Water and the Murray Darling Basin - A Statistical Profile

Australia

2000-01 to 2005-06

Chapter 5 — Natural Resource Management in the Murray-Darling Basin

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CHAPTER 5

NATURAL RESOURCE MANAGEMENT IN THE MURRAY-DARLING BASIN

INTRODUCTION	This chapter describes Natural Resource Management (NRM) practices within the Murray-Darling Basin (MDB).
	A range of NRM issues are relevant when considering land use activities in the MDB. In particular, agriculture uses natural resources, such as land and water, as well as other inputs (e.g. fertiliser, labour, physical and financial assets) to generate production. Agricultural land use can affect water quantity and quality, dryland salinity, native vegetation, weed invasion, biodiversity and soil erosion. Preventative and remedial management of these issues can lead to significant costs for farmers through the possible reduction in the area of usable agricultural land and adverse affects on the physical environment.
NRM POLICY AND IMPLEMENTATION STRATEGIES	In the past decade, there have been a range of policy initiatives aimed at improving NRM practices. The 'Natural Heritage Trust (NHT) of Australia' was established under the <i>Natural Heritage Trust of Australia Act 1997</i> to "repair and replenish Australia's natural capital infrastructure" (NHT 2007:8). Funds were allocated to projects and programs aimed at providing solutions to nationally significant environmental problems.
	The Australian Government's 'Caring for our Country' program commenced on 1 July 2008, and integrates a number of existing Commonwealth programs including: the Natural Heritage Trust, the National Landcare Program, the Environmental Stewardship Program, and elements of the Working on Country program (Australian Government 2008a).
	To facilitate the delivery of NRM throughout Australia, the Australian Government, in association with state and territory governments, established 56 NRM regions. In most cases, the NRM region boundaries are based on catchments or bio-regions. Integrated NRM plans have been developed for each region to assist in evaluation of the environmental, social and economic impacts of NRM decisions. The plans aim to improve the sustainable management of natural resources (Australian Government 2008b).
	 In order to assess the impact of individual NRM issues, natural resource managers (e.g. regional, state and national management authorities) require information to determine: the extent of issues; what practices are being (or will be) undertaken to address them;
	the time and cost required to manage them; andthe barriers to implementing management practices.
	NRM issues that affect Australia's environment and agricultural land include:native vegetation - the degradation in quantity and quality;

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NRM POLICY AND IMPLEMENTATION STRATEGIES continued	 soil quality - erosion, salinity, sodicity, compaction and acidification of soils; water issues - quantity and quality of surface and ground water; and weeds and pests - the impact on biodiversity and agricultural production as a result of weeds or pests.
NRM REGIONS IN THE	There are fifteen NRM regions fully-contained within the MDB, while six others overlap
MURRAY-DARLING BASIN	MDB boundaries (map 5.1). Of the six regions that are partially in the Basin, four have
	more than 70% of their area within the MDB:
	 South Australia (SA) Murray Darling Basin (98%);
	Western in New South Wales (72%);
	 Wimmera in Victoria (72%); and
	South West in Queensland (71%).
	The two remaining NRM regions have only a very small proportion of their total area in
	the MDB:
	SA South East (6%); and
	SA Arid Lands (2%).

When presenting statistics by NRM region, the fifteen regions entirely in the MDB and the four regions with the vast majority of their area within the MDB are included, however the two regions with small areas in the MDB are excluded. Therefore, in this chapter, nineteen NRM regions are aggregated to form the MDB. Map 5.1 shows the location of the NRM regions in the MDB.

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Source: Department of Environment, Water, Heritage and the Arts 2008

ISSUES IDENTIFIED IN NRM REGIONAL PLANS	Information about the delivery of major NRM initiatives and region-specific programs and plans is available on the Australian Government NRM website: http://www.nrm.gov.au/index.html. This source identifies the NRM issues which are considered to be a priority as a result of consultation between stakeholders and the regional bodies administering each region. Examples of key stakeholders include: governments (local, state/territory, commonwealth), academic and scientific communities, industry, environmental and Indigenous groups, and regional communities.
	 For the 19 NRM regions in the MDB, the following are identified as issues of priority: water quality and/or quantity (identified by 16 of the 19 NRM regions); salinity (irrigation and dryland) (identified by 14 of the 19 NRM regions); biodiversity (identified by 14 of the 19 NRM regions); soil health and/or soil erosion (identified by 10 of the 19 NRM regions); native vegetation (identified by 9 of the 19 NRM regions); and weeds and/or pests (identified by 8 of the 19 NRM regions).
	(4) were issues of priority.
NRM PROBLEMS AND PRACTICES DESCRIBED BY FARMERS	As 84% of land in the MDB is used for agriculture (based on the 2005–06 ABS Agricultural Census), most NRM activities are undertaken to improve economic and environmental conditions on agricultural land. For 2004–05, the ABS conducted an NRM Survey which sought information from Australian farmers about the NRM issues affecting their agricultural land holding, activities undertaken to address issues, and the financial cost and time spent to undertake preventative or remedial activities. The main NRM issues and related problems identified in the 2004–05 NRM Survey have

been divided into five broad groups: native vegetation, weeds, pests, land and soil, and water (table 5.2).

5.2 MAIN NATURAL RESOURCE MANAGEMENT ISSUES AFFECTING AUSTRALIAN FARMS—2004–05

NATIVE VEGETATION Vegetation thickening	WEEDS Decreased production	PESTS Decreased animal or crop production	LAND AND SOIL Erosion	WATER Surface and groundwater availability
Excessive native vegetation	Decreased farm value	Damaged native vegetation	Soil acidification	Water quality
Declined quality	Increased fire risk	Decreased biodiversity	Compaction	

Source: Natural Resource Management on Australian Farms, 2004–05 (cat. no. 4620.0)

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NRM issues on farmsIn the MDB in 2004–05, the vast majority of farms (92% of farms) conducted some NRM
activities for preventative or remedial reasons, consistent with the proportion of all
Australian farms (table 5.3). This level was greater than the proportion of farms reporting
NRM issues (87% in the MDB and 86% in Australia), due to farmers managing issues
before they become problematic (i.e. for preventative reasons). For each NRM issue, the
proportions of farms reporting NRM issues and conducting activities, as well as average
expenditure and average effort, are generally similar in MDB farms compared to all
Australian farms.

5.3

NRM ISSUES IDENTIFIED ON FARMS AND MANAGEMENT BY FARMERS, Murray-Darling Basin and Australia—2004–05

	Farms reporting an issue (% of total farms)(a)		Farms undert management activities (% o total farms)(a	aking of a)(b)	NRM expenditure (average \$/farm undertaking management)		NRM effort (person days/farm)	
	MDB	Aust.	MDB	Aust.	MDB	Aust.	MDB	Aust.
Native vegetation(c)	(d)46	(d)45	(d)61	(d)62	5 400	5 000	31	32
Needs	76	73	83	80	12 200	11 200	41	39
Pests	71	69	78	76	8 100	7 300	43	39
and and soil	48	46	61	58	13 200	12 000	54	51
Nater(c)	42	38	35	33	9 100	7 400	27	24
Any issue	87	86	92	92	32 200	28 200	132	121

(a) Number of farms was approximately 53,900 for the MDB; 129,900 for Australia.

(b) Activities undertaken for remedial or preventative purposes.

(c) Data for the Lower Murray Darling region excluded due to confidentiality issues.

(d) This is the proportion of farms with native vegetation on their land, not the proportion of total farms. Number of farms with native vegetation was approximately 33,000 for the MDB; 81,800 for Australia.

Source: Natural Resource Management on Australian Farms, 2004–05 (Reissue), ABS cat. no. 4620.0; ABS data available on request, Natural Resource Management Survey, 2004–05

NRM activity, expenditure and effort on farms in the MDB In 2004–05, more farms in the MDB undertook management activities for weeds (83% of farms) and pests (78%) than for other NRM issues (table 5.3). Water issues were managed least (35%). A similar management pattern is exhibited nationally and this might suggest that the control of pests and weeds is a more common farming activity and related directly to agricultural output, than problems associated with water.

Interestingly, for some issues, more NRM activity translates into more NRM expenditure, but this is not always the case (table 5.4). In 2004–05, the proportion of MDB farms managing weeds was higher than for any other NRM activity. MDB farms spent more on managing weeds (\$545m), and this activity had a relatively high average expenditure per farm (\$12,200), when compared with other NRM issues. By contrast, although a large number of MDB farms managed pests (42,200), they recorded a relatively low average expenditure per farm (\$8,100). Average expenditure on land and soil problems was higher than any for other NRM issue (\$13,200 per farm), however fewer farms needed to undertake land and soil activities, compared with activities addressing weeds and pests.

Of the estimated total 6.6 million person days spent managing NRM issues, most effort was spent managing weeds, pests, and land and soil (approximately 1.8 million person days spent on each of these three issues). Similar to the trend for average NRM expenditure, most effort (54 person days per farm undertaking NRM activities) was spent on land and soil activities. MDB farms reported the lowest effort expended on managing

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NRM activity, expenditure and effort on farms in the MDB continued

water issues (27 person days per farm on average) of all the NRM issues, equivalent to half of the effort put towards land and soil activities.

NRM ISSUES IDENTIFIED ON FARMS AND MANAGEMENT BY FARMERS-Murray-Darling **5.4** Basin—2004–05

			FARMS UNDERTAR	ING					
	FARMS RE	PORTING	MANAGEM	ENT					
	AN ISSUE		ACTIVITIES(a)		NRM EXPENDITURE		NRM EF	NRM EFFORT	
		Proportion		Proportion			Total		
		of total		of total		Average \$/farm	person	Person days/farm	
		farms		farms	Total	undertaking	days	undertaking	
	no.	(%)(b)	no.	(%)(b)	(\$m)	management(c)	('000)	management(d)	
Native vegetation(e)	15 200	(f) 46	20 000	(f)61	108	5 400	627	31	
Weeds	41 000	76	44 600	83	545	12 200	1 842	41	
Pests	38 400	71	42 200	78	340	8 100	1 824	43	
Land and soil	26 000	48	32 900	61	433	13 200	1 762	54	
Water(e)	22 700	42	18 600	35	170	9 100	497	27	
Any issue	47 100	87	49 800	92	1 603	32 200	6 579	132	

(a) Activities undertaken for remedial or preventative purposes. (f) This is the proportion of farms with native vegetation on their land, not

(b) Number of farms was approximately 53,900 for the MDB.

(b)Number of farms was approximately 53,900 for the MDB.the total farms. Total farms with native vegetation was approximately
33,000 for the MDB.(c)Average NRM expenditure per farm undertaking NRM activities.33,000 for the MDB.(d)Average NRM effort (in terms of person days) per farm undertaking
Source: Natural Resource Management on Australian Farms, 2004–05

NRM activities. (e) Data for the Lower Murray Darling region excluded due to

confidentiality issues.

NRM issues reported by irrigated and non-irrigated farms

In 2004–05, almost 90% of MDB farms reported being affected by an NRM issue (table 5.5). Overall, irrigated and non-irrigated farms reported similar proportions of NRM issues. Non-irrigated farms were more likely than irrigated farms to report being affected by land and soil issues: 50% of non-irrigated farms, compared with 43% of irrigated farms.

the total farms. Total farms with native vegetation was approximately

(Reissue), ABS cat no. 4620.0; ABS data available on request,

Natural Resource Management Survey, 2004-05

Despite many farms in the MDB being affected by drought conditions in 2004-05, water issues were less commonly reported than other NRM issues (6,700) by irrigated farms in the MDB. The frequency of reporting water issues was not very different between non-irrigated and irrigated farms (43% and 40% respectively).

It is difficult to determine why irrigated farms report similar levels of water issues as non-irrigated farms. One possible reason is that farms that would normally have irrigated in 2004–05 could not irrigate, and reported themselves as a non-irrigated farm.

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NRM issues reported by irrigated and non-irrigated farms continued

5.5 NRM ISSUES IDENTIFIED ON IRRIGATED AND NON-IRRIGATED FARMS—Murray-Darling Basin—2004–05

IRRIGATED FARMS NON-IRRIGATED FARMS Proportion of total Proportion No. irrigated No. of total reporting reporting non-irrigated farms an issue farms (%)(b) an issue (%)(a) (d)43 (d)47 Native vegetation(c) 3 400 11 800 Weeds 13 100 79 27 900 ری 67 75 Pests 11 100 27 300 73 Land and soil 7 200 43 18 800 50 Water(c) 6 700 40 16 000 43 14 600 88 32 500 87 Any issue

(a) Number of irrigated farms was approximately 16,600 for the MDB.

(b) Number of non-irrigated farms was approximately 37,300 for the MDB.

(c) Data for the Lower Murray Darling region excluded due to confidentiality issues.

(d) This is the proportion of farms reporting that they have native vegetation on their land, not the proportion of total farms.

Source: ABS data available on request, Natural Resource Management Survey, 2004–05

Water issues affecting farms

The effect of discharged water on river and wetland health is one environment issue relevant to the MDB. Saline water discharge and elevated levels of nutrients discharged from irrigation drainage into rivers or groundwater can produce algal blooms and reduced water quality. This affects not only biodiversity, but also human settlements because of a reduced ability to use the water for drinking, recreation or downstream irrigation. Water availability is another issue of importance for sustaining livestock and growing pasture and crops. Specific water issues affecting farms are described in the following section.

In 2004–05, the two most significant water-related NRM issues in the MDB identified by farms reporting water issues were the availability of surface water (69%) and groundwater (33%) (table 5.6). Other issues, like toxicity events and excess nutrient loads, were reported by less than 8% of farms identifying water issues.

Water issues affecting farms continued

5.6 WATER ISSUES ON FARMS—Murray-Darling Basin—2004–05

FARMS REPORTING
A WATER ISSUE
••••••

	No. of farms	Proportion of farms reporting water issues (%)(a)	Proportion of total farms (%)(b)
Surface water availability	15 700	69	29
Groundwater availability	7 400	33	14
Water clarity	2 200	10	4
Excess nutrient load	1 500	7	3
Toxicity event	200	1	_
Other surface water quality problems	2 000	9	4
Other groundwater quality problems	2 100	9	4
Other issues	4 600	20	9

— nil or rounded to zero (including null cells)

(a) Number of farms reporting water issues was approximately 22,700.

(b) Number of farms was approximately 53,900.

Source: ABS data available on request, Natural Resource Management Survey, 2004–05

Farmers conducted a variety of activities to address the water issues occurring on their farms. The most common activities employed were:

earthworks, drains and water pumping (42% of MDB farms undertaking water

- activities);
- planting trees and shrubs (28%); and,
- removing stock from waterways (23%).

Relatively fewer farms carried out water testing (11%) (table 5.7).

5.7 ACTIVITIES CONDUCTED TO ADDRESS WATER ISSUES ON FARMS—Murray-Darling Basin—2004–05

FARMS REPORTING AN ACTIVITY

	No. of farms	Proportion of farms undertaking water activities (%)(a)	Proportion of total farms (%)(b)
Earthworks, drains and water pumping	7 900	42	15
Tree and shrub planting maintenance	5 300	28	10
Removal of stock from waterways	4 300	23	8
Monitoring of groundwater table	3 300	18	6
Fencing to protect riparian zones	3 200	17	6
Water testing	2 100	11	4
Other activities	1 800	9	3

(a) Number of farms reporting water activities was approximately 18,600.

(b) Number of farms in MDB was approximately 53,900.

Source: ABS data available on request, Natural Resource Management Survey, 2004–05

Location of water issues affecting farms

The proportion of farms reporting water issues in the MDB differed depending on where in the Basin they were located. Surface water availability was more problematic for farmers located in the northern part of the MDB with more than 38% of farms reporting this as an issue in the following NRM regions: Western, Namoi, Border Rivers, Condamine and South West NRM regions, as well as in the Australian Capital Territory and Lachlan (map 5.8). By contrast, in the southern MDB, less than 20% of farms reported surface water availability as a problem, more specifically in the Mallee, SA Murray Darling Basin, North East and Goulburn-Broken NRM regions.

Groundwater availability was generally more problematic for farms in the northern New South Wales NRM regions. Those regions where more than 19% of farms had an issue with groundwater availability were: the Western, Namoi, Condamine, Australian Capital Territory and Central West. Less farms reported groundwater availability as an issue in the other NRM regions (map 5.9).



Source: ABS data available on request, Natural Resource Management Survey 2004–05, Geoscience Australia 2004



5.9 FARMS REPORTING PROBLEMATIC GROUNDWATER AVAILABILITY, Murray–Darling Basin NRM regions—2004–05

Source: ABS data available on request, Natural Resource Management Survey 2004–05, Geoscience Australia 2004

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