

C H A P T E R

S I X T E E N

*A casuarina left standing on its roots
- the land has walked away.*

The land has mixed with air and blown away.

U N S C R A M B L I N G T H E P A S T

Healthy floodplains are vital to Australia's inland river system, but they are now suffering the death of a thousand cuts. Each of a multitude of large and small changes has sliced a little deeper into the processes that keep them functioning. The danger is that Australia's rivers will permanently lose their ability to replenish and renew themselves, and there are already clear warning signs that this is happening. Scientists do not yet fully understand how all the different parts of the system work, but lack of perfect knowledge cannot be an excuse for not acting. And just as there are many causes for the problems wrought on floodplains, there are many different agencies and people who will have to work, individually and in cooperation, to try and halt and perhaps reverse the processes of degradation.

L I F E O F A T H O U S A N D B A N D A I D S ?

The Murray-Darling river system is now in crisis. The 20 major and dozens of minor streams that flow into it, draining a seventh of Australia's inland, are sick and dying. There are many symptoms of the crisis, and many causes. There is no fast way to rehabilitate the system, no quick cure to bring it back to health. Many millions of Australians have each played their unwitting parts in damaging the rivers, and many millions must each play their part in repairing them. The scale of the problem is vast, and the economic and environmental implications are daunting.

To scientists, watching the system degrade before their eyes, the ideal answer is to return the river to its natural flow regime. But the Australians who live and work in the Basin, and many of those who don't, depend for their livelihoods on the very processes which are destroying the river's ecology. Some scientists say the root cause is overpopulation, that floodplains simply cannot support the numbers of people who now live near them and exploit them.

Other researchers grimly hope that rivers will remain useful as water supplies even when their native ecology is dead, that through engineering we can turn a natural system into an artificial one. Some say it may be too late now to do anything else anyway. So should we just weep for an ecology which is beyond rescue, and

press on in the hope that human ingenuity can create a new and productive type of river system?

Perhaps there is a middle way. Just as our river systems are dying through the death of a thousand cuts, maybe it will be possible to repair them — slowly — with a thousand bandaids. Countless small actions by the millions of people who depend on the rivers may be enough to cobble together a river system in which the old and the new can somehow survive together.

The first lesson from scientists studying floodplain processes is that we must be patient. Nature works slowly, in fits and starts. It has taken more than 100 years to mess up the system, it may take twice as long to repair it. The growing understanding we now have of how floodplains work should give Australians the confidence to begin a task that future generations will have to continue.

Friday, June 30, 1995, was a momentous day for the Murray-Darling River system. In an historic decision, but one hardly remarked on by the media at the time, the five different Australian governments which hold sway over the waters of the Basin agreed to put a cap on future water diversions, freezing them at 1994 levels. The decision marked a turning point; a recognition that the era of growth had finished, and that the time for rehabilitation had



Top: A farm walk near Yass, New South Wales. Originally conducted by Landcare, farm walks encourage participation, which is vital to developing community understanding of natural resource management issues.

Bottom: Schools and communities are making a valuable contribution to monitoring the 'health' of our waterways through programs such as Water Watch. Photos: David Eastburn, MDBC



begun. The decision to impose the cap followed an audit of water use in the Murray-Darling Basin, which came to the alarming finding that water use in the Basin was still increasing by more than one percent a year — despite a series of decisions by different State

Governments to halt new irrigation allocations. (58)

However, a cap on water use, on its own, is no solution — although it may be the beginning of one. If efforts to protect and rehabilitate Australia's inland rivers are to succeed, a myriad of small and large decisions need to be made, and a plethora of other small and large actions need to be taken.

In August 1997, the New South Wales Government brought down a major Water Reform package which will have enormous implications for the health of Murray-Darling floodplains. The package includes establishing community-based committees, who will help set and fine-tune water management rules for each river valley. Up to 10 per cent of the water allocated to irrigation in each valley will be clawed back and reallocated as environmental flows. However, most of the measures in the NSW Water Reform package do not come into force until 1998, so it remains to be seen how well they will work in practice.

Who can help?

Actions to protect and rehabilitate rivers and their floodplains need to be taken at all levels of Australian society. There are three main spheres of responsibility: individual, regional and governmental. Most of the measures suggested in the next chapter, which deals with managing water flows, are directed at the governmental level — at State and Federal water management authorities, natural resource agencies and legislatures.

Most of the measures suggested in the final two chapters are directed at the regional level — councils, landcare groups, regional public service officers, educators and other community groups and representatives. They explore different issues, and offer general management advice. Other recent publications offering advice in this area, to individuals and regional managers, are listed at the end of Chapter 19 under Floodplain Management Advice. In addition, most State Government departments have fact sheets or similar information available about many aspects of floodplain management.

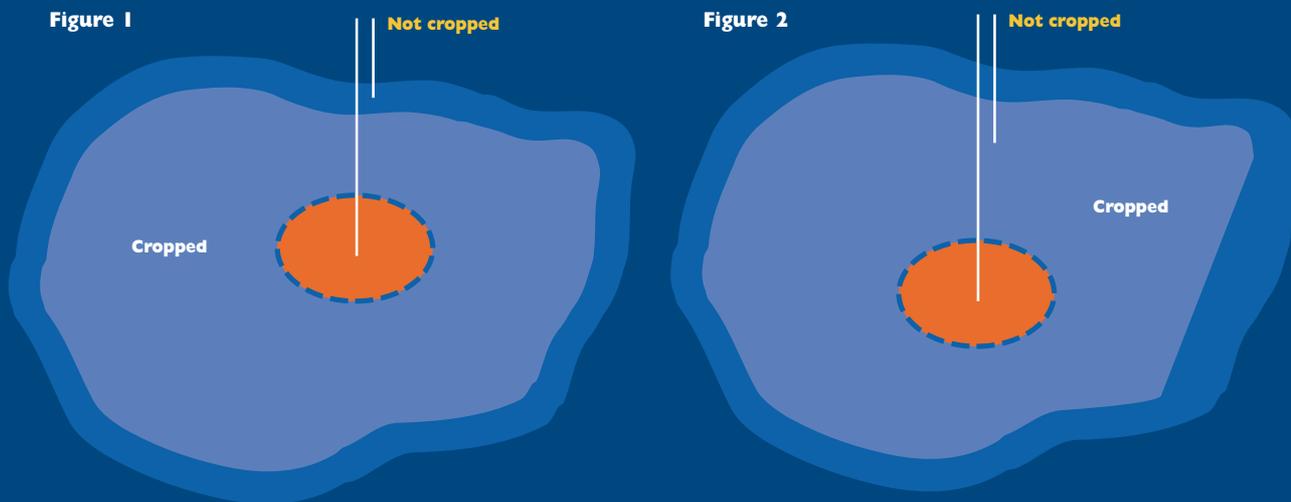
Perhaps the main difficulty in offering advice for managing floodplains is that every stretch of river faces different problems. Earlier chapters have talked about ecological principles that apply generally throughout the Murray-Darling Basin, and about the many different problems brought about by changes over the past two centuries. It cannot be emphasised enough that neither the problems nor their solutions are uniform throughout the Basin: it is an enormously complicated system with correspondingly complicated problems. Different, and indeed sometimes opposite, rehabilitative measures may need to be taken along different river sections.

There is no substitute for local observation, planning and experimentation, although always with an eye on the larger river system. What may be the best solution for one part of the Basin could prove disastrous in another. For example: in some areas it will be necessary to open up floodplains to more frequent inundation; in other areas it will be necessary to do the opposite. That said, there are seven overriding principles that should be applied across the Basin.

First, landholders and local communities must always be directly involved in any remedial planning or action, whether it involves mapping floodplain wetlands, fencing off demonstration sites or making decisions about future management. A useful

Increasingly, communities are working with governments to protect and conserve our natural resources. Angling groups are also helping fisheries scientists to monitor freshwater fish populations and the condition of aquatic habitats throughout the Murray-Darling Basin. Photo: David Eastburn, MDBC





Lakebed cropping guidelines — working with the land

Figure 1: Recommended layout of uncropped areas on lakebeds which are cropped once-only following flooding and drying, and which are not cultivated after the crop is harvested. *Briggs & Jenkins, 1997 (58a)*

Figure 2: Recommended layout of uncropped areas on lakebeds which are cropped and cultivated repeatedly between floods.

Basin-wide programs, such as the Murray-Darling Basin Commission's *Special Forever*, are fostering an understanding of the area's unique natural values. Photo: David Eastburn, MDBC



model for action is the landcare movement, and other related 'care' programs, which bring communities together to work locally on shared natural resource issues.

Second, there is no single, right answer. Floodplains are very diverse systems with many different problems. The variability of Australia's climate means they are naturally highly variable systems, characterised by a patchwork of different habitats. The best approach to managing floodplains is to try a diversity of different management techniques, and to see what works and what doesn't in different areas. One crucial ingredient for success — and the main reason for this publication — is a better understanding of floodplain and river processes. Within certain bounds, floodplains are dynamic, changeable ecosystems that vary enormously between seasons and years. Local managers will have to learn for themselves the differences between natural variation and long-term problems.

Third, it is time to put an end to taxpayer subsidies, overt or hidden, which promote the degradation of floodplains and rivers. All costs must be taken into account, especially when fixing the price of water. For example: extracting water for irrigation imposes costs on other river users, such as graziers and fisherfolk, and on town and urban water users. It also imposes costs on future generations,

and erodes the system's ability to clean and maintain itself. Much of the damage that has been done in the past to Australia's inland rivers has stemmed from distant governments subsidising uneconomic activities. Government funds should not be used to subsidise infrastructure that degrades floodplains and rivers.

Fourth, it must be recognised that floodplains are for floods. Only developments that will not be affected by floods should be allowed on them. Although this seems obvious, the reduced flooding frequency of the past several decades means areas naturally prone to regular inundation are now sometimes regarded as being above flood levels. If there has been no flood for a decade, it is easy to assume an area is flood free. But all areas of floodplain will be flooded sooner or later, even under the drastically changed modern flow conditions. And if water managers do act to return flow to something closer to its natural cycle, floods will — and should — become more regular occurrences even in areas where they have been absent for many years.

Fifth, river systems must be regarded as economically, environmentally and culturally valuable ecosystems, not simply as conduits for water. Water that flows out to sea is not 'wasted'; it is the price Australians must pay to keep their rivers clean and alive.

In times past, water managers believed they could allocate most or all of the water in some rivers to irrigation, but now the consequences of doing so are becoming obvious. There must be no more diversions of water from Murray-Darling rivers; the 1995 cap on diversions must be made permanent. The 100-year trend of ever increasing water extraction from the system must be reversed. It is time to start putting some water back.

Sixth, remedial actions at all scales should attempt to return inland rivers to flow and flooding regimes as close as possible to their natural cycles. It is tempting to see the problem as being simply the volume of water being extracted for irrigation, but that is just one of many contributing factors. Reducing water extraction is necessary, but will not, on its own, cure our rivers.

Seventh, any attempt to remedy the problems of Australia's inland rivers must take account of the needs of the people who live and work in the Basin. It must be implemented in a way that maintains the livelihoods of Australians, and their stewardship of the land. It must recognise that many of the activities which are now



degrading the river system were actively encouraged by past, and sometimes present, governments, and that irrigators and other Basin residents should not be forced to bear the full financial burden of rehabilitation work.

Degrees of ecological impacts of different types of lakebed cropping. Impacts assume cropping organic (no herbicides or fertilisers) and that perennial vegetation, including lignum, is not removed. This assumption does not apply to irrigated or dryland cropping lakebeds.

Type of cropping	Frequency of cultivation cropping	Effects on soil	Ground vegetated between crops	Soil cracks reform between crops	Impact on dryland wildlife	Impact on wetland wildlife ^A	Flood regime	Overall ecological impact
One crop following floodwater recession	Occasional, higher where lakes flood more frequently	Low	Yes	Yes	Low	Low ^A	Not altered ^B	Low
One crop following rainfall	Occasional, higher in higher rainfall zones	Low	Yes	Yes	Medium	Low ^A	Not altered	Medium
Second crop after first crop following floodwater recession or rainfall	Infrequent	Low	Sometimes	Sometimes	Medium	Low ^A	Not altered ^B	Medium
Frequent cropping and cultivation	Frequent	High	No	No	High	Low ^A	Not altered ^B	High
Cropping following occasional water release ^C	Infrequent	Probably Low	Yes	Yes	Medium	Low ^A	Medium alteration	Medium
Cropping following regular water release	Frequent	Unknown	No	Not usually	High	Medium	Large alteration	High
Irrigated cropping ^D	Frequent	High ^E	No	Not usually	High	High	Very large alteration	Very High
Dryland cropping ^{DF}	Frequent	Probably High	Not usually	Not usually	High	Very High	Very large alteration	Very High

^A Ploughing lakebeds reduces rotifer numbers, but lakebed cropping without altering water regimes is likely to have minimal effects on waterbirds.

^B Water flows can be temporarily excluded from lake by banks.

^C Cropping occurs after natural floods as well as following water release.

^D Included for comparison only. These guidelines do not deal with these forms of cropping.

^E From McKenzie *et al.* (1991).

^F Cropping on lakes from which water has been deliberately and permanently (or near permanently) excluded.