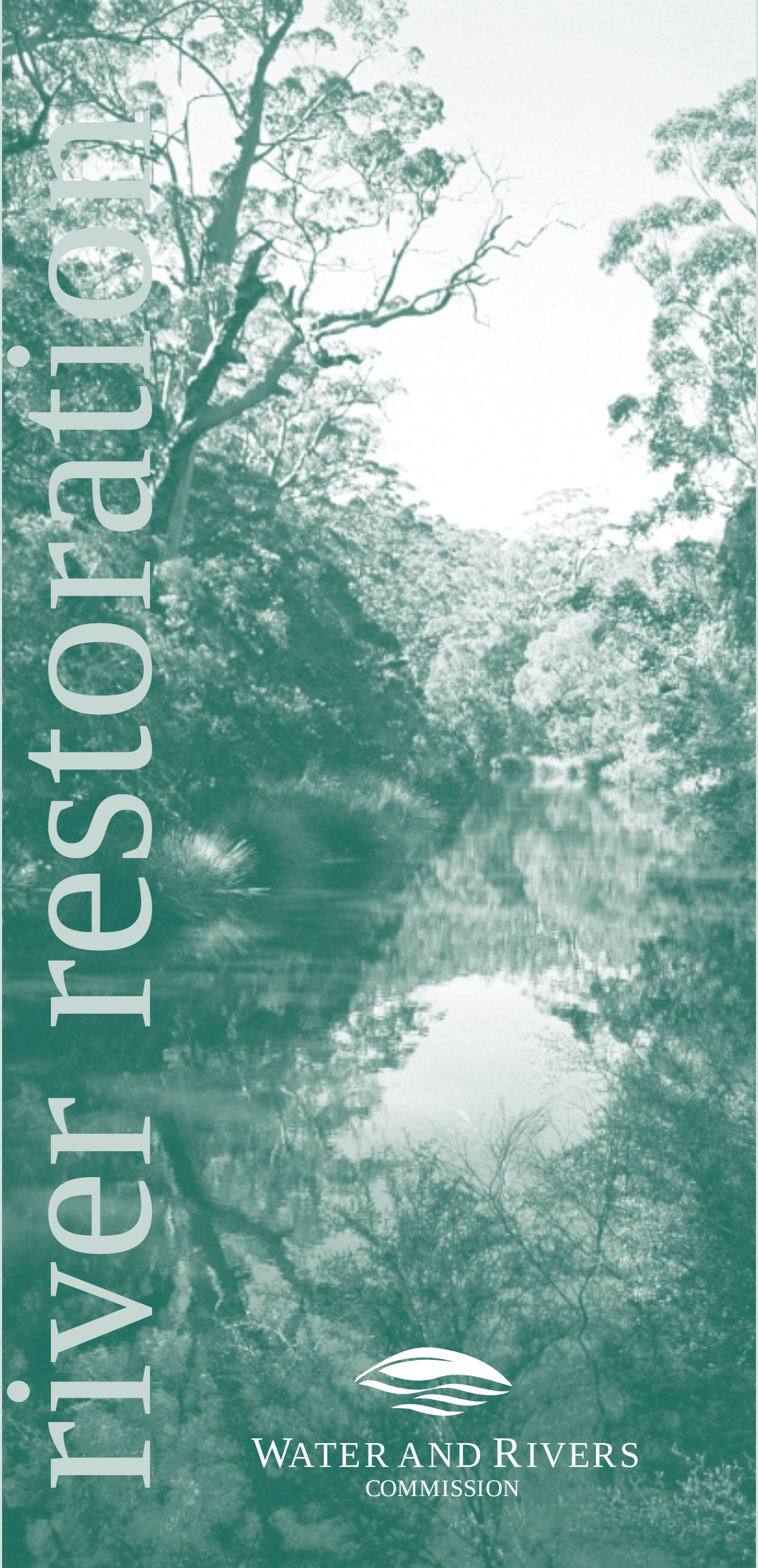

Planning for Waterways Management

Guidelines for Preparing a Regional Strategy for Natural Resource Management

WATER AND RIVERS COMMISSION

February 2001
Report No. RR 12

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PLANNING FOR WATERWAYS MANAGEMENT

Guidelines for Preparing a Regional Strategy for Natural Resource Management

Prepared by
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Jointly funded by

Natural Heritage Trust

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Foreword

Many Western Australian rivers are becoming degraded as a result of human activity within and along waterways and through the off-site effects of catchment land uses. The erosion of foreshores and invasion of weeds and feral animals are some of the more pressing problems. Water quality in our rivers is declining with many carrying excessive loads of nutrients and sediment and in some cases contaminated with synthetic chemicals and other pollutants. Many rivers in the south-west region are also becoming increasingly saline.

The Water and Rivers Commission is responsible for coordinating the management of the State's waterways. Given that Western Australia has some 208 major rivers with a combined length of over 25 000 km, management can only be achieved through the development of partnerships between business, landowners, community groups, local governments and the Western Australian and Commonwealth Governments.

The Water and Rivers Commission is the lead agency for the Waterways WA Program, which is aimed at the protection and enhancement of Western Australia's waterways through support for on-ground action. One of these support functions is the development of river restoration literature that will assist Local Government, community groups and landholders to restore, protect and manage waterways.

This document is part of an ongoing series of river restoration literature aimed at providing a guide to the nature, rehabilitation and long-term management of waterways in Western Australia. It is intended that the series will undergo continuous development and review. As part of this process any feedback on the series is welcomed and may be directed to the Catchment and Waterways Management Branch of the Water and Rivers Commission.

Guidelines for Preparing a Regional Strategy for Natural Resource Management

Purpose of this document

The development of regional Natural Resource Management (NRM) strategies is often a complex and daunting process. This is because regional strategies deal with a wide range of issues across a large area and there are often many stakeholders involved. The management of water on the landscape is an important component of any a regional NRM strategy.

The purpose of this document is to contextualise waterways management within the regional planning framework and recommend components for inclusion in a regional NRM strategy. The various waterways issues that might be considered as part of a regional strategy are also outlined. This is the second document of a series that suggest approaches to planning for waterways management at various scales (see also Water and Rivers Commission, River Restoration Reports RR 13 and RR 14). Organisations looking to develop or review regional NRM strategies should also refer to a waterways planning overview document (see Water and Rivers Commission, River Restoration Report 11) that outlines key principles and process for planning waterways management within the framework of NRM in Western Australia.

Managing waterways

Healthy waterways are an asset to communities and significant social, environmental and economic benefits are derived from these systems. For example, ecological services of a healthy waterway would include biofiltration (the natural filtering of pollutants, sediment and nutrients by riparian vegetation), which acts to maintain high water quality. Such a service forms a critical link in an ecological system that imparts a range of benefits to the community through reduced cost of processing water for consumption, increased potential for eco-tourism, maintenance of biodiversity, increased quality of environment for recreational pursuits, improved livestock health and so on.

When the condition of a waterway declines, the services that it provides may be threatened, with a subsequent decline in the social, environmental and economic benefits. Therefore, in order to retain the benefits derived from a healthy waterway, there is a requirement to manage the pressures that threaten the health of the system and where necessary take action to restore the system.

Importantly, it is the values that individuals, communities or our society as a whole place on waterways that will largely determine the pressures that threaten waterway health and the response in terms of environmental management (see Figure 1). Often, the scale at which a waterway is viewed will influence the perceived value of the system and its management. For instance, individual landholders at the top of a catchment may value waterways that run across their properties differently than the community members of a township adjacent to a receiving estuary. Land management practices within the catchment will influence estuarine water quality and potentially the economic and social activities that the townsfolk derive from a high level of estuarine health.

It is important that waterways are managed within a catchment context. Indeed, the strong biophysical linkages between waterways and their catchments makes it impossible to effectively manage waterways in isolation of their catchment. The cooperative management of land and water resources through Integrated Catchment Management (ICM) is essential for waterway health.

The more we understand and value waterways, the greater the motivation to manage them sustainably.

Regional planning

Western Australia is facing a number of significant challenges associated with land and water resource degradation. Widespread clearing of deep rooted native vegetation and its replacement primarily with shallow-rooted annual crops and pastures has altered the natural hydrological balance. As a consequence, increased salinisation of the landscape threatens water resources, agricultural production, biodiversity, rural infrastructure and rural communities. Furthermore, many estuaries are becoming eutrophic as a result of increased nutrient input, with negative consequences for wildlife, human

Figure 1. It is the values that individuals, communities or our society as a whole place on waterways that will largely determine the pressures that threaten waterway health and the response in terms of environmental management (diagram adapted from Rapport, 1998).

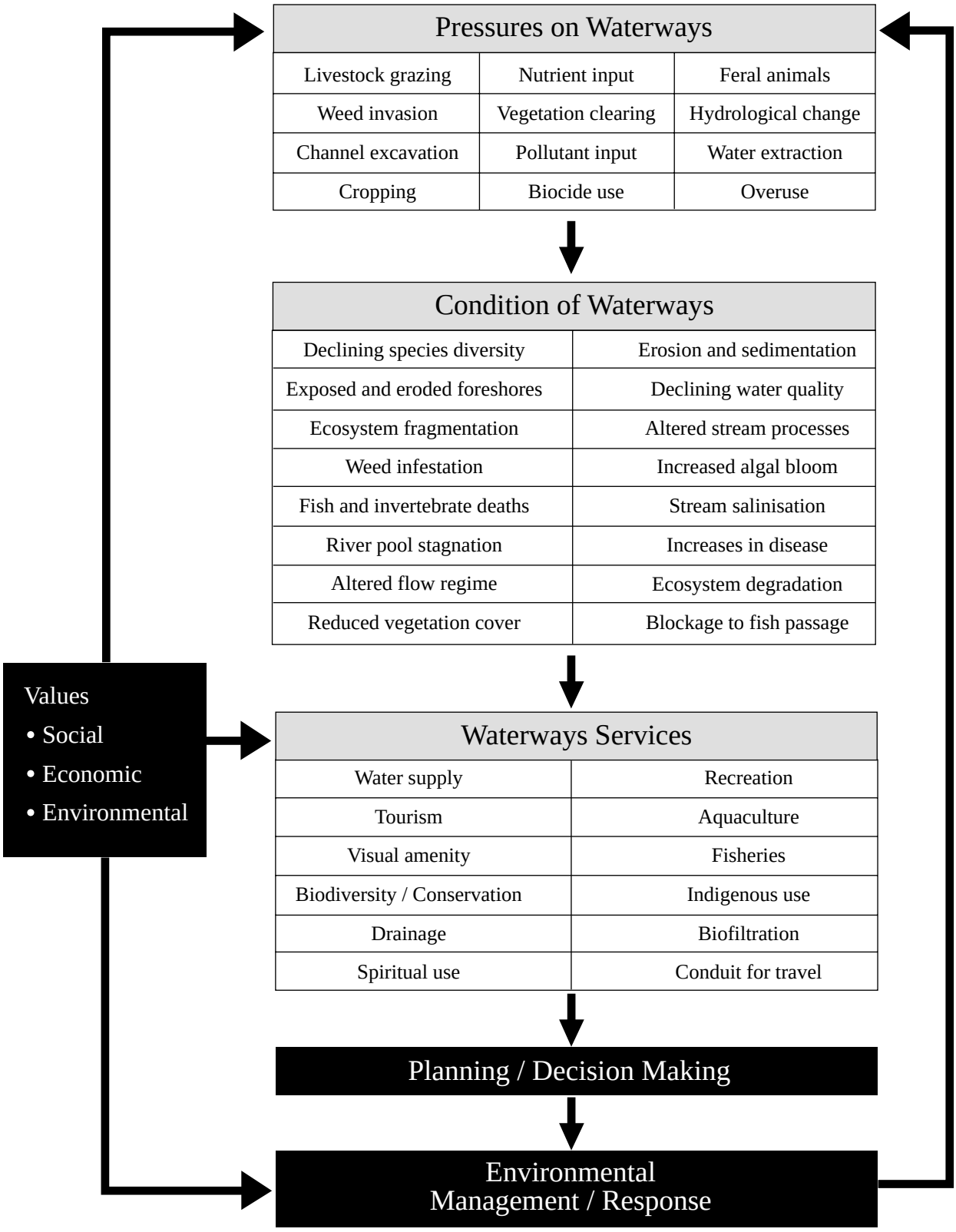
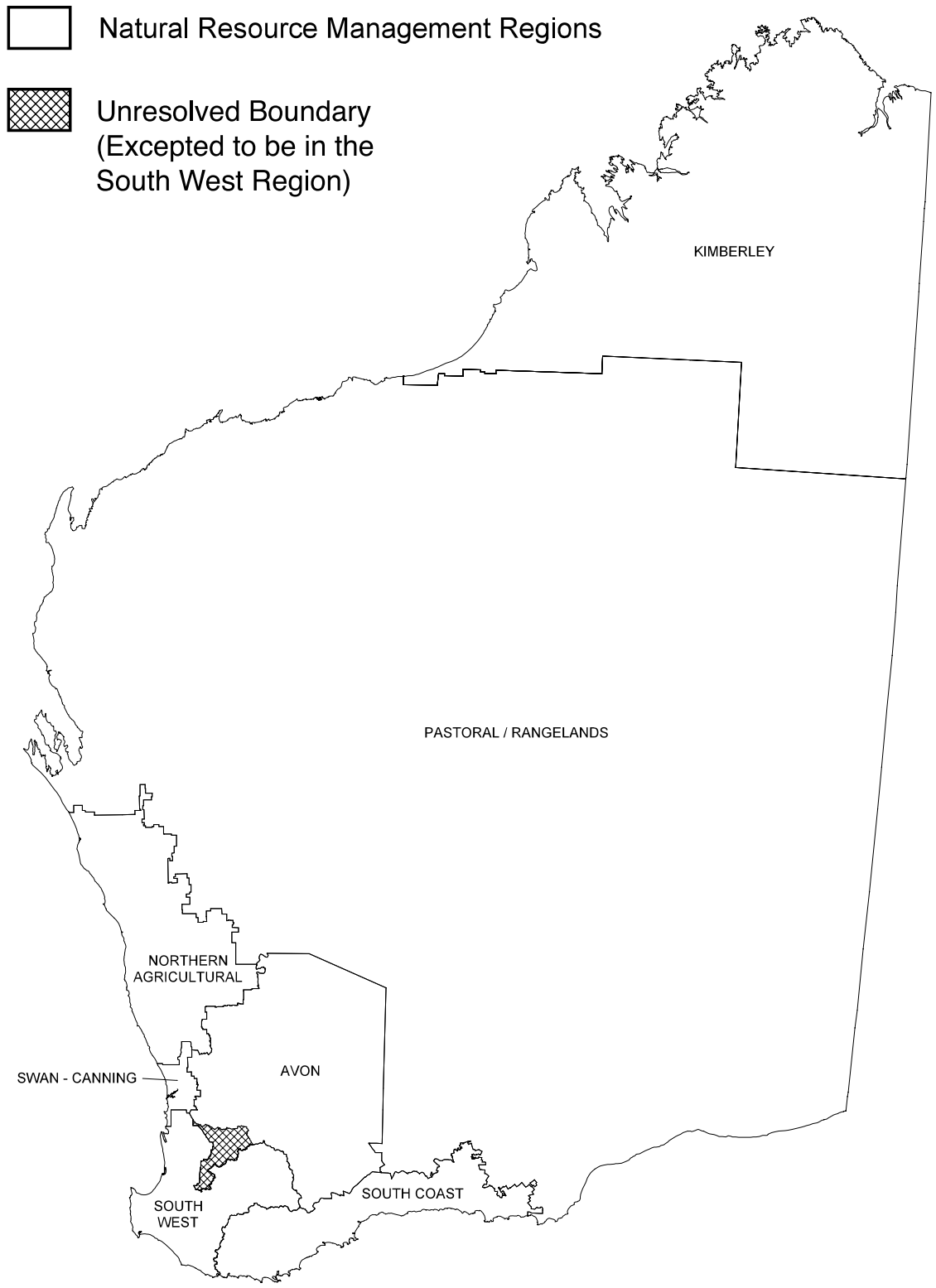


Figure 2. In Western Australia there are currently seven Natural Resource Management (NRM) regions; South Coast, South West, Swan-Canning, Avon, Northern Agricultural, Pastoral/Rangelands and Kimberley. It is important to note that regions and their boundaries may change as NRM evolves in Western Australia.



health, commercial and recreational fisheries, recreation and tourism. Solutions to these problems and others will require fundamental changes in land use and may involve trade-offs between land use and biodiversity values in the landscape. Alternative and innovative approaches to existing land uses may need to be found and affected communities supported. Most importantly, action to address these issues must by undertaken in a cooperative manner in strategic catchments.

Regions and sub-regions are recognised as a critical scale for the strategic coordination of NRM allowing social, environmental and economic dimensions to be considered in an integrated way. Coordination between stakeholders is also most efficient at this scale, allowing trade-offs and agreements to be negotiated, priorities determined and shared investment arrangements agreed upon.

Natural Resource Management (NRM) is defined as the ecologically sustainable management of land, water and biodiversity resources for the benefit of existing and future generations, and for the maintenance of the life support capability of the biosphere. It does not include mineral or marine resources.

In Western Australia there are currently seven NRM regions; South Coast, South West, Swan-Canning, Avon, Northern Agricultural, Pastoral/Rangelands and Kimberley (see Figure 2). For each region, at least one Regional NRM Strategy is proposed or being developed. Depending on the size of the region and the complexity of issues, sub-regional strategies may also be developed. This is an evolving process and the number of regions could change.

The regional approach to the development of NRM is encouraged through federal sponsorship (i.e. Natural Heritage Trust). In addition, a recent discussion paper on the development of a national policy on the management of natural resources in rural Australia also advocates the regional approach (AFFA, 2000). The Western Australian government has developed a policy for a NRM framework that will include a partnership approach in relation to the development and implementation of regional strategic plans (WA Government, 2000).

Development of a regional strategy

Regional strategies provide a vision and set a timeframe for attempts to tackle environmental degradation, whilst balancing social and economic considerations across a region. The principles and process involved in their development are common to all levels of planning (see Water and Rivers Commission, River Restoration Report 11). In particular, their development necessarily involves the participation and endorsement of a wide cross-section of the community and government. Through consultative processes, the development of regional strategies will identify conflicting demands on the resource base and identify ways for stakeholders to work together towards the sustainable management of natural resources.

Regional strategies should be integrated with other levels of planning by recognising and supporting the plans and planning processes of sub-regional, catchment, landcare, community and government groups as the activities of these may be fundamental to the implementation of a regional strategy. Regional strategies should also recognise linkages with other NRM strategies developed at the Commonwealth, State and regional scale.

Components of a regional strategy

Existing regional strategies take varied and valid approaches to the layout of their documents. As a guide, a regional strategy may include the following components:

Preliminary section

Foreword

The foreword is usually written by someone other than the authors of the strategy. It explains the purpose and direction of the strategy.

Executive summary

A summary of the main points of the document including an outline of the process and the main direction of the recommendations is provided. An executive summary is generally written by the person preparing the strategy.

Acknowledgements

It is important to recognise those that helped develop the strategy and any copyright material used.

Contents

A table of contents including page numbers is a standard part of a regional strategy document.

Introduction

The introduction explains who commissioned the strategy and why. It defines the terms of reference (i.e. land, water and biodiversity) and lists members of the strategy development group. It also defines the extent of the region and its boundaries (e.g. bio-regional, major drainage basin, catchment lines).

Background section

This section documents all the natural resource management and biodiversity conservation information relevant to the region. This includes reference to plans, strategies, policy documents and other materials. Thereby demonstrating a commitment to cooperative and coordinated NRM.

Regional overview

A regional overview helps to place the region in the broader state or national context. It should consist of the following:

Landscape

Present information about the broad physical features of a region (e.g. tablelands, coastal plain, floodplains).

History

Provide a brief description of regional history incorporating indigenous and non-indigenous activity.

Natural resources

Describe the geology, soils and hydrology of the region. This should also include an assessment of the condition of the region's natural resources and their current management.

Biodiversity

Describe the region's flora, fauna, ecosystems and their conservation status. Also, provide a list of the region's endangered and threatened species should be included.

Climate

Provide and overview of the local climatic conditions.

Primary production

Provide a review of the current primary production and statement on it's economic value and direction.

Demographics

A brief description of the region's population demographics.

Land tenure

Briefly describe land tenure in the region.

The strategy

This is the main body of the strategy document and consists of a number of distinct components:

Vision statement

Describe how the community would like the region to look into the future (period to be defined).

Values

Identify characteristics that your community likes about itself and the region.

Priority issues

List the land, water and biodiversity issues that concern the community, ranked in order of importance.

Goals

Identify the desired outcome in relation to the issues and priorities.

Objectives

The objectives should clearly identify what is to be attempted under each goal.

Strategies

This section indicates the strategies and processes by which the objectives are to be achieved. Outputs, outcomes and performance indicators should be developed for each strategy. Strategies can be ranked in order of importance.

Implementation

A framework needs to be developed for implementing the strategies through priority setting and actions. The framework should identify and outline processes for engaging the community across the region.

Monitoring and evaluation

Identify performance indicators for monitoring the progress of strategy implementation. Document the review process is documented to provide a structured approach to evaluating and reconsidering the validity of the strategy's vision, issues, objectives and strategies.

Community participation and agreement section

Gaining endorsement and support of community for the regional NRM strategy is extremely important. A list of groups that endorse the strategy should be included as well as a list of groups that do not endorse the strategy and an explanation for their dissent should be included.

Reference section

Appendices

Appendices should include any supplementary material .

Maps

Conveniently locate maps in one section.

Glossary

Technical terms and acronyms used in the strategy should be described here.

Bibliography

Provide an alphabetical listing by author of literature used in the report preparation.

Table 1. Water resource management issues.

Theme	Issue	Condition	Cause/Pressure
Ecological	Instream and riparian vegetation degradation.	Declining riparian vegetation. Exposed and eroded foreshores. Erosion and sedimentation. Ecosystem decline. Fragmentation. Loss of diversity.	Livestock grazing. Salinisation and waterlogging due to clearing. Inappropriate fire regimes. Conflicting and unsustainable use of the riparian zone.
	Exotic plant and animal invasions.	Weed infested foreshores. Clogged waterways. Loss of native vegetation. Altered stream ecology. Ecosystem degradation. Threat to native species by predation and disease.	Weed introductions. Livestock grazing. Aquaculture escapees. Existing pests. Garden escapees.
	Nutrient enrichment.	Declining water quality. Algal blooms – macro and micro. Fish kills. Loss of seagrass. River pool stagnation. Anoxic events.	Nutrient and organic matter transport from catchments.
	Point source pollution.	Declining water quality. Algal blooms – macro and micro. Fish and invertebrate fauna kills. Loss of seagrass. River pool stagnation. Anoxic events. Environmental contamination.	Discharge of pollutants. Biocide use.
Hydrological	Stream salinisation.	Decreased useability of water. Dying vegetation. Changes from freshwater to saltwater conditions. Salinised stream water quality. Exposed foreshores. Loss of diversity.	Altered catchment hydrology brought about by clearing.
	Waterlogging and inundation.	Dying vegetation. Increased extent of water logging along waterways. Stagnation.	Altered catchment hydrology brought about by clearing. Inadequate drainage. Sedimentation of waterways.

Theme	Issue	Condition	Cause/Pressure
Hydrological cont'd.	Stream flow changes.	Declining basal flows. Vacant niches for invasive species. Blockage to fish passage. Altered flow regimes. Drowned river valleys. Altered timing, pattern and volume of flow. Loss of wetland and floodplain connection. Altered stream ecology.	Damming of streams. Building weirs, culverts and crossings. Pumping from streams and wetlands. Pumping from streams and wetlands. Water drainage and extraction. Increased groundwater levels.
	Flooding.	Increased flood frequency. Increased flood damage. Use of floodplain for development. Erosion and avulsions.	Inappropriate floodplain development.
	Drainage.	Degraded drains. Erosion and sedimentation. Weed infestation. Eutrophication of downstream waterways.	Rural and urban drainage. Channel straightening and desnagging.
Geomorphological	Channel changes.	Channel widening and deepening. Changes to riffle patterns. In-stream erosion and sedimentation. Floodplain erosion. Loss of river pools.	Altered catchment discharge regime and loss of vegetation. Direct excavation of channel bed.

Incorporation of waterways management into regional strategies

During the development of a regional strategy, the stakeholders will decide on a vision for their region based on their values and priority issues. From these they will set goals and identify objectives and strategies for achieving their realisation. The priority issues facing waterways in any region will differ, but there are a number in common to many areas of the state that may warrant consideration for inclusion in a regional strategy (see Table 1). Many of these issues will need to be approached at a catchment or local scale. Where these issues are widespread, have the potential to impact broadly on social or economic concerns or are viewed as a priority in a region, they may be identified and tackled through a regional strategy. Regional planning would take a largely strategic viewpoint, identifying and prioritising areas for action at a catchment scale and defining mechanisms to increase understanding of the problem and its solution, as well as approaches to engaging stakeholders. Organisations looking to incorporate waterways management into regional NRM strategies should refer to the principles and process underpinning waterways management (Water and Rivers Commission, River Restoration Report RR 11).

References and further reading

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