

KNOWLEDGE **Rivers**

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Management of Murray Cod in the MDB

Statements, recommendations and supporting papers

Workshop held in Canberra, 3-4 June 2004

Integrated catchment management in the Murray–Darling Basin

A process through which people can develop a vision, agree on shared values and behaviours, make informed decisions and act together to manage the natural resources of their catchment: their decisions on the use of land, water and other environmental resources are made by considering the effect of that use on all those resources and on all people within the catchment.

Our values

We agree to work together, and ensure that our behaviour reflects the following values.

Courage

- We will take a visionary approach, provide leadership and be prepared to make difficult decisions.

Inclusiveness

- We will build relationships based on trust and sharing, considering the needs of future generations, and working together in a true partnership.
- We will engage all partners, including Indigenous communities, and ensure that partners have the capacity to be fully engaged.

Commitment

- We will act with passion and decisiveness, taking the long-term view and aiming for stability in decision-making.
- We will take a Basin perspective and a non-partisan approach to Basin management.

Respect and honesty

- We will respect different views, respect each other and acknowledge the reality of each other's situation.
- We will act with integrity, openness and honesty, be fair and credible, and share knowledge and information.
- We will use resources equitably and respect the environment.

Flexibility

- We will accept reform where it is needed, be willing to change, and continuously improve our actions through a learning approach.

Practicability

- We will choose practicable, long-term outcomes and select viable solutions to achieve these outcomes.

Mutual obligation

- We will share responsibility and accountability, and act responsibly, with-fairness and justice.
- We will support each other through necessary change.

Our principles

We agree, in a spirit of partnership, to use the following principles to guide our actions.

Integration

- We will manage catchments holistically; that is, decisions on the use of land, water and other environmental resources are made by considering the effect of that use on all those resources and on all people within the catchment.

Accountability

- We will assign responsibilities and accountabilities.
- We will manage resources wisely, being accountable and reporting to our partners.

Transparency

- We will clarify the outcomes sought.
- We will be open about how to achieve outcomes and what is expected from each partner.

Effectiveness

- We will act to achieve agreed outcomes.
- We will learn from our successes and failures and continuously improve our-actions.

Efficiency

- We will maximise the benefits and minimise the costs of actions.

Full accounting

- We will take account of the full range of costs and benefits, including economic, environmental, social and off-site costs and benefits.

Informed decision-making

- We will make decisions at the most appropriate scale.
- We will make decisions on the best available information, and continuously improve knowledge.
- We will support the involvement of Indigenous people in decision-making, understanding the value of this involvement, and respecting the living knowledge of Indigenous people.

Learning approach

- We will learn from our failures and successes.
- We will learn from each other.

Management of Murray Cod in the Murray-Darling Basin

*Statement, recommendations
and supporting papers*

*Workshop held in Canberra,
3-4 June 2004*

*Mark Lintermans and
Bill Phillips (editors)*



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1. Introduction

On 3-4 June 2004, the *Management of Murray cod in the Murray-Darling Basin* workshop was held in Canberra and attended by approximately 50 people representing a cross-section of government and non-government stakeholders and experts.

The Murray cod is Australia's largest freshwater fish and an icon species. It has significant economic, cultural, recreational and environmental values for all Australians.

The workshop reviewed current knowledge of the history, status, population trends, threats and management responses relating to Murray cod and formulated the priority actions outlined in Section 3 below. These are intended to provide an immediate response to the concerns of the workshop participants about the future of this icon species.

In formulating these priority actions the objectives from the *Native Fish Strategy for the Murray-Darling Basin 2003-2013* were used to frame the responses. This was done to ease their ready adoption and immediate implementation by the Murray-Darling Basin Ministerial Council and its member Governments.

The workshop acknowledged that recreational fishing is an important part of the Australian culture and economy. The future of Murray cod depends on the wise management of its environment and recreational fisheries.

The workshop concluded that there are compelling scientific reasons for concern about the future for this species. These are summarised below.

2. The reasons for concern

- The population of Murray cod across the Murray-Darling Basin has declined significantly from its early-European settlement levels;
- Causes for decline include habitat loss and degradation, barriers to fish passage, flow regulation, cold-water releases and fishing;
- Murray cod is a slow-growing, territorial, long-lived species at the top of the food-chain (a top predator). It is especially vulnerable to overfishing, localised habitat alteration, pollution events and poor water quality, as witnessed by a succession of recent fish kills in some parts of the Basin;
- Stocking from hatcheries is currently an important management tool used to supplement Murray cod fisheries across the Basin each year, but it is not a long-term conservation solution. Stocking may be masking the true status of the species, and presents other risks such as reduced genetic diversity;
- The Living Murray Programme offers an ideal opportunity to address many of the management and community engagement needs of Murray cod outlined below. However, the workshop expressed concern that this opportunity seems to have been lost, as Murray cod are no longer an icon species in this programme.
- While convinced that there are good reasons for concern about the future of this species, the workshop identified a number of priority research needs (see section 4 below) that would clarify the Basin-wide status of the populations more precisely, allow for investigation and monitoring of cod ecology and population dynamics and help guide management interventions to reduce or minimise threatening processes.



3. Priority actions for securing the future of Murray cod

3.1 Vision for the icon of the Murray-Darling Basin: the Murray cod

The workshop formulated the following vision for the future of Murray cod across the Basin.

“Self-sustaining Murray cod populations managed for conservation, fishing and culture”

3.2 Priority Objectives

The *Management of Murray cod* workshop reviewed the 13 objectives of the *Native Fish Strategy* and concluded, based on current knowledge, that those objectives highlighted below represent the highest priorities for pursuing the above vision for the future of Murray cod in the Basin in the immediate future.

The identification of these priority objectives was done with the full knowledge and expectation that existing and proposed activities being undertaken under all 13 objectives of the *Native Fish Strategy* are likely to provide some direct or indirect benefits for Murray cod. While these actions are important in the pursuit of the broader vision of the *Native Fish Strategy*, those objectives identified below, and then amplified further through specific actions, are those the workshop participants believe will help secure the future of Murray cod more rapidly.

The priority actions presented below are meant to complement, not replace existing or proposed actions through the *Native Fish Strategy*.

The workshop recognised that while there is significant knowledge about the species, there are important gaps in that knowledge that need to be addressed as a matter of priority. It was the collective view of those present that investment directed at pursuing the objectives highlighted below is necessary now in order to minimise the risk of the Murray cod populations of the Basin declining even further. Additional research is essential to support and refine this investment. In order to ensure that addressing these research needs is given appropriate priority in the short-term, the workshop adopted an additional objective, as provided below. This is considered

a cross-cutting or overarching objective since the actions it proposes (see the following section) relate to all others.

For each highlighted objective below, priority actions have been identified. In Section 4 priority research needs are also provided. Note that for the priority objectives identified below, the text has been amended slightly from that contained in the *Native Fish Strategy* to make it specific to the Murray cod situation.

Overarching Objective. To establish and maintain fundamental information on population structure and dynamics for Murray cod across the Basin to guide and assess all other priority objectives.

Native Fish Strategy Objective 1. To repair and protect key components of aquatic and riparian habitats important for sustaining Murray cod populations.

Native Fish Strategy Objective 2. To rehabilitate and protect the natural functioning of wetlands and floodplain habitats for native fish; and revive the links between terrestrial ecosystems, wetlands and rivers

Native Fish Strategy Objective 3. To improve key aspects of water quality that affect native fish

Native Fish Strategy Objective 4. To modify flow regulation practices to facilitate Murray cod rehabilitation.

Native Fish Strategy Objective 5. To provide adequate passage for native fish throughout the Basin

Native Fish Strategy Objective 6. To devise and implement recovery plans for threatened native fish species and communities

Native Fish Strategy Objective 7. To create and implement management plans for all non-threatened native fish species and communities

Native Fish Strategy Objective 8. To control and manage carp and other alien fish species effectively

Native Fish Strategy Objective 9. To increase understanding of fish diseases and parasites, and to protect native fish from such threats

Native Fish Strategy Objective 10.

To manage recreational Murray cod fisheries in a sustainable manner while recognizing the social, cultural, economic and recreational value of the fishery.

Native Fish Strategy Objective 11. To protect the natural species composition, population structure, genetic integrity and diversity of native fish communities from the adverse effects of human interventions into native fish movements and restocking

Native Fish Strategy Objective 12. To ensure native fish populations are not threatened from aquaculture

Native Fish Strategy Objective 13.

To ensure community and partner ownership and support for and understanding of the Murray cod management vision above.

3.3 Achieving the Priority Objectives

To pursue the priority objectives highlighted above, and their associated actions set out below, the workshop recognised that a number of institutional and policy initiatives are needed. These are as follows:

3.3.1 Institutional and policy actions

The management of Murray cod is a multi-jurisdictional issue, and requires integrated, multi-jurisdictional responses. Actions needed to provide this approach are as follows:

1. Establish a Murray Cod Reference Group under the Murray-Darling Basin Commission's Fish Management and Science Committee (FMSC) (similar to the Fish Passage Reference Group) to provide regular advice through the FMSC to the Ministerial Council, the MDBC Community Advisory Group (CAC) and the NFS Community Stakeholder Group, on key management issues such as the:

- size, structure, status and dynamics of Murray cod populations;
- levels of fishing catch from cod populations;
- levels of recruitment;

- impacts of stocking efforts;
- incidence, severity, causes of, and responses to fish kills;
- adequacy of current management arrangements, including the impact of set lines on Murray cod populations, appropriateness of current bag and size limits and seasonal closures and future management options;
- feasibility, design and implementation of potential additional Murray cod conservation measures that are widely employed in the management of other freshwater and marine fisheries. Options include closed areas, catch and release areas, identification, definition and declaration of critical habitats and management as trophy fisheries.¹

2. Prepare the national Recovery Plan for Murray cod (required under the *Environment Protection and Biodiversity Conservation Act 1999* – EPBC Act) in close collaboration with the proposed Murray Cod Reference Group (see above). The Reference Group should liaise with and provide advice to the Victorian Department of Sustainability and Environment, the agency contracted by the Commonwealth Department of Environment and Heritage to prepare the Plan, in consultation with other relevant State and Territory agencies. This should ensure that the Plan reflects the priorities presented here and in the *Native Fish Strategy*, and any new research findings that address key knowledge gaps. The Recovery Plan and the priority actions identified by this workshop could then form the basis for developing a long-term plan of management for Murray cod across the Basin.

3. While the current legislative and regulatory management arrangements for Murray cod within the Basin States and the ACT are largely consistent, there remain anomalies.

¹ The Victorian Recreational Fishing Peak Body (VRFish) does not support special 'catch and release' designated areas for Murray cod angling and recommends the decision for 'catch and release' should always remain as an individual choice. VRFish does not support compulsory closures for Murray cod recreational fishing, this includes catch and release and trophy waters. There is already a 3 month closure of all areas across the Basin.



Where possible and sensible (that is, there are no biological reasons for differences continuing), such cross-jurisdictional anomalies should be investigated and rectified to provide a uniform and unambiguous administrative framework across the Basin

4. Responses to recent fish kills involving Murray cod have highlighted deficiencies in how agencies respond to such incidents, and there is a need to clearly identify legal responsibilities and develop, refine and implement fish kill protocols in some jurisdictions. The refinement of these fish kill protocols will need to take account of EPBC Act reporting requirements, co-ordinate cross-border events through the MDBC and inform other relevant bodies (such as the Natural Resource Management Ministerial Council). Jurisdictions should harmonise these protocols across the Basin States and the ACT. Recovery activities following fish kills also need to be reviewed and strengthened, with actions such as restocking, temporary closures and preparation of local recovery plans considered.
5. Noting the importance and benefits to Murray cod populations of having appropriate water quality and flow regimes operating, each jurisdiction is urged to pursue more integrated management efforts between their fisheries and water management agencies.

For each of the priority objectives the workshop considers the following as the key actions:

3.3.2 Management information

Overarching Objective. To establish and maintain fundamental information on population structure and dynamics for Murray cod across the Basin to guide and assess all other priority objectives.

Priority actions

6. Critically review and synthesise existing information on the population structure, status and dynamics of Murray cod (Step 1); develop (Step 2) and implement (Step 3) a Basin-wide plan to measure and monitor these parameters at the Basin and management unit scale. [Note this action is indicated for attention by the proposed Murray Cod Reference Group – Action 1 above]

7. Use the measures and monitoring of Murray cod population structure, status and dynamics (as collected under steps 1-3 above) to re-assess the priority and activities conducted under the 13 *Native Fish Strategy* objectives.

3.3.3 Habitat repair and protection

Native Fish Strategy Objective 1.
To repair and protect key components of aquatic and riparian habitats important for sustaining Murray cod populations.

Priority actions:

8. Identify appropriate management units for Murray cod (jurisdictional, habitat zones, genetic Evolutionary Significant Management Units) across their range and then apply these to:
 - a. map Murray cod habitats and from among these identify the critical habitats;
 - b. identify, prioritise and address the threats to Murray cod within each management unit;
 - c. develop, cost and implement a recovery plan for habitat and threat reduction in each management unit (valley, region, State). Plans should identify areas for rehabilitation to facilitate the expansion of Murray cod populations into areas formerly occupied;
 - d. monitor the impact of these recovery plans.
9. Ensure that habitat rehabilitation for Murray cod includes actions to see important native prey species retained or restored.
10. Further promote Catchment Management Authorities (and the equivalent regional natural resource management bodies) to factor into their catchment plans and associated investment strategies actions to improve habitat conditions for Murray cod.

3.3.4 Flow regulation

Native Fish Strategy Objective 4.
To modify flow regulation practices to facilitate Murray cod rehabilitation.

Priority actions:

11. Develop and implement protocols for managing flow regimes (the timing of releases, volumes, rate of rise and fall etc) to rehabilitate Murray cod populations.
12. Monitor the response of Murray cod (and other native species) to flow management activities and incorporate such knowledge into improved flow management practices.

3.3.5 Managing recreational fisheries

Native Fish Strategy Objective 10.
To manage recreational Murray cod fisheries in a sustainable manner while recognizing the social, economic and recreational value of the fishery.

There is some evidence based on limited scientific data, reports from recreational anglers and articles in popular fishing magazines and newspapers to suggest that there has been a recovery of Murray cod stocks in some New South Wales waters. However, the extent of this recovery, the role of fish stocking programs and other causative factors, and the actual status of wild populations of Murray cod are unknown and need to be determined.

Priority actions:

13. Through the proposed Murray Cod Reference Group (see action 1 above), assess the appropriateness of current or potential fishing regulations and practices such as angling methods, bag and size limits and seasonal closures.
14. Develop and implement a Basin-wide management plan for Murray cod (see action 2 above) that has reference points built in that result in appropriate 'precautionary approach'-based management responses;
15. Adopt, enforce and regularly evaluate rigorous harvest controls for Murray cod for each management unit (see action 8 above) based on the best available information.

16. Adopt the 'best available practice' stocking policies and practices (see Phillips. B, 2003: *Managing Fish Translocation and Stocking in the Murray-Darling Basin*)

3.3.6 Community and partner ownership

Native Fish Strategy Objective 13.
To ensure community and partner ownership and support for and understanding of the Murray cod management vision above.

It is important to pursue ways to encourage public ownership of the issues affecting Murray cod and seek to gain a broader connectedness to rivers from among the community, rural, urban, city and country dwellers.

Priority actions:

17. Improve communication between all stakeholders (such as managers, scientists, Indigenous communities, regional communities, local governments, regional bodies, State government agencies, environmental groups, recreational. fishers etc) to share knowledge, promote understanding and develop appropriate management approaches for Murray cod. More specifically:
 - a. through stakeholder consultation, foster suitable fishing competition policies to ensure sustainable angling practices;
 - b. compile and widely disseminate available information on cod habitat needs to support remedial actions being undertaken by a range of stakeholders;
 - c. promote community reporting of illegal activities and threats to Murray cod and investigate the establishment of 'river sentinels' to monitor river/fish health and assist in prevention of illegal activities.
 - d. involve the community in the development and implementation of action statements and recovery plans for Murray cod (see various actions above).
18. Indigenous participation in the management of Murray cod is essential, with Indigenous issues and participation considered as part of the mainstream, rather than peripheral or separate. To assist this happening, provide mechanisms for greater communication and interaction between Indigenous stakeholders



and the MDBC's working groups/committees such as the Community Advisory Committee and the Fish Management and Science Committee.

19. Promote the Murray cod as an icon species and indicator of river health and sustainability through:
 - a. the development and wide dissemination of a range of awareness-raising and educational tools about the values and significance of the species plus the threats to it and management responses needed by stakeholder groups to protect and rehabilitate cod populations;
 - b. using well known (credible) human icons to promote the river icon, the Murray cod, and to act as champions for the issues and community responses being sought.
 - c. investigation of the possible application of the 'tidy town' concept (like '*Welcome to Sustainable Cod Country*' or '*We care about Murray cod, and are doing something about it*') to raise awareness and promote on-ground actions;

4. Key research needs:

For each of the priority objectives above, the workshop identified the key research needs as set out below. A broader consideration of research priorities was undertaken during the workshop also and the results of this informal survey of views is provided as Appendix 1

4.1 Management information

The overarching objective focused on the collection and maintenance of information needed to guide and inform management actions. The priorities in this regard were indicated as follows:

1. Determine the genetic composition of Murray cod populations throughout the Basin.
2. Determine the structure (age, size, spatial connectivity) and dynamics of cod populations in each management unit

4.2 Habitat repair and protection

3. Undertake habitat mapping for Murray cod with identification of critical habitats to focus management actions.

4. Establish the appropriate scales (spatial and temporal) for rehabilitation investments.
5. Develop an improved understanding of the habitat requirements for all life stages of Murray cod.
6. Determine the habitat requirements of the important native prey species for Murray cod, at all life stages

4.3 Flow regulation

7. Establish the links between flows and Murray cod recruitment.
8. Determine the flow requirements of all life stages (eggs, larvae, juveniles, adults) and critical life history components (movement, spawning, recruitment) of Murray cod.
9. Develop an improved understanding of the impact of water quality on Murray cod.

4.4 Managing recreational fisheries

10. Investigate the effectiveness and threats posed by stocking in the maintenance of wild Murray cod populations.
11. Investigate reports suggesting that Murray cod numbers may be recovering in some areas in NSW, although not to early-European levels.
12. Establish the total annual harvest (including catch and catch and release, unknown, unreported and illegal catch etc) of Murray cod across the Basin, and within prescribed management units.

4.5 Community and partner ownership

13. Define the level of public recognition, understanding and 'ownership' of Murray cod, their ecology and the threats and management approaches to secure the long-term future of the species.
14. Document the significance of Murray cod in Indigenous culture and oral history.
15. Clarify the existing uptake of ethical practices by recreational fishers, and how to promote these ideals more broadly among anglers and the wider community.

It is timely for the MDBC to hold a workshop on the 'Management of Murray cod in the Murray-Darling Basin' just one month after the launch of the Native Fish Strategy for the MDB 2003-2013.

The Native Fish Strategy (NFS) aims to ensure that the Basin sustains viable fish populations and communities throughout its rivers. The 50-year goal of the NFS is to rehabilitate all native fish species in the Basin back to 60 percent or more of their estimated pre-European settlement levels. A range of threatening processes has contributed to the decline in fish habitat and native fish populations in Australia. Changed river flows continue to add to the problems of salinity, reduced water quality (including cold-water pollution), alien fish species such as carp, and blue-green algal blooms – all of these factors affect declining native fish populations.

While it is important to stress that the NFS is concerned with *all* native species and communities, across the *whole* Basin, the one species that arguably captures the hearts and minds of anglers, conservationists and biologists alike is the charismatic Murray cod. This great fish was originally found throughout most of the Murray-Darling Basin, and in large numbers. However, its dramatic decline in range and abundance has resulted in its recent listing as 'vulnerable' under the Australian Government's *Environment Protection and Biodiversity Conservation Act 1999*. Also, a commercial fishery for the species in South Australia has recently been wound up, meaning that there now are no commercial fisheries for native fish in the rivers of the Basin.

The Workshop gets its teeth into some of the more pertinent issues surrounding the current management of the species:

- Are bag and size limits appropriate and consistent across jurisdictions?
- Should set lines be banned?
- Are current stocking practices appropriate – some anglers tell us that the fishing in their stretch has never been better?
- Is the 'springtime' moratorium on the taking of Murray cod appropriate across the entire range of the species, including the lower Murray and the upper Darling reaches?

This workshop is one of a series that have been conducted over the last few years to address specific issues under the banner of the NFS. Previous workshops have focussed on fishways, translocation and stockings, downstream migration and habitat rehabilitation and management.

The collection of papers contained in this document represents the current body of knowledge on the management and conservation of Murray cod in the Murray-Darling Basin. The challenge now is to galvanise this information into pragmatic, workable solutions that will inform future decisions and secure the future for this icon species.

Jim Barrett
Manager
Native Fish Strategy



Welcome to Country

Workshop participants were welcomed to country by the respected Ngunnawal elder Agnes Shea, who outlined the importance of fishing to her people when she was a child around Yass and Brungle. Agnes hoped the workshop would be productive and concluded by expressing the desire that our children will still be able to go down to the river to fish for cod, as she did.

Indigenous perspective on Murray cod

The workshop opened with a talk entitled 'The Mob and the Fish' by Phil Duncan, Senior Aboriginal Policy & Liaison Officer, Aboriginal Liaison & Cultural Heritage Unit of the NSW Department of Primary Industries. Phil discussed the totemic relationships between the Mob and cod, as well as how Indigenous people managed the catch of this species and how they did it in a sustainable manner. This included not catching fish during spawning seasons, not targeting 'trophy' fish, moieties, association between fish and people etc. Aboriginal people own significant parcels of land with water frontage, and should be significant players in cod management. Indigenous fisheries issues need to be considered as part of the mainstream, and not treated separately. As explained by Phil, there is no written record of Aboriginal interactions with cod, only verbal accounts, and NSW Department of Primary Industries is embarking on a major research program with Indigenous people to collect and record this vital information.

Perspectives from Recreational Fishing Representatives

The workshop continued with a series of short presentations provided by recreational fishing representatives from Queensland, New South Wales, Victoria and South Australia. Each presenter was asked to address the importance of Murray cod to recreational anglers and their vision for cod management.

Presentations were given by:

- Les Kowitz (Queensland): Freshwater Fishing & Stocking Association of Queensland Inc.
- Terry Maloney (New South Wales): South West Anglers Association
- Robert Loates (Victoria): VR Fish
- John Winwood (South Australia): Inland Waters Recreational Fishing Council

More detailed summaries, as provided by the speakers are given in Appendix 2. In summary, while each presentation gave unique perspectives, there were a number of common values and issues identified. The iconic status of Murray cod was highlighted by all speakers, with the species considered the premier native fish in the Murray-Darling Basin.

The economic value of recreational cod fisheries was also highlighted by presenters, with the significant tourism and angling revenue generated by cod of importance to towns along the Murray River.

The importance of stocking programs in developing and maintaining put-and-take fisheries was emphasised, particularly in impoundments.

It was recognised that the abundance of cod and other native fish had suffered as a result of numerous impacts such as habitat destruction, alien species and inappropriate water management practices, as well as a significant illegal take of fish.

The view was expressed that the majority of inland recreational anglers accepted and embraced the current management controls on cod such as bag limits, closed seasons etc. The need for adequate enforcement programs was a common theme, with illegal fishing activities perceived to be having significant impacts on cod abundance.

