and waterway management actions. The Acting Chief Executive of Goulburn Murray Water, explained that while the death of 200 mature Murray cod in Broken

Creek was 'unfortunate...it is interesting to note that there are anecdotal reports of such kills occurring in the past'⁷. This ignored the inability of fish to escape because of the presence of weirs, of regulated flows, elevated nutrient levels and the incapacity of depleted and fragmented populations to recover from natural disturbance events such as drought. Indeed, Broken Creek Murray cod populations appear not to have recovered, perhaps contributed to by the limited operation of the fishway to allow recolonisation (Butcher 2003; S. Saddler unpubl. data).

Fish kills can be related to low flows, particularly in times of drought. The response of agencies to the Broken Creek fish kills revealed that, despite a lack of evidence, the Victorian Water Allocation Framework was believed to be protecting freshwater ecosystems by providing environmental flows. In response to questions regarding a strategy for preventing further fish kills, it was stated by the responsible Department that 'risk of further fish kills will be mitigated by ensuring adequate environmental flows in rivers and streams which is more likely where Streamflow Management Plans and Bulk Entitlements are in place to specify flows that are sufficient to meet the needs of in-stream biota including fish'⁸. The National Competition Council (2001) however, found that Bulk Water Entitlements, like those on the Goulburn River, were failing to protect the ecological values of aquatic ecosystems. Compounding base-level environmental flows in over-allocated river systems like the Goulburn-Broken, is a reduction in water returning to the rivers from irrigation channels due to improved watering systems, recycling, and better management of distribution systems. It has been estimated that such flows have been reduced by 90 billion litres a year since 1993/4 (equivalent to 2% of the Murray-Darling Basin Cap) and are likely to be halved by 2023 and halved again by 2053 (Close & Prasad 2002). While the river system will benefit from the reduced pollution from irrigation drains, an environmental water allocation should be made to compensate for the reduced river flow caused by less water returning from farms to the river.



5 Steve Cooper, *The Australian*, 25 February 2004.

6 Sherryl Garbutt, Minister for Environment and Conservation, Media Release 26 November, 2002.

7 I. Howley, Acting Chief Executive of Goulburn Murray Water, correspondence to Environment Victoria, 23 January, 2003.

8 B. Kefford Chair of the Dry Conditions Taskforce, Department of Natural Resources and Environments, correspondence to Environment Victoria, 6 December, 2002.

The experiences of the Broken Creek fish kill shaped the community response to the Goulburn River fish kill. Immediately following the Goulburn River fish kill, regional newspapers were reporting government agencies' claim that the kill had been caused by low dissolved oxygen before any scientific investigation had occurred. 'Low dissolved oxygen' appears to be a common 'cover all reason' suggested by agencies as the cause of such kills, rather than a symptom of unknown events that resulted in the creation of water with low dissolved oxygen. 'Low oxygen levels' does not explain the cause of these low levels, objectively assess other potential causes, or explain why eye witness reports indicated that some fish were behaving in a manner that anglers and scientists considered to be consistent with poisoning (T. Ryan pers. comm.; EPA 2004).

Community and environment groups argued in the media and to the Hon. John Thwaites, Minister for Environment and Water, that the Goulburn River fish kill required more than 'a business as usual' response, given that many of the fish killed were supposedly protected by both State and Commonwealth laws. As a result, Minister Thwaites agreed to establish an environmental audit of the Goulburn fish kill. This is the first audit of its kind and will be undertaken by an independent auditor on behalf of the Victorian Environment Protection Agency, with the objective to: *obtain the information and understanding to guide the management of the Goulburn River towards providing a healthier river system. This will include improvements towards meeting the needs of the environment and water users, therefore reducing the likelihood of further fish kill events in the future.*

Discussion

The fish kills in the Goulburn-Broken River systems raise important issues regarding the management of native fish and the failure of Governments to protect them, given that government is the entity that is responsible for the protection of the fish resource (Department of Primary Industry 2003). These fish kills have shown the depth of concern that many people, including farmers, landholders, recreational fishers, environmentalists, scientists, managers and the public has for the future of river systems. The public sees fish as a key indicator of river health and Murray cod is an identifiable, icon species. If this species can be killed in large numbers, then it can certainly happen to many other species, without as much public concern.

Understanding the inter-relationships between a range of factors over time is vital if the number of kills occurring the Goulburn River System is to be reduced. This view appears to be borne out by analysis of the risks of fish kills in the Goulburn River that found that reductions in native fish populations result from the interactions between inadequate flows, poor water quality, poor habitat and predation (Cottingham *et al.* 2001). A range of other factors such as barriers to recolonisation and angler take also impact on native fish populations and may inhibit their rehabilitation.

The health of the Murray River System is a political issue. Industry leaders, advocates and consultants have argued that 'the river is in good health'⁹. Such views dismiss clear scientific evidence that shows that the Murray is in decline and the historical record of environmental change in the Murray system.

The recent kills of Murray cod are an indication of rivers under stress and of being managed more for water supply than for ecosystem well-being and threatened species protection. Illegal fishing has been described as the theft of a public resource (Department of Primary Industry 2003) and the loss of these fish due to fish kills should be viewed in the same way. We need to learn from these fish kills and improve management actions and responsibilities because we cannot afford to lose such valuable and irreplaceable public assets.

⁹ P. Weller, Truth at risk, not river health, *Weekly Times*, 17 December 2003.

Recommendations

- Ensure an Integrated Catchment Management approach to waterways that includes management issues such as adequate environmental flows, reserves and habitat protection and water quality, to protect riverine ecosystem health.
- Assessment is required of the toxicity and use of herbicides used in irrigation industry.
- Cooperation between angling and conservation groups should be facilitated to help public protection of fish populations. e.g. fishcare volunteers.
- A fish kills website needs to be established to make all information and data on fish kills publicly available.

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References

Brown, P., Sivakumaran, K.P., Stoessel, D., Giles, A., Green, C. Walker, T. 2003. *Carp population biology in Victoria*. Marine and Freshwater Resources Institute Report No. 56, Department of Primary Industries, Snobs Creek, Victoria.

Butcher, P. 2003. *An analysis of the November 2002 Broken Creek fish kill*. EPA unpublished report, February 2003.

Close, A. and Prasad, A. 2002. *Analysis of irrigation returns from irrigation districts in New South Wales and Victoria*. Murray-Darling Technical Report 2002/3. Murray-Darling Basin Commission, Canberra.

Cottingham, P., Beckett, R., Breen, P., Feehan, P., Grace, M., Hart, B. 2001. *Assessment of the Ecological Risks Associated with Irrigation in the Goulburn Broken Catchment*. Cooperative Research Centre for Freshwater Ecology, April 2001.

Cottingham, P., Crook, D., Hillman, T., Roberts, J., Rutherford, I., Stewardson, M. 2003. *Flow-related environmental issues associated with the Goulburn River below Lake Eildon*. A Report to the Department of Sustainability and Environment and the Murray

Darling Basin Commission, Cooperative Research Centre for Freshwater Ecology and Cooperative Research Centre for Catchment Hydrology.

Department of Natural Resources and Environment. 2002. *Healthy rivers, healthy communities and regional growth. Victorian river health strategy*. Victoria, Department of Natural Resources and Environment.

Department of Primary Industries. 2003. *Wild native freshwater fish trade compliance strategy 2003/4*. Prepared by the native freshwater fish trade compliance workshop, Swan Hill, May 2003. DPI, Victoria.

Ecos Environmental Consulting Pty. Ltd. 2004. *Discussion paper. Fish kills and their occurrence in the Goulburn-Broken catchment*. Report prepared for Nolan ITU and EPA Victoria.

Ellis, I. and Meredith, S. 2004. *Guidelines for future release effects on lower Darling River fish deaths*. Consultancy report for NSW Dept. of infrastructure, Planning and Natural Resources. Murray Darling Freshwater Research Centre, Mildura.

Environment Defenders Office of Queensland. 2003. <http://www.edo.org.au/edoqld/edoqld/new/nathanwin.htm> 22 December, 2003

EPA. In prep. Interim Fish Kill Protocol. EPA, Victoria.

EPA. 2004. *The Goulburn Weir Fish Kill of January 2004*. EPA Scientific Assessment Report April 2004. EPA, Victoria.

Kearney, R.E. and Kildea, M.A. 2001. *The Status of Murray cod in the Murray-Darling Basin*. Report to Environment and Heritage. University of Canberra, Belconnen.

Lugg, A. 2000. *Fish Kills in NSW*. Unpublished report. NSW Fisheries, Sydney.

Marsh, 2004. *Conceptual framework for multi-agency response. Goulburn Broken catchment*. Marsh & McLennan Companies, Report 15 June 2004.

McLoughlin, R. 2002. *Drought and freshwater fish species survival*. Paper prepared for the Victorian Drought Taskforce. Unpublished Report. Natural Resources and Environment, Victoria.

National Competition Council. 2001. *Assessment of Government's progress in implementing the National Competition Policy and related reforms. June 2001*. National Competition Council, Canberra.

Nolan ITU. 2004. *Environmental audit of the Goulburn River. Detailed audit scope – September 2004*. Unpublished report.

