AVON
CATCHMENT COUNCIL

AVON INVESTMENT PLAN 2005–2006

Avon Catchment Council
February 2005

GOVERNMENT OF WESTERN AUSTRALIA

Swan Avon INTEGRATED CATCHMENT MANAGEMENT

Australian Government

SUMMARY

The Avon Investment Plan 2005-06 is the culmination of an extensive planning process carried out over 4 months from November 2004 to February 2005. The process has involved direct input from over 50 community, NGO and Agency (Australian, State and Local Government) representatives, who have helped to prioritise resource condition and Management Action Targets drawn from the regional strategy. The information presented identifies realistic and achievable targets for investment in the 2005-06 financial year, which will significantly contribute to managing resource change within the region.

The plan identifies investment opportunities totaling $13.79m (plus an additional strategic reserve contingency) sourced from State and Australian Governments through NAP and NHT and supported by community funding. Planning for the second and third years of investment will be carried out from March to December 2005. This planning will incorporate a high level of project development to provide assurances to current investors and to offer investment opportunities to other organisations. A summary of proposed investment is shown in table S1. Indicative investment for 2006-07 and 2007-08 has been noted and will be better developed during March to December 2005.

On ground investment will be delivered through a series of projects and will be coordinated through three delivery programs that have been created to integrate activities across resource themes (Water, Land and Biodiversity). The programs are:

1. Integrated Water Management.

2. Sustainable Industries.

3. Natural Diversity.

Capacity building is not delivered via the delivery program structure. It is however, considered an important function and a large amount of work associated with identifying skills gaps necessary to be addressed to achieve resource condition targets has been carried out. This review has identified coordination and delivery of monitoring and evaluation, stakeholder relations, indigenous NRM and building strategic partnerships are priority activities and should be addressed as functional operations of the ACC.

Table S1. Budget summary

Program and sub-programs	NHT	NAP	Total
Integrated Water Management **Sub-programs:** 1. Managing surface water (farm water planning and maintaining environmental flows).		580,000	580,000
2. Water quality (nutrient, sediment and wastewater management (mining, urban and agricultural)).		736,000	736,000

3. Dryland salinity (managing watertables in upper and middle catchments, valley floors).		1,750,000	1,750,000
4. Asset management (groundwater aquifers, roads at risk, rural towns).		1,014,000	1,014,000
Contribution to organisational management costs*			**283,650**
Sub total			**4,363,650**
Sustainable Industries **Sub-programs:** 1. Biosecurity (problem animal and plant pests).	235,000		235,000
2. Soil acidity (management of soil pH in agricultural systems).		831,000	831,000
3. Soil health.		689,000	689,000
Contribution to organisational management costs			**128,100**
Sub total			**1,883,100**
Natural Diversity **Sub-programs:** 1.Biodiversity threat management (fire).	80,000		80,000
2. Asset management (river pools, tributaries, native species, cultural and heritage values natural ecological communities, ecosystems, landscapes/ecoscapes).	1,745,000	521,5000	6,960,000
Contribution to organisational management costs			**503,250**
Sub total			**7,543,250**
Total*			**13,790,000**

*Project delivery management, functional management positions, program management and administration – see section 6

Figures S1 to S4 provide an overview of the allocation of funding per output category, per program area and investment source.

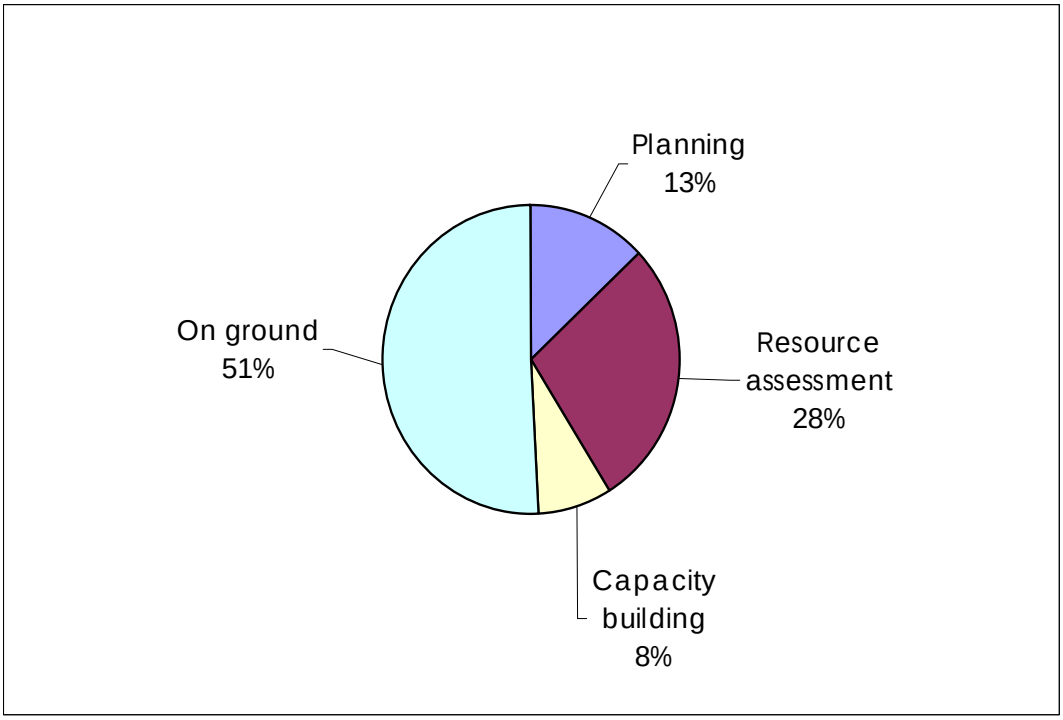


Figure S1 Allocation of investment per output category 2005-06

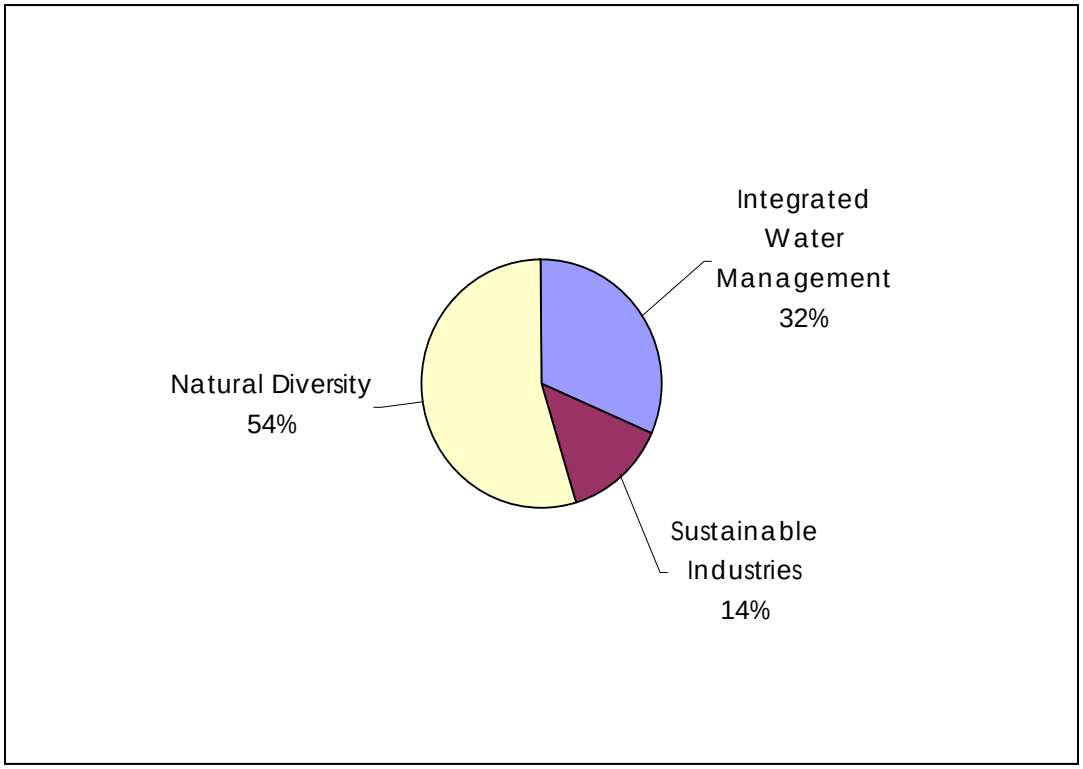


Figure S2 Allocation of investment per program area 2005-06

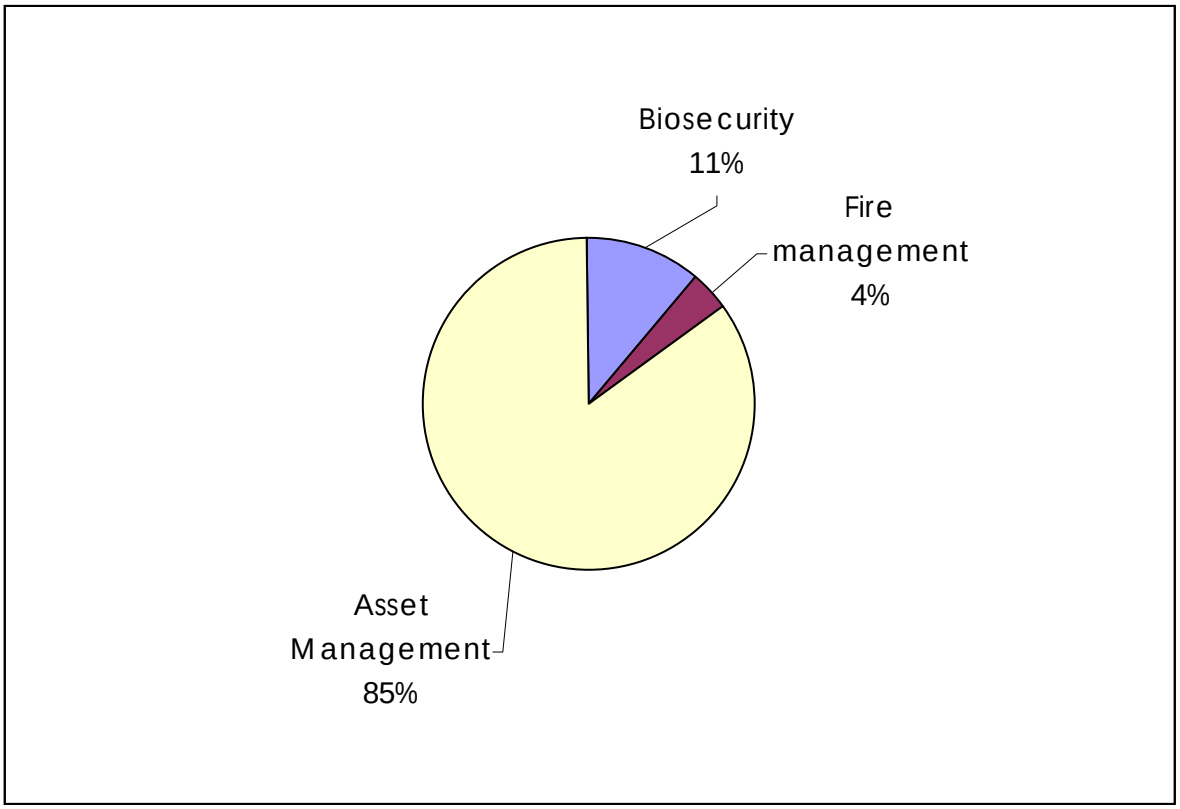


Figure S4 Investment allocation – NHT 2005-06

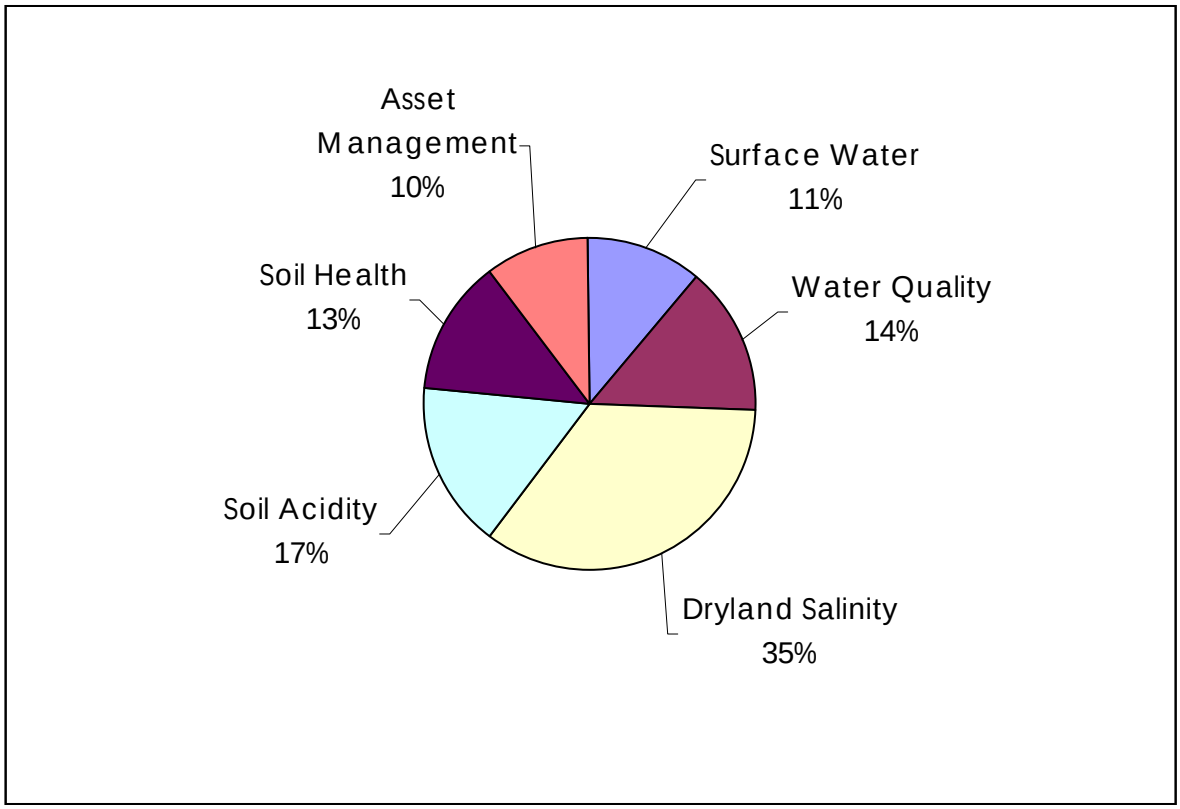


Figure S3 Investment allocation -NAP 2005-06

The investment planning process, as detailed in the Regional NRM Strategy, has guided production of this plan. Evolution of the processes described has occurred through interaction with funding organisations and community groups, however much of the investment prioritisation process and delivery program structure has been retained.

The committee structure established to assist investment planning has included an NRM Program Committee, comprising community, agency and Council representation to oversee investment planning and four sub-program committees linked to delivery programs and capacity building. The NRM Program Committee has established a logical target prioritisation and budget allocation process, while sub-program committees have had responsibility for prioritisation of Management Action Targets and project development.

The projects and program structure strongly align to NAP and NHT priorities and continuous improvement will occur through the ongoing project development phase (initially to December 2005).

CONTENTS

Section 1

1. INTRODUCTION

This document is the first stage of the Avon Investment Plan (AIP) and identifies investment opportunities for the 2005-06 financial year, with indicative investment identified for the following two financial years. This approach has been taken due to the short time period between completion of the Regional NRM Strategy and commencement of investment planning. Consequently, the AIP also primarily identifies opportunities for investment from NHT and NAP.

The planning process has involved a series of actions to prioritise 20 year Targets, Management Action Targets (MATs) and Management Actions (MAs) drawn from the Regional NRM Strategy. The results of this process have been the identification of priority threats and asset classes and incorporation of priority targets into three delivery program structures. To guide this process the ACC has established a committee structure with membership drawn from community, agencies, industry and non-government organisations.

Opportunities for cooperative funding from other organisations have not been investigated fully and further investment planning and detailed project planning is scheduled for March to December 2005. This will allow a second phase (investment years 2-3) of the AIP to be further developed.

The budget allocation process associated with investment planning has applied principles that ensure adequate funding for both asset and threat management, although the primary focus for this phase of investment planning is asset management. Delivery programs reflect this priority and detailed project schedules have been developed to identify specific points of investment. A total of $13.79m sourced from NHT and NAP has been allocated across delivery programs and functional management activities, with an indication provided of an additional 25%, potentially available through the strategic reserve.

The Avon Catchment Council (ACC) has recognised ongoing commitments to Australian, State and Local Governments and agreements already in place with the Swan Catchment Council (SCC). Ongoing investment planning will include strengthening such commitments and incorporating partnerships to address NRM issues in crown/pastoral zones within the Avon. The second and third years of investment planning will also identify cross regional opportunities and/or efficiencies where issues extend beyond the regional boundary.

The AIP is directly linked to regional strategic planning and a review of the Strategy document is recommended to enable a better understanding of the terms and processes utilised.

The plan is presented in two sections. Section 1 provides an overview of the planning process and Section 2 details program and project investment.

2 LINKAGES

2.1 Linkages to the Regional NRM Strategy

2.1.1 Targets

The intention of the ACC, as demonstrated in the Avon NRM Strategy, is to link resource condition targets (20 year Targets), MATs and MAs directly to investment planning. The investment priority is the 3-5 year MAT level. A detailed prioritisation process of both 20 year Targets and MATs, to enable a realistic and achievable investment plan to be developed, has been carried out. The process has utilised the prioritisation methodology outlined in the NRM Strategy and there has also been a level of refinement of processes that naturally occurs when continuous improvement practice is applied. The number of MATs, the time sequencing of MATs and the availability of funding naturally limits the amount of actions carried out over the life span of the proposed investment plan.

Figure 2.1, describes the strategy and investment plan development process, as outlined in the Regional Strategy document. The first set of actions in the delivery and review component of figure 2.1 describes the identification of regional assets and associated project development. The first stage of this activity has been carried out and several hundred assets of regional, state and national importance have been identified, however, integration with project planning has not commenced, due to time limiting factors. To address this issue the AIP has identified that for the first year of investment implementation a significant amount of work needs to be completed to better identify assets. There will also be greater capacity due to outcomes of project actions aimed at asset identification, post the first year of investment to target asset management through the Local Area Planning process. It should also be noted that a large amount of detailed project planning will occur immediately following investment plan submission. This work will include development of co-funding opportunities for regional organisations, development of partnership agreements etc.

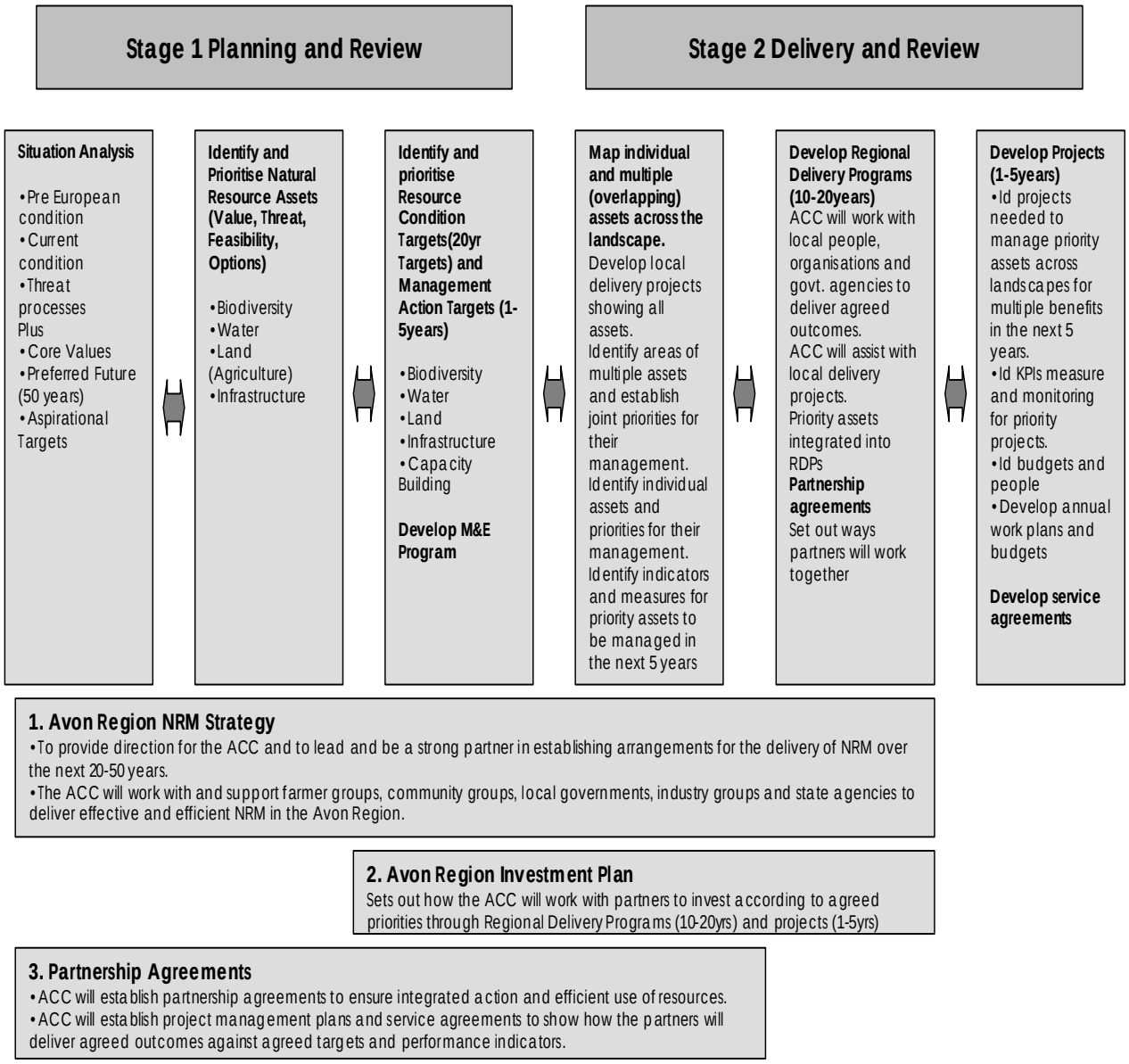


Figure 2.1 Planning and Delivery structure

2.2 Local Area Planning and asset collation

Local Area Planning is an integral part of the delivery and review (stage 2) component shown in figure 2.1and is primarily associated with the process of asset identification and collation. This level of planning recognises and provides a link between locally significant assets (at the Local Government scale) and regional, state and national assets. It also notes that local assets are often best managed by local communities. It is not the primary delivery mechanism for NRM within the region but is a component of the process. To date Local Area Planning has been carried out in 14 of the 34 Local Government Areas (LGAs) represented in the Avon Region. This work was completed in 2004 and was supported by the ACC.

Local Area Planning also provides a link between regional NRM planning and local priority recognition and identification and planning for the management of local iconic assets is an integral part of Local Area Plans (LAPs). In order to align to the Regional Strategy and AIP all LAPs were required to focus development on the three program areas (Integrated Water, Sustainable Industries and Natural Diversity). Many plans still require significant work to reach completion.

To support the continued development of LAPs and to assist in asset identification the following course of action will be taken in the second half of 2005:

- completion of asset collation – state, national and regional;
- research and incorporation of LGA corporate/strategic/land management planning into LAPs;
- identification and prioritisation of locally significant assets; and
- fostering of demonstrable links between regional strategic planning and LAPs to ensure locally significant, iconic assets and NRM threats are managed by local communities.

This is considered a functional management priority for the next 6 months (post AIP approval). Funding for this activity will be allocated from the functional management support component built into all project requests and from project activities specifically targeted at asset identification.

2.1.3 Planning

Regional investment planning has generally followed the process described in sections five and six of the Strategy document and shown in figure 2.1. The process for 20 year Target and MAT prioritisation have been adapted from SIF criteria and are described in three stages:

1. Assessment of trade off values.
2. Identifying priorities for investment.
3. MAT sequencing.

2.1.4 Delivery mechanisms

The process for delivery of management actions described in the Regional Strategy has generally been followed. The Strategy describes the delivery mechanism as being four Regional Delivery Programs, coordinated by a delivery manager and supported by sub-committees:

1. Integrated Water Management

2. Sustainable Industry Development

3. Natural Diversity

4. Capacity Building

Capacity building is not being addressed as a delivery program in the AIP. This has occurred, as it is not possible to set physical 20 year Targets for capacity building activities. Capacity building is an enabling activity that is considered an important and primary function of the ACC and is essential for project implementation. The skills necessary to carry out the range of functions associated with capacity building are not currently incorporated with in the ACC's structure and section 6 provides a context of how such activities may be delivered.

The 20 year Targets, MATs and MAs addressed by each of the three programs have been further developed and now reflect a high level of integration of activities across programs. Program descriptions are provided in section 7.

2.2 Delivering to Commonwealth and State NRM outcomes

2.2.1 Regional investment plans guidelines and processes

Under the NHT and NAP Bilateral Agreement between the Australian and State governments regional NRM groups are responsible for developing regional NRM strategies for accreditation and implementing agreed components of the strategies and investment plans. To guide the development of investment plans the NHT /NAP obligations have been described in the Regional Investment Plans Guidelines and Processes paper (Sept 2004). The AIP has followed the principles outlined in this document including:

- State, Local and Australian Government agency representatives are important partners in the planning process. Representatives have assisted in the development of key aspects of the plan at the program and sub-program level, the identification of opportunities for joint funding of activities and the technical review of project proposals.

- Stakeholders from the Avon community and non-government organisations represented in the region have been highly involved in investment planning. Greening Australia (WA), WWF, farm production groups (e.g. Facey), Community Landcare Coordinators and industry representatives (including the Wheatbelt

Channel Group) have all had significant input at the sub-program committee level and have provided valuable input to the project development process.

- Due to the short time period between Regional Strategy completion and the commencement of investment planning, the ACC have decided to commit to a two stage investment plan. The AIP, for submission, in February 2005, will concentrate on investment for the first year of the plan (2005-06). Opportunities for cooperative funding from other organisations have been identified at the program level and this is reflected in the project budget tables. Further opportunities will be sought prior to July 2005.

- Salinity investment framework decision making processes have been applied and are demonstrated at the planning phase highlighted in section 2.1. All targets have been developed utilising the national NRM "Standards and Targets Framework – Matters for Target".

- Regional scale capacity building activities have been included as functional management activities in investment planning and will provide support across all delivery programs.

2.3 Swan Region MOU

The allocation of NAP boundaries has necessitated that the SCC and the ACC develop a Memorandum of Understanding (MOU) for the management of salinity and water quality issues in the Avon-Upper Swan Region. This region includes the SCC's North East (Brockman River and Ellen Brook Catchments) and Eastern Hills sub-regions (Wooroloo Brook and the Upper Helena River).

ACC and SCC representatives met in January and February 2005 to discuss the proposed project activities relevant to the Avon-Upper Swan Region and these have been incorporated into project schedules (Avon-Upper Swan Region commitments highlighted in schedules) in section 7.

2.4 Crown/Pastoral

The Avon Region covers 11.8 million hectares of which 3.5 million hectares is crown/pastoral land. NRM in the crown/pastoral zone is coordinated by the Rangelands NRM Coordinating Group. The ACC has indicated a willingness to align relevant program activities with this group. There are a number of threat based and asset focused issues that are addressed by both the Regional Strategy and the AIP that will positively impact the crown/pastoral area. These activities include:

- Biosecurity – ensuring that biosecurity threats from crown/pastoral land to agricultural land and vice versa are understood in regards to their spatial distribution and impacts. This is particularly relevant to such target species as wild dogs.

- A number of natural diversity projects that address ecoscapes, ecosystems, species management and fire management are applicable within the crown/pastoral region due to the landscape focus of these activities.

- Groundwater management, particularly in regards to mineral operations covers the crown/pastoral region, as do projects that focus on management of the Avon River and its tributaries.

Ongoing negotiation to facilitate coordinated project activities for this area has been highlighted by the ACC for action.

3 INVESTMENT PLAN DEVELOPMENT

3.1 Committee structures

The Regional NRM Strategy details a program structure for delivery of regional investment. The structure is based on the establishment of Regional Delivery Programs, with program activities determined by the prioritisation of 20 year Targets. On review of the proposed organisational process the ACC determined that committees be established to both guide the development of the AIP and projects and activities within the delivery programs. The committee structure developed comprises a Natural Resource Management Program Committee (NRMPC) and four sub-committees (figure 3.1). The development of the described committee structure and decision making process used by all committees has been greatly influenced by the community consultation process associated with completion of the NRM Strategy (carried out in February and May 2004).

3.1.1 Natural Resource Management Program Committee

Membership of the NRMPC is described below. During the course of the investment planning phase this group has co-opted representatives from the four sub-committees to assist in the decision making process. The Committee is chaired by a Council community member and decisions must be ratified by the ACC.

The members of the NRMPC are:

- Russell Crook (Chair – ACC community member).
- Fred Bremner (ACC community member and Integrated Water Management Convenor).
- Colin Stacey (ACC community member and Sustainable Industries Program Convenor).
- Merrilyn Temby (ACC community member and Capacity Building Program Convenor).
- Cec McConnell (ACC Agency representative– Department of Agriculture).
- Bruce Bone (ACC Agency representative– Department of CALM).
- Andrew Prior (ACC Agency representative – Wheatbelt Development Commission).
- Martin Revell (Agency representative – Department of Environment).
- Jo Burges (community representative – capacity building).

- Glenice Batchelor (CLC representative).
- Sally Gomes-Trent (community representative and Natural Diversity Program Convenor).
- Peter Sullivan (ACC Programs Manager).
- Catherine Lyons (Regional NRM Facilitator).

This Committee's responsibilities include:

- To report and make recommendations for the advancement of natural resource management in the Avon catchment region to the ACC.
- To report and make recommendations on progress towards achieving the Regional NRM Strategy and the AIP.
- To act as an interim AIP Project Steering Committee.
- To be accountable for the Avon investment planning process.
- To lead the investment plan process in all aspects from process development to investment plan production and delivery. The key over-riding deliverable is an AIP approved by the ACC and submitted to the JSC by 28 February 2005.
- To undertake and deliver within timeframes the key tasks allocated to the Committee in the investment plan process.
- To provide leadership, coordinate and resource all supporting investment plan Committees, teams and tasks to achieve their tasks in the investment plan process.

3.1.2. Sub-committees

Four sub-committees have been established and have responsibility for the management of delivery programs. The sub-committees are:

- Integrated Water Management;
- Sustainable Industries;
- Natural Diversity; and
- Capacity Building (this program focussed on development of functional management positions to support programs, projects and the ACC).

Membership and program descriptions are detailed in sections 4 and 7.

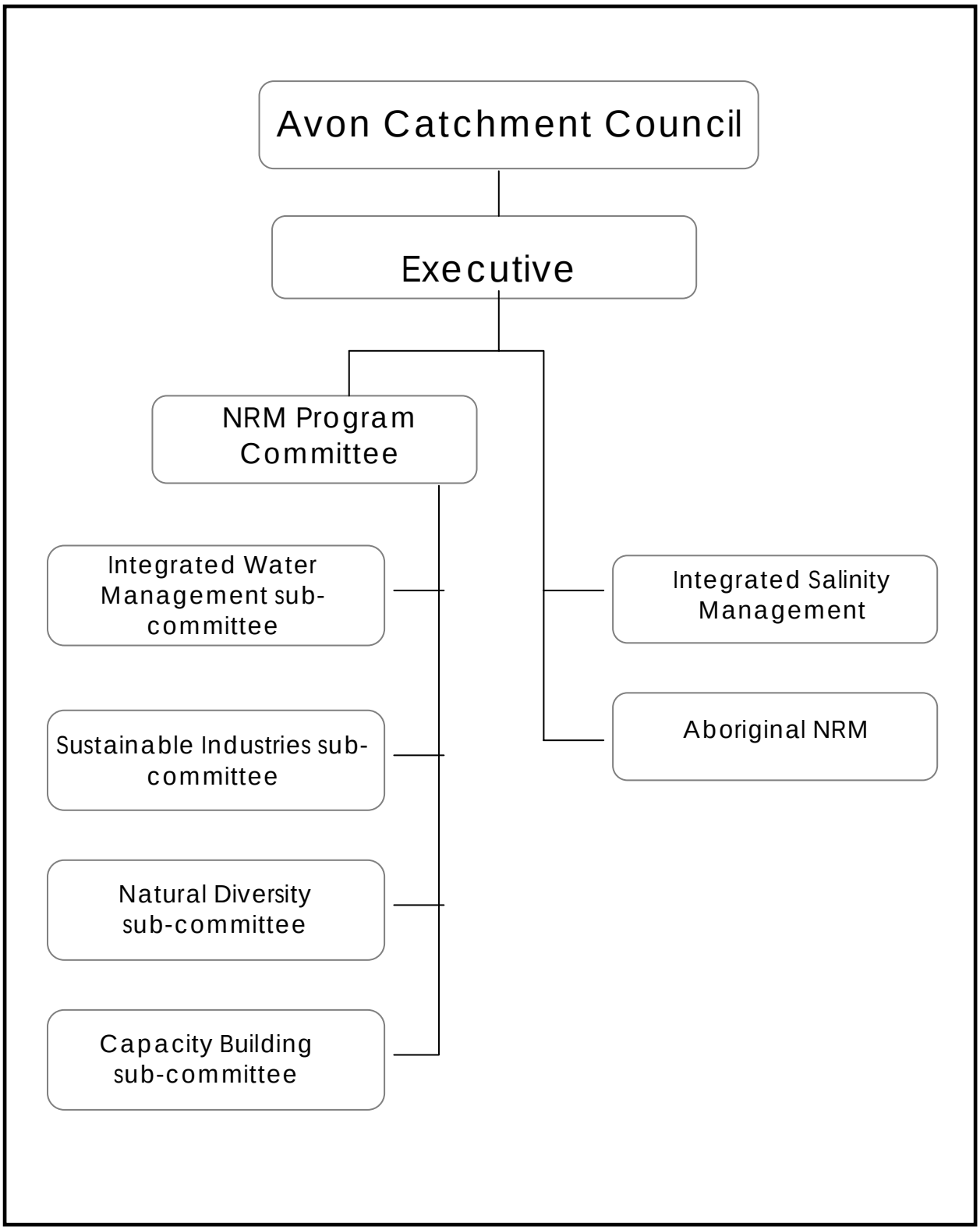


Figure 3.1 Interim committee structure

3.2 Planning process overview

The NRMPC was tasked with guiding the process for regional investment planning and all sub-committees, except for Capacity Building, focussed on MAT prioritisation and project development. An overview of the investment planning process is shown in figure 3.2. The NRMPC has completed the following activities as part of the investment planning process:

- identification of regionally significant threats across all asset classes;
- prioritisation of 20 year targets;
- review of asset and priority threat distribution across all asset classes;
- development of the indicative funding split between threats, based on priority;
- ensured that all assets classes are addressed in the investment planning process;
- determined the composition of delivery programs, which involved reallocation of both threat and asset 20 year targets and MATs between programs, to create highly integrated delivery programs;
- development of criteria for prioritising MATs; and
- development of the indicative budget allocation per program area.

The four sub-committees have been responsible for the majority of prioritisation and project development activities. Tasks completed in support of investment planning include:

- prioritising MATs using NRMPC developed criteria, this was a large and time consuming task, involving the prioritising upward of 30 MATs;
- development of program goals;
- grouping of MATs into project categories; and
- development of project schedules.

The Capacity Building sub-committee operated slightly differently, due to the lack of capacity building targets in the Strategy. This sub-committee examining and addressed functional management and skills gaps within the ACC.

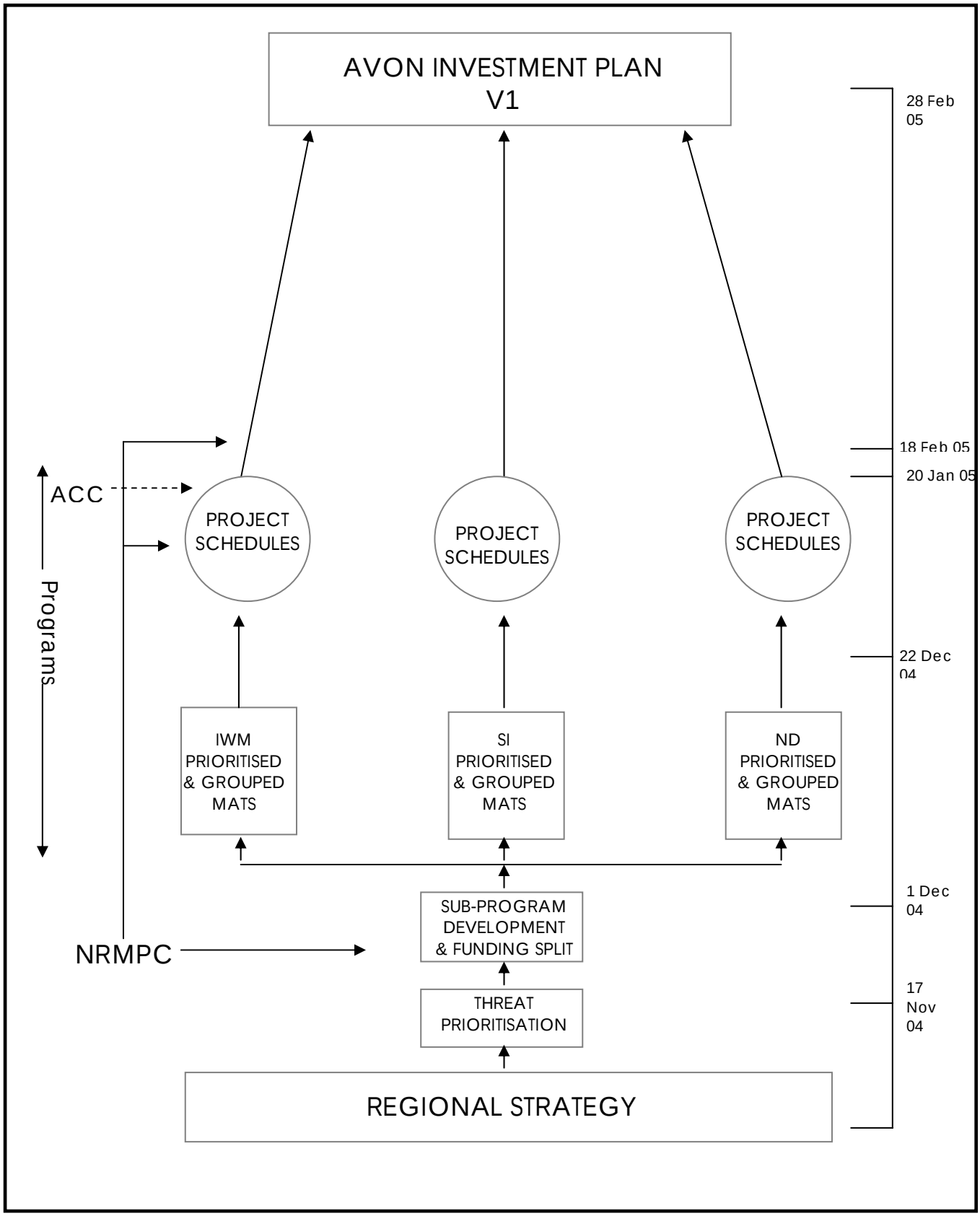


Figure 3.2 Investment planning process

3.3 Prioritisation process

Two points of investment have been identified from 20 year Targets and MATs:

1. Threat management.

2. Public asset management.

Public assets have the greatest value in terms of investment of public dollars. Therefore, public assets that are threatened have been allocated the majority of funding for the current investment planning phase.

3.3.1 Threats

A summary of regional resource threats, drawn from the Regional Strategy and their relevance to resource themes has been outlined in table 3.1.

Table 3.1 Threat by resource theme matrix

Land resource theme Threats	Biodiversity resource theme	Water resource theme
Dryland Salinity	Salinity	Salinity
Flooding	N/A	Flooding
Nutrient loss/eutrophication	Nutrient enrichment	Nutrient enrichment
N/A	Acidity (Water)	Acid groundwater
Waterlogging	Waterlogging	N/A
N/A	Sedimentation	Sedimentation
Water repellence, Water erosion	Increased surface water run off	
Biosecurity	Weeds, animal pests and diseases	
Land use pressure	Over allocation of water, Incompatible land use, Physical disturbance, Mismanagement (land)	
Soil structure decline	Fire	
Subsurface compaction	Fertiliser	
Surface water supply shortages	Pesticide use	
Soil Acidity	Overgrazing	
Wind erosion	Drainage discharge	
Soil fertility decline	Clearing	

Prioritisation the top 12, cross asset theme, threats was made through application of the following criteria (by the NRMPC) to each resource theme:

- High (3 points)=75% of assets will be affected by this threat over the next 20 years.
- Moderate (2 points) = 50% of assets will be affected by this threat over the next 20 years
- Low (1 point) = less than 50% of assets will be affected by this threat over the next 20 years.

The NRMPC considered the imminent nature of the threat, its current and potential severity and the extent of its impact, when applying the criteria outlined. The results of this prioritisation process are shown in table 3.2.

Table 3.2 Threat prioritisation

Resource themes Threats	Land	Water	Biodiversity	Total
Salinity	2	3	3	8
Waterlogging	1	1	2	4
Water erosion	2	1	1	4
Soil acidity	3	0	0	3
Altered water regimes	1	3	1	5
Sub-surface compaction	2	1	0	3
Soil fertility	3	0	0	3
Land use pressure	1	1	1	3
Biosecurity	3	2	2	7
Disease	3	1	2	6
Inappropriate fire	1	2	3	6
Fragmentation	0	1	3	4

The shaded areas in table 3.2 identify the five priority threats, which are:

- **salinity,** incorporating all dryland salinity processes, seepage, valley floor salinity and groundwater rise.
- **water quality (altered water regimes)***, including nutrient loss, water quality issues, eutrophication and acid water.
- **surface water(altered water regimes) *,** incorporating increased surface water run off.

- **biosecurity,** incorporating feral animals, weeds, exotic and endemic diseases e.g. phytophthora; and

- **inappropriate fire** regimes, which are a significant threat to natural diversity, water quality and land assets if not managed appropriately and this is considered a major issue for local government.

Others threats nominated by the NRMPC, after review of the proposed priority list:

- **soil acidity**; and

- **fragmentation,** which has resulted from broad scale clearing and creates "a lack of biological resources" to sustain a species.

* Altered water regimes was broken down into two key threats that were identified as being the most regionally significant.

3.3.2 Public assets

Regional priority asset classes addressed by the investment plan have been identified through review of 20 year Targets in the Regional Strategy. The asset classes addressed are those that relate to specific asset management, rather than generic concepts. Consequently, the following asset classes have been given priority, noting that the land resource theme is not represented due to its threat management focus:

- **Landscapes/ecoscapes**, are the mosaic of ecosystems that cross the landscape from "ridge to ridge". They include both terrestrial and aquatic ecoscapes and incorporate wetland complexes, large scale reserves, rivers, river tributaries and pools. Managing resources at such a landscape scale encompasses a range of integrated threat management responses with the potential for multiple benefit outcomes.

- **Regional groundwater aquifers** are potential water supply sources for domestic and industry use and have potential impacts on increased flooding. They need to be better understood and managed in a sustainable manner.

- **Infrastructure, including roads and towns** at risk from salinity, form the basis for the bulk of community assets within the region. Cultural, recreational and community facilities are all vital in helping to sustain the social resource base within the region.

- **Native species** (all naturally occurring flora and fauna species). The region has 4000 identified plant species, over 400 animal species and unknown number of invertebrate species. Species condition is closely linked to location and many plants and animals that inhabit valley floor areas are severely threatened by processes such as salinity.

- **Natural ecological communities.** The region has a large variety of distinctive ecological communities, including 10 Threatened Ecological Communities. Of these one is critically endangered, five are endangered and four are vulnerable.

- **Ecosystems** (discrete sets of natural ecological communities) including aquatic and terrestrial ecosystems, as well as granite outcrops and lateritic breakaways. The region contains six fresh and saline ecosystems of national or sub-regional importance, as well as a large number of wetlands and lake chains. There is a representative amount of pre European vegetation associations, including Salmon gum, wandoo and York gum woodlands and such associations have both a biodiversity and iconic value.

4 DELIVERY PROGRAMS

4.1 Integration and triple bottom line outcomes

The ACC has chosen to develop integrated delivery programs that address resource management with a focus on triple bottom line outcomes.

The triple bottom line approach utilised in program development has applied the following principles to threat and asset management:

- Threat management activities are primarily focused on industry development, extension activities and building capacity. The infrastructure protection component of the Integrated Water Management Program provides a good example of this approach. This activity aims to manage a resource asset, being groundwater, via extension and industry development, while taking into consideration the social outcomes of infrastructure loss.

- Asset management involves a greater focus on direct environmental outcomes, including asset identification, biodiversity value determination, protection and enhancement etc. While review of all project components also show a level of extension activities aimed at encouraging broader participation in and understanding of asset management.

Projects are the delivery point for programs and at this level triple bottom line values, that utilise SIF principles associated with valuing public asset management, have also been applied. Projects have identified the following:

- identification of the potential benefits to resource assets the project will have and recognition of specific threats being managed;

- contribution the project will have to resource condition change;

- contribution to broader national NRM outcomes;

- threat management responses that consider and manage threats, at a catchment scale, that will generally impact the asset being managed;

- ensuring that threat management focussed projects are developed in the context of industry development, with positive economic outcomes for land managers; and

- linkages to community capacity activities to encourage participation and long term community ownership are identified.

- There has also been ongoing planning in the area of community capacity building and all programs have been asked to demonstrate linkages to such outcomes when developing projects.

The project schedules (section 7) demonstrate application of this process.

4.2 Methodology

4.2.1 Program development and integration

The allocation of priority 20 year Targets, MATs and MAs to the three programs was carried out with a focus on integration of activities across program areas.

The underlying principles associated with development of the agreed delivery program structure (table 4.1) are:

- programs are closely aligned to Regional Delivery Program groupings, as outlined in the Strategy;
- water threat issues are grouped, as this is the context they can be effectively managed in;
- problem plant and animal pests, including those impacting on biodiversity are grouped together and are managed by Sustainable Industries; and
- in regards to water assets, there is a focus on managing not just water resources but the biodiversity values associated with such assets and consequently they have been grouped under Natural Diversity.

Ongoing capacity to manage programs will be the responsibility of project delivery managers with support from functional delivery managers and from sub-committees. This structure is described in section 6.

Table 4.1 Investment program structure

1. Integrated Water Management Program
Sub-programs: 1. Managing surface water (farm water planning and maintaining environmental flows). 2. Water quality (nutrient, sediment and wastewater management (mining, urban and agricultural)). 3. Dryland salinity (managing watertables in upper and middle catchments, valley floors). 4. Asset management (groundwater aquifers, roads at risk, rural towns)
2. Sustainable Industries Program
Sub-programs: 1. Biosecurity (problem animal and plant pests). 2. Soil acidity (management of soil pH in agricultural systems). 3. Soil health.
3. Natural Diversity Program
Sub-programs: 1.Biodiversity threat management (fire and fragmentation). 2. Asset management (river pools, tributaries, native species, cultural and heritage values natural ecological communities, ecosystems, landscapes/ecoscapes).

4.2.2 Target Prioritisation

The three sub-program committees (Integrated Water, Sustainable Industries and Natural Diversity) were tasked with the prioritisation of 20 year threat focussed targets and prioritisation of MATs for both assets and threats.

Priority 20 year targets identified through this process are shown in table 4.2 and further details are provided in tables 7.1 and 7.2.

Table 4.2 Programs and 20 year Targets

1. Integrated Water Management Program	
Sub-programs:	Priority 20 year targets*
1. Managing surface water (farm water planning and maintaining environmental flows).	$W_3T_{20}1$, $W_3T_{20}2$
2. Water quality (nutrient, sediment and wastewater management (mining, urban and agricultural)).	$W_1T_{20}1$, $W_4T_{20}3$, $W_4T_{20}4$
3. Dryland salinity (managing watertables in upper and middle catchments, valley floors).	L_2 T_{20} 1, L_2 T_{20} 2
4. Asset management (groundwater aquifers, roads at risk, rural towns)	$W_4T_{20}1$, $W_4T_{20}2$, I_1T_{20} 1, I_3T_{20} 1
2. Sustainable Industries Program	
Sub-programs:	Priority 20 year targets
1. Biosecurity (problem animal and plant pests).	L_3 T_{20} 1, $B_5T_{20}5a$
2. Soil acidity (management of soil pH in agricultural systems).	L_1 T_{20} 1
3. Soil health.	$L_5T_{20}1$
3. Natural Diversity Program	
Sub-programs:	
1.Biodiversity threat management (fire and fragmentation).	$B_5T_{20}5a$
2. Asset management (river pools, tributaries, native species, cultural and heritage values natural ecological communities, ecosystems, landscapes/ecoscapes).	W_5T_{20} 1,W_1T_{20} 2, $W_2T_{20}1$, $B_1T_{20}1a$, $B_1T_{20}1b$, $B_1T_{20}1c$, $B_2T_{20}2a$, $B_2T_{20}2b$, $B_2T_{20}2c$, $B_3T_{20}3a$, $B_3T_{20}3b$, $B_4T_{20}4$

*Drawn from the Avon NRM Strategy and noted in project schedules (section 7)

4.2.2.1 MAT prioritisation

The following criteria, adapted from section 3 of the Regional Strategy, were applied by sub-program committees to prioritise MATs:

1. Has there been minimal or no prior investment in the target?

2. Is there a level of urgency required to implement the target based on the level of threat (to an asset or cross regionally)?

3. Does the target need to be completed first to enable other actions to be carried out?

4. Is the target technically feasible?

5. Will the target achieve multiple outcomes (across programs and within the program)?

These criteria were not weighted, due to the complexity associated with development and analysis. A yes/no response was allocated per criterion, per MAT and a tally taken of positive responses. All sub-program committees chose to further add explanation to the prioritisation decisions reached.

From this assessment an investment ranking was applied, as described in section 3 of the Regional Strategy:

A = urgent first step.

B = important but not time critical.

C = important but linked to other targets.

The results of this process form the basis for project development and prioritised MATs linked to projects are shown in section 7.6.

5 BUDGET ALLOCATION

5.1 Asset and threat investment splits

5.1.1 Asset and threat investment allocation

An ideal approach to achieve the aspirational goals of the ACC is to manage all threats across the region over the next 20-50 years. Accordingly, there needs to be significant investment in threat management, irrespective of the location of assets. If, however, asset management is not occurring in unison with threat management it could be assumed that many high value public assets would be lost in the short to medium term. This will occur, as the management of known, broad scale, threats is unlikely to progress rapidly enough to stop the loss of particular assets. Over a fifty year time scale a higher proportion of investment should initially be directed to the asset management stream, while the management of threats becomes effective enough for general asset protection (figure 5.1). However, investment in specific assets must consider the broad scale catchment threats that may impact the long term condition of the particular asset. Without addressing this aspect, investing in specific asset management may be a poor investment. This approach is consistent with SIF principles regarding public investment in asset management.

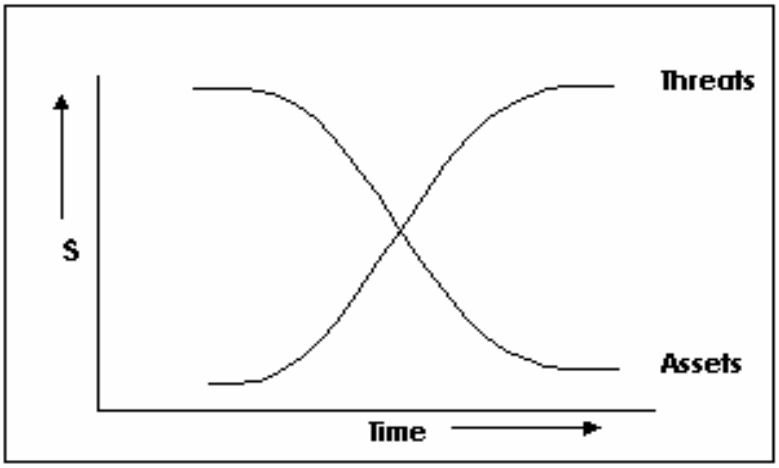


Figure 5.1 Investment in assets and threats

This approach was considered to translate to a 60:40 investment split between asset management and threat management, as a guide for the first year of funding. This ratio accounts for the need to focus spending of public funding on public asset management, while taking into account that the majority of threatening processes are occurring at a landscape scale and require ongoing management actions.

5.1.2 Asset investment allocation

The management of high value public assets should be a priority action, as such prioritisation of assets classes at a 20 year Target scale has not been carried out. The priority actions associated with asset management have been identified at the delivery program level, where MATs have been prioritised based on criteria described in section 4.2.2.1.

Ongoing management of assets beyond the first year of the investment plan will involve the utilisation of an asset identification and prioritisation process carried out within the region in 2004. This process identified state and national assets and through a series of shire based assessments, regional priority assets (including those of iconic nature). It is considered, however, that the level of asset information available to the ACC at present requires further review. To assist this process and as part of the first year of investment, all program activities that are focussed on asset management have a resource assessment component. This will also further enable better incorporation of regional priorities into Local Area Planning.

5.1.3 Threat investment allocation

Effective allocation of funding to the threat management component of the AIP required that the 40% threat funding allocation was further prioritised between threats based on identified regional priorities. This was carried out by the NRMPC applying the following criteria to priority threats:

1. Do it now or we will not be able to manage the issue in the future (now or never).

2. It will cost too much to manage the threat in the future, if it is not addressed now.

3. The longer the threat is left, the potential for more environmental harm to result will increase.

4. If nothing is done to manage the threat now will it have any impact on resource condition change?

5. Will managing the threat have multiple outcomes?

The focus in applying the criteria was the lifecycle of the current AIP. There was, however, an acknowledgement that there is a need to address some threats now, regardless, due to risk factors arising over the next 5 years.

The outcome of the prioritisation process is shown in table 5.1. The level of positive response (yes) determined the 70:30 funding allocation of threats.

Table 5.1 Threat prioritisation

Criteria Threats	Do it now or not able to do it in the future	Cost prohibitive if not addressed	Increased Environmental impact if not addressed	Can it be delayed by 3-5yrs	Multiple Outcomes	Funding Split (of total 40% allocated to threats)
Surface Water	No	No	Yes	No	Yes, Links to salinity management	30%
Water Quality	Yes	Yes	Yes	No	Yes	70%
Salinity	Yes	Yes	Yes	No	Yes, Links to Surface Water.	70%
Biosecurity	Yes	Yes	Yes	No	Yes	70%
Soil Acidity	No	Yes	Yes	Yes	No	30%
Fragmentation	Yes	Yes	Yes	No	Yes	70%
Fire	Yes	No	Yes	No	No	30%

5.2 Indicative program budget allocation

To determine an indicative allocation of NAP and NHT investment across delivery programs the NRMPC reviewed the allocation of funding to sub-program activities, to determine their relevance to asset or threat management. The review concluded:

- The Integrated Water Management Program is primarily focussed on threat management, accounting for approximately 80% of program activities i.e. managing surface water, water quality and dryland salinity. Asset management constitutes a small component (approximately 20%) of this program and is concentrated on the management of groundwater aquifers, roads at risk and rural town issues. This allocation is reflective of the NRM response deemed suitable to manage such assets, rather than the scale of the issue i.e. managing groundwater aquifers is primarily focussed on the control of point sources of pollution and on resource identification, rather than managing the entirety of the asset.

- The Sustainable Industries Program is 100% focussed on the management of threats and this is consistent with strategic planning to date.
- The Natural Diversity Program has acquired the majority of assets from across the asset classes represented in the Strategy, these include the assets associated with the Avon River and its tributaries. This distribution accounts for the 80:20 split of assets and threats within the program and the subsequent allocation of funds. The majority of NHT funding is allocated to this program, due to the associated funding criteria. It was determined that the asset management approach adopted by this program would see assets managed for a range of threats, with outcomes that would benefit water quality and assist in controlling salinity.
- The NRMPC considered that capacity building activities will have a cross program impact and as such this point of investment will be considered a functional management activity (these functions and associated funding are detailed in section 7).
- The remaining funds were allocated to commitments to the Swan Region NAP MOU and Council delivery management activities (see section 6).

Table 5.2 Program budget allocation

Source	NHT	NAP	NHT	NAP	NHT	NAP
Asset Managem-ent (60% of total funding)	$1.26m	$4.98m				$1.56m
Threat Managem-ent (40% of total funding) 70% $3.6m	Fragmentation (20%) $0.72m		Biosecurity (10%) $0.36m			Water Quality and Salinity (70%) $2.52m
Threats 30% $1.6m	Fire (5%) $0.008m			Acidity and Soil Health (95%) $1.52m		
Total	$2.06m	$4.98m	$0.36m	$1.52m		$4.08m

6 FORWARD PLANNING

6.1 Capacity to deliver

The ACC currently has support structures in place that will form the basis of program and project management associated with implementation of the AIP. However, without expansion and redevelopment of these resources the efficient and effective delivery of program and project activities and the achievement of 20 year Targets and MATs is unlikely to occur.

6.1.1 Current ACC support structures

The current ACC management structure comprises:

- Chief Executive Officer.
- Program Manager.

Other operational support staff include:

- Regional NRM Facilitator (Australian Government funded).
- Indigenous NRM support officer.
- Sub-program Coordinators - management of programs is currently carried out by sub-program coordinators, the majority of which have been employed for the duration of the AIP development period.
- The ACC employs a team of three permanent staff members, who provide administrative support.

Support from partner agencies and organisations is significant and resources and facilities are provided to assist all ACC planning activities.

6.1.2 Proposed program and project structures (July 2005 on)

The aim of the ACC is to maintain a minimal staffing structure capable of overseeing program activities. At present, both project management and project coordination capacity is minimal, without expansion of operational support the likelihood of successful implementation of investment sought and achievement of targets is low. To do this a series of operational, delivery and functional management structures have been proposed.

6.1.2.1 Operational support

A core investment of $380,000 is proposed to support the executive and operational costs of the Council. Core investment has been assumed to be in addition to the ACC's indicative NHT/NAP funding. Activities supported by this funding are external to direct project management and include administrative support to the Council

(executive and finance), member's operating (travel and sitting fees) and overhead costs (facility rental etc). The estimate of $380,000 assumes marginal costing of corporate support services through service level agreements with stakeholder government agencies. Core funding arrangements will require further clarification and negotiation during the investment plan approval process.

The positions associated with operational support are:

1. Chief Executive Officer (reverting to an Executive Officers position).

2. One administration officer to support the operations of the ACC and its associated committees.

3. A Financial Officer to provide finance management support to the ACC.

6.1.2.2 Delivery and functional management

An amount of $915,000 for generic program management costs, funding the ACC's delivery and functional management structure and associated program administration support is proposed. The amount has been netted from the indicative NHT/NAP investment of $13.79 million and has been apportioned across programs. A further notional 2% has been built into the net indicative allocation of $12.87 million at project level. This is a contingency to support the generic program management funding. The percentage rate to be applied (up to 2%) will be determined on finalisation of the detailed resourcing of the ACC delivery and functional management structure. Project management resources in this category apply across all program activities.

Delivery and functional management support is made up of the following positions:

- The Programs Manager role is continued in its current context.

- A preliminary estimate is that three Project Delivery Management positions are required to meet NHT and NAP bilateral commitments. These positions will administer the delivery and reporting of project outcomes (including M&E), coordinate and supervise external project delivery contracts, manage project budgets and track achievement of resource condition targets.

- Five functional manager positions are proposed. These positions have been identified through a detailed and comprehensive gap analysis. This analysis identified skills gaps that need to be addressed, to ensure effective achievement of resource condition targets. These skills include M&E coordination, stakeholder liaison, Aboriginal NRM support (two positions covering eastern and western areas and associated family groups) and local Government and LAP coordination (associated with ongoing asset identification). A detailed budget for these positions is shown in section 6.1.2.3

- Two project support staff are considered essential, based on previous experience in regards to project delivery and management.

Figure 6.1details the relationship and responsibilities associated with these positions.

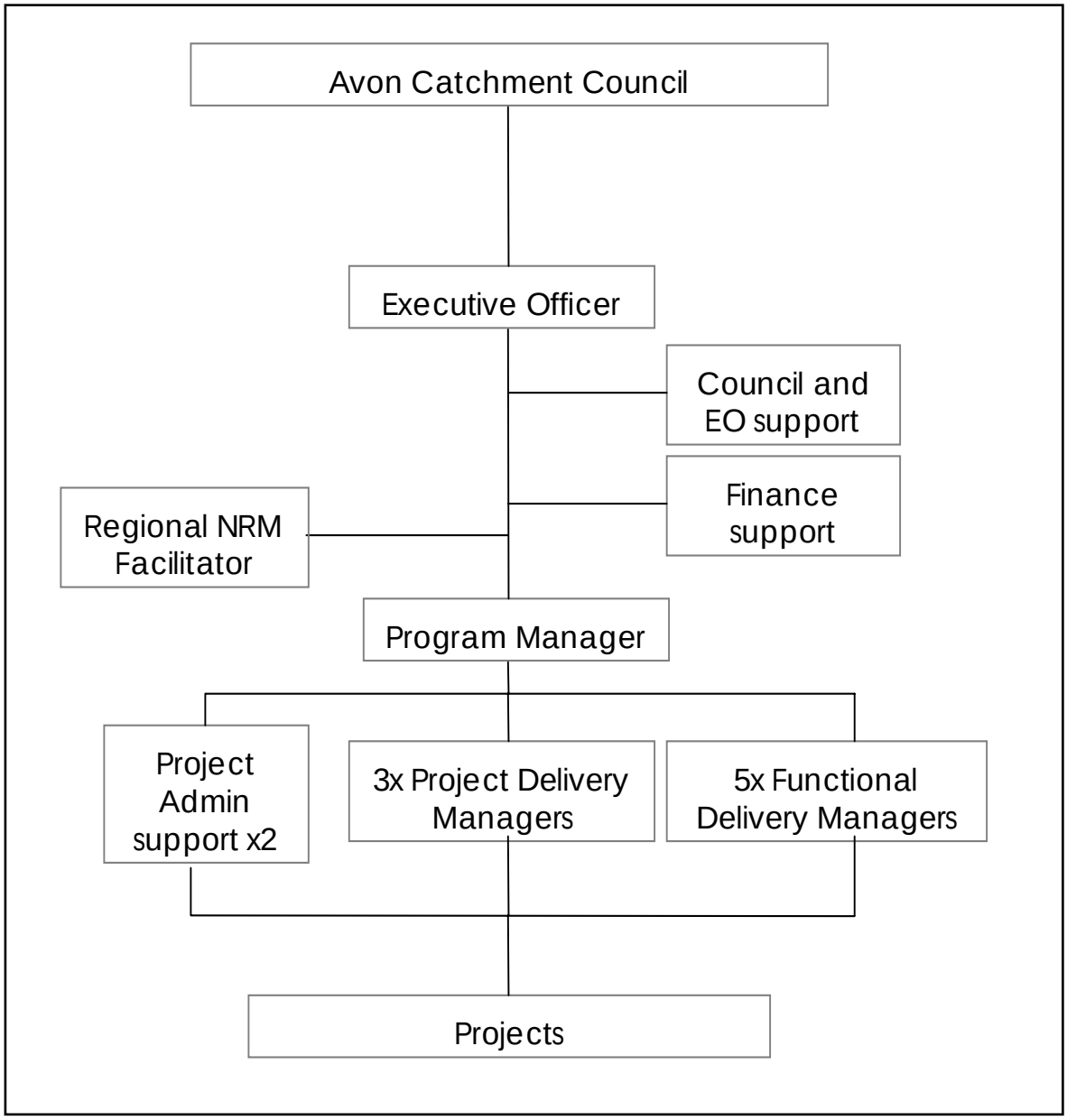


Figure 6.1 Proposed delivery structure.

6.1.2.3 Functional management budget

The project schedule for the five functional manager's positions is detailed in table 6.1. The schedule identifies the method for addressing skills gaps, which may hinder achievement of resource targets if not addressed. The schedule has been developed by he Capacity Building sub-committee. Membership of this sub-committee is:

- Merrilyn Temby (ACC- sub-committee Convenor)
- Jo Burges (community representative)
- Rod Garlett (Indigenous NRM)
- Trish Janssen (Dept. of Education - agency representative).
- Catherine Lyons (Regional NRM Facilitator)
- Vanessa Malcolm (CLC Dowerin/Goomalling -CLC representative).
- Juana Roe (Dept. of Agriculture - agency representative).
- Lisa Shreeve (Wheatbelt Area Consultative Committee)
- Nathan Malin (LGA representative)
- Elizabeth Kington (Coordinator)
- Carla Swift (Secretary)
- Monica Durcan (support staff)

Table 6.1 Functional management budget

								Forward Funding	
Activity	**Activity Type**	**NHT**	**NAP**	**Other$_1$**	**Other$_2$**	**Output Code**	**Outputs**	**06-07**	**07-08**
A Stakeholder relations									
A1NRM regional skills register	Building capacity for implementation		10, 000			CB4.4 RA2.3	1 new database 1 report	10,000	10,000
A2Marketing strategy	Building capacity for implementation		50, 000			CB1.1 CB1.3 RA2.3	5 awareness raising events 4 displays 1 report	50,000	50,000

A3Communication strategy	Planning for key management actions		50,000			CB1.4 CB1.2 CB1.5	4 media opportunities 4 newsletters 1 website updated	50,000	50,000
A4Publication and reporting strategy	Setting and reviewing targets (20 year Targets and MAT's		10,000			P1.1	4 best practice guidelines	10,000	10,000
A5External Partnerships	Building capacity for implementation					CB3.3 CB3.1 CB3.2	4 collaboration negotiations 1 procedures template 2 formal collaboration documents	20,000	20,000
A6Internal Relations	Building capacity for implementation					CB4.1 CB2.1	1 governance Tool developed 2 skills and training events	20,000	20,000
B Monitoring & Evaluation									
B1Data collation	Monitoring, evaluation and review		10,000			RA1.2	1 new monitoring survey initiated	35,000	35,000
B2Data storage	Monitoring, evaluation and review		10,000			CB4.4 CB1.5 RA3.2	1 new database 1 website designed 1 Information management system	10,000	10,000
B3Adaptive management framework	Assessing the feasibility and cost benefits of management options Planning for key management actions Investment in implementation		10,000			P1.1	1 best practice guideline	20,000	20,000
B4Data sharing	Setting and reviewing targets (20 year Targets		10,000			CB3.2	1 MOU agreement	10,000	10,000

	and MAT's)								
B5Data collection responsibility	Monitoring, evaluation and review		15,000			CB2.1	3 training sessions	5,000	5,000
B6Evaluation reporting	Monitoring, evaluation and review		30,000			RA2.3	4 reports	30,000	50,000
B7NRM evaluation	Building capacity for implementation		35,000			RA2.2	1 review	40,000	40,000
C Local Government Liaison /Local Area Planning									
C1LGA engagement	Building capacity for implementation		30,000			CB3.2 CB1.1	10 MOU agreement 3 awareness and training workshops	30,000	30,000
C2NRM Local Area Plans	Setting and reviewing targets (20 year Targets and MAT's)		25,000			RA2.3	LGA reports	50,000	50,000
C3CLC hosting	Planning for key management actions		20,000			CB5.1	34 community groups assisted	20,000	20,000
C4LGA NRM involvement	Building capacity for implementation		25,000			P4.2	NRM Plans developed	25,000	25,000
D Aboriginal NRM Support									
D1Aboriginal facilitation of NRM	Planning for key management actions		80,000			CB1.1 CB1.1	30 arrangement for collaboration 2 study tours	80,000	80,000
D2NRM cultural value ID	Asset identification Threat ID and risk assessment		40,000			CB3.2 P1.1 CB3.1 CB5.1	3 MOU agreements 1 best practice guideline 1 procedure manual 6 regional Aboriginal communities assisted	50,000	50,000
D3Indigenous NRM training and education	Building capacity for implementation		40,000			CB2.1 RA3.2	5 training sessions and workshops	50,000	50,000

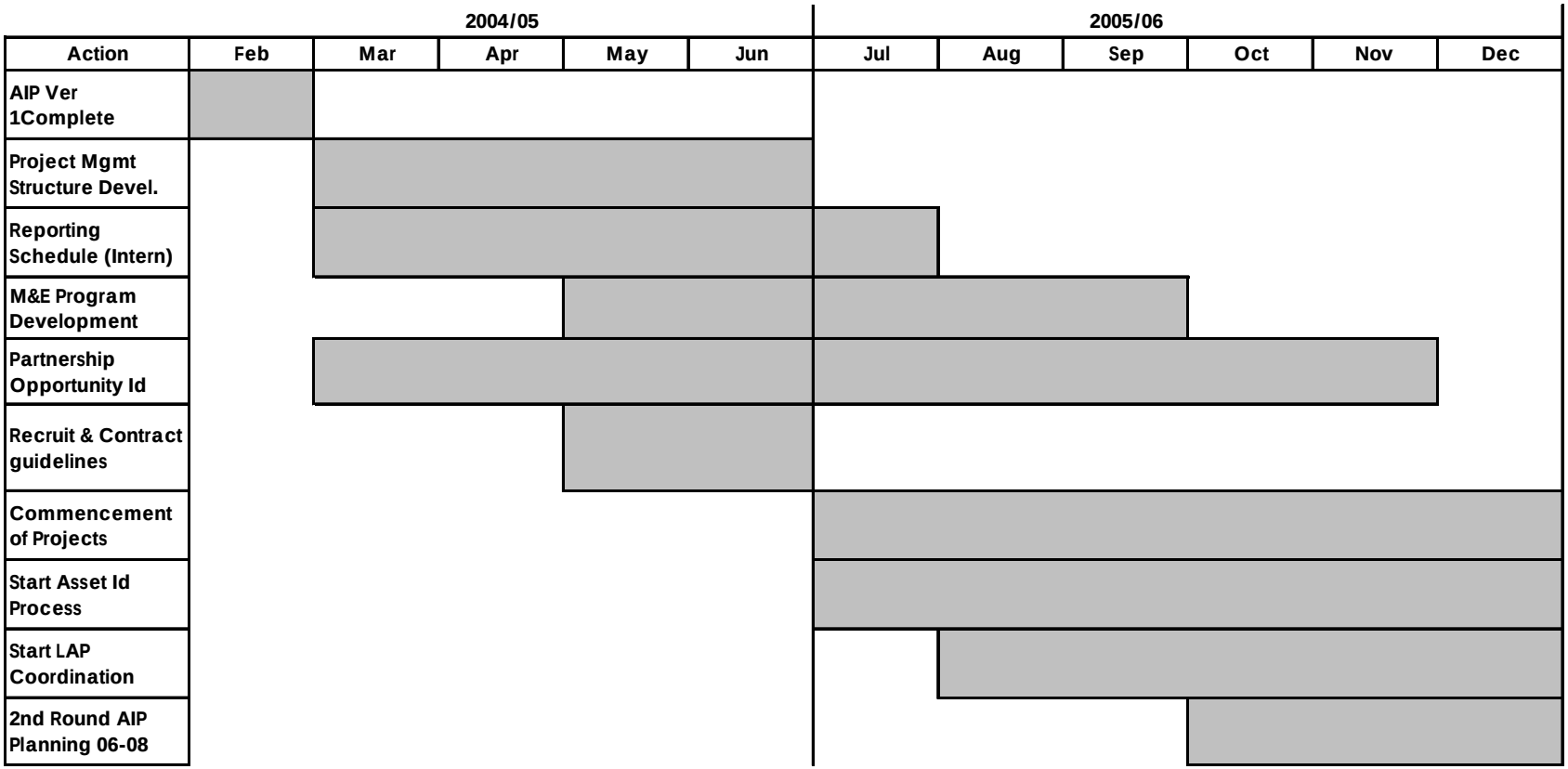
						CB4.3	1 information management system 1 organisational learning review		
Total			**500,000**					**615,000**	**635,000**

6.2 Ongoing investment planning

The work schedule for the period from AIP submission to December 2005 will focus on developing and testing suitable project management structures and negotiation with partner organisations for ongoing resource support to ensure achievement of project objectives.

The ongoing schedule for investment planning is detailed in figure 6.2.

Figure 6.2 Forward planning schedule to Dec 05



Section 2

7 INVESTMENT PRIORITIES

7.1 Program and project planning

7.1.1 Budget development principles

The underlying budgeting principles utilised in the project planning process are:

- Employment costs are based on the Western Australian Public Service Award. Most professional positions were estimated at a Level 6 with associated on costs and operating. This level also provides flexibility in being able to allocate sufficient funds to contractors, rather than employees to carry out project activities. Such funding arrangements will underpin the implementation of project budgets to enable the ACC to minimise employment of staff and maximise the use of contract arrangements, where appropriate. It is important to note that the ACC intend to have a minimal staff structure in place to reduce overall employment costs associated with project implementation (see section 6).

- Estimates for operating costs were developed using existing budgeting information developed by the ACC. Vehicle costs were estimated from current Council vehicle leasing arrangements and by comparison with Western Australian Department of Agriculture vehicle leasing costs. Travel and computer acquisition costs were averaged from internal budget information.

- On costs for all positions has been set at 22%. This figure is made up of 13.8% overheads, *6.2%* on-costs (long service leave 3.5%, extended annual/sick leave 1.2%, annual leave loading 1.5%) plus a 2% contingency. The additional 2% allows for the funding of essential project management activities, not covered by functional or delivery management funding. On costs enable cost sharing across projects for ACC overheads, including office rental, telecommunications expenses, corporate support etc.

- High priority investments have been identified per project (point 11 of project schedules) comprising 100% of available NHT/NAP investment. Contingency budgets expressed in point 12 of the project schedules have been identified in order to allow for an additional 25% allocation of funding, potentially available through strategic reserve funds. Alternatively, section 7.6 outlines potential opportunities for additional strategic reserve funding of regional activities.

7.2 Budget summary

Table 7.1 summarises the budget allocation to programs and project areas. Program and project specific budgets are shown in section 7.6.

Table 7.1 Summary of NAP/NHT Investments

Program and activity	Description of activity	Actions	Principal resource condition targets	Principal management action targets	$, 000			
					Source	**2005/06**	**2006/07**	**2007/08**
Integrated Water Management - Managing Surface Water	Avon River Waterway Management	1. Review of bore monitoring. 2. Nutrient monitoring. 3. Flood event prediction. 4. Gap analysis - flood mapping. 5. Management planning for pt source nutrient pollutants. 6.Fencing the Avon. 7. Extension.	W1T201Monthly concentration of total nitrogen and total phosphates.	W4MAT8.1, W1MAT2.1, W1MAT2.4, W1MAT2.5, W1MAT2.9, W1MAT5.2, W2 MAT7.3, L2 MAT 6.2.	**NAP**	736000	452000	442000
					NHT			
					Private	2000		
					State Gov.			
					Local Gov.			
Integrated Water Management - Water Quality	Groundwater Source Identification, Assessment and Monitoring	1. Review of bore locations 2. Id low salinity groundwater sources 3. Investigative drilling. 4. Sustainable resource use guidelines. 5. Extension.	W4T201 Groundwater aquifers identified. W4T202 Regional groundwater aquifers managed.	W4MAT8.1, L2MAT8.1, W4MAT4., W4MAT1.1, W4MAT7.1, L2MAT6.2.	**NAP**	410000	410000	400000
					NHT			
					Private			
					State Gov.			
					Local Gov.			
Integrated Water Management- Water Quality	Protection of Community Assets	1.Water management plans. 2. Heritage and cultural protocols. 3. Extension.	I3T20110 Rural towns have salinity risk managed. W5T201Heritage and cultural values.	W5MAT7.1, I3MAT2.1, I3MAT5.1, I3MAT7.1, I3MAT6.1, I3MAT1.1, I3MAT6.2, I3MAT6.2, I3MAT3.1, L2MAT6.1.	**NAP**	354000	375000	375000
					NHT			
					Private			
					State Gov.	130000		
					Local Gov.	130000		

Integrated Water Management - Dryland Salinity	Protection of Transport Assets (roads, rail and aviation)	1. Inventory of assets. 2. Heritage and cultural protocols. 3. Education package and demonstration of management options.	IT201 Roads at risk.	I1MAT1.1, W5MAT7.1, I1MAT2.1, I1MAT6.1, I1MAT3.3, I1MAT3.2, I1MAT4.1, I1MAT6.1, I1MAT7.1, L2MAT6.2	**NAP**	250000	250000	250000
					NHT			
					Private			
					State Gov.			
					Local Gov.			
Integrated Water Management - Dryland Salinity	Salinity Management	1.Review of bore locations. 2. Demonstrate acid groundwater disposal methods. 3. Planning for groundwater extraction and disposal. 4. Temporal analysis and engineering options review. 5. Id high risk groundwater recharge zones. 6. Asset protection 7.Deep rooted perennial establishment. 8. Extension and policy development.	L2T201 Reduction of groundwater rise. L2T202 Valley floor salinity reduction. W4T203 Disposal of groundwater from mining. W4T204 Disposal of groundwater from agricultural.	W4MAT8.1, L2MAT8.1, L2MAT2.1, L2MAT7.1, L2MAT7.4, W4MAT3.4, W4MAT5.4, W2MAT7.1, L2MAT6.2	**NAP**	1750000	1750000	1720000
					NHT			
					Private	1500000		
					State Gov.			
					Local Gov.			
Integrated Water Management - Managing Surface Water	Water management and self sufficiency	1. Data collection. 2. Farm water planning training. 3. Integrated plan development. 4. Extension.	W3T201 Zero water deficits. W3T202 Environmental surface water requirements.	W3MAT4.1, W3MAT6.1, W3MAT5.1, W3MAT7.1, L2MAT6.2	**NAP**	580000	400000	300000
					NHT			
					Private	200000		
					State Gov.	130000		
					Local Gov.			
Sustainable Industries - Biosecurity	Spatial distribution of priority environmental pests	1. Consultation and regional issue ID. 2. Scoping issues (including spatial distribution). 3. Issue promotion. 4. Development of management strategies. 5. Regional representation.	L3T201 Reduction in impact of pest species.	L3MAT5.1, L3MAT6.1, B4 MAT 5.1	**NAP**			
					NHT	235000	145000	65000
					Private	15000		
					State Gov.			
					Local Gov.			

Sustainable Industries - Soil Acidity	Identification of contributing land management practices and options.	1. Current status determination. 2. Establish benchmarks. 3. Review land management and amelioration methods. 4. Id sustainable management practice. 5. Demonstration of sustainable practice.	L1.1T201 Soil Acidity management.	L1.1 MAT2.1, L1.1 MAT6.2.	**NAP**	831000	326000	220000
					NHT			
					Private	60000		
					State Gov.			
					Local Gov.			
Sustainable Industries - Soil Health	Awareness of soil health limiting factors and contributing management practice.	1. Review testing methodology. 2. Extension campaign, to increase awareness of soil fertility. 3. Landscape demonstration. 4. Review of land management practices.	L1.5T201 Soil fertility.	L1.5 MAT2.1, L1.5 MAT3.1	**NAP**	689000	360000	280000
					NHT			
					Private	63000		
					State Gov.			
					Local Gov.			
Natural Diversity - Asset Management	Inventory and information management.	1. Asset inventory. 2. Assessment of fresh and saltwater wetlands.		B1MAT1.1abc, B1MAT1.2bc, B1MAT2.1abc, B2MAT1.1abc, B2MAT2.1abc, B2MAT3.1abc, B3MAT1.1ab, B3MAT2.1ab, B3MAT2.2ab, B5MAT 1.1, B5MAT1.2, B5MAT2.1, B5MAT8.1, W2MAT2.1, W2MAT2.2	**NAP**	320000	300000	225000
					NHT	400000	300000	225000
					Private			
					State Gov.			
					Local Gov.			

Natural Diversity - Asset Management	Saving native species and communities at risk.	1. Strategic framework. 2. Action based training. 3. Conservation plans. 4. Conservation actions. 5. Monitoring sites.		B1MAT5.1b, B1MAT5.1c, B1MAT6.1b, B1MAT6.1c, B1MAT7.1c, B1MAT8.1b, B1MAT8.1c, B2MAT6.1c	**NAP**	360000	430000	180000
					NHT	860000	430000	180000
					Private			
					State Gov.			
					Local Gov.			
Natural Diversity - Asset Management	Healthy ecosystems	1. Id priority aquatic ecosystems. 2. Conservation plans. 3. Landholder training. 4. Protection and improvement of ecosystems. 5.Monitoring. 6. Improving condition of river pools. 7. Tributary surveys. 8. Id threatening processes for tributaries. 9. Increasing local capacity. 10. Revegetation. 11. Monitoring.	W2T201 Tributaries. W2T202 Avon River Pools	B3MAT3.1, B3MAT3.2ab, B3MAT5.1ab, B3MAT6.1ab, B3MAT7.1ab, W1MAT2.10, W1MAT3.2, W1MAT5.4, W2MAT1.1, W2MAT1.2, W2MAT1.3, W2MAT2.1, W2MAT2.2, W2MAT3.1, W2MAT5.1, W2MAT5.2, W2MAT6.1, W2MAT7.4, W2MAT8.1	**NAP**	1700000	1488750	1363750
					NHT		1488750	1363750
					Private			
					State Gov.			
					Local Gov.			
Natural Diversity - Asset Management	Conserving regional ecoscapes.	1. Selection and options for ecoscapes. 2. Conservation plans. 3. Support teams. 4. Implementation. 5. Monitoring sites.		B4MAT1.1, B4MAT3.1, B4MAT5.1, B4MAT6.1, B4MAT6.1, B4MAT7.1, W2MAT8.1	**NAP**	2600000	3204000	3261000
					NHT			
					Private			
					State Gov.			
					Local Gov.			

Natural Diversity - Asset Management	Local bushland management	1. Biodiversity management training. 2. On ground works and incentive schemes. 3. Monitoring sites.		B1MAT3.1, B1MAT4.1, B1MAT5.1a, B1MAT6.1a, B1MAT7.1a, B1MAT7.2a, B1MAT7.3, B1MAT8.1a, B1MAT8.2, B2MAT3.1, B2MAT3.2, B2MAT4.1a, B2MAT5.1,	**NAP**	235000		
					NHT	485000	1230000	1230000
					Private			
					State Gov.			
					Local Gov.			
Natural Diversity - Biodiversity Threat Management	Fire management for biodiversity outcomes.	1.Fire management guidelines. 2. Fire management training		B5MAT5.7	**NAP**			
					NHT	80000	80000	40000
					Private			
					State Gov.			
					Local Gov.			
					Sub-total NHT	20600000	3673750	3103750
					Sub-total NAP	10815000	9745750	9016750
					Total (NHT/NAP)	12875000	13419500	12120500

7.3 MAT sequencing

All MATs have been assigned a category in a sequence of eight and this has determined the delivery order for project actions. Application of the sequence of eight to MATs has enabled a logical sequence of actions to be carried out and has influenced the development of project schedules. Consequently, there are a number of projects proposed that have an asset identification and threat assessment phase in the first investment year. In order to achieve significant on ground actions across the first investment period, most programs have deviated slightly from the sequence and have attempted to provide a mix of assessment and on ground works focussed activities, where opportunities exist.

The eight steps are:

1. Asset identification.
2. Threat identification and risk assessment.
3. Assessing the feasibility and cost benefits of management options.
4. Setting and reviewing targets.
5. Planning for key management actions.
6. Building capacity for implementation.
7. Investment in implementation.
8. Monitoring evaluation and review.

7.3.2 Non-priority MATs

All programs have identified non-priority or "flow on" MATs through the prioritisation process. These "flow on" MATs are not a priority for year one of funding. Generally, they require other MATs to be satisfied before they can be addressed and are reliant on the process of asset identification and planning, which is being carried out in many instances in the first year of funding. The process associated with phase two of the AIP will address the majority of year one non-priority MATs.

7.4 Monitoring and evaluation

Under agreements for the delivery of NAP and NHT regional groups are responsible for:

- setting aspirational, resource condition and management action targets;
- completing a monitoring and evaluation strategy;
- reporting to the Joint Steering Committee; and

- reporting annually on resource condition change.

Monitoring and evaluation (M&E) will be carried out at three levels:

1. Regional resource condition. The ongoing monitoring of changes in resource condition over the ARB using a consistent set of nominated indicators, methodologies and output recording and evaluating the effectiveness of actions undertaken to bring about change in resource condition. Information gathered in the National Land and Water Resources Audit has generally been accepted as base line data for resource condition where applicable. It is envisaged the State Government will play an important role in resource assessment and the ACC does not want duplicate State responsibilities in this area.

2. Management actions. As actions, their monitoring is output based in that they are monitored by their completion or by the degree to which they achieved their stated intention.

3. Financial and project reporting, which will assist in tracking projects' achievement of milestones, contribution to program goals and achievement of budgets.

The ACC acknowledges its role as a major custodian, collator and evaluator of information gathered through M&E processes. It also acknowledges its membership to WALIS and will seek to utilise existing frameworks for the storage of data, where possible.

Initial involvement with state level M&E programs has commenced and reporting schedules and processes will be developed, as part of the project planning process outlined in section 6. To assist this process a regional M&E coordinator position has been proposed. This position will provide linkages between state and national M&E structures and programs.

7.5 Project schedules

7.5.1 Contribution to investor priorities

The goals of the National Action Plan for Salinity and Water Quality:

- to prevent, stabilise and reverse trends in salinity, particularly dryland salinity; and
- improve water quality and secure reliable allocations for human uses, industry and the environment.

The goals of the Natural Heritage Trust are:

- biodiversity conservation;
- sustainable use of natural resources; and
- community capacity building and institutional change

Table 7.2 summarises project activity delivery to the outcomes of both funding programs.

Table 7.2 Summary of NAP/NHT investments sought by targets

Principal Resource Condition Targets	Principal Management Action Targets*	Identified NAP/NHT investments (activities)	Expected outcomes and outputs from NAP/NHT Investments#
W1T201 The average monthly concentration of total nitrogen and total phosphates and total suspended solids will not exceed targets of 1 mg/L (N), 0.1mg/L (P), (TSS to be determined) at Walyunga gauging station. (Cf: Environmental Protection Policy Swan-Canning). W2T201 Priority sections and major and minor tributaries identified for sediment and nutrient management purposes, or for salinity control have improved by at least one 'foreshore condition' class (Pen & Scott, 1995) by 2025.	W4MAT8.1, W1MAT2.1, W1MAT2.4, W1MAT2.5, W1MAT2.9, W1MAT5.2, W2 MAT7.3, L2 MAT 6.2.	1. Review of bore monitoring. 2. Nutrient monitoring. 3. Flood event prediction. 4. Gap analysis - flood mapping. 5. Management planning for point source nutrient pollutants. 6. Fencing the Avon. 7. Extension.	Outcomes Resource Condition: Water quality (nutrient levels and sediment) in the Avon River and its tributaries and riparian zone condition will be improved by 5% over 2005 status. MATs: W1MAT2.1. 30% of nutrient loss sites identified. W1MAT2.4 and W1MAT2.5 Increased frequencies of flood predicted, linked to groundwater rise and climate change data. W1MAT5.2. 95% of riparian vegetation on land adjacent to the Avon River protected, contributing to water quality outcomes. W2MAT7.3 20% of priority sections of Avon tributaries fenced and protected with positive water quality outcomes. L2 MAT 6.2. 10% of land managers have an awareness of alternative water management techniques, with positive water quality outcomes. Outputs: 80km of flood mapping, including contour map set (flood id). Gap analysis and data collation – flood risk. 1 x waste water treatment plan.

			47km of Avon River and tributaries fenced. 1 x educational package. 2 x regional workshops. 1 x exploratory drilling program (combined program across projects).
W4T201 Groundwater aquifers suitable for domestic or productive use are identified by 2010 and are maintained at a defined suitable level and quality. W4T202 Regional groundwater aquifers managed to minimise the impacts of salinity and flooding according to sub-regional groundwater management plans (Note: 20 year target to be set in 2005 following regional groundwater and surface water assessment currently undertaken as a part of the EEI program)	W4MAT8.1, L2MAT8.1, W4MAT4.1, W4MAT1.1, W4MAT7.1, L2MAT6.2.	1. Review of bore locations. 2. Id low salinity groundwater sources. 3. Investigative drilling. 4. Sustainable resource use guidelines. 5. Extension.	Outcomes Resource condition: Groundwater aquifer extent understood and commencement of management to ensure sustainable use by community and industry. Threats to aquifers identified and a 10% improvement in current status achieved (protection focus). MATs: L2MAT8.1. Benchmarking process 20% complete. W4MAT4.1. 50% of 20year targets for groundwater management completed. L2 MAT 6.2. 10% of land managers have an awareness of alternative water management techniques, with positive water quality outcomes. Outputs: Improved monitoring program. 3 x assessments – identification groundwater resources. 1 x exploratory drilling program (combined program across projects). 4 x newsletters. 1 x study tour.

			1 x capacity building workshop.
I3T20 1 By 2025, 10 rural towns in the Avon Region have the risk of damage to infrastructure and heritage values due to salinity and flooding reduced by 50% compared with 2004 risk assessments. W5T201 Known heritage and cultural values are maintained and enhanced by 2025.	W5MAT7.1, I3MAT2.1, I3MAT5.1, I3MAT7.1, I3MAT6.1, I3MAT1.1, I3MAT6.2, I3MAT6.2, I3MAT3.1, L2MAT6.1.	1.Water management plans. 2. Heritage and cultural protocols. 3. Extension.	Outcomes Resource Condition: Salinity and flooding reduced by 10% and a 20% improvement in cultural and heritage values in 3 towns. MATs: I3MAT2.1. 3 Geophysical surveys completed and information incorporated in planning. I3MAT5.1. Plans completed for 2 rural towns. I3MAT7.1. Demonstration of groundwater management completed for 1 town. I3MAT6.1. 2 Waterwise education and training packages completed and delivered in 1 town. I3MAT1.1. 50% of rural town assets identified. L2 MAT 6.2. 10% of land managers have an awareness of alternative water management techniques, with positive water quality outcomes. Outputs: 3 x geophysical surveys. 4 x integrated water management plans. 1 x integrated water management scheme. 1 x water sensitive urban design plan. 1 x feasibility study. 1 x capacity building – training workshop. 1 x educational package. Implementation of water management plan for 2

			priority rural towns. 4 X newsletters.
I1T20 1 By 2025, the percentage of roads at risk due to high water tables and flooding is reduced to 10% (2, 520 km) or less of the total road network in the Avon River Basin.	I1MAT1.1, W5MAT7.1, I1MAT2.1, I1MAT6.1, I1MAT3.3, I1MAT3.2, I1MAT4.1, I1MAT6.1, I1MAT7.1, L2MAT6.2	1. Inventory of assets. 2. Heritage and cultural protocols. 3. Education package and demonstration of management options.	Outcomes Resource Condition: Achievement of 5% reduction in the number of roads affected by flooding due to the implementation of best practice. MATs: I1MAT2.1. 50% of land managers and LGAs with an understanding of the impacts of flooding and watertables on infrastructure. I1MAT6.1. 20% of LGAs, all relevant State Government Departments and 20% of land management groups have an increased understanding of water management for infrastructure protection. I1MAT3.2. 10% of LGAs involved in demonstrating effective culvert management. L2 MAT 6.2. 10% of land managers have an awareness of alternative water management techniques, with positive water quality outcomes. Outputs: 2 x inventories of threatened assets (salinity threat). 4 x field trials – demonstration of management options for salinity and waterlogging. 1 x educational package – salinity management for LGAs, land managers and government agencies. 4 x newsletters.

L2T201 Reduction in the average rate of groundwater rise on land in middle and upper catchment areas from 15-30mm to 10-20mm by 2025. (The target for middle and upper catchment area refers to very significant reductions in groundwater rise. This action is considered essential to allow recovery and containment and ongoing utilisation of the land resources). L2T202 The extent of valley floor salinity is less than 12% of land used for agriculture by 2025. (Note the area affected in currently over 5.4%. This is expected to eventually increase to over 27%)(The target for the valley floor recognises that saline land has a value in its own right and the intent is to contain salinity in these areas and utilise saline land as a resource) W4T203 Disposal of groundwater from mining operations is managed according to statutory	W4MAT8.1, L2MAT8.1, L2MAT2.1, L2MAT7.1, L2MAT7.4, W4MAT3.4, W4MAT5.4, W2MAT7.1, L2MAT6.2	1.Review of bore locations. 2. Demonstrate acid groundwater disposal methods. 3. Planning for groundwater extraction and disposal. 4. Temporal analysis and engineering options review. 5. Id high risk groundwater recharge zones. 6. Asset protection. 7.Deep rooted perennial establishment. 8. Extension and policy development.	Outcomes Resource Condition: Understanding of groundwater disposal impacts on river systems and wetlands is increased by 20%, extent of recovery actions on saline land increased by 20%. MATs: L2MAT8.1. Benchmarking process 20% complete. L2MAT2.1. Identification of 20% of landscape positions with the potential for increased recharge. L2MAT7.4. Implementation of 2000ha of tree crops for recharge management. W4MAT3.4. Acid water management demonstrated effectively at 1 sites. W4MAT5.4. 2 Best management of 1 groundwater extraction site commenced. W2MAT7.1. Priority waterways identified and commencement of implementation of drainage water management guidelines. L2 MAT 6.2. 10% of land managers have an awareness of alternative water management techniques, with positive water quality outcomes. Outputs: 1 x exploratory drilling program (combined program across projects). 1 x demonstration site for groundwater disposal covering 10,000ha. Series of management plans for drainage and implementation at the catchment scale (approx.

licence conditions by 2009. W4T204 Disposal of groundwater from agricultural operations is managed according to acceptable 'best practice' guidelines by 2009.			100,000 ha treated). 1 x temporal analysis assessment – drainage extent and impacts. 1 x demonstration of management for high recharge zones (5000ha). 800 ha of tree crops planted in target recharge zones to assist demonstration. 3 x extension field days. 5 x educational packages.
W3T201 By end 2025, 50% of agricultural properties in the 'Wheatbelt' zone and 50% of agricultural properties in the 'Avon Arc' have zero annual water deficits. W3T202 Environmental surface water requirements are maintained within the 'Avon Arc' zone until 2025 and beyond.	W3MAT4.1, W3MAT6.1, W3MAT5.1, W3MAT7.1, L2MAT6.2	1. Data collection. 2. Farm water planning training. 3. Integrated plan development. 4. Extension.	Outcomes Resource Condition: A 5% increase in environmental water flows are achieved in the Avon Arc through improved management of existing water harvesting processes. MATs: W3MAT4.1 Targets for water self sufficiency identified. W3MAT7.1. 10% of landholders (at targeted sites) demonstrating water self sufficiency. L2 MAT 6.2. 10% of land managers have an awareness of alternative water management techniques, with positive water quality outcomes. Outputs: 1 x survey on water consumption per LGA. 1 x training course in farm water planning techniques (including training material) 5 x integrated demonstration catchment surface

			water plans (200, 000ha). 1 x extension package – display and written material.
L3T201 A 50% reduction in the economic and environmental impacts of all priority animal and plant pests across the region by 2014.	L3MAT5.1, L3MAT6.1, ND	1. Consultation and regional issue ID. 2. Scoping issues (including spatial distribution). 3. Issue promotion. 4. Development of management strategies. 5. Regional representation.	Outcomes Resource Condition: A 10% reduction in the impact of targeted pest species in assets managed for Natural Diversity. MATs: L3MAT6.1. Measurable (potential 10%, linked to Natural Diversity outcomes) reduction in invasive weeds and pest animals and their associated impacts on remnant vegetation and improved nutrient cycling patterns through management of weeds (reduced competition etc.). Outputs: 9 x farmer forums (issues scoping). 4 x LGA forums (issues scoping). 1 x NGO forum (issues scoping). 9 x sub-regional map set – pest distribution. 1 x biosecurity database. 30 x LAPs with biosecurity component. 3 x extension and training workshops. 9 x sub-regional pest management strategies. 1 x regional pest management strategy.
L1.1T201 Soil acidity levels (top and sub-surface) at or above pH 5.5 ($CaCl_2$), in all soils with low	L1.1 MAT2.1, L1.1 MAT6.2.	1. Current status determination. 2. Establish benchmarks. 3. Review land management and amelioration methods.	Outcomes Resource condition: Cross regional soil acidity extent and levels

capacity to buffer pH change by 2020.		4. Id sustainable management practice. 5. Demonstration of sustainable practice.	understood, significant impact on acidity levels in targeted demonstration sites. MATs: L1.1 MAT6.2. 10% of land managers implementing practices that contribute to reduced contamination of water bodies, less nitrate pollution of groundwater and reduced waterlogging, flooding and salinity. Outputs: 1x status assessment. 1 x acidity monitoring database. 1 x triple bottom line assessment of amelioration techniques. 4 x case studies covering 10,000ha. 6 x field assessments of management techniques, covering 60,000ha. 1 x management practice summary. 10 x point source field impact assessments (10, 000ha). 5 x management demonstration sites covering 5000ha.
L1.5T201 100% of soils with recognised fertility issues (elements, organic matter and microbial activity) are identified within 5 years and a 30% improvement over benchmarked fertility levels is achieved by 2020.	L1.5 MAT2.1, L1.5 MAT3.1	1. Review testing methodology. 2. Extension campaign, to increase awareness of soil fertility. 3. Landscape demonstration. 4. Review of land management practices.	Outcomes Resource condition: Parameters for soil health understood (biological, chemical and physical) and resource condition target better defined. L1.5 MAT2.1 30% of land mangers in targeted areas reducing fertiliser and chemical use, with associated positive impacts on water quality.

			Outputs: 1 x field study of spatial distribution and testing methodology. 1 x benchmarking summary. 10 x regional workshops on soil health and extension package. 3 x demonstration sites (85,000ha). 3 x sustainable practice demonstration sites (70,000ha). 6 x case studies and extension packages.
All Natural Diversity 20 year Targets	B1MAT1.1abc, B1MAT1.2bc, B1MAT2.1abc, B2MAT1.1abc, B2MAT2.1abc, B2MAT3.1abc, B3MAT1.1ab, B3MAT2.1ab, B3MAT2.2ab, B5MAT 1.1, B5MAT1.2, B5MAT2.1, B5MAT8.1, W2MAT2.1, W2MAT2.2	1. Asset inventory. 2. Assessment of fresh and saltwater wetlands.	Outcomes Resource Condition: 50% increase in regional asset identification and composition and 20% increase in identification of the extent of threats potentially impacting regional assets. MATs: All MATs. 100% increase in regional recognition of priority assets and primary information developed to assist understanding asset distribution and composition. Outputs: 1x asset database and management system. 1 x study.
1.All native species that naturally occur in the Avon region persist in viable populations.	B1MAT5.1b, B1MAT5.1c, B1MAT6.1b, B1MAT6.1c, B1MAT7.1c, B1MAT8.1b, B1MAT8.1c, B2MAT6.1c	1. Strategic framework. 2. Action based training. 3. Conservation plans. 4. Conservation actions.	Outcomes Resource Condition: Move to increase a change in the status of 37

2.Maintain the extent and integrity (structure and composition) of all natural ecological communities that occur in the Avon Region		5. Monitoring sites.	species of plants and animals and a 100% increase in the protection of the 10 species. MATs: B1MAT5.1b, B1MAT5.1c. Effective recovery actions for 25% of species at risk from threatening processes, such as salinity and water quality established. B1MAT6.1b, B1MAT6.1c. Threatening processes for 10% of critically endangered and endangered species identified and management responses commenced. B1MAT7.1c. Commencement of 100% of targeted conservation plans. Outputs: Series of strategic plans for threatened species. 8 x workshops (estimated 1000 participants) 14 x workshops (120 participants). 2 x management workbooks. 6 x extension displays. 25 x community groups involved in delivery. 9 x recovery plans for 9 species/communities. 29 x surveys, covering 61,000ha. 3,240 ha of terrestrial vegetation enhanced/rehabilitated. 30 ha of native species planted. 118ha of remnant vegetation protected by fencing. 6 x breeding programs and 7 species targeted.

			8 x translocation programs and 5 species targeted. 16 x seed banks. 15 ha of pest plant control. 2412ha of land protected from animal pests. 50ha of surface drainage. 215 invertebrate pest programs. 31 x monitoring programs established. 68 x monitoring programs enhanced.
Vulnerable" Ecosystems (ecosystems whose current extent in good condition exceeds 15% of their pre-European extent and their current extent exceeds 2000 ha) retain their current extent and integrity and have at least 15% of their pre-European extent formally protected for conservation (reserve system or legally binding management agreement). "Threatened" Ecosystems (ecosystems whose current extent in good condition is less than 15% of their pre-European extent, or have <2000 ha total extent remaining, retain their current extent	B3MAT3.1, B3MAT3.2ab, B3MAT5.1ab, B3MAT6.1ab, B3MAT7.1ab, W1MAT2.10, W1MAT3.2, W1MAT5.4, W2MAT1.1, W2MAT1.2, W2MAT1.3, W2MAT2.1, W2MAT2.2, W2MAT3.1, W2MAT5.1, W2MAT5.2, W2MAT6.1, W2MAT7.4, W2MAT8.1	1. Id priority aquatic ecosystems. 2. Conservation plans. 3. Landholder training. 4. Protection and improvement of ecosystems. 5.Monitoring. 6. Improving condition of river pools. 7. Tributary surveys. 8. Id threatening processes for tributaries. 9. Increasing local capacity. 10. Revegetation. 11. Monitoring.	Outcomes Resource Condition: 80% of regional ecosystems identified and a 20% increase in the status (protection focus) of 10% of identified priority ecosystems. MATs: W1MAT3.2, W1MAT2.10, W1MAT5.4, W2MAT1.2, W2MAT1.1, W2MAT1.3 and W2MAT5. 1. Improvement in the condition of 3 Avon River pools and management planning for 10 tributaries commenced. Flood risk identified and mapped. B3MAT3.2ab and B3MAT5.1ab. Improved quality of 5 aquatic ecosystems (fresh and saline wetlands) and improvement in condition of associated remnant vegetation. B3MAT3.2ab, B3MAT5.1ab Protection of 10 terrestrial iconic assets from threatening process such as salinity commenced. Outputs: 1 x ecosystem priority plans developed.

and retain/improve their integrity, and have at least 60% of their remaining extent formally protected for conservation (reserve system or legally binding management agreement). W2T201 Priority sections of major and minor tributaries, identified for sediment and nutrient management purposes. Or for salinity control have improved by at least one 'foreshore condition' class ((Pen & Scott, 1995) by 2025. (Note: priority sections to be identified and a specific 20-year target to be set by 2007 based on MAT's W1.3.1. W1.3.2 and W1.3.3) W1T202 The current hydrological capacity[1] of the Avon River Pools is not reduced by more than 20% by 2025. Linked 20 year Targets W1T201 The average monthly concentration of total nitrogen and total phosphates and total			3 x ecosystem strategy plans developed. 20 x training workshops and associated extension package. 20 x flora surveys on 1250ha. 20 x conservation covenants in place (2500ha). 1250ha of remnants fenced. 20 x benchmarking programs. 2 x river management plans. 2 x river asset surveys and assessments. 1 x extension workshop and associated material. 330 ha of river tributaries revegetated. 1 x redeveloped monitoring program.

suspended solids will not exceed targets of 1 mg/L (N), 0.1mg/L (P), (TSS to be determined) at Walyunga gauging station			
Conserve the extent and integrity of the natural diversity (species, NECs and ecosystems) within 12 landscapes/ecoscapes, which best represent, the natural diversity of the Avon River Basin.	B4MAT1.1, B4MAT3.1, B4MAT5.1, B4MAT6.1, B4MAT6.1, B4MAT7.1, W2MAT8.1	1. Selection and options for ecoscapes. 2. Conservation plans. 3. Support teams. 4. Implementation. 5. Monitoring sites.	Outcomes Resource Condition: Conservation status of 1 recognised ecoscapes increased by 20%. Working towards condition improvement B4MAT1.1Retaining viable native species populations and communities in 1 ecosystem by managing threats such as salinity. B4MAT7. Commencement of restoration of threatened species and communities in 1 IBRA region by managing threats such as salinity. W2MAT8.1. Measurable improvement in the condition of water quality at established water monitoring sites. Outputs: 1 x ecoscapes strategic plan – including asset id. 4 x ecoscape plans. 50 x workshops (estimated 500 participants) and associated extension material. 2 x covenants at ecoscape scale and 10 voluntary agreements. 20ha of riparian vegetation protected/enhanced. 1000ha of terrestrial vegetation enhanced. 100ha of native species planted.

			100ha of weed control. 5000ha of animal pest control. 2700ha protected from wind erosion. 6000ha of surface drainage. 10 x monitoring programs.
The Avon River Basin contains a connected and functional network of vegetation that represents the natural diversity of the regions and supports regional scale ecological functions	B1MAT4.1, B1MAT5.1a, B1MAT6.1a, B1MAT7.1a, B1MAT7.2a, B1MAT7.3, B1MAT8.1a, B1MAT8.2, B2MAT3.1, B2MAT3.2, B2MAT4.1a, B2MAT5.1, B2MAT6.1a, B2MAT7.1a, B2MAT7.2a, B2MAT8.1, B2MAT8.2, B5MAT2.1	1. Biodiversity management training. 2. On ground works and incentive schemes. 3. Monitoring sites.	Outcomes Resource Condition: 100% increase in the recognition of regional scale iconic assets and management commenced for targeted locations. MATs; B1MAT4.1, B1MAT5.1a, B1MAT6.1a, B1MAT7.1a and B1MAT7.2a . Planning commenced in 15 LGAs for maintenance of the viability of local iconic assets by managing threats such as salinity, fragmentation etc. B1MAT7.2a. Conservation planning for threat management for 5 high value remnants in 15 LGAs completed. B2MAT7.2a. 500ha of NECs protected by conservation agreements. B2MAT4.1a, B2MAT8.1and B2MAT8.2 Benchmarks established to enable long term resource condition change identification. Outputs: 30 x guideline documents. 9 x training courses (150 participants) and associated extension material.

			500ha of agreements to protect. 2250ha of remnant vegetation fenced. 600ha of native species planted. 5 x seed banks. 10,000ha of animal pest control.
All Natural Diversity 20 year Targets	B5MAT5.7	1.Fire management guidelines. 2. Fire management training	Outcomes Resource Condition: 25% improvement in the long term condition of riparian vegetation through adoption of fire management plans. MATs: B5MAT5.7. Protection and enhancement of species through effective shire based fire management planning in 10 LGAs. Protection of riparian vegetation and associated water quality issues through appropriate fire management plans. Outputs: 4 x best practice guidelines. 2 x training workshops (80 participants)

*See appendix Table A1.1. #Preliminary outcomes only and are highly dependant on year 1 asset collation.

7.5.2 Project schedule formats

Project schedules detail the allocation of investment to program, sub-program and project activities. The schedules have been developed by the three program sub-committees and are described in two parts:

1. Program overview, detailing program and sub-program goals and contribution to resource management outcomes.

2. Project overviews, providing linkages between project activities and regional targets and detailing proposed funding for the 2005-06 financial year.

7.6 Program and project schedules

7.6.1 Integrated Water Management Program

1. Program Goal

The protection, management and sustainable use of water is the basis for all natural resource management outcomes.

We live in a vast inland area of droughts and floods. The management of water assets must cover these extremes to reduce the impact they have on the environment, production and social assets of the region.

The Integrated Water Program, through a series of sub-programs, proposes a range of on ground works, scientific research, monitoring and evaluation, and community participation to achieve the long term sustainability of the regions natural resources.

2. Program/sub-program structure

Integrated Water Management Program Program Goal:	Priority 20 year targets	Priority MATs
Sub-programs		
1. Managing surface water (farm water planning and maintaining environmental flows).	$W_3T_{20}1$, $W_3T_{20}2$	W3.4.1, W3.5.1, W3.7.1, W3.6.1, L2.6.2
2. Water Quality (nutrient, sediment and wastewater management (mining, urban and agricultural)	$W_1T_{20}1$,	W4.8.1, W1.2.1, W1.2.4, W1.2.5, W1.2.9, W1.5.2, W2.7.3, L2.6.2,
3. Dryland Salinity (managing watertables in upper and middle catchments, valley floors)	$L_2T_{20}1$, $L_2T_{20}2$	W4.8.1, L2.8.1, L2.2.1, L2.7.1 , L2.7.4, W4.3.4, W4.5.4, W4.7.3, W2.7.1, L2.6.2 W4.8.1, L2.8.1, W4.4.1,

4. Asset Management (groundwater aquifers, roads at risk, rural towns, community assets)	$W_4T_{20}1$, $W_4T_{20}2$, $I_1T_{20}1$, $I_3T_{20}1$	W4.1.1, W4.7.1, I1.1.1, W5.7.1, I1.2.1, I1.6.2, I3.2.2, I3.1.1, I3.5.2, I3.6.2, I3.7.1, I3.6.1, I3.3.1, L2.6.2

3. Sub-program description

3.1. Managing Surface Water

An expansion in the availability of reticulated water, the clearing of catchments and changes in land management has led to an increase in surface water runoff across the Avon River Basin. At the same time we live in a changing environment of lower rainfall with periods of drought. The management of surface water to harvest water for domestic and productive uses, and to reduce the impact of flooding and erosion is a significant issue for the Avon River Basin. In the Avon Arc however, increased use of surface water by dam construction and other means of harvesting has highlighted the need to manage surface water to ensure the over use of this resource does not occur. This will ensure environmental flows to sustain aquatic ecosystems are maintained.

The Managing Surface Water Sub-program will address the following issues:

- Surface water resources from the landscape, granite outcrop and from public and private infrastructure are harvested for social, ecological and social values.
- Stream flow requirements for functional aquatic ecosystems is maintained.
- Local flooding and erosion is minimised.

3.2. Water Quality

Declining water quality across the Avon River Basin can be attributed to four main factors; salinity, excess nutrients, acidity and sediments. Altered land management has been the primary cause of water quality decline through the removal of vegetation, inappropriate nutrient management, discharge of acidic groundwater, the removal of riparian vegetation and the River Training Scheme.

Rising watertables and disposal of groundwater has brought acidic and salty water to the surface. Point source and diffuse nutrients is causing eutrophication of waterways, and the alteration of catchments and water bodies has increased delivery of sediment to waterways. The management and improvement of water quality is paramount for all Natural Resource Management activities in the Avon River Basin. Water quality affects waterway health, agricultural and urban land, biodiversity assets, both terrestrial and aquatic, and community assets such as infrastructure.

The Water Quality Sub-Program will address the following issues:

- Nutrient, salinity and sediment loads discharged to the Swan River and estuary are maintained or reduced to levels that maintain river health.

- Floods to have access to the floodplain, for improved nutrient stripping, sediment deposition and native seed dispersal. Flood damage to infrastructure and property is minimised.
- The natural function of the Avon River is restored and managed for long-term benefit of the community.

3.3. Dryland Salinity

The clearing of native vegetation has been a key element of rural development in the Avon River Basin since the early 1900s. However in the last few decades it has become clear that this has produced major changes in the water cycle, causing groundwater levels to rise rapidly bringing with it natural salt stored in the soil.

In agricultural situations annual pastures with low water-use have replaced high water-using native vegetation. This has affected natural hydrologic processes, as the amount of rainfall now exceeds the usage capacity of the vegetation. The result is increased recharge and a rise in the groundwater, often causing it to intersect valley slopes or floors as discharge (seepage). Groundwater discharge is saline when salts previously stored in the soil and rock dissolve in the rising groundwater and enter streams or come to the soil surface, where evaporation may result in surface accumulations of salt crystals. Groundwater within two metres of the soil surface can be drawn further up the profile into the plant root zone through capillary action.

The management of groundwater for salinity through a series of monitoring, research, community participation, tree cropping and catchment planning initiatives forms the basis of this sub-program.

Issues addressed

- High-risk groundwater recharge areas are identified and managed.
- Review and development of best practice guidelines for salinity management.
- The impacts of groundwater abstraction and disposal is known and managed in a sustainable way to minimise on and off site impacts.
- Implementation of best practice management actions, including revegetation, tree crops and engineering options.

3.4 Asset Management

The Asset Management Sub-program aims to manage and protect towns and associated infrastructure, roads, rail, aviation, groundwater assets and other assets of significant cultural or historical value.

Management of infrastructure assets has a two-fold effect as not only are some of these assets under threat from salinity and waterlogging but there is also an increased risk of salinity and waterlogging due to inappropriate design and inadequate capacity to perform their function (road culverts for example).

Appropriate management will not only protect important assets from degradation but will also lead to reduced maintenance costs.

Groundwater assets include those that can be utilised for production or domestic use. These assets are of high importance due to the low rainfall experienced by most of the Wheatbelt.

Rivers, foreshores, wetlands and other specific sites are often places of spiritual and cultural significance. Traditional landowners may have strong spiritual attachments to these assets. These areas are also places of spiritual significance for non-indigenous communities.

Issues addressed within the Asset Management Sub-program:

- Community assets, including towns and associated infrastructure, and cultural and historical assets are managed to minimise the impacts of threatening processes.
- Transport infrastructure is managed to reduce the impact of high water tables, salinity and flooding.
- Groundwater resources with potential productive yield are identified and managed for maximum community benefit.

4. Potential Partnerships:

Australian Rail group (Westnet Rail), MRWA, NACC, Bureau of Meteorology, CLCs, Community Groups, CRC Leme, CRC plant based management, CSIRO, DAWA, CALM, DoE, farm improvement groups, FESA, FPC, Greening Australia, Heritage Council of WA, landholders, LCDCs, catchment groups, LGAs, PGA, OMA, private consultants, PURSL, Local Government, SCC, Universities, Water Corp, WAFF, WACMG, WANTFA, Western Power, WDC, WWF.

5. Sub-committee

The Integrated Water Management sub – committee comprises:

- Fred Bremner (ACC community representative - Convenor).
- Linda Vernon (CLC Trayning- CLC representative).
- Martin Revell (Dept of Environment - agency representative).
- Amanda McLean (community representative).
- Claire Taylor (Aust Govt. NRM Facilitator).
- Claudia Hadlow (WA Channel Management Group).
- Tim Emmott (Greening Australia).
- Kevin Trustrum (CLC Mt Marshall - CLC representative).

- Owen Donovan (Forest Products Commission - Agency Representative).
- Ben Mouriitz (ACC – community representative).
- Chantelle Noack (Coordinator).
- Jason MacKay (Secretary).

Meeting outcomes to date have included:

- Completion of prioritisation of MATs – 13 December 2004.
- MAT grouping and project development – 21 December 2004.
- Input to project formulation – 10 - 21January 2005.

6. Next Steps

Priorities identified for the program beyond the current investment cycle include:

- Proposals for new dam constructions in Avon Arc are referred for environmental assessment and planning for the provision of environmental water flows is undertaken.
- Improved nutrient management of both diffuse and point source pollution through the development and implementation of BMP options.
- Flood and floodplain management plans, including flood response plans, are developed and where appropriate incorporated into Town Planning Schemes.
- Regional drainage options are assessed, planned and demonstrated.
- Implementation of management plans for high risk groundwater abstraction/disposal sites.
- Review and implementation of best practice options for salinity control, including revegetation, tree crops and integrated catchment plans.
- Assessment of engineering and revegetation options for groundwater reduction beneath roads and monitoring of roads at risk.

Preparation and implementation of integrated catchment plans, including Waterwise education and training, for protection of community assets.

Project Id No. IWM001

Project Title: Avon River waterway management.

1. Project Summary (Aims):

The aim of this project is to maintain and/or improve the current average monthly concentration of total nitrogen, total phosphorus and total suspended solids being discharged into the Swan Canning Estuary.

2. Project Description:

The Swan Canning Estuary and the Avon River are identified as state priority assets. The Swan River and estuary have been identified as the first 'Icon Asset' by the WA State Government, the Avon River makes a significant contribution to the water quality of the estuary.

Currently the Avon River's average monthly concentration of total nitrogen, total phosphates and total suspended solids discharged into the estuary does not exceed the targets set in the Environmental Protection Policy Swan-Canning, of 1 mg/L (N), 0.1mg/L (P), (TSS to be determined) at Walyunga gauging station. However, this target can be exceeded during major flood events, such as in January 2000, which resulted in a 1 in 20-year summer flood. This delivered 270 gigalitres of discharge to the Swan-Canning Estuary- five times the volume of the estuary. The Swan River was closed to public because of this flood event. This demonstrates the need for improved nutrient and flood management as outlined below:

1. Identify and manage high-risk nutrient loss locations in the Upper Swan, Avon and Mortlock River Systems, including the Northam Waste Water Treatment Plant.

2. Predict, model and map short and long term flood events of the Avon River to allow floods access to the floodplain for improved nutrient stripping.

3. Fencing of both the Avon River and major tributaries, to reduce threatening processes such as nutrients and erosion.

4. Contribution to land managers understanding of alternative water management techniques on a basin wide scale.

5. This project has links with several Natural Diversity, Sustainable Industry and other Integrated Water Projects as follows.

- Healthy Ecosystems project - the protection of the riparian zone leading to improvements in water quality.

- Getting Started "Baselining" the Region's Natural Diversity project - the identification and assessment of threatening processes to the Avon River such as nutrients and salinity.

- Back from the Edge: Saving Native Species and Communities Most at Risk project – the protection of riparian threatened or declining communities of the Avon River.

- Increased awareness of soil health limiting factors and demonstration of fertility testing for long term soil health project- contributes to the health of the Avon River through improved nutrient and soil management having an impact on the level of nutrients and sediments transported into the Avon River and it's tributaries.

- Benchmarking soil acidity status and identification of contributing land management practices project – improvements in soil acidity could have long term impacts on water quality and sediment loads to river by enhancing the prospects of re-growth and the reduction of leaching nutrients and soil erosion.

- Salinity Management Project – Will see an improvement in groundwater levels and salinity, which will lead to an improvement in saline water entering waterways and allow an increase in regeneration and improved success for revegetation.

Components of this project denoted as cross regional are those areas that are eligible for funding under the National Action Plan (please see MATs).

3. Asset Description:

The assets of the Avon River system (and adjacent waterways) eligible for NAP investment include the river channel, floodplain, fringing vegetation and the remaining river pools. The main channel and floodplain of the Avon River is identified as extending from Yenyenning Lakes downstream to the confluence of the Wooroloo Brook at Walyunga, and includes the south branch through the town of Brookton. The Upper Swan River is identified as extending from the confluence of Wooroloo Brook to the junction of the Brockman River and includes Ellen Brook and Helena River. The main river channel was originally braided, with many small channels interweaving between thickly vegetated islands, and punctuated by numerous deep, sandy pools. The Avon is now a highly disturbed river system due to clearing the catchment for agriculture and establishment of towns adjacent to the river. It was also deliberately disturbed to reduce flood impacts on towns and agricultural land in the floodplain under the River Training Scheme during 1958-72. The Avon Rivercare Program has been embraced by the Avon River community since 1996 and through planning and implementation of on ground works a marked improvement in the health of river pools, riparian vegetation and aquatic systems has resulted.

Major and minor tributaries to the Avon River are very extensive throughout the Avon River Basin and are extensively affected by salinity, nutrient enrichment and sedimentation. Minor tributaries are also generally significantly altered on land used for agriculture. They play a significant role in the health of the Avon River and Swan Canning Estuary due to the quality of water entering the Avon River from these tributaries.

Tributaries, the Avon River and Upper Swan River are considered to be social, economic and environmental assets within the local community and are highly regarded as icons to the region.

4. Threat Description:

Nutrients are essential to the growth of all photosynthesising organisms and farmers and gardeners add nutrients to soil through fertilisation to stimulate the growth of their crops. However, if the nutrients from the fertiliser or other sources end up in waterways, this unintended fertilisation may result in overproduction of plants or algae and cause environmental problems generally known as nutrient enrichment or eutrophication. Eutrophication leads to a reduction in ecological function and has the potential to close waterways for public use.

Sedimentation in our waterways leads to fish kills, clogged streams and reduced storage volume of river pools. Sedimentation however is not the only problem of eroded particles entering our waterways. There is also a problem when the lighter soil particles fail to settle out and remain suspended in the water. These suspended particles block out light filtering through the water thereby reducing in stream photosynthesis, and altering the ecology of these waterways.

Through the River Training Scheme of 1958 – 1972 major channel works were implemented to increase stream flow velocity, to avoid flooding of towns and farmland adjacent to the Avon River. This has subsequently caused massive channel erosion and sediment mobilisation. Consequently, river pools are filling with sediment, causing a reduction in capacity to sustain aquatic life over the summer months. Floods also have reduced access to the floodplain, hence there is reduced nutrient stripping capacity.

The Avon River is a significant contributor of nutrient and sediment load of the Swan-Canning Estuary, which causes occasional algal blooms, and fish kills. Targets are set for nutrient load reduction to the estuary under the EPP Swan Canning, and the risk of exceeding the target is greatest during summer flood events.

5. Contribution to Target or Resource Condition:

Reduction in total nitrogen, total phosphorus and total suspended solids from the Avon River to the Swan-Canning Estuary, through the adoption and implementation of Best Practice Options. Increased community awareness in floodplain, riparian and water quality management. Improved flood and floodplain management for greater nutrient stripping capacity and the reduction in bank and floodplain erosion will reduce the movement of sediments into the Avon River and subsequently the Swan-Canning Estuary. The fencing of the Avon River and its tributaries will allow natural regeneration of the riparian zone and lead to improve water quality and stability of banks. This will ensure the ongoing protection of watercourses, the Avon River and the Swan Canning Estuary and see an improvement in foreshore condition of the tributaries themselves.

6. Twenty Year Target/s:

W1T201 The average monthly concentration of total nitrogen and total phosphates and total suspended solids will not exceed targets of 1 mg/L (N), 0.1mg/L (P), (TSS to be determined) at Walyunga gauging station. (Cf: Environmental Protection Policy Swan-Canning).

W2T201 Priority sections and major and minor tributaries identified for sediment and nutrient management purposes, or for salinity control have improved by at least one 'foreshore condition' class (Pen & Scott, 1995) by 2025.

7. Management Action Target/s:

- W4MAT 8.1 A regional groundwater monitoring strategy for the Avon River Basin is developed and being implemented by 2007 (Cross Regional).
- W1MAT 2.1 Areas of high-risk nutrient loss in the "Avon Arc" and Mortlock River System are identified and mapped by 2007 (Cross Regional).
- W1MAT 2.4 A report of the predicted long-term potential for increased frequencies of 1-in-25 year probability flood events considering both rising water tables and climate change is prepared by end 2005.
- W1MAT 2.5 Flood risk modelling and mapping for non-urban floodplain areas is complete by 2006 and is being adopted through statutory processes for assessment of development proposals to ensure that long-term flood impedance is not more than 5% of present conditions.
- W1MAT 2.9 The Northam Waste Water Treatment Plant has zero nutrient release to the Avon River by 2009.
- W1MAT 5.2 By 2009, 95% of agricultural land adjacent to the Avon River is fenced both sides.
- W2MAT7.3 Fencing 200km of priority sections of major tributaries is complete by 2009.
- L2MAT 6.2 Basin wide extension program ensures that 80% of land managers have an understanding of the benefits and impacts of the application of alternative water management techniques and a systems-based approach by 2009 (Cross Regional).

8. Management Actions:

- Identify soil types and land uses with high potential to cause nutrient loss.
- Model future flood risk potential in the Avon River Basin.
- Floodplain risk assessment for non-urban floodplain areas.
- Statutory processes for assessment of development proposals within the floodplain including risk assessment.
- Evaluate options for zero nutrient release from the Northam WWTP, including local water re-use.
- Extension of BMP for nutrient, salinity and sediment management, including:

– Valuing remnant vegetation for resource protection.

- Some yet to be developed.

9. Contribution to National NRM outcomes:

- The impact of salinity on land and water resources is minimised, avoided or reduced.
- Ecosystem services and functions are maintained or rehabilitated.
- Surface and groundwater quality is maintained or enhanced.
- The impact of threatening process on locations and systems which are critical for conservation of biodiversity, agricultural production, towns, infrastructure and cultural and social values, is avoided or minimised.

10. Project Linkages

Aboriginal	Local Government	Marketing & Communication	M & E	Skills & Training	Local Area Plans
Recognition of cultural value of river and floodplain.	*Adoption of flood risk modelling etc through statutory processes.*	*Dissemination of information to relevant landholders and stakeholders*	*No of sites sampled for snapshot.* *No of reports produced.* *No of people attending workshops.* *Water quality improvements from Northam WWTP.*	*Delivery of training to land managers in years 2 & 3.*	*Investigate where data from this project can fit into LAPs.*

11. Activity/Output Schedule

								Forward Funding $	
Activity	**Activity Type**	**NHT $**	**NAP $**	**Other$_1$**	**Other$_2$**	**Output Code**	**Outputs**	**06-07**	**07-08**
1. Review of current bore locations and function and recommendations for further bore sites	Monitoring, evaluation and review (?)		Being funded through Groundwater source identification, assessment and management			P3.1	See Groundwater source identification and management project.		
2. Intensive monitoring	Threat identification and risk		72,000			RA1.2 RA2.3 (Year 2	1 x Analysis (Data collection	98,000	98,000

snapshot for nutrients. Interpretation and report on data (Implementation of management actions year 2 onwards)	assessment					OG2.3 OG3.3 OG4.4 OG5.3 OG12.5)	at 300 sites)		
3.Desktop report for predicted flood events.	Threat assessment and risk assessment		50,000			RA3.3	1 x Study		
4. Gap analysis of existing flood mapping and complete maps through contour mapping.	Threat assessment and risk assessment		400,000			RA2.3 RA3.3	1 x Analysis (80km of flood mapping Gap analysis, data collection)	100,000	100,000
5. Implementation of improved management options for nutrient point source pollution.	Threat assessment and risk assessment		35,000	DoE 2000	Water Corp $TBA	CB2.1 OG12.2	1 x workshop 1 x improved treatment of sewerage	35,000	25,000
6. Fencing of Avon and major tributaries within region.	Planning for key management actions. Investment in impleme		154,000	DoE 40000		OG2.3	47 km of Avon River and tributaries fenced	194,000	194,000

	ntation								
7. Extension	Building capacity for impleme ntation.		25,000			CB1.1 CB1.2 CB1.3 CB1.4 CB2.1	1 x educational material, 4 x written products, 1 x workshops.	25,000	25,000
	Total		**736,000**	**2000**				**452,000**	**442,000**

Activity 4. Requires a large investment in year one as contour mapping requires an aerial survey, which logistically needs to occur in a one off activity. Therefore funding cannot be spread over several years.

Activity 6: To achieve the target of 200km of tributaries and 95% of the Avon fenced a total of 47km of fencing is required per year. 1 FTE is required to run the program with $2000/km for fencing material. Note that additional funding outside NAP investments is available to meet the fencing target.

12. Contingency Activity/Output Schedule

Activity	**Activity Type**	**NHT**	**NAP**	**Other$_1$**	**Other$_2$**	**Output Code**	**Outputs**
Total							

Project Id No. IWM 002

Project Title:

Groundwater source identification, assessment and monitoring.

1. Project Summary (Aims):

Groundwater resources with potential for water supply or production are identified and managed in a sustainable way.

2. Project Description:

Groundwater resources in the region are generally unsuitable for domestic consumption or agricultural use. There are some fresh to brackish groundwater resources in the region, which have potential for use. These assets are very important but currently very little is known of their locations, quality and quantity, this has led to these water resources being used on an unregulated opportunistic basis. Potential environmental impacts will also be identified through the development of guidelines for sustainable use.

The project outcomes will identify and manage fresh to brackish groundwater assets as follows:

- Development and implementation of a regional groundwater monitoring strategy.
- Identify groundwater benchmark levels and quality.
- Set the 20-year Target.
- Significant groundwater resources with potential productive yield are assessed, reported on and managed for maximum community benefit.
- Develop guidelines for sustainable use of groundwater. This will also included identification of potential environmental impacts due to increase use of the resource.
- Look at opportunities for industry development which optimises sustainable water use.
- Contribution to land managers understanding of alternative water management techniques on a basin wide scale.

This project has strong linkages with the Water Management and Self-sufficiency Project– The outcomes of this project will address $W_3T_{20}1$ By end 2025, 50% of agricultural properties in the 'Wheatbelt' zone and 50% of agricultural properties in the 'Avon Arc' have zero annual water deficits.

Components of this project denoted under MATs as Cross Regional, are those areas that are eligible for funding under the National Action Plan.

3. Asset Description:

In the Avon River Basin, groundwater generally occurs in rock fractures, in areas of more deeply weathered and decomposed rock, in colluvium, and in sandy alluvial deposits along large creeks and rivers. Aquifers of deeply weathered rock are found mainly in the Yilgarn Block.

The low salinity groundwater resources in the western part of the region occur in relatively small areas of sandplain and paleovalleys. They are locally important for town water supply and increasingly for irrigated agriculture. Although limited in extent, they represent the only significant groundwater resources in an area characterised by low supplies and high groundwater salinity.

4. Threat Description:

Inappropriate utilisation, both under and over use, has the potential to impact on the resource and other assets. Inadequate management can lead to increased flooding, rising water tables and salinity and impact on aquatic environments that rely on the resource. Land, biodiversity and infrastructure assets that can be affected by rising water tables are also at potential risk.

5. Contribution to Target or Resource Condition:

Groundwater resource mapping and appropriate management will ensure the ongoing sustainability of groundwater resources and minimise the impacts of groundwater rise and flooding. Adequate management will also ensure the protection of groundwater dependant ecosystems.

6. Twenty Year Target/s:

- W4T201 Groundwater aquifers suitable for domestic or productive use are identified by 2010 and are maintained at a defined suitable level and quality.

- W4T202 Regional groundwater aquifers managed to minimise the impacts of salinity and flooding according to sub-regional groundwater management plans (Note: 20 year target to be set in 2005 following regional groundwater and surface water assessment currently undertaken as a part of the EEI program).

7. Management Action Target/s:

- W4MAT8.1 A regional groundwater monitoring strategy for the Avon River Basin is developed and being implemented by 2007 (Cross Regional).

- L2 MAT8.1 Benchmark groundwater levels and quality consistent with National Land and Water Resource Audit standards by 2008 (Cross Regional).

- W4MAT 4.1 The 20-year resource condition targets for regional groundwater aquifer management are set by end 2006.

- W4MAT 1.1 A report on surveys of groundwater resource with potential productive yield within the region is prepared by 2009.
- W4MAT 7.1 Significant groundwater resources are managed for maximum community benefit by adoption of water allocation "best management" criteria by 2009.
- L2MAT 6.2 Basin wide extension program ensures that 80% of land managers have an understanding of the benefits and impacts of the application of alternative water management techniques and a systems-based approach by 2009.

8. Management Actions:

- Develop appropriate groundwater survey database and survey methods.
- Undertake preliminary regional assessment of prospective aquifers.
- Arrange assessment of potentially beneficial aquifers within the region.
- Groundwater level and quality monitored and assessed (Cross Regional).
- Area of salinity monitored, including improved mapping (Cross Regional).
- Benchmark:

– Changes in uptake of practice.

– Resulting contribution to resource condition change (threat focus).

- Extension of BMP for groundwater management, including:

– Surface water management.

– Valuing remnant vegetation for resource management protection.

- Some yet to be developed.

9. Contribution to National NRM outcomes:

- The impact of salinity on land and water resources is minimised, avoided or reduced
- Surface and groundwater quality is maintained or enhanced.
- Surface water and groundwater is securely allocated for sustainable production purposes and to support human uses and the environment, within the sustainable capacity of the water resource.

10. Project Linkages

Aboriginal	Local Government	Marketing & Communication	M & E	Skills & Training	Local Area Plans
Identification of traditional springs and other culturally significant sites	*Local government planning schemes include groundwater resources.*	*Dissemination of information to relevant landholders and stakeholders*	*No of reports produced. Aquifers identified and managed according to Best Management criteria. RCT's set.*	*Knowledge of sustainable groundwater use and irrigation practices to local landowners*	*LAP's include groundwater resource location and management.*

11. Activity/Output Schedule

								Forward Funding $	
Activity	**Activity Type**	**NHT $**	**NAP $**	**Other$_1$**	**Other$_2$**	**Output Code**	**Outputs**	**06-07**	**07-08**
1. Review of current bore locations and function including recommendations for further bore sites	Monitoring, evaluation and review		200,000			RA1.1, RA1.3 RA2.1 RA2.3	1 x Enhancement of existing monitoring programs. 1 x RCT set. 1 x Report	200,000	200,000
2. Desk top study of potential and existing low salinity groundwater sources	Asset Identification		20 000			RA2.3	1 x Study		
3. Investigation drilling of potential sources	Asset Identification		70 000			RA2.1	1 x Study	70 000	60 000
4 Development of best management criteria for sustainable	Investment in Implementation		30 000			P4.2,	1 x Analysis		

use of the resource									
5. Extension	Building capacity for impleme ntation		90,000			CB1.1 CB1.2 CB1.3 CB2.1	4 x Newsletter s1 x study tours. 1 x display 1 x workshop	40,000	40,000
		Total	**410,000**					**410,000**	**400,000**

Activity 1: Funding for this project also contributes to projects 1,2 & 4. Therefore covers 2 FTE +$50,000 operational.

12. Contingency Activity/Output Schedule

Activity	**Activity Type**	**NHT**	**NAP**	**Other$_1$**	**Other$_2$**	**Output Code**	**Outputs**
	Total						

Project Id No. IWM 003

Project Title:

Protection of community assets.

1. Project Summary (Aims):

The aim of this project is to develop and implement methods to protect community infrastructure and heritage and cultural sites from the threats of rising water tables, salinity and flooding.

2. Project Description:

Community assets within the Avon River Basin consist of towns and their associated infrastructure and heritage and cultural sites. They are important to the community for social, economic and environmental reasons, however many of these assets are currently, or have the potential to be, under threat from a number of threatening processes as outlined below.

Most rural infrastructure is associated with towns and transport corridors, both of which are located in the landscape where the risk of salinity and flooding is increasing due to rising regional groundwater tables. There is also further risk due to actions that may be taken to combat the effects of salinity and flooding on land, water or biodiversity assets.

Cultural and historical assets are those that are significant to both the Aboriginal and non-Aboriginal community and include buildings, other infrastructure and areas of significance to local Aboriginals. These assets are also at risk from salinity and flooding depending on their location in the landscape.

The protection of these valued community assets is important to the local community and will be achieved in the following ways:

- Develop protocols to ensure heritage and cultural values are included in NRM planning.
- Development of a rural town water management model, water management plans and practices and the implementation of an integrated water management pilot schemes.
- Research and collate information regarding management of threats to town infrastructure and cultural/historical sites within the region.
- Distribute and utilise information of threat management to assist communities to protect assets.
- Contribution to land managers understanding of alternative water management techniques on a basin wide scale.

- This project has links with the Salinity Management Project through the identification of high-risk recharge areas, which are linked to priority assets, and the subsequent management of these areas.

3. Asset Description:

Community assets include built assets of town sites and associated infrastructure and any significant cultural and heritage sites.

4. Threat Description:

Dryland salinity, waterlogging and flooding threaten the cultural and community assets of the region through damage to substrate and surface materials. This damage has impacts on the ability of the assets to perform their function as well as increasing the expenditure of managing agencies on repairs, refurbishment and maintenance. Of the 38 towns identified as being affected by salinity and high water tables in Western Australia, 21 are within the Avon River Basin, this equates to over 35% of the population of the Avon Region. The cost of repairs and maintenance is expected to run into the tens of millions of dollars if appropriate management actions are not investigated and implemented.

5. Contribution to Target or Resource Condition:

The collation and research of information regarding management of these threats with respect to community infrastructure and culturally significant sites will be used to manage assets to reduce damage from salinity, rising groundwater and flooding. Development of protocols for heritage and cultural assets will ensure their ongoing protection with respects to NRM planning and activities.

6. Twenty Year Target/s:

- I3T20 1 By 2025, 10 rural towns in the Avon Region have the risk of damage to infrastructure and heritage values due to salinity and flooding reduced by 50% compared with 2004 risk assessments.

- W5T201 Known heritage and cultural values are maintained and enhanced by 2025.

7. Management Action Target/s:

- W5MAT7.1 A report is prepared that outlines protocols to ensure heritage and cultural values identified in local and regional plans are considered in NRM programs and projects by 2006.

- I3 MAT 2.2 Geophysical surveys are completed for 5 priority rural towns (RTLA program) by 2006.

- I3 MAT5.1Prepare"implementation Plans" for 5 priority rural towns (RTLA program) by 2009.

- I3 MAT 7.1 Implement "Integrated Water Management Systems" demonstration projects in two towns by 2006.

- I3 MAT 6.1 Complete 5 "Waterwise" education and training programs as a part of implementation planning for the 5 priority rural towns by 2009.
- I3 MAT 1.1 Rural town assets at risk within the region are identified by 2006.
- I3 MAT 6.2 Prepare a "Water Sensitive Urban Design" Manual suitable for rural towns in the region by 2006.
- I3 MAT 3.1 Complete a feasibility study for each of a waste/ storm water recycling process and for desalinisation of pumped groundwater in the region by 2006.
- L2MAT 6.2 Basin wide extension program ensures that 80% of land managers have an understanding of the benefits and impacts of the application of alternative water management techniques and a systems-based approach by 2009.

8. Management Actions:

- Identify the five priority rural towns.
- Identify two towns most suitable for demonstration.
- Prepare "Works Plans" for the water management demonstrations.
- Develop cost sharing arrangements with appropriate partners for the demonstration projects.
- Develop appropriate "Waterwise" information and training.
- Identify rural towns with assets at risk to rising water tables that are not currently a part of the RTLA program.
- Develop appropriate "Water Sensitive Urban Design" information.
- Arrange ground-based geophysical surveys for the 15 priority rural towns.
- Extension of BMP for transport infrastructure management, including:

- Surface water management.

- Valuing remnant vegetation for infrastructure protection.

- Farm drainage and pumping guidelines (technical/ legal).

- Some yet to be developed.

9. Contribution to National NRM outcomes:

- The impact of salinity on land and water resources is minimised, avoided or reduced
- Surface and groundwater quality is maintained or enhanced.

- The impact of threatening process on locations and systems which are critical for conservation of biodiversity, agricultural production, towns, infrastructure and cultural and social values, is avoided or minimised.

- Surface water and groundwater is securely allocated for sustainable production purposes and to support human uses and the environment, within the sustainable capacity of the water resource.

10. Project Linkages

Indigenous	Local Government	Marketing & Communication	M&E	Skills & Training	Local Area Plans
Develop protocols to include cultural and heritage values in NRM projects. *Inventories of culturally significant assets.* *Consultation in regards to fencing.*	*Develop protocols to include cultural and heritage values in NRM projects.* *Inventories of culturally significant assets.*	*Contact stakeholders and asset managers.* *Dissemination of information.*	*No of reports produced.* *No if shires including cultural and heritage values in NRM.* *No of people attending workshops.*	*Water sensitive urban design skills* *Cultural awareness in NRM planning* *Waterwise education and training programs yrs 2 & 3.*	*Salinity risk assessment Yr2/3* *Inventories of cultural and heritage values* *Threats to community assets identified in LAP's*

11. Activity/Output Schedule

								Forward Funding $	
Activity	**Activity Type**	**NHT $**	**NAP $**	**Other$_1$** (LGA)	**Other$_2$** (Ag Dept)	**Output Code**	**Outputs**	**06-07**	**07-08**
1. Development of water management plans and practices and the implementation of an integrated water management pilot schemes.	Asset Identification Threat identification and risk assessment Building capacity for implementation.		300,000	130,000	130,000	RA2.2, RA2.1, RA3.3, CB1.1, OG10.1 OG10.4, OG13.6,	3 x Geophysical survey 4 x water management plans 1 x integrated water management scheme 1x water sensitive	300,000	300,000

	Assessing the feasibility and cost benefits of management actions						urban design,1 x feasibility study. 1 x Waterwise training 1 x implementation of water plan		
2. Development of protocols to include heritage and cultural values in NRM planning.	Investment in implementation		25,000 (from core capacity functions)			RA2.3	1 x Study		
3. Extension	Building capacity for implementation		54,000			CB1.1, CB1.2, CB2.1, CB2.2,	Educational material, 4 x newsletters, 1 x workshops 1x educational material	75,000	75,000
Total			**354,000**	**130,000**	**130,000**			**375,000**	**375,000**

12. Contingency Activity/Output Schedule

Activity	**Activity Type**	**NHT**	**NAP**	**Other$_1$**	**Other$_2$**	**Output Code**	**Outputs**
Total							

Project Id No. IWM004

Project Title:

Protection of transport assets (roads, rail and aviation).

1. Project Summary (Aims):

The aim of this project is to see a reduction in the percentage of transport infrastructure at risk from rising water tables, salinity, waterlogging and flooding, through appropriate management actions.

2b. Project Description:

This project will compile an inventory of transport assets within the Avon Region. After an investigation into risk analysis, threat mapping, management options and demonstration, the inventory will be used to better manage threats to transport infrastructure across the region to reduce the impact of threatening processes.

The project outcomes will be achieved through the completion of the following:

- Identify and record transport assets within the region.
- Research and collate information regarding threat analysis methods and management of those threats to infrastructure within the region.
- Development of an education and extension program for transport asset managers including the utilisation of existing threat management information.
- Demonstration of management options.
- Link at local government level for improved methods of construction and maintenance of transport assets.

This project has links with the following projects.

- Salinity Management Project- identification of high-risk recharge areas that are linked to priority assets and the subsequent management of these areas.
- Water Management and Self-sufficiency Project – the location of surface water management activities may have an impact on transport infrastructure affected by surface water runoff, inundation and flooding.

3. Asset Description:

The built infrastructure within the Avon River Basin is fundamentally important to community development and management of natural resources within the region. There are a total of 25,203 km of roads and 1,918 km of rail within the Avon River Basin. Aviation is becoming another important means of transport with both public and private airstrips located throughout the region. This extensive regional transport network is essential for commerce and social cohesion. In addition, there are major

transport linkages from Perth to the north and south of the state, and to Kalgoorlie-Boulder and the Eastern States that pass through the region. Road and rail networks are also significant as landscape corridors that enhance environmental values.

4. Threat Description:

Dryland salinity, waterlogging and flooding threaten the transport assets of the region through damage to substrate and surface materials. This damage has impacts on the ability of the assets to perform their function as well as increasing the expenditure of managing agencies on repairs, refurbishment and maintenance.

Most roads and rail infrastructure, and some airstrips, have been located in low gradient landscape positions and as a result are now at risk of impact from rising water tables and flooding. Aviation facilities will be affected where airstrips are deteriorated due to high water tables.

1963km (7.8%) of roads within the Avon River Basin are currently at risk and a further 5626km (22%) is potentially risk from high water tables. The estimated 20-year regional cost for roads currently at risk is $99 million.

Efficient infrastructure is fundamental to the effectiveness of local communities and economies within the region. Decline in infrastructure services will deter community development and detract from new enterprise initiation.

5. Contribution to Target or Resource Condition:

The development of a regional transport policy along with demonstration of management options will direct effective management of salinity, waterlogging and flooding with respect to transport infrastructure. The collation and research of information regarding management of these assets will lead to improved construction, maintenance and planning of infrastructure assets. These actions will reduce the percentage of roads within the region that are at risk due to high water tables and flooding through improved management actions both of the threats and the assets themselves.

6. Twenty Year Target/s:

- I1T20 1 By 2025, the percentage of roads at risk due to high water tables and flooding is reduced to 10% (2, 520 km) or less of the total road network in the Avon River Basin.

7. Management Action Target/s:

- I1 MAT 1.1 An inventory of transport assets, including roads, rail, airstrips and associated assets (e.g. culverts, bridges) is prepared for LGA's within the region by 2005.

- W5MAT 7.1 A report is prepared that outlines protocols to ensure heritage and cultural values identified in local and regional plans are considered NRM programs and projects by 2006.

- I1 MAT 2.1 The risk of high water tables and flooding for transport infrastructure is known within each Local Government Area by 2009.
- I1 MAT 6.1 By end of 2005 an education package is developed for LGA's, Main Roads, catchment or conservation groups and land managers, to encourage an understanding of the links between catchment management and the protection of key infrastructure.
- I1 MAT 3.3 Methods of road risk assessment are evaluated by 2005.
- I1 MAT 3.2 Assess alternative culvert materials and designs to suit changed catchment hydrology by 2007.
- I1 MAT 4.1 Priority roads for preventative action identified through regional transport policy development processes by 2007.
- I1 MAT 6.1 More than one full-time employee (or equivalent) with technical skills for transport infrastructure management integrated with landscape management is working with LGA's within the region by 2005.
- I1 MAT 7.1 Ten sites are implemented demonstrating preventative management options for transport assets by 2007.
- L2MAT 6.2 Basin wide extension program ensures that 80% of land managers have an understanding of the benefits and impacts of the application of alternative water management techniques and a systems-based approach by 2009.

8. Management Actions:

- Local area inventories of transport assets including the identification of priority assets within the region.
- Regional transport policy development.
- Risk assessment modelling and surveys undertaken for roads at risk.
- Feasibility assessment modelling of technical options for prevention, recovery and adaptation.
- Review current information (MRWA) and evaluate options for road risk assessment.
- Engage and improve stakeholder capacity (including land managers and key transport organisations i.e. LGA's, MRWA) to design and adopt integrated catchment management approaches to infrastructure developments and maintenance.
- Develop cost-sharing arrangements for implementation.
- Extension of surface water, groundwater and infrastructure management.

9. Contribution to National NRM outcomes:

- The impact of salinity on land and water resources is minimised, avoided or reduced.
- Surface and groundwater quality is maintained or enhanced.
- The impact of threatening process on locations and systems which are critical for conservation of biodiversity, agricultural production, towns, infrastructure and cultural and social values, is avoided or minimised.
- Surface water and groundwater is securely allocated for sustainable production purposes and to support human uses and the environment, within the sustainable capacity of the water resource.

10. Project Linkages

Indigenous	Local Government	Marketing & Communication	M&E	Skills & Training	Local Area Plans
Develop protocols to include cultural and heritage values in NRM projects. *Inventories of culturally significant assets.*	*Develop protocols to include cultural and heritage values in NRM projects.* *Inventories of transport assets*	*Contact stakeholders and asset managers.* *Dissemination of information.*	*No of reports and newsletters produced.* *No of people attending workshops.* *No of field days and trails*	*Training for LGA's, catchment groups, land managers and main roads.*	*Salinity risk assessment Yr2/3* *Inventories of transport infrastructure* *Threats to transport assets identified in LAP's*

11. Activity/Output Schedule

								Forward Funding $	
Activity	**Activity Type**	**NHT $**	**NAP$**	**Other$_1$**	**Other$_2$**	**Output Code**	**Outputs**	**06-07**	**07-08**
1. Preparation of inventory of transport assets and report on risk assessment methods to transport infrastructure from flooding. (Some work done through National Land	Asset Identification Threat identification and risk assessment Assessing the feasibility and cost benefits of management		50,000			RA2.3	2 x Data anlysis	50,000	50,000

& Water Resource Audit).	options								
2. Development of protocols to include heritage and cultural values in NRM planning.	Investment in implementation		Funded under Protection of community assets					Funded under Protection of community assets	Funded under Protection of community assets
4. Development and extension of education/ information package for asset managers (e.g. LGA's, catchment groups and MRWA) and demonstration of management options, including research into threat management to transport assets with regard to waterlogging, flooding and salinity.	Building capacity for implementation Assessing the feasibility and cost benefits of management options. Setting and reviewing targets. Investment in implementation Threat identification and risk assessment		200,000			P1.1 CB1.1 CB1.2 CB4.1 OG10.4 OG10.1 OG10.3 OG5.2 OG4.1 OG4.6 OG9.1	1x study 4 x trials, 1 x field day 1 x education package 4 x newsletters	200,000	200,000
	Total		**250,000**					**250,000**	**250,000**

Activity 4: Requires employment of at least 1FTE to address MAT as well as development of education package and extension hence the required large funding allocation.

12. Contingency Activity/Output Schedule

Activity	**Activity Type**	**NHT**	**NAP**	**Other$_1$**	**Other$_2$**	**Output Code**	**Outputs**
Total							

Project Id No. IWM005

Project Title:

Salinity management.

1. Project Summary (Aims):

- to manage landscape water in order to slow down or reduce the rate of groundwater rise and the spread of salinity;
- to provide management options for areas where the reversal of salinity is not cost effective, to ensure salt affected land is used productively and/or to enhance conservation values; and
- to manage the abstraction and disposal of groundwater primarily for agricultural operations (but also mining) to minimise on and off site impacts.

2. Project Description:

Agriculture is the dominant use of land in the Avon River Basin. The area of land used for agriculture is 7.4 million hectares – the total area of the Avon River Basin is 11.8 million hectares. The region contains 25% of WA farms and accounts for 39% of all farmland in the States agricultural area.

An assessment of threats to land resources has identified dryland salinity as a major issue for the Avon River Basin. Salinity currently affects 5.3% of the region and may potentially impact 27.4%. The predicted increase of salinity is a major threat to land quality and to sustainable production, therefore management that is able to slow or reduce the amount of recharge, and hence impact rates of water table rise, is a primary focus of this project. Management of local flow systems and groundwater aquifers are considered as a part of farming systems where rising groundwater is affecting land assets and agricultural productivity. Management includes options for reducing groundwater recharge and for enhancing discharge.

Rising water tables are also associated with acidification processes often resulting in low pH, highly saline water. Safe disposal of both saline and acidic water is essential for resource protection.

Deep drainage governance issues are also significant and require review and policy change. Management of groundwater flow systems is important for control of salinity in the region, and will be addressed though a combination of both engineering and biological options. Management of the disposal of that groundwater is important to minimise on and off site impacts.

This will be achieved through 3 strategic areas: 1) engineering 2) biological options and 3) governance of water management. All areas will be underpinned by resource monitoring and on ground activities will be linked to priority assets or key regional demonstration sites which require catchment water management to be addressed. Activities as outlined below:

1) Engineering options (surface and groundwater)

- Assessment of the extent and safe disposal of acid groundwater.
- Identification of impacts of abstraction and disposal of saline groundwater.
- The development and implementation of Best Management Practices (BMP) guidelines for the safe disposal of saline groundwater.
- Undertake a temporal analysis of the extent and physical impacts of drainage and survey farmers regarding the social impacts of drainage.
- Assessment of potential benefits and impacts of modified drainage to tributaries.
- High-risk groundwater recharge landscape zones identified that target priority assets or demonstration sites to guide catchment management within the Avon River Basin and adjacent NAP Region (Cross regional).

2) Biological options

- Increasing land managers understanding of alternative water management techniques on a basin wide scale.
- Tree crops established for groundwater control benefits within the Avon River Basin and adjacent NAP Region (Cross regional).

3) Governance

- Input to policy development for drainage.

This project has strong links with the Getting Started: "Baselining" the Region's Natural Diversity, Healthy Ecosystem, Sense of Place: Conserving the Region's Characteristic Ecoscapes and Back from the Edge: Saving Native Species and Communities Most at Projects through the identification of high risk recharge areas that are linked to priority landscapes, ecosystems, communities and species and the subsequent management of these areas. These projects also address wetlands and waterways, which are traditionally the receiving bodies for drainage water, this can have a detrimental impact on vegetation and aquatic health if not adequately managed.

Components of this project denoted as Cross Regional, are those areas that are eligible for funding under the National Action Plan.

3. Asset Description:

N/A

4. Threat Description:

Soluble salts commonly associated with soil salinity leads to water-quality deterioration, loss of native aquatic habitats and ecosystems, death of existing native vegetation and affect the vigour of growing plants including crops. The combined affect of rising water tables and an increase groundwater salinity has seen 388,000ha (5.3%) of the Avon River Basin become saline and a further 2 million ha (27.4%) at risk of salinity in the future. Groundwater salinity ranges from less than

2,750 mg/L to the west, increasing to greater than 35,000mg/L in other areas across the region.

Acid groundwater is known to have a devastating effect on the ecosystem, through stunted plant growth, fish kills and death of other aquatic or marine organism and linkages to blue-green algae (cyanobacteria) blooms. As well as a financial cost of poor crop health, loss of crop productivity; and damage to public and private infrastructure (i.e. corrosion of concrete). Acid groundwater (pH<4) is present in approximately 20% of groundwater bores monitored in the Central Agricultural Region (Ghauri, 2004). It is recognised as occurring naturally although is considered an environmental risk with discharge at the surface due to rising groundwater or pumping and drainage. The detailed extent of this threat is currently not well understood.

The abstraction and disposal of this groundwater can have environmental, social and economic affects on and off site and needs to be effectively managed.

5. Contribution to Target or Resource Condition:

Resource targets are aimed at reducing the predicted extent of salinity (approx. 27% of the region) and where reduction is not possible, ensuring that the productive values and conservation values of salt affected land are maintained. A part of the process in achieving these targets is contributing to the ongoing development of region and state frameworks that develop policy and processes for long term management of saline water.

6. Twenty Year Target/s:

- L2T201 Reduction in the average rate of groundwater rise on land in middle and upper catchment areas from 15-30mm to 10-20mm by 2025. (The target for middle and upper catchment area refers to very significant reductions in groundwater rise. This action is considered essential to allow recovery and containment and ongoing utilisation of the land resources).

- L2T202 The extent of valley floor salinity is less than 12% of land used for agriculture by 2025. (Note the area affected in currently over 5.4%. This is expected to eventually increase to over 27%)(The target for the valley floor recognises that saline land has a value in its own right and the intent is to contain salinity in these areas and utilise saline land as a resource)

- W4T203 Disposal of groundwater from mining operations is managed according to statutory licence conditions by 2009.

- W4T204 Disposal of groundwater from agricultural operations is managed according to acceptable 'best practice' guidelines by 2009.

7. Management Action Target/s:

- W4MAT 8.1 A regional groundwater monitoring strategy for the Avon River Basin is developed and being implemented by 2007(Cross Regional).

- L2 MAT 8.1 Benchmark groundwater levels and quality consistent with National Land and Water Resource Audit standards by 2008 (Cross Regional).
- L2 MAT 2.1. High-risk groundwater recharge landscape zones identified for all shires, linked to priority assets by 2009.
- L2 MAT 7.1 At least 50% of the landscapes identified within Local Area Plans (with a focus on managing local flow systems and points of high recharge e.g. the base of granite outcrops) managed using best management practice options for salinity by 2009.
- L2 MAT 7.4 More than 20,000Ha of commercial tree crops are established in areas where groundwater control benefits will occur by 2009.
- W4MAT 3.4 Assessment of treatment methods for safe disposal of acid groundwater by 2008.
- W4MAT 5.4 Management plans and demonstration for 10 areas identified as being of high risk due to groundwater abstraction and disposal prepared and implemented by 2009.
- W2MAT 7.1 Local priority waterways identified within Local Area Plans with modified drainage have demonstrated 'net benefit' (to be determined)(not expected to be retrospective).
- L2MAT 6.2 Basin wide extension program ensures that 80% of land managers have an understanding of the benefits and impacts of the application of alternative water management techniques and a systems-based approach by 2009 (Cross Regional).

8. Management Actions:

- Assessment of current groundwater levels, trends, quality.
- Identify areas of greatest risk within the landscape (including local flow systems) as part of preparing Local Area Plans.
- Development of targeted options to manage such sites.
- Catchment demonstration of best management practice for salinity management.
- Assess groundwater monitoring information for groundwater pH.
- Arrange trial of acid groundwater treatment options, including lime beds and use of ameliorant solutions.
- Development of engineering options that build on EEI.
- Development of 'Best Practice' guidelines for groundwater extraction.

- Assessment of potential benefits and impacts of modified drainage to major and minor tributaries is prepared.
- Extension of BMP for salinity management, including:

– Surface water management.

– Phase farming processes that incorporate commercial perennial, annual crop and pasture options targeted to environmental conditions and linked to positive farm productivity outcomes.

– Valuing remnant vegetation for resource management protection and farm production.

– Salt tolerant plant species (including plant breeding outcomes), saltland pastures and salt bush alleys and PURSL options.

– Farm drainage and pumping guidelines (technical/legal).

– Financial management skills to budget for NRM expenditure.

9. Contribution to National NRM outcomes:

- The impact of salinity on land and water resources is minimised, avoided or reduced.
- Ecosystem services and functions are maintained or rehabilitated.
- The impact of threatening process on locations and systems which are critical for conservation of biodiversity, agricultural production, towns, infrastructure and cultural and social values, is avoided or minimised.

10. Project Linkages

Aboriginal	Local Government	Marketing & Communication	M & E	Skills & Training	Local Area Plans
Identification of culturally significant sites adjacent to priority waterways and with respect to the salinity threat..	*Include Local government in planning process for groundwater disposal. Development and ownership of LAP.*	*Dissemination of BMP options to relevant landholders and stakeholders*	*Development of regional groundwater monitoring strategy.* *Number of people attending workshops.* *Number of reports produced.* *Area planted to commercial tree crops.*	*Knowledge of best practice guidelines for groundwater disposal to relevant stakeholders and workshops for Dryland Salinity*	*Used to identify local priority waterways and Identification of areas under risk within LGA's*

			Number of identified landscapes managed using BMPs.	*BMPs.*	

11. Activity/Output Schedule

								Forward Funding $	
Activity	**Activity Type**	**NHT $**	**NAP $**	**Other1**	**Other2**	**Output Code**	**Outputs**	**06-07**	**07-08**
Assessment									
1. Review of current bore locations and function and make recommendations for further bore sites	Monitoring, evaluation, and review		Being funded through Identification and management of Groundwater assets project			RA1.3 RA2.1 RA2.3	See groundwater source identification, assessment and management project		
Engineering									
2a. Demonstration and assessment of acid groundwater disposal methods. Build on EEI data and activities.	Assessing the feasibility and cost benefits of management options		100,000			RA2.3 OG12.7	1x Demonstration site.	250,000	250,000
2b. Preparation and implementation of management plans for high risk groundwater abstraction and	Investment in implementation		400,000			P4.2 OG3.4 OG4.4 OG10.1 OG10.2 OG10.3 OG10.4 OG	Number of management plans, area of land treated through drainage, length of priority waterwa	300,000	300,000

disposal sites							ys protected.		
3. Temporal analysis and review of engineering options for groundwater management and salinity control.	Assessing the feasibility and cost benefits of management options		100,000			P1.1 RA2.3	1 x Study	50,000	20,000
Catchment Scale									
4a. Utilisation of existing information for identification of high-risk groundwater recharge zones for priority assets or demo site	Assessing the feasibility and cost benefit of management options. Investment of implementation		200,000			RA2.1 RA2.3 OG5.1 OG4.6 OG10.1 OG10.2 OG10.3 OG10.4	1 x Analysis. 3 x catchment scale trials and demos covering 30000ha Dependant on outcomes of LMAT2.2	100,000	100,000
4b. Implementation to protect key assets	Investment of implementation		400,000			OG4.1, OG4.6, OG5.1, OG5.2, OG5.3, OG5.4, OG10.1, OG10.2, OG10.3, OG10.4	MATL2.2.1, will include revegetation, tree crops, sub-surface and surface drainage, groundwater pumping on 10%	400,000	400,000

							of identified sites		
Biological									
5. Planting of commercial tree crops and deep rooted perennials (See note below)	Investment of implementation		400,000	$1200 000 (Land holders)		OG5.1 OG4.1	800 ha of tree crops planted	500,000	500,000
Governance									
6. Extension and policy.	Building capacity for implementation		150,000			CB1.1 CB1.2 CB1.3 CB1.4 CB2.1	4 x written products, 3 x field days, 1 x electronic media (ie video, CD)	150,000	150,000
Total			**1,750,000**	**1,500, 000**				**1,750,000**	**1,720,000**

Activity 4. If Commonwealth funded by Infinitree then this funding would focus on non-commercial species with biodiversity or other values.

12. Contingency Activity/Output Schedule

Activity	Activity Type	NHT	NAP	Other$_1$	Other$_2$	Output Code	Outputs
Planting of commercial tree crops and deep rooted perennials.	Investment of implementation.		100,000	300,000		OG5.1 OG4.1	200ha of tree crops planted
	Total		100,000	300,000			

Project Id No. IWM 006

Project Title:

Water management and self-sufficiency.

1. Project Summary (Aims):

To assist local communities to achieve minimal water deficits and reduce reliance on reticulated water supplies. Implementation of project initiatives will assist to provide sufficient water for environmental flows (especially within the Avon Arc) and reduce the impact of flooding and erosion.

2. Project Description:

The Avon Region is a major importer of water from the Goldfields Water Supply Scheme. This factor combined with an increase in surface water runoff from catchments cleared for agriculture, is having a negative impact on the water balance of the region as well as increasing flooding and erosion in some areas. Where reticulated water is not available, many farms and small communities have inadequate water supply, especially during droughts. There are opportunities to reduce annual water deficits (when demand is greater than supply) and improve the water balance of the region by increased water harvesting and reducing flooding and erosion. At the same time retaining adequate stream flow for environmental requirements.

This will be achieved in the following ways:

- Demonstrate by the development of integrated catchment plans the potential for the more efficient and appropriate use of identified water supplies on farms.
- Encourage a catchment approach to water supply management and development and demonstrate how water supply planning may assist in addressing problems associated with groundwater salinity, flooding and erosion.
- Demonstrate how farm water planning may contribute to achieving improved land and water management practices.
- Facilitate accredited training courses designed to ensure that there is an increased number of Farm Water Planners available to the rural sector who are skilled to a minimum level of technical competency.

This project has links with several Natural Diversity and Sustainable Industry Projects as follows:

- Healthy Ecosystems, Sense of Place: Conserving the Region's Characteristic Ecoscapes and Back from the Edge: Saving Native Species and Communities Most at Risk Projects through the protection of assets from surface water runoff and its associated threats of prolonged inundation, flooding and erosion.

- Increased awareness of soil health limiting factors and demonstration of fertility testing for long term soil health project. As well as the benchmarking soil acidity status and identification of contributing land management practices project - contributes to the quality of surface water through improved nutrient, acidity and soil management.

- Groundwater Source identification and Monitoring Project - as appropriate use of groundwater resources can contribute to the target of 50% of agricultural properties in the 'Wheatbelt' zone and 50% of agricultural properties in the 'Avon Arc' having zero annual water deficits.

3. Asset Description:

- Surface water is considered an asset for supply and environmental flows. Surface water run-off is important for farm and town water supply especially where reticulated scheme water is not available in the region.

- Environmental surface water flows is also considered an asset and must be maintained, particularly within the Avon Arc zone where increased pressure is placed on this resource due to increasing number of small-scale landholders.

4. Threat Description:

Surface water runoff from catchments cleared for agriculture has increased and the use of surface water, due to the availability of reticulated water, has decreased. The opportunities for local water supplies integrated with surface and groundwater management, including water recycling, are not fully realised. This has led to flooding and erosion in some areas and in some rural towns this is considered to be a part of the cause of high water tables affecting built assets. Of the 38 towns identified as being affected by salinity and high water tables in Western Australia, 21 are within the Avon River Basin.

5. Contribution to Resource Condition Change:

The project contributes to water self sufficiency through training and implementation of integrated plans, at the same time ensuring environmental flows are maintained. Improved management of surface water for supply will reduce the dependence on reticulated water and increase the percentage of properties within the Wheatbelt and Avon Arc have a zero annual water deficit.

6. Twenty Year Target/s:

- W3T201 By end 2025, 50% of agricultural properties in the 'Wheatbelt' zone and 50% of agricultural properties in the 'Avon Arc' have zero annual water deficits.

- W3T202 Environmental surface water requirements are maintained within the 'Avon Arc' zone until 2025 and beyond.

7. Management Action Target/s:

- W3MAT4.1 The volume of water used annually for farm and town supply from reticulated schemes is identified within 30 Local Area Plans and targets for reduced use are set by 2007.
- W3MAT 6.1 More than 10 accredited people with farm water planning skills are providing services within the region by 2009.
- W3MAT 5.1 By 2007, 5 integrated plans are prepared to demonstrate on-farm self-sufficiency for water supply.
- W3MAT 7.1 50% of landholders within demonstration projects have a self-sufficient water supply by 2009.
- L2MAT 6.2 Basin wide extension program ensures that 80% of land managers have an understanding of the benefits and impacts of the application of alternative water management techniques and a systems-based approach by 2009

8. Management Actions:

- Some yet to be developed.
- Extension of BMP for salinity management, including:

– Surface water management.

– Farm drainage and pumping guidelines (technical/legal).

– Provide employment and training for suitable technical support.

9. Contribution to National NRM outcomes:

- The impact of threatening process on locations and systems which are critical for conservation of biodiversity, agricultural production, towns, infrastructure and cultural and social values, is avoided or minimised.
- Surface water and groundwater is securely allocated for sustainable production purposes and to support human uses and the environment, within the sustainable capacity of the water resource.

10. Project Linkages

Aboriginal	Local Government	Marketing & Communication	M & E	Skills & Training	Local Area Plans
Awareness of culturally significant areas associated with watercours	*Beyond year 1, LGA's need to be involved for referral of dams etc*	*Dissemination of information to relevant stakeholders and landholders*	*Reductions in demand for reticulated water.* *Number of accredited Farm Water Planners.* *Number of self-sufficient landholders within*	*Training in farm water planning skills.*	*Water use identified and targeted for reduction in LAP's*

es.			*demonstration catchments.* *Number of participants at workshops.*		

11. Activity/Output Schedule

								Forward Funding $	
Activity	**Activity Type**	**NHT $**	**NAP $**	**Other1** (DoE)	**Other2** (Landholder)	**Output Codes**	**Outputs**	**06-07**	**07-08**
1. Data collection	Setting and reviewing targets		150,000			RA2.3	1x analysis (30 shires have annual reticulated water consumption figures and targets set for reduced use).	100,000	100,000
2. Training courses in farm water planning and review of current course structure.	Building capacity for implementation		50,000	50,000		CB2.1 CB2.2 RA2.3	1 x training course 1 x training material enhanced 1 x analysis		
3. Integrated plans prepared and implemented	Planning for key management actions. Investment in implementation		370, 000	80,000 (Link with CDI implementation)	200,000	OG13.3 OG13.6 OG13.2 OG10.1 OG10.2 OG10.3	5 x integrated catchment plans covering approx. 200,000ha. 10% uptake within target catchments (20,000 ha).	290,000	190,000
4. Extension	Building capacity for implementation		10,000			CB1.2 CB1.3	1 x Written products, 1 x display developed	10,000	10,000
Total			**580,000**	**130,000**	**200,000**			**400,000**	**300,000**

12. Contingency Activity/Output Schedule

Activity	Activity Type	NHT	NAP	Other$_1$	Other$_2$	Output Code	Outputs
Total			100,000	300,000			

7.6.2 Sustainable Industries Program

1. Program Goal

Agriculture industries are responsible for generating considerable wealth and supporting a large proportion of the population, as such a significant component of the region's natural resource management will need to occur through agriculture. Therefore maintaining a profitable and sustainable agricultural industry is paramount to achieving environmental and social outcomes. Improving agricultural management for environmental benefit has underpinned the development of this program.

This program is targeted at both NHT and NAP funding sources. The biosecurity sub-program primarily addresses environmental biosecurity threats and as such is seeking NHT support. The two soil health sub-programs are dealing with fundamental soil health threatening processes that directly contribute to water quality e.g. increased fertilser use to manage soil fertility levels contributes to nutrient loads in rivers. These sub-programs are seeking NAP support.

2. Program/sub-program structure

Sustainable Industries Program	Priority 20 year targets	Priority MATs
Sub-programs		
1. Biosecurity (problem animal and plant pests).	L_3 T_{20} 1, Biodiversity targets	L_3 MAT V.1, L_3 MAT VI.1
2. Soil acidity (management of soil pH in agricultural systems).	L_1 T_{20} 1	L1.1 MAT 2.1, L1.1 MAT 6.2
3. Soil health (soil fertility).	$L_5T_{20}1$	L1.5 MAT 2.1, L1.5 MAT 3.1

3. Sub-program description

3.1. Biosecurity

Awareness of biosecurity risk issues and threats to agriculture and environmental systems within the region needs to be enhanced and all landholders (private and public) need to take responsibility for managing biosecurity issues. Planning for biosecurity needs to be carried out at all industry levels, including State and Local Government. Such management should consider the value of biosecurity in an industry and NRM context.

Priorities addressed:

- improved linkages between biosecurity management organisations;
- representation of regional NRM issues in decision-making forums; and

- spatial identification of priority environmental biosecurity threats and management response development.

3.2. Soil Acidity

The off site impacts of soil condition decline are often difficult to identify, however, if the case of acidification, the impacts of reduced plant growth and water usage may be seen in increased water run-off, waterlogging down slope, increased turbidity of streams, and nitrate leaching. As the majority of threats to soils are derived from agricultural management practices, the response to managing soil acidity should primarily be taken in an agricultural industry context.

Priorities addressed:

- understanding the current extent of soil acidity;
- finding alternative options to lime; and
- investigating options for land management practices that contribute to soil acidification.

3.3. Soil Health

Soil is the largest natural resource and is often considered only in the context of its utilisation by agricultural industries. Healthy soils are, however, important for a range of reasons, not only for sustaining plant and animal productivity, but also for maintaining or enhancing water and air health, and supporting human health and habitation.

Priorities addressed:

- encouraging a broader understanding of all aspects of soil health; and
- methods for monitor soil health with a focus on both productivity and ecosystem maintenance.

4. Potential Partnerships

The program offers opportunities to a number of partner organisations. It should be noted that the sub-programs proposed do not intend to replicate activities of existing government agencies but will identify gaps that need to be addressed by such organisations. Potential partners (funding and support):

- Greening Australia (WA) – environmental biosecurity issues.
- Facey Group - environmental biosecurity issues, soil management.
- Local Government – regional biosecurity issues.
- WANTFA – soil management.
- UWA - soil management.

- Dept of CALM - environmental biosecurity issues.
- WA Dept of Agriculture (including APB) - environmental biosecurity issues, soil management.
- WA Dept of Environment - soil management.
- Catchment groups - environmental biosecurity issues, soil management.
- LCDCs and shire based environmental groups - environmental biosecurity issues, soil management.
- Industry groups e.g. farm consultants, fertiliser companies - environmental biosecurity issues, soil management.

5. Sub-committee

The Sustainable Industries sub – committee comprises:

- Colin Stacey (ACC - sub-committee Convenor).
- Harvey Morrell (CLC Brookton -CLC representative).
- Cec McConnell (ACC- agency representative, Dept of Agriculture).
- Vanessa Crispe (Facey Group - community representative).
- Jo Burges (capacity building representative).
- Mike Grasby (Aust Govt. NRM Facilitator – Sustainable Agriculture).
- Don Cummins (Coordinator).

Meeting outcomes to date have included:

- Completion of prioritisation of MATs – 3 December 2004.
- MAT grouping and project development – 13 December 2004.
- Input to project formulation – 14 December 2004 to 17 January 2004.

6. Next Steps

Priorities identified for the program beyond the current investment cycle include:

- Review, discussion and distribution of state and national strategies for animal and plant pest and disease management with regional stakeholder groups.
- Distribution of biosecurity threat assessment information from state and national governments to local groups.

- Utilisation of existing modelling of distribution patterns of target animal pest species, linked to development of appropriately scaled management responses and BMP.
- Network arrangements with farm consultants and other information or service providers to ensure 'best practice' advice is provided for soil management.
- BMP for managing acidity in relation to practice adoption, linking acidity management to overall soil health and cumulative impact on resource condition. Specific BMP for the management of acidic sub-soils developed.
- Soil acidity awareness extension campaign focussing on both top and sub-soil acidity.
- Systems based methodology looking at multiple benefits of managing soil fertility.

Project Id No. SI001

Project Title:

Identification of the spatial distribution of priority environmental pests and development of regional management responses.

1. Project Summary (Aims):

This project has two primary aims. Firstly it will spatially identify threats (by actual or surrogate measures) and assist in development of suitable management responses. The specific species identified have been nominated as having the greatest environmental impact within the region and have localised impacts, which have not been adequately addressed at community or government levels. Secondly, it will address the need to develop improved linkages between organisations with a stake in regional biosecurity. Representation of regional NRM groups and regional NRM issues in decision-making forums is essential for the recognition of biosecurity issues, especially those with environmental impacts.

2. Project Description:

- Development of a process to identify significant regional environmental issues.
- Development of linkages between organisations and community based groups with a key stake in regional biodiversity (CALM, APB).
- Identification of mechanisms for NRM group involvement in regional biosecurity forums.
- Identification of existing areas of support, lead organisations and environmental/agricultural issues.
- Input to ongoing BMP development for biosecurity.
- Identification of the environmental impacts of new industries establishing in the region.
- Identified linkages (input/output) to the Natural Diversity Assessment project – identifying environmental pest species and ensure management responses are recognised.
- Review of the impact of biosecurity issues. To drive research into the impacts of biosecurity issues (including economic impacts), or to help develop better management options. Investigation of incentive schemes targeting specific threats.
- Extension carried out through relevant agencies and the ACC to develop and promote a regional position regarding biosecurity and help target extension by the relevant agencies e.g. wild dogs and CALM.

- Project will make recommendations to the ACC for consideration in policy development.
- Identified linkages (input/output) to the Natural Diversity Assessment project – identifying environmental pest species and ensuring that management responses are recognised.
- Identified linkages to IWM Program Avon River and its Tributaries project, through the identification and management of identified pest species.

3. Asset Description:

- Land Resources - plant and animal pests and diseases.
- Natural Diversity – Whole of Avon River Basin.

4. Threat Description:

Biosecurity is the management of plant, animal and disease risks to agricultural production, the environment and human health.

5. Contribution to Target or Resource Condition:

- Invasive environmental weeds can permanently alter the composition of natural species associations in reserves, forest, wetlands and vegetation remnants through competition with and displacement of native, and endemic species.
- Weed invasion may alter nutrient cycling patterns. Specific impacts on agriculture include; plant competition for moisture, light and nutrients, toxic effects and injury to stock, interference with operations, contamination of crops and produce (market access risk), and the harbouring of animal and plant pests and diseases.
- Pest animals degrade the landscape and are significant causal agents leading to the extinction of native animals and plants and control measures by landowners add to the cost of agricultural production.

6. Twenty Year Target/s:

- L3T201 A 50% reduction in the economic and environmental impacts of all priority animal and plant pests across the region by 2014.

7. Management Action Target/s:

- L3MAT 6.1 A regional policy, planning and information framework will be developed by 2007 to ensure that regional responses are coordinated with state and national pest and disease strategies.
- L3MAT 6 .1 By 2009, the extent of rabbits, cats, dogs and foxes, their economic and environmental impacts and management options will be understood by 80% of land managers. Note: Surrogate measures will include the uptake of actions for control, such as '1080' poison usage, attendance at field days and targeted group surveys.

- Natural Diversity Asset Class 5. Threats that need to be addressed at bioregional scales, such as high water tables, altered hydro periods, habitat loss and fragmentation, declining water quality, sedimentation, weeds, pests and diseases are quantified by Dec 2005.

8. Management Actions:

- Facilitation of the development of coordinated management plans between all land users at the local community level for implementation of BMP.
- To map the extent and severity of known threats.
- Impact and severity of various threats for each bioregion are prioritised by Dec 2005.

9. Contribution to National NRM outcomes:

- The impact of threatening process on locations and systems which are critical for conservation of biodiversity, agricultural production, towns, infrastructure and cultural and social values, is avoided or minimised.

10. Project linkages

Indigenous	Local Government	Marketing & Communication	M&E	Skills & Training	Local Area Plans
Potential links to indigenous land management	*Involvement of LGAs in identification of locally impacting biosecurity issues.*				*Input of biosecurity issues to ongoing LAP development*

11. Activity/Output Schedule

								Forward Funding $	
Activity	**Activity Type**	**NHT $**	**NAP $**	**Other$_1$**	**Other$_2$**	**Output Code**	**Outputs**	**06-07**	**07-08**
1. Consultation with all levels of government and NGOs and via farmer forums, to develop a view of regional biosecurity issues.	Threat identification and risk assessment	35,000		15,000		CB2.1	9 x farmer forums – sub-regional. 4 x Local government forums. 1x NGO forum.	30,000	10,000

2. Development of a scoping document that identifies regional biosecurity issues (including spatial distribution), potential threats from activities such as new industry development, gaps in current information networks and management frameworks that exist.	Planning for key manage ment actions	75,000				P5.1	1 x review.		
3. Promotion (to management organisations) of alternative options to manage environmental biosecurity issues (including incentive schemes) and assist in the integration of such information to LAPs.	Threat identifica tion and risk assessme nt	55,000				P4.1	9 x sub regional map set. 1 x biosecurity database. Contributio n to 30 x LAPs. 3 x extension workshops.	45,000	
4. Development of regional and local management strategies for significant environmental biosecurity issues.	Planning for key manage ment actions	50,000				P4.1	9 x sub-regional manageme nt strategies. 1 x regional document. 3 x regional delivery workshops	50,000	35,000
5. ACC involvement, representation or consultation sought in regional decision making forums e.g. ZCAs to enable recognition of	Investme nt in impleme ntation	20, 000				CB3.2	ACC membershi p of regional and sub-regional groups.	20,000	20,000

regional priorities (especially environmental).									
	Total	**235,000**		**15,000**				**145,000**	**65,000**

[1] Industry groups and participating land managers

12. Contingency Activity/Output Schedule

Activity	**Activity Type**	**NHT**	**NAP**	**Other[1]**	**Other[2]**	**Output Code**	**Outputs**
Review and understanding of spatial distribution of significant environmentally biosecurity issues.	Threat identification and risk assessment	35,000				P4.2	1 x regional database and map set.
Demonstration of BMP-targeted for all priority species.	Investment in implementation	55,000				OG8.1 OG8.3	8 x demonstration sites and extension package developed – 6000 ha
	Total	**90,000**					

Project Id No. SI002

Project Title:

Identification of land management practices that contribute to soil acidity and development of sustainable land management options.

1. Project Summary (Aims):

Identification and remediation of soil acidity, particularly in sub-soils is difficult. In the past 10 years lime products have been actively promoted as a solution to managing soil acidity, however, issues have developed recently, particularly in eastern areas regarding the efficacy and sustainability (off farm) of continued use of lime as an ameliorate. This project will:

- assist in benchmarking the current extent of soil acidity (via surrogate measures) to assist in resource condition assessment;
- look at identifying and testing alternative options to lime; and
- help identify and manage land use practices contributing to soil acidification.

2. Project Description:

- Test the reliability of current and proposed methodologies for monitoring soil pH.
- Review the links between land use practice and the incidence of soil acidity – leading to the development of sustainable farming practices to manage acidity.
- Review the sustainability (including economic) of existing practices e.g. liming and lime extraction
- Identify and benchmark the status of soil pH – would utilise existing data and aim to be carried out as part of a monitoring program for 5-10years.
- Extension of positive outcomes of pH management and monitoring under current management systems.
- Identification of new, cost effective alternatives to liming.
- Lobby agencies etc to look at long term sustainability issues when developing soil acidity BMP guidelines.
- Define sustainable management for soil pH, including fertiliser usage, organic matter and alternatives to lime. Help define a sustainable BMP for soil acidity management.
- Demonstrate management techniques that help to control acidity as the extension focus of the project.

- Identified linkages to the selection of demonstration landscapes in the Natural Diversity Ecoscapes project.

3. Asset Description:

N/A

4. Threat Description:

Soil acidity is most prevalent in sandy soils with a low capacity to buffer pH change. It is the second highest degradation risk to land and soil, with over half the ARB having a moderate to high risk of sub-surface acidification. Thirty two percent of soils have a high risk of sub-surface acidification. Identification and remediation of sub-soil acidity is difficult and cost effective techniques for remediation of sub-soil acidity are still to be developed.

5. Contribution to Target or Resource Condition:

Soil acidity contributes to the following issues, to varying degrees:

- increased dryland salinity, waterlogging and flooding;
- increased nitrate pollution of groundwater and reduced water quality;
- reduced plant yields, farm income, land values and domestic/export earnings;
- reduced plant species options for agriculture;
- reduced vegetation cover and accelerated runoff and erosion;
- irreversible degradation of the clay minerals of soil, hence reduced fertility;
- declining pH of waterways and aquatic environments; and
- increased infrastructure cost as a result of increased salinity, waterlogging, flooding and sediment on road and in drains.

6. Twenty Year Target/s:

- L1.1T201 Soil acidity levels (top and sub-surface) at or above pH 5.5 ($CaCl_2$), in all soils with low capacity to buffer pH change by 2020.

7. Management Action Target/s:

- L1.1 MAT 2.1 Regional database established to record the status of top and sub-soil pH documented for all Land Resource Sub-Regions by 2008.
- L1.1 MAT 6.2 80% of land managers have knowledge of BMP for soil acidity (including economic benefits) by 2008.

8. Management Actions:

- Methodology and monitoring of top and sub-soil pH established (Cross Regional).
- Land use practice monitored in relation to soil pH (Cross Regional).

9. Contribution to National NRM outcomes:

- The impact of threatening process on locations and systems which are critical for conservation of biodiversity, agricultural production, towns, infrastructure and cultural and social values, is avoided or minimised.

10. Project Linkages

Indigenous	Local Government	Marketing & Communication	M&E	Skills & Training	Local Area Plans
				Skills training - farm/catchment scale demonstration activities.	*Potential incorporation in LAP development.*

11. Activity/Output Schedule

								Forward Funding $	
Activity	**Activity Type**	**NHT $**	**NAP $**	**Other$_1$**	**Other$_2$**	**Output Code**	**Outputs**	**06-07**	**07-08**
1. Review and report on current status of regional soil acidity databases and testing methodology.	Asset Identification		60,000			RA1.3 RA2.3	1 x study on status of existing data sets. 1 x updated monitoring database.		
2. Establishment of benchmarks for soil acidity within the region – spatial extent, risk/threat and economic, potential off site impacts (expenditure on amelioration).	Threat identification and risk assessment. Setting and reviewing targets (RCT's and MAT's)		140,000			RA1.3	1 x triple bottom line assessment of amelioration methodology. 4 x case studies over 100, 000ha.	40,000	
3. Review broad	Assessing		206,			P1.1	6 x field	100,000	50,000

scale land use practices, amelioration techniques and overlay with benchmark information.	the feasibility and cost benefits of manage ment options.		000			OG9.4	assessments and demonstrati ons of methodolo gy approx. 60,000 ha.		
4. Review of sustainable management practice and research resources. Including off site impacts of practices e.g. lime extraction.	Assessing the feasibility and cost benefits of manage ment options		220,00 0			P1.1 O.G	1 x study manageme nt practice. 10 x point source field assessment of impacts – 10,000ha. 1x data base	116000	100,000
5. Demonstrate sustainable practices at a farm/catchment scale.	Investme nt in impleme ntation		205, 000	60000		OG9.4	5 x demonstrati on sites – linked to production groups – 5000 ha	70000	70000
Total			**831, 000**	**60,000**				**326,000**	**220,000**

[1] Industry groups and participating land managers

12. Contingency Activity/Output Schedule

Activity	**Activity Type**	**NHT**	**NAP**	**Other[1]**	**Other[2]**	**Output Code**	**Outputs**
Total							

Project Id No. SI003

Project Title:

Increased awareness of soil health limiting factors and demonstration of land management practices that contribute to long term soil health.

1. Project Summary (Aims):

The land assets of the Avon Catchment are predominantly managed by agricultural land uses, therefore improving soil condition by appropriate agricultural management is a fundamental component of the long term management of the land asset. This project addresses the win:win scenario, where improved management (through monitoring of the resource and increased understanding of the impacts of different management options) can lead to improve productivity and improved soil health. The project will benchmark aspects of soil health in a sub-catchment of the Avon region, with the long-term aim of developing methods to monitor aspects of soil health related to productivity and ecosystem maintenance, at various scales. The potential outcome of this project is that in investment years 2-3, industry organisations will increase involvement with the outlook being for such groups to adopt and extend the processes developed.

2. Project Description:

- Increasing landholders overall knowledge of and capacity to manage soil health.
- Expanding the concept of monitoring soil health parameters to assess management impacts.
- Development of farm scale, soil health indicators, that can be incorporated into quality assurance processes that may have a use on a regional scale across the Avon Catchment.
- Reviewing land management practices and the relationship between soil health, climatic conditions and land management on a catchment scale.
- Establishing a preliminary set of soil health benchmarks to assist the ACC in monitoring progress towards regional Resource Condition Targets.
- Identified linkages to the IWM water quality project – managing sediment and nutrient loads.
- Aim is to implement demonstration through farm production groups.

3. Asset Description:

N/A

4. Threat Description:

Most soils in the Wheatbelt zone have naturally low soil fertility levels, although this has improved to some extent. Fertility loss occurring through soil degradation and poor management is common, however, the lack of broader understanding about the chemical and physical interactions within soils often leads to opportunities to improve soil fertility being overlooked.

5. Contribution to Target or Resource Condition:

Declining fertility is linked to declines in soil structure, increased levels of erosion and secondary salinity. In addition, run off containing nitrogen and phosphates have been linked to stream and groundwater pollution. The project will address identification of regional benchmarks for soil health indicators. These will assist land managers match management decisions that address long term soil sustainability issues with improved agricultural production. It is hoped that an additional spin off from this project is that the production costs and application of chemical inputs can be reduced by improving soil health.

6. Twenty Year Target/s:

- L1.5T201 100% of soils with recognised fertility issues (elements, organic matter and microbial activity) are identified within 5 years and a 30% improvement over benchmarked fertility levels is achieved by 2020.

7. Management Action Target/s:

- L1.5 MAT 2.1 Six representative land resource areas (catchment scale) with complete soil fertility mapping and linked criteria by 2009.

- L1.5 MAT 3.1 By 2008, 10 training courses will have been held with the intended outcome being that 70% of land managers will have an understanding of the benefits of the sustainable management of soil fertility in a resource management context.

8. Management Actions:

- Develop and test a comprehensive soil fertility assessment process at the farm and catchment scale, which can be linked to other soil management issues such as soil pH by 2006. Method will also utilise the existing soils database and remote sensing to help determine the extent of soil fertility rates in soils used for agriculture (Cross Regional).

- Systems based methodology developed and extended looking at multiple benefits of managing soil fertility to:

– Increase the efficiency of fertilser use (reduce usage).

– Increase sustainable crop and pasture production on a range of soil types.

– Manage associated soil degradation issues, such as structure decline and pH.

9. Contribution to National NRM outcomes:

- The impact of threatening process on locations and systems which are critical for conservation of biodiversity, agricultural production, towns, infrastructure and cultural and social values, is avoided or minimised.

10. Project Linkages

Indigenous	Local Government	Marketing & Communication	M&E	Skills & Training	Local Area Plans
				Workshop process aimed at skills development. *Catchment scale demonstration.*	*Potential incorporation in LAP development.*

11. Activity/Output Schedule

								Forward Funding $	
Activity	**Activity Type**	**NHT $**	**NAP $**	**Other$_1$**	**Other$_2$**	**Output Code**	**Outputs**	**06-07**	**07-08**
1.Review of existing testing methodology to ensure that it is feasible, sustainability not production focussed and aimed at land manager usage – utilising and creating links with industry groups.	Assessing the feasibility and cost benefits of management options		50,000			RA2.3	1x field study , development of spatial data and testing of methodology 1 x review of methodology.		
2.Campaign aimed at extending testing methodology and increasing understanding of soil health parameters to shift land managers to sustainable	Building capacity for implementation		130,000	14,000		CB2.1	10 x regional workshops and extension package.	60,000	Proposed Industry adoption

management practices.									
3.Demonstration at the landscape scale to assist in benchmarking soil health and to demonstrate testing methodology.	Investment in implementation		252,000	49,000		OG9.4	3 x demonstration sites at catchment scale – 85,000 ha.	150,000	130,000
4.Review of sustainable soil management (including issues such as compaction, waterlogging, acidity, nutrients, organic matter etc) looking at industry development to improve to soil health. Potential to roll into a long term sustainable management project delivered by industry groups.	Planning for key management actions		257,000			P1.1 OG9.4	3 x demonstration sites – sustainable practice 70,000 ha. 6 x case studies and extension packages.	150,000	150,000
Total			**689, 000**	**63,000**				**360,000**	**280,000**

1 Industry groups and participating land managers

12. Contingency Activity/Output Schedule

Activity	Activity Type	NHT	NAP	Other1	Other2	Output Code	Outputs
Development of full range of soil health limiting factors monitoring processes in monitoring package – erosion, compaction and structure decline.			175,000				

Demonstration at the landscape scale to assist in benchmarking full range of soil health threats and to demonstrate testing methodology.	Investment in implementation		125,000				
Development of soil health benchmarks as focus for EMS development.			80,000				
Total			**380,000**				

7.6.3 Natural Diversity Program

1. Program Goal

The goal for natural diversity conservation in the Avon River Basin is to retain, restore and enhance the Avon Region's natural biodiversity in ways that are consistent with the core values and sustainability goals of the region.

This goal will be achieved through a combination of assessment, planning, increasing capability, on-ground actions and ongoing learning/monitoring. The focus is on achieving outcomes through partnering between NRM specialists, industry and community to retain viable systems and processes across the landscape and where species, communities and ecosystems are vulnerable and threatened focussing efforts on reducing the rate of loss as well as restoration and enhancement of natural diversity.

2. Program/sub-program structure

Natural Diversity Program	Priority 20yr Targets	Priority MATs
Sub-programs:		
1.Biodiversity threat management (fire and fragmentation).	B_5T_{20}5a	B5 MAT 5.7
2. Asset management (river pools, tributaries, native species, cultural and heritage values natural ecological communities, ecosystems, landscapes/ecoscapes).	W_5T_{20} 1,W_1T_{20} 2, W_2T_{20}1, B_1T_{20}1a, B_1T_{20}1b, B_1T_{20}1c, B_2T_{20}2a, B_2T_{20}2b, B_2T_{20}2c, B_3T_{20}3a, B_3T_{20}3b, B_4T_{20}4	B1MAT1.1, B1 MAT 1.2bc, B1 MAT 2.1abc B2 MAT 1.1abc, B2 MAT 2.1abc, B2 MAT 3.1abc, B3 MAT 1.1ab, B3 MAT 2.1ab, B3 MAT 2.2ab, B5 MAT 1.1 B5 MAT 1.2, B5 MAT 2.1, B5 MAT 8.1, W2 MAT2.1, W2 MAT 2.2, B1MAT 5.1b, B1 MAT 5.1c, B1 MAT 6.1b, B1 MAT 6.1c, B1 MAT 7.1c, B1 MAT 8.1b, B1 MAT 8.1c B2 MAT6.1c, B3 MAT 3.1ab, B3 MAT 3.2ab, B3 MAT 5.1ab, B3 MAT 6.1ab, B3 MAT 7.1ab, W1 MAT 2.10, W1 MAT 3.2, W1 MAT 5.4, W2 MAT 1.1, W2 MAT 1.2, W2 MAT 1.3, W2 MAT 2.1, W2 MAT 2.2, W2 MAT 3.1 W2 MAT 5.1, W2 MAT 5.2, W2 MAT 6.1, W2 MAT 7.4 , W2 MAT 8.1, B4 MAT 1.1, B4 MAT 3.1, B4 MAT 5.1, B4 MAT 6.1, B4 MAT 7.1, W2 MAT 8.1

2. Sub-program description

2.1 Biodiversity Threat Management

This sub-program aims for biodiversity conservation principles to be considered in fire management planning at an IBRA sub regional scale. These guidelines will guide local government and private landholders in development of effective fire plans and secondly be the basis of an education program including demonstration.

2.2 Asset Management

This sub-program will:

- Develop an inventory and information management system, primarily from existing but disparate sources, of information on current status, condition and major processes threatening the regions natural diversity. The information will be used by decision makers for analysis, priority setting, and monitoring and evaluation for the Back from the Edge, Healthy Ecosystems, Sense of Place, Our Patch and Fire Management projects.

- Develop a strategic approach to threatened species and community management and to carry out urgent recovery actions.

- Help to maintain or increase the extent and integrity of all terrestrial and aquatic ecosystems. Key ecosystems in the region are priority vegetation associations within the highly fragmented wheatbelt such as granite dome ecosystems, dolerite dykes, greenstone ranges, and saline and freshwater wetlands.

- Conserve the extent and integrity of the natural diversity (species, NECs and ecosystems) within 12 landscapes which best represent the natural diversity of the Avon River Basin (undertaking 12 projects within the first three years). Two landscapes within each IBRA region that provide the best representation of the natural diversity will be selected for intensive conservation action. In total , when complete, this project will maintain and enhance nature conservation assets over some 720,000ha.

- Support local governments and communities across the whole Avon River Basin in their conservation aspirations for their local patch. Including helping local communities to make significant conservation improvements in areas not covered by other projects with selection of conservation sites based local and regional priorities.

4. Potential Partnerships:

CALM, Greening Australia Western Australia, WWF, DoE.

3. Sub-committee process

Members of the sub-committee are:

- Sally Gomes-Trent (community representative - Convenor,).

- Brian Whittington, (ACC - community representative).
- Neil Riches (Australian Government Biodiversity Coordinator).
- Richard McLellan (WWF).
- Chris Curnow (WWF proxy).
- Robert Lambeck (Greening Australlia WA).
- Martin Revel (Department of Environment - agency representative).
- Bruce Bone (ACC agency representative – Dept of CALM).
- Aminya Ennis (CALM proxy).

The sub-committee first developed the Program goals, MAT's and MA's and then guided development of the project outlines and budgets. Members from Greening Australia, WWF and CALM developed project outcomes and budgets for specific sub programs.

Next Steps

- The Assets project will be significantly complete in Year 1 but ongoing surveys are envisaged for knowledge gaps such as saline wetlands in years 2 and 3.
- The next steps for the Species and Communities project are dependent on the outcomes of the strategic plan for conservation of threatened species and communities, which could change the direction of some Recovery Plans.
- The emphasis for the Ecosystems Project is on on-ground works in years 2 and 3.
- The Ecoscapes project will develop at least two further Ecoscapes and continue on-ground actions for all operational Ecoscapes.
- The Local Government Conservation project will involve the remainder of the local governments in years 2 and 3 and focus on on-ground activities and community participation.

Project Id No. ND001

Project Title:

Getting started: "baselining" the Region's natural diversity.

1. Project Summary:

The aim of this foundation project is to develop an inventory and information management system, primarily from existing but disparate sources, of information on current status, condition and major processes threatening the regions natural diversity. The information will be used by decision makers for analysis, priority setting, and monitoring and evaluation for the Back from the Edge, Healthy Ecosystems, Sense of Place, Our Patch and Fire Management projects. The project will provide valuable baseline data for monitoring and evaluating the effectiveness of on-ground outcomes in achieving resource condition change for the action based projects.

The project will be closely aligned with asset and threat components of projects in Integrated Water and Sustainable Industries.

2. Project Description:

There is significant information currently available but not in readily accessible form. This project will gather existing information, undertake a gap analysis, undertake activities to fill the gaps where information is insufficient for decision making and provide the information in one location in readily accessible formats. Assessment includes:

- inventory of current distribution, abundance and condition of species, of all natural ecological communities and Avon ecosystems;
- gap analysis;
- baseline information for monitoring and evaluation and Management Action Targets;
- an information management system;
- designing an ongoing biodiversity survey program based on the gap analysis; and
- threat assessment at a broad level.

3. Asset Description:

The extent of current knowledge and knowledge requirements for each project are outlined below.

- Threatened Species. Good knowledge of the extent and location of threatened species but new information being added continuously.
- Threatened Ecological Communities. Currently 10 Threatened communities identified. This is an area requiring significant assessment

- Ecosystems. There is mapping of the remaining native vegetation within Beard Vegetation Types providing an analysis of the most depleted ecosystems at a broad level. There is a need for a comprehensive wetland classification and condition assessment of wetlands/salt lakes to complement existing monitoring systems. For riparian zones, there is good knowledge of the Avon River and some tributaries but several of its tributaries need further investigation.
- Ecoscapes. A review of existing criteria is required to best select Ecoscapes. Some criteria may require additional baseline information.

4. Threat Description:

Assessment of threats that need to be addressed at bioregional scales, such as high water tables, altered hydro periods, habitat loss and fragmentation, declining water quality, sedimentation, weeds, pests and diseases is required. Each project will need to undertake a site based threat assessment as part of project design.

5. Contribution to Target or Resource Condition:

This project will provide quality asset and threat information that provides an important foundation for achieving the 20 year Targets for all the other projects. This baseline information will enable effective actions to achieve and measure targets.

6. Twenty Year Targets:
This project delivers to all Natural Diversity 20 year Targets. It will provide adequate quality asset and threat information at a suitable scale to enable the Back from the Edge, Healthy Ecosystems, Sense of Place, Our Patch and Fire Management projects.

7. Management Action Target/s:

- B1MAT1.1abc An inventory (including estimates of current distribution and abundance of species in the region known to be viable, declining and threatened established by Dec. 2009 for viable species, by Dec. 2007 for declining species, and by Dec. 2006 for threatened species.

- B1MAT1.2bc Priority declining and threatened species and priority locations (areas containing high numbers or unique occurrences of declining or threatened species) identified by Dec. 2006 for threatened species and by Dec. 2007 for declining species.

- B1MAT 2.1abc A threat assessment for viable, declining and threatened species in the region completed and results included into 30 LAPs by June 2006 for threatened species, by June 2007 for declining species and by June 2008 for currently viable species.

- B2 MAT 1.1abc An inventory of the current extent and integrity of all natural ecological communities (terrestrial and aquatic) completed by Dec. 2007.

- B2 MAT 2.1abc A threat assessment for currently viable, declining and threatened NECs designed and applied and results incorporated into 30 LAPs by December 2006.

- B2 MAT 3.1abc Priority viable, declining, threatened NECs (terrestrial and aquatic) and priority locations (areas containing multiple NECs or unique occurrences of uncommon NECs) identified by Dec. 2006.

- B3 MAT 1.1ab An agreed classification of Avon ecosystems, and an inventory and map of the distribution, extent / condition integrity of vulnerable and threatened ecosystems completed by Dec. 2007.

- B3 MAT 2.1ab A threat assessment for ecosystems completed and results incorporated into 30 LAPs by December 2006.

- B3 MAT 2.2ab The threat to major low lying ecosystems due to rising groundwater and potential discharge from drainage schemes is predicted by Dec 2006.

- B5 MAT 1.1 Classification of distinct regions within the Avon River Basin that have similar biophysical and human land-use patterns completed by Dec. 2005.

- B5 MAT 1.2 Biodiversity survey program for all asset classes implemented by Dec. 2005.

- B5 MAT 2.1 Threats that need to be addressed at bioregional scales, such as high water tables, altered hydro periods, habitat loss & fragmentation, declining water quality, sedimentation, weeds, pests & diseases are quantified by Dec. 2005.

- B5 MAT 8.1 Regional biodiversity monitoring program for high water tables, altered hydro periods, habitat loss and fragmentation, declining water quality (nutrient, acidity, salinity and sediments), sedimentation, weeds, pests & diseases developed and initiated by 2005.

- W2 MAT 2.1 The extent of salinity risk, flooding and sedimentation, threatening processes is mapped for 13 major tributaries within the "Ävon Arc" and Mortlock River System by 2009.

- W2 MAT 2.2 A report identifying the extent of threatening processes, including salinity risk, flooding and sedimentation to major tributaries and associated wetland systems within the Lockhart and Yilgarn catchments is complete by end 2006.

Major salt lakes and other wetlands of regional significance in the Avon River Basin are identified and characterised based on hydrological and ecological criteria by 2007.

5. The threat to major salt lakes due to rising groundwater and potential discharge from drainage schemes is predicted by 2005.

8. Management Actions:

- Review current information and assess conservation status for each taxa and identify knowledge gaps.

- Establish an information management system to provide ready access to existing biophysical data sets relevant to the region.

- Design and initiate an ongoing biodiversity survey program for viable, declining and threatened species by Dec 2005.
- Review and adapt / adopt existing criteria (e.g. extinction risk, urgency, feasibility, prior investment, additional environmental benefit, community recognition (icon species)) for selecting priority species and locations.
- Develop and apply threat assessment process.
- Review and adapt / adopt existing classifications of NECs (e.g. EPBC Act 1999) to develop an agreed nomenclature, mapping system and measures of integrity for terrestrial and aquatic NECs in the Avon Basin (develop in consultation with other regions to ensure cross-regional consistency).
- Design and implement an ongoing biodiversity survey program for NECs by Dec 2005.
- Develop and apply threat assessment process.
- Determine priority NECs & locations.
- Review and adapt/ adopt existing classifications to develop an agreed nomenclature, mapping system and measures of integrity for terrestrial (including outcropping granite, doleritic dykes, greenstone ranges etc) and aquatic (saline and freshwater wetlands) ecosystems of the Avon Basin (developed in consultation with other regions to ensure cross-regional consistency and undertaken in conjunction with mapping of NECs).
- Establish an information management system to provide ready access to existing biophysical data sets relevant to the region.
- Design and implement an ongoing biodiversity survey program.
- Develop an assessment framework for all ecosystems of the Avon River Basin utilising existing ecosystem classification, inventory, assessment and mapping (e.g. Beard-Hopkins) to identify the CAR status of all ecosystems within the Avon Region.
- Develop a classification and assessment process for wetlands to determine their current condition and capacity for receiving drainage.
- Review and adapt / adopt existing classifications.
- Design and initiate biodiversity survey program.
- To map the extent and severity of impact of known threats.
- Impact and severity of various threats for each bioregion are prioritised by Dec. 2005.
- Review and adapt/adopt existing incentive schemes with higher levels of incentives for activities that protect higher priority assets.

- Review state wide Monitoring and Evaluation guidelines and adopt / adapt to meet regional needs.

9. Contribution to National NRM outcomes:

- Biodiversity and the extent, diversity and condition of native ecosystems are maintained and rehabilitated.
- Populations of significant species and ecological communities are maintained and rehabilitated.
- Ecosystem services and functions are maintained or rehabilitated.

10. Project Linkages

Indigenous	Local Government	Marketing & Communication	M&E	Skills & Training	Local Area Plans
Need to engage – heritage, cultural issues.	*Recognition of LGA processes and structures.*	*Opportunities to inform community of availability of information*	*Identified need for social monitoring*	*Training required to support data base users*	*Check off against LAP reports.*

11. Activity/Output Schedule

								Forward Funding $	
Activity	**Activity Type**	**NHT $**	**NAP $**	**Other$_1$**	**Other$_2$**	**Output Code**	**Outputs**	**06-07**	**07-08**
1. Inventory of assets, condition and threats for the Threatened Species, Ecological Communities, Ecosystems, Ecoscapes, Fire and Local Bushland Action projects and other areas where information is not currently available, to improve the quality of decision making for all projects	Asset and threat identification	220,000	200,000			RA3.2	1 Information management system	300,000	250,000
2. Additional assessment of	Asset and	180,000	120,000			RA1.1	1 study completed		

fresh and saltwater wetlands	threat identification					RA 2.1		300,000	200,000
	Total	**400,000**	**320,000**					**600,000**	**450,000**

12. Contingency Activity/Output Schedule

Activity	**Activity Type**	**NHT**	**NAP**	**Other$_1$**	**Other$_2$**	**Output Code**	**Outputs**
Additional assessment of other priorities identified from the gap analysis, where information is not currently available, to improve the quality of decision making for all other projects.	Asset and threat identification	100,000	100,000			*RA1* *RA2.1*	1 study completed
	Total	**100,000**	**100,000**				

Project Id No. ND002

Project Title:

Back from the edge: saving native species and communities most at risk.

1. Project Summary:

The aims of the project are to develop a strategic approach to threatened species and community management and to carry out urgent recovery actions.

Due to the strong relationship between the threatening processes to species and communities of salinity and weeds, actions for this project will be integrated with salinity projects in Integrated Water and with the Biosecurity Project in regard to environmental weed management.

2. Project Description:

The project has two key components:

1. The development of a strategic plan for conservation of threatened species and communities that provides clear strategic context and feasibility, which is currently lacking for conserving existing populations in situ. This work is critical for the 450 (approx.) species at risk from rising saline water tables for which current conservation approaches will be insufficient.

2. To carry out urgent recovery actions for critically endangered, endangered and vulnerable species and communities. Conservation options will be based on feasibility and cost benefit and lead to on ground actions, such as landholder participation and community involvement in specific targeted restoration projects. Conservation options and plans will be incorporated into Local Area Plans.

3. Asset Description:

Under the 2004 state listings there are 110 species of threatened flora and 187 species of Priority Flora, five Threatened and 14 Priority bird species, five Threatened and seven Priority mammals with one Threatened and seven Priority reptiles and frogs. Under national EPBC listings (1999) there are 5 Extinct, 71 Endangered and 23 Vulnerable flora species, three Endangered and seven Vulnerable bird species and Two extinct, one Critically Endangered, one Endangered and four Vulnerable mammal species.

This project will focus on conservation actions for the 10 highest priority declining species and for 27 ‘critically endangered’ and ‘endangered’ species and for priority declining communities and 10 ‘critically endangered’ and ‘endangered’ NEC’s.

4. Threat Description:

While the Baseline Project addresses threats at bioregional scales, threat assessment in this project targets the site specific threats for those species and communities already identified as most at risk.

The major threat to native species and communities are primarily related to salinity and inundation, such as in valley floors, where there has already been a significant depletion of genetic diversity and a decrease in the abundance of vascular plants and water bird species.

5. Contribution to Target or Resource Condition:

The major contributions to resource condition change will be the strategic approach to developing the most effective recovery actions and specific actions that are targeted towards assets most at risk. These include 10 priority locations with high numbers of declining species, species restoration for the 27 "critically endangered" and "endangered" species, with conservation actions for an additional 20 threatened species. Priority will be given to critically endangered species.

6. Twenty Year Target/s:

- All native species that naturally occur in the Avon region persist in viable populations.
- Maintain the extent and integrity (structure and composition) of all natural ecological communities that occur in the Avon Region.

7. Management Action Target/s:

- B1 MAT 5.1b Conservation plans for priority locations which contain high numbers, or unique occurrences, of known declining species completed by Dec 2007.
- B1 MAT 5.1c Conservation plans for priority threatened species commenced by June 2005 and completed by Dec 2007
- B1 MAT 6.1b Action based training provided to individuals undertaking restoration programs for priority declining species by June 2008.
- B1 MAT 6.1c Biodiversity implementation teams established and trained to undertake species restoration work in all priority locations containing the 27 "critically endangered" and "endangered" species by June 2008.
- B1 MAT 7.1c Conservation actions for 27 'critically endangered' and 'endangered' species that have existing conservation plans commenced by Dec 2005.
- B1 MAT 8.1b Long term monitoring sites and protocols for assessing status of declining species designed and established by June 2006.
- B1 MAT 8.1c A monitoring program established for high priority 'threatened species' by end 2007.

- B2 MAT 6.1c Biodiversity implementation teams established and trained to undertake restoration work for all threatened NECs by June 2006.

8. Management Actions:

- Prepare conservation plans for selected locations containing priority declining species.
- Prepare conservation plans for all currently listed 'critically endangered' and 'endangered' species that do not currently have plans.
- Prepare conservation plans for five additional priority threatened species.
- Design action learning skills development program for restoration of declining species.
- Design and implement value-based public awareness programs for viable, declining and threatened species.
- Select training "model" sites from priority locations for "critically endangered" and "endangered" species.
- Design and implement value-based public awareness programs for viable, declining and threatened species.
- Implement on-ground works and other priority actions identified in relevant conservation plans above.
- Review conservation status of all species for which information is available.
- Design and establish long term monitoring sites.
- Review conservation status of all species for which information is available.
- Select training "model" NECs from among threatened NECs and design training framework.

9. Contribution to National NRM outcomes:

Populations of significant species and ecological communities are maintained and rehabilitated.

10. Project Linkages

Indigenous	Local Government	Marketing & Communication	M&E	Skills & Training	Local Area Plans
Need to engage – heritage, cultural issues.	*LGA project involvement desirable.* .	*Primary stakeholders identified.*	*Identified need for social monitoring.*	*Training for involved community involved.*	*Check off against LAP report.*

11. Activity/Output Schedule

								Forward Funding $	
Activity	**Activity Type**	**NHT $**	**NAP $**			**Output Code**	**Outputs**	**06-07**	**07-08**
1. Developing a strategic framework for declining and threatened species and communities	Planning for key management actions and assessing feasibility and cost benefit,	140,000	280,000			P4.2	Strategic plan for threatened species and communities developed		
2. Action based training for individuals and community involved in species and communities restoration	Building capacity	90,000	10,000			CB1.1 CB1.2 CB1.3 CB1.4 CB2.1 CB2.2 CB5.1	8 awareness raising/1000 participants 19 written products/2500 recipients 6 displays 25 media opportunities 14 workshops/ 120 participants 2 workbooks/ 250 distributed 25 community groups or projects	150,000	50,000

3. Conservation plans for declining and threatened species and communities restoration	Planning for key management actions	94,000	10,000			P4.1	9 recovery plans/9 species or communities covered by plans		
4. Conservation actions for 10 declining species and 27 critically endangered species	Investment in implementation	501,000	50,000			RA2.1 RA3.2 RA4.1 P5.1 OG3.4 OG4.6 OG7.1 OG7.2 OG7.3	29 studies/61,000 ha surveyed 3 information systems 11 research studies 8 plans 3,240 ha terrestrial vegetation enhanced/rehabilitated 30ha planted/30 ha of local natives 118ha protected by fencing 6 breeding programs/520 individuals bred 8 translocation programs/770 individuals translocated 16 seed banks 15ha pest plant control	450,000	450,000

						OG7.4 OG8.1 OG8.3 OG8.4 OG10.3	2,412ha pest (vertebrate) animal control 215 pest (invertebrate) control 50ha surface drainage/1km		
5.Monitoring sites and recovery actions	Monitoring, evaluation and review	35,000	10,000			RA1.2 RA 1.3	31 monitoring programs 68 monitoring programs enhanced	60,000	120,000
	Total	**860,000**	**360,000**					**860,000**	**360,000**

12. Contingency Activity/Output Schedule

Activity	**Activity Type**	**NHT**	**NAP**	**Other$_1$**	**Other$_2$**	**Output Code**	**Outputs**
Total							

Project Id No. ND003

Project Title:

Healthy Ecosystems.

1. Project Summary:

Given that current information indicates that all ecosystems in the Avon Region are either vulnerable or threatened, the major purpose of this project is to maintain or increase the extent and integrity of all terrestrial and aquatic ecosystems. Key ecosystems in the region are priority vegetation associations within the highly fragmented wheatbelt such as granite dome ecosystems, dolerite dykes, greenstone ranges, and saline and freshwater wetlands.

Due to the significance of salinity to low lying ecosystems this project will be integrated with salinity projects in Integrated Water. Strong links are also envisaged between this project and the Biosecurity Project in recognition of the serious threat posed to the regions ecosystems by environmental weeds. There will be very strong links between the river and tributary projects in Integrated Water and related projects in Natural Diversity.

2. Project Description:

This project will focus on land managers/holders undertaking specific maintenance and restoration works and contributing to the ongoing monitoring and evaluation program established in the "baselining" project. Permanent protection will be achieved through land management agreements and conservation covenants.

3. Asset Description:

This project targets terrestrial ecosystems based on vegetation associations and fresh and saline wetland and riparian ecosystems.

The terrestrial ecosystems component will initially target the most threatened and vulnerable ecosystems in the Region which include Salmon Gum, Wandoo and York gum, Gimlet and Red Morrel woodlands. Granite Outcrops and Laterite Breakaways have been included in this project in recognition of the unique biodiversity and flora-fauna interactions they support.

The aquatic ecosystems targeted in this project will initially be drawn from those designated by *The Directory of Important Wetlands in Australia*. These include Cowcowing Lakes, Yealerring Lakes, Yorkrakine Rock Pools, Lake Cronin, Lake Grace System and the Avon River Valley (from Walyunga to Toodyay). The project will also consider a number of other wetlands that are expected to be added to the list of national and state priority assets and two riparian ecosystems identified as being of national significance. These are the North Mortlock River and the Avon River from the town of Toodyay to Walyunga.

4. Threat Description:

While the "baselining" project addresses threats at bioregional scales, threat assessment in this project targets the site specific threats for those ecosystems already identified as priorities.

The major threats to this region's biodiversity are related to salinity and inundation and their greatly reduced extent and fragmentation. For salinity and inundation, it has shown there has already been a significant depletion of genetic diversity and a decrease in the abundance of vascular plants and water bird species. For terrestrial systems, there are 41 terrestrial ecosystems with less than 15 percent and 29 with less than 10 percent of their extent remaining. In addition, there is the influence of weeds, inappropriate fire regimes and accelerated spread of Dieback (*Phytophthora spp.*). Widespread declining health of wandoo woodlands (*Eucalyptus wandoo) is* also a cause of concern.

For aquatic systems, increasing levels of salinity and inundation caused through high water tables are the biggest threats. River pools are seriously threatened by sedimentation and eutrophication due to nutrient enrichment.

5. Contribution to Target or Resource Condition:

The major contributions to resource condition change for riverine systems are improving the condition of 12 major Avon River pools, foreshore and channel assessment together with action plans prepared for 13 major tributaries and best practice guidelines for tributary restoration involving 330ha of revegetation.

The major contributions to resource condition change for wetland and terrestrial ecosystems are to improve priority areas, focussing on fresh and saline wetlands of national significance, woodlands of salmon gum, wandoo and York gum, granite outcrops and lateritic breakaways. Gaining management agreements and covenants is an essential priority.

6. Twenty Year Target/s:

- Vulnerable" Ecosystems (ecosystems whose current extent in good condition exceeds 15% of their pre-European extent and their current extent exceeds 2000 ha) retain their current extent and integrity and have at least 15% of their pre-European extent formally protected for conservation (reserve system or legally binding management agreement).

- "Threatened" Ecosystems (ecosystems whose current extent in good condition is less than 15% of their pre-European extent, or have <2000 ha total extent remaining, retain their current extent and retain/improve their integrity, and have at least 60% of their remaining extent formally protected for conservation (reserve system or legally binding management agreement).

- W2T201 Priority sections of major and minor tributaries, identified for sediment and nutrient management purposes. Or for salinity control have improved by at least one 'foreshore condition' class ((Pen & Scott, 1995) by 2025. (Note: priority

sections to be identified and a specific 20-year target to be set by 2007 based on MAT's W1.3.1. W1.3.2 and W1.3.3).

- W1T202 The current hydrological capacity[1] of the Avon River Pools is not reduced by more than 20% by 2025.

Linked 20 year Targets

- W1T201 The average monthly concentration of total nitrogen and total phosphates and total suspended solids will not exceed targets of 1 mg/l (N), 0.1mg/l (P), (TSS to be determined) at Walyunga gauging station.

7. Management Action Target/s*:*

- B3 MAT 3.1ab Review and adapt / adopt existing criteria to identify priority terrestrial and aquatic ecosystems by 2007.
- B3 MAT 3.2ab Options for retaining and improving the integrity of vulnerable and threatened ecosystems are assessed for feasibility and cost benefit by Dec 2005.
- B3 MAT 5.1ab Biodiversity conservation plans for vulnerable and threatened terrestrial and aquatic ecosystems developed and incorporated into 30 Local Areas Plans by 2009.
- B3 MAT 6.1ab LGA-based biodiversity implementation teams established and trained to undertake and mentor retention/improvement of priority vulnerable and threatened ecosystems within each LGA by June 2008.
- B3 MAT 7.1ab Conservation programs implemented in priority vulnerable and threatened ecosystems in each Local Area by Dec 2009.
- W1 MAT 2.10 Priority for restoration of major river pools is established by 2005.
- W1 MAT 3.2 Sediment management plans for 12 priority river pools are complete by 2009. (Note: Sediment management plans have been prepared for Beverley, Blands, Gwambygine, Boyagarra, Burlong, and Northam Town pools).
- W1 MAT 5.4 Commercial operations are removing more than 20,000m3 of sediments annually from priority river pools by 2009.
- W2 MAT 1.1 Foreshore and channel assessment surveys are complete for 13 major tributaries within the "Avon Arc" and Mortlock River System by 2009.
- W2 MAT 1.2 A report on reconnaissance-scale surveys of the major tributaries in the Lockhart and Yilgarn catchments is complete by end of 2006.
- W2 MAT 1.3 Priority minor tributary assets are identified within 30 Local Government Plans by end 2005.
- W2 MAT 2.1 The extent of salinity risk, flooding and sedimentation, threatening processes is mapped for 13 major tributaries within the "Avon Arc" and Mortlock River System by 2009.

- W2 MAT 2.2 A report identifying the extent of threatening processes, including salinity risk, flooding and sedimentation major tributaries and associated wetland systems within the Lockhart and Yilgarn catchments is complete by end 2006.
- W2 MAT 3.1 A tool kit with "Best Practice" guidelines for tributary restoration based on ecological and hydrological principles is developed through consultative processes by 2006.
- W2 MAT 5.1 Management Action Plans to be prepared for 13 priority sections within tributaries in consultation with local communities in the "Avon Arc" and Mortlock River System by 2009.
- W2 MAT 5.2 Management Plans are prepared for 10 priority sections of major tributaries within the Lockhart and Yilgarn catchments by 2007.
- W2 MAT 6.1 Local capacity for priority waterway assets management is built through 10 river restoration workshops completed by 2009.
- W2 MAT 7.4 Revegetation, including commercial tree crop options, of 2000ha adjacent to priority major tributary sections by 2009.
- W2 MAT 8.1 Stream flow monitoring requirements for major and minor tributaries reviewed on the basis of threat assessment and new facilities installed by 2009.

8. Management Actions:

- Gain agreement on criteria for selecting priority ecosystems from key stakeholders and undertake assessment using those criteria.
- Establish and apply a process and criteria for determining and evaluating cost effectiveness of alternative options for conserving ecosystems.
- Commence preparation of conservation plans for initial 10 ecosystems (terrestrial and aquatic) at significant risk.
- Design training programs for on-ground and mentoring skills development for the teams working with vulnerable and threatened ecosystems.
- Identify priority ecosystems and implement conservation plans.

Relevant WATER MAs

- Priorities river pools based on Value, Risk and Feasibility of action.
- Prepare management plans for priority river pools.
- Measurement of sediment transportation and rate of river pool infill.
- Undertake foreshore and channel surveys for priority major and minor tributaries in the “Avon Arc” and Mortlock River System.

- Undertake reconnaissance surveys of major tributaries in the Lockhart and Yilgarn Catchments.
- Assess minor tributaries within Local Area Planning process.
- Assess and map salinity, flooding and sedimentation risk through regional hydrological modelling.
- Develop management guidelines for major tributaries in response to threatening processes based on environmental and social values.
- Develop management guidelines for minor tributaries in consultation with local communities.
- Priorities tributaries for Management Planning (including proposals for engineering works as a criteria).
- Undertake management planning according to priorities schedule.
- Undertake river restoration workshops.
- Existing stream flow monitoring is maintained continuously.
- Additional requirements for stream flow monitoring assessed and installed.

9. Contribution to National NRM outcomes:

- Biodiversity and the extent, diversity and condition of native ecosystems are maintained and rehabilitated.
- Populations of significant species and ecological communities are maintained and rehabilitated.
- The impact of salinity on land and water resources is minimized, avoided or reduced.
- Ecosystem services and functions are maintained or rehabilitated.
- Surface and groundwater quality is maintained or enhanced.
- The impact of threatening process on locations and systems which are critical for conservation of biodiversity, agricultural production, towns, infrastructure and cultural and social values, is avoided or minimised.

10. Project Linkages

Indigenous	Local Government	Marketing & Communication	M&E	Skills & Training	Local Area Plans
Need to engage – heritage, cultural issues at selected	*LGA involvement in project important*	*Project is Avon wide and will require excellent communication with land*	*Identified need for social monitoring*	*Skills and training required for facilitators and involved*	*Check off against priorities LAP reports.*

sites		*managers.*		*land managers*	

11. Activity/Output Schedule

								Forward Funding $	
Activity	**Activity Type**	**NHT $**	**NAP $**	**Other$_1$**	**Other$_2$**	**Output Code**	**Outputs**	**06-07**	**07-08**
1. Identify priority terrestrial and aquatic ecosystems,	Assessing the feasibility and cost benefit of manage ment option, setting and reviewin g targets s		50,000			P4.2	Ecosystems priority plan developed	10,000	10,000
2. Biodiversity conservation plans for priority threatened ecosystems	Planning for key manage ment actions		60,000			P3.1	3 Ecosystem strategy plans	60,000	60,000
3. Landholder participants trained in restoration	Capacity building		55,000			CB1.1 CB1.2 CB1.3 CB1.4 CB2.1 CB4.2	20 training sessions, 6 written products, 1 mobile display, 6 media	55,000	55,000
4. Condition of ecosystems improved and area of threatened ecosystems formally protected increased	Investme nt in impleme ntation		705,00 0			RA 2.1 RA2.3 OG1.1 OG1.2 OG2.2 OG2.4 OG3.4	20 flora surveys and reports on 1,250 ha rem veg (wetland and terrestrial), 20 conservatio n	700,000	700,000

							covenants or voluntary agreements protecting and enhancing 2500 ha (wetland and terrestrial)1, 250 native veg (wetland and terrestrial protected by fence.		
Long term monitoring sites and protocols established	Monitoring, evaluation and review		25,000			RA 1.2	20 new monitoring programs established	25,000	25,000
	Sub-Total		895,000					890,000	890,000
								Forward Funding	
Activity	Activity Type	NHT	*NAP*	Other$_1$	Other$_2$	Output Code	Outputs	06-07	07-08
1 Improving the condition of river pools including by removing sediment.	Threat identification and risk assessment. Assessing the feasibility and cost benefits of management options. Planning for key management actions		80,000			RA2.3 P4.2 OG6.1	Report,2X management plans,>20,000m3 sediments removed annually	80,000	80,000

2. Tributary surveys and management plans	Asset identification. Planning for key management actions		150,000			RA2.3 P4.2	2 X surveys, 2X management plans	219,000	174,000
3. Identification, mapping and reporting of threatening processes to tributaries and associated wetlands	Threat identification and risk assessment		150,000			RA2.3	Study	175,000	
4. Local capacity for waterway management built through id of priority assets workshops and manuals.	Asset identification. Building capacity for implementation Assessing the feasibility and cost benefits of management		100,000			RA2.3 CB2.1 CB2.2	Study, 2 X workshops, 1X manuals	130,000	130,000
5.Revegetation and tree crops of tributaries	Investment in implementation		225,000	85,000 (landholder)		OG3.2 OG3.3 OG4.1 OG4.4 OG4.5 OG5.1 OG5.2	330 ha tributaries revegetated or tree cropped	1,050,000	1,050,000
6. Monitoring of tributaries	Monitoring, evaluation and review		100,000			RA1.3	Existing monitoring program enhanced	433,500	433,500
	Sub-Total		805,000	225,000				2,087,500	1,867,500

Total		**1,700,000**	**225,000**				**2,977,500**	**2,727,500**

12. Contingency Activity/Output Schedule

Activity	**Activity Type**	**NHT**	**NAP**	**Other$_1$**	**Other$_2$**	**Output Code**	**Outputs**
Conservation programs implemented. Area of threatened ecosystems formally protected increased	Investment in implementation	65,000	390,000			OG1.1 OG2.2OG2.4 OG4.3 OG4.6	15 flora surveys on 1,000 ha rem veg (wetland and terrestrial), 15 flora survey reports, 15 conservation covenants and voluntary agreements protecting 1,000 ha (wetland and terrestrial) 750 native veg (wetland and terrestrial protected by fence.
	Total	65,000	390,000				

Project Id No. ND004

Project Title:

Sense of place: conserving the Region's characteristic ecoscapes.

1. Project Summary:

This project aims to conserve the extent and integrity of the natural diversity (species, NECs and ecosystems) within 12 landscapes that best represent the natural diversity of the Avon River Basin (undertaking 12 projects within the first three years). Two landscapes within each IBRA region that provide the best representation of the natural diversity will be selected for intensive conservation action. In total, when complete, this project will maintain and enhance nature conservation assets over some 720,000ha.

This project will address threats to biodiversity from salinity and water quality and will contribute to managing these threats across the Avon Basin. It will also contribute to achieving management targets that have been identified as part of the Integrated Water and Sustainable Industries projects. Weeds are a significant issue and the project will link with Sustainable Industries Program biosecurity projects.

2. Project Description:

The project will operate in landscape areas of generally between 30,000ha and 100,000ha. Natural resource specialists working with land managers/holders and the community will undertake fencing, regeneration, revegetation, weed and animal pest management, surface water management, drainage, groundwater pumping and improved fire management.

3. Asset Description:

Twelve individual Ecoscapes will be selected based on conservation priorities and taking into account salinity mitigation criteria.

4. Threat Description:

Although the specific Ecoscapes that comprise this project have not yet been selected, it is anticipated that the greatest threats will be lack of sufficient native vegetation for species survival and continuing reduction in native vegetation quality by climate change, disease, insect attack, grazing, weed invasion. Threats to fauna include predation, increased lack of habitat and local extinctions. Salinity will be the greatest threat for ecoscapes low in the landscape.

5. Contribution to Target or Resource Condition:

This project contributes to resource condition change by conserving the extent and integrity of four Ecoscapes in year 1 and 12 by year 6. On-ground works will retain the viability of populations and communities, restore threatened species and communities, conserve regionally significant biodiversity assets and enhance landscape connectivity.

6. Twenty Year Target:

- Conserve the extent and integrity of the natural diversity (species, NECs and ecosystems) within 12 landscapes/ecoscapes, which best represent, the natural diversity of the Avon River Basin.

7. Management Action Target/s:

- B4 MAT 1.1 Two ecoscapes that best represent the natural landscape diversity (ecosystems, NECs and species) and are best able to retain that diversity identified in each bioregion by Dec 2005.

- B4 MAT 3.1 Options for conservation of representative ecoscapes assessed for feasibility and cost benefit by Dec 2005.

- B4 MAT 5.1 Biodiversity conservation plans developed for representative ecoscapes (1 per IBRA region) by June 2006 with an additional 1 per IBRA region developed by June 2008.

- B4 MAT 6.1 Bioregional biodiversity teams established and trained to undertake mentoring and project management skills to conserve representative landscapes by June 2008.

- B4 MAT 7.1 Actions identified in conservation plans for representative ecoscapes (including fencing, regeneration, revegetation, weed and animal pest management, surface water management, drainage, groundwater pumping and other actions) implemented by 2009.

- W2 MAT 8.1 12. Strategic regional monitoring program for water quality (nutrient, acidity, salinity and sediments) developed and initiated by 2005.

8. Management Actions:

- Review and adapt/ adopt existing criteria or develop novel approaches and criteria to identify and select ecoscapes best representing natural diversity in the Avon Basin (developed in consultation with other regions to ensure cross-regional consistency.

- Establish and apply a process and criteria for determining and evaluating options for retaining the natural diversity of representative ecoscapes.

- Prepare priority conservation plans.

- Design skills development programs in mentoring and project management for bioregional teams.

- Initiate on-ground works according to priorities identified in conservation plans.

9. Contribution to National NRM outcomes:

- Biodiversity and the extent, diversity and condition of native ecosystems are maintained and rehabilitated.

- Populations of significant species and ecological communities are maintained and rehabilitated.
- Ecosystem Services and functions are maintained and rehabilitated.

10. Project Linkages

Indigenous	Local Government	Marketing & Communication	M&E	Skills & Training	Local Area Plans
Need to engage – heritage, cultural issues.	*LGA involvement where appropriate* *Recognition of LGA processes and structures.*	*Communication within project and progress/results to the wider community.* *Strong communication between production and conservation sectors*	*Identified need for social monitoring*	*Skills and training required for facilitators and involved communities.*	*Check priorities within LAP report.*

11. Activity/Output Schedule

								Forward Funding $	
Activity	**Activity Type**	**NHT $**	**NAP $**	**Other$_1$**	**Other$_2$**	**Output Code**	**Outputs**	**06-07**	**07-08**
1. Selection and options for Ecoscapes	Asset and threat identification, feasibility, cost benefit, setting and reviewing targets		85,000			P4.2	Strategic plan for selection of Ecoscapes	170,000	115,000
2. Biodiversity conservation plans for selected Ecoscapes developed.	Planning for key management actions		225,000			P3.1	Four Ecoscapes plans developed	300,000	230,000
3. Teams established and trained to undertake	Building capacity		131,000			CB1.1	30 awareness events, 300 participants	150,000	150,000

mentoring and project management						CB1.2 CB1.3 CB1.4 CB1.5 CB2.1 CB4.2	20 written products , 100 farm recipients 1 displays, 8 media , 1 web site, 20 workshops, 200 participants 4 knowledge evaluation events		
4. Actions identified implemented	Investment in implementation		2,059,000			OG 1.1 OG1.2 OG 2.3 OG 2.4 OG 3.3 OG4.6	2 Covenants, 10 voluntary agreement, Area riparian vegetation protected (18ha), Area terrestrial vegetation protected (1,000ha) Area of riparian vegetation enhanced (2ha), Area native species planted (100ha), area pest plant control (100ha), pest vertebrate control (5000ha), Area protected soil erosion	2,500,000	2,670,000

						OG 8.1 OG8.3 OG9.1 OG10.1	(2,700ha), Area treated surface drainage (6,000ha/26 km)		
5. Reference and monitoring sites designed and established	Monitoring evaluation and review		100,000			RA1.2	10 Number of new monitoring programs established	84,000	96,000
Total			**2,600,000**					**3,204,000**	**3,261,000**

12. Contingency Activity/Output Schedule

Activity	**Activity Type**	**NHT**	**NAP**	**Other$_1$**	**Other$_2$**	**Output Code**	**Outputs**
Total							

Project Id No. ND005

Project Title:

Our patch: local people caring for local bushland.

1. Project Summary:

The aim of this project is to support local governments and communities across the whole Avon River Basin in their conservation aspirations for their local patch. It provides for local communities to make significant conservation improvements in areas not covered by the other projects. Selection of conservation sites will be based on local and regional priorities.

2. Project Description:

The communities of each local government area will select five highest value bushland remnants for enhancement through rehabilitation, establishment of wildlife corridors, buffers, weed management, vermin control, improved fire management.

3. Asset Description:

The assets include high value bushland areas treasured by local communities and may, along with viable species and ecological communities, contain threatened flora and fauna, threatened ecological communities and ecosystems.

4. Threat Description:

Given that the bushland areas are located across the Avon landscape, and have not yet been selected, threat description is necessarily general. It is likely to include " a lack of biological resources" to sustain a species i.e. insufficient habitat, food, mates (inbreeding or no breeding) as a result of fragmentation, habitat degradation through inappropriate fire regimes, weed proliferation, rising water tables and inundation.

5. Contribution to Target or Resource Condition:

This project contributes to relevant 20 year Targets by actions to maintain viability of native species and communities in and around the selected bushland areas.

6. Twenty Year Targets:

- The Avon River Basin contains a connected and functional network of vegetation that represents the natural diversity of the regions and supports regional scale ecological functions.

7. Management Action Target/s

- B1 MAT 3.1 Conservation options for viable are assessed for feasibility and cost benefit by June 2007 for viable species.

- B1 MAT 4.1 MATs reviewed for viable species by Dec 2009, following completion of threat assessments and assessment of management options.
- B1 MAT 5.1a General biodiversity conservation guidelines developed and incorporated into 30 Local Area Plans by June 2006 and conservation plans for the five remnants with highest biodiversity values in each local area developed by Dec 2006.
- B1 MAT 6.1a Information packages containing conservation guidelines for remnant vegetation provided to each LGA by June 2008.
- B1 MAT 7.1a Priority biodiversity conservation actions based on guidelines in the 30 Local Area Management Plans implemented by 2010.
- B1 MAT 7.2a Conservation actions for the five highest-value remnants in each LGA that currently do not have a threat management plan, commenced by Dec 2006.
- B1 MAT 7.3 Implement public awareness and participation programs for viable, species by June 2006.
- B1 MAT 8.1a Long term monitoring sites and protocols for assessing status of currently viable species designed and established by June 2006.
- B1 MAT 8.2 Status of selected viable species reviewed at 3 yr. intervals.
- B2 MAT 3.1 Priority viable NECs (terrestrial and aquatic) and priority locations (areas containing multiple NECs or unique occurrences of uncommon NECs) identified by Dec 2006.
- B2 MAT 3.2 Conservation options for viable NECs are assessed for feasibility and cost benefit by end 2005.
- B2 MAT 4.1a MATs for currently viable NECs reviewed and updated by Dec 2007.
- B2 MAT 5.1 Biodiversity conservation guidelines for viable NECs incorporated into 30 Local Area Plans by Dec 2006.
- B2 MAT 6.1a Training in conservation of viable NECs provided for all private landholders engaged in covenanting and other incentive schemes by Dec 2006.
- B2 MAT 7.1a Priority conservation actions for viable NECs (based on guidelines in the 30 Local Area Plans) implemented by 2009.
- B2 MAT 7.2a The area of priority viable NECs under conservation agreements is increased by 500 ha annually for 5 years.
- B2 MAT 8.1 Long term monitoring sites and protocols for assessing status (extent and integrity) of currently viable NECs designed and established by June 2006.
- B2 MAT 8.2 Status of selected viable NECs reviewed at 3 year intervals.

- B5 MAT 2.1 Threats that need to be addressed at bioregional scales, such as high water tables, altered hydro periods, habitat loss & fragmentation, declining water quality, sedimentation, weeds, pests & diseases are quantified by Dec 2005.

8. Management Actions:

- Develop and apply a process and criteria for determining and evaluating options for retaining viable species.
- Develop framework for refining targets which would ensure that all resource condition targets for the Asset Class "Species" will be met.
- Review and refine targets following assessment of priorities and threats.
- Develop general planning guidelines for retention of viable species.
- Develop conservation plan for 5 priority remnants in each Local Area.
- Prepare information packages.
- Design and implement value-based public awareness programs for viable species.
- Implement on-ground works and other priority actions identified in relevant conservation plans above.
- Implement on-ground works and other priority actions identified in relevant conservation plans above.
- Design public awareness program and integrate with LAPs.
- Review conservation status of all species for which information is available.
- Design and establish long term monitoring sites.
- Review and adapt/adopt existing monitoring and evaluation procedures for viable species.
- Determine priority NECs & locations.
- Establish and apply a process and criteria for determining and evaluating conservation options.
- Review and refine targets by Jun 2007 following assessment of priorities and threats.
- Develop general conservation guidelines for NECs that are not at immediate risk.
- Identify areas where the greatest diversity or unique occurrences of currently viable NECs occur.
- Design training program for conservation of viable NECs.

- Implement on-ground works and other priority actions for NECs identified in local area plans.
- Establish covenanting and other incentive schemes for priority viable NECs.
- Identify and establish long term monitoring sites.
- Review the conservation status of all NECs against 2005 benchmarks and RCTs.
- Map the extent and severity of impact of known threats.
- Impact and severity of various threats for each bioregion are prioritised by Dec 2005.

9. Contribution to National NRM outcomes:

- Biodiversity and the extent, diversity and condition of native ecosystems are maintained and rehabilitated.
- Populations of significant species and ecological communities are maintained and rehabilitated.
- Ecosystem Services and functions are maintained and rehabilitated.

10. Project Linkages

Indigenous	Local Government	Marketing & Communication	M&E	Skills & Training	Local Area Plans
Consider indigenous priorities in selecting bushland areas. *If indigenous values involve indigenous community in planning and management*	*This is a LGA based project* *Priorities in LAPs are important in site selection.*	*Key marketing to local communities through local government.*	*Identified need for social monitoring*	*Skills and retraining required for facilitators and involved community* *Training addressed in project.*	*Check off against LAP report.*

11. Activity/Output Schedule

								Forward Funding $	
Activity	**Activity Type**	**NHT $**	**NAP $**	**Other$_1$**	**Other$_2$**	**Output Code**	**Outputs**	**06-07**	**07-08**
2. Biodiversity	Building	45,000				CB1.2	30 written	45,000	45,000

guidelines and training for all local government areas in the region	capacity for implementation					CB 1.4 CB 2.1	guidelines, 750 recipients, 10 X media, 9 X Training and workshops, 150 participants		
3. On ground action and incentives	Investment in implementation	420,000	235,000			*OG1.2* OG 2.4 OG3.4 OG4.6 OG7.4 OG8.1 OG8.3	500ha agreements, 2,250 ha native vegetation fenced and enhanced, and 600 ha planted to native species, 5 seed banks established, 2,250ha pest plant measures,10,000 ha pest animal control	1,000,000	1,000,000
4. Monitoring sites designed and established		20,000				RA 1.2	15 X new monitoring programs established	50,000	50,000
Total		**485,000**	**235,000**					**1,230,000**	**1,230,000**

12. Contingency Activity/Output Schedule

Activity	**Activity Type**	**NHT**	***NAP***	**Other$_1$**	**Other$_2$**	**Output Code**	**Outputs**
On ground action and incentives	Investment in implementation	500,000	500,000			*OG1.2* OG 2.4 OG3.4 OG4.6 OG7.4 OG8.1 OG8.3	500ha agreements, 2,250 ha native vegetation fenced and enhanced, and 600 ha planted to native species, 5 seed banks established, 2,250ha pest plant measures,10,000 ha pest animal control

Total	**500,000**	**500,000**			

Project Id No. ND006

Project Title:

Fire management and biodiversity.

1. Project Summary*:*

This project aims to facilitate biodiversity conservation principles to be considered in fire management planning at an IBRA sub regional scale. These guidelines will guide local government and private landholders in development of effective fire plans and secondly be the basis of an education program including demonstration.

Development of this project will be undertaken with strong involvement by the Aboriginal community, FESA and Local Government.

2. Project Description:

This project will provide fire management guidelines for biodiversity and a fire and biodiversity education program. The project addresses fire as a significant threat to natural diversity, water, air quality and land assets if not managed appropriately. It is a major issue for local government, which has a primary responsibility through the Bush Fire Act for fire management and control. Biodiversity has generally not been considered as part of fire management. This project will address issues such as fire frequency, fire timing and intensity, requirements for internal access and internal fire breaks. In addition, the fire management guidelines need to incorporate management of potential fire hazards created by fencing remnant vegetation and riparian zones, and creation of corridors.

3. Asset Description:

This project is focussed in the first year on fire management for areas of public and private native vegetation, and in the second year on revegetation, and fenced riparian zones.

4. Threat Description:

With respect to the issue of fire management, there will always be tensions between protection of life and property and protection of natural assets. For biodiversity conservation, fire at too frequent intervals can disadvantage fire sensitive perennial species and favour annual (often weedy) species. Fire at too infrequent intervals can disadvantage short-lived species without long term seed storage systems. Fire intensity and timing can also impact on species succession. Wide firebreaks/access reduce area for nature conservation and if internal, break up habitat, disrupt interior dependent species effectively increasing edge to area ratios and allow introduction of weeds and vermin. Burning whole reserves in a wild or managed fire can eliminate species that may not be able to recolonise from distant un-burnt vegetation. In addition, in the pastoral zone frequent linking landscape scale wildfires are thought to be having severe impacts on biodiversity.

5. Contribution to Target or Resource Condition:

This project will contribute to all natural diversity resource condition targets in that through the guidelines and education it will provide a consistent approach to fire management for natural diversity across the Avon River Basin and is designed to suit the different vegetation conditions within each IBRA sub-region.

6. Twenty Year Targets:

This project will contribute to all natural diversity 20 year Targets.

7. Management Action Target/s:

- Fire management plans developed for each bioregion by Dec 2007.

8. Management Actions:

- Assess risk and options for effective fire regimes.

9. Contribution to National NRM outcomes:

10. Project Linkages

Indigenous	Local Government	Marketing & Communication	*M&E*	Skills & Training	Local Area Plans
Need to engage – heritage, cultural issues.	*LGA project involvement.* *Recognition of LGA processes and structures.*	*Local government and FESA are primary stake holders.*		*Training for local government important.*	

11. Activity/Output Schedule

								Forward Funding $	
Activity	**Activity Type**	**NHT $**	**NAP $**	**Other$_1$**	**Other$_2$**	**Output Code**	**Outputs**	**06-07**	**07-08**
1. Develop fire management guidelines on IBRA sub region basis	Planning for key manage ment actions	60,000				P1.1	4 Best practice sub IBRA region manageme nt biodiversity fire guidelines'	80,000	40,000

2.Training on fire management and demonstration	Investment in implementation	20,000				CB2.1 OG 3.4	2 training sessions/workshops, 8o participants	0	0
	Total	**80,000**						**80,000**	**40,000**

12. Contingency Activity/Output Schedule

Activity	**Activity Type**	**NHT**	***NAP***	**Other$_1$**	**Other$_2$**	**Output Code**	**Outputs**
	Total						

7.6 Strategic reserve and Infinitree

There are a number of activities that are not fully addressed in project schedules that the ACC considers could be supported by the strategic reserve. All project schedules have highlighted such potential contingency funding (pt 12 in project schedules) and this totals $2.22m.

Additionally a tree cropping project has been submitted to the ACC for consideration for investment from Infinitree. The project aims to promote the use of revegetation (tree crops) to control groundwater at a large scale. This project will provide commercial incentives for broad scale revegetation and this will be done by combining the commercial value from wood and fibre production with the value of the environmental service of lowering groundwater (salinity mitigation benefit). There will be a significant monitoring and evaluation component in the project to demonstrate the environmental benefits of extensive revegetation.

A full project template for this project has been developed, however, a further level of negotiation with partner organisations is required to adequately identify regional commitments.

The proposed project is seeking up to $10million.

APPENDIX

Table A1.1 Priority MATs per Program area

Program: Integrated Water Management	
Principle Resource Condition Target/s	Priority MATs
W1T201 The average monthly concentration of total nitrogen and total phosphates and total suspended solids will not exceed targets of 1 mg/l (N), 0.1mg/l (P), (TSS to be determined) at Walyunga gauging station. (Cf: Environmental Protection Policy Swan-Canning). W2T201 Priority sections and major and minor tributaries identified for sediment and nutrient management purposes, or for salinity control have improved by at least one 'foreshore condition' class (Pen & Scott, 1995) by 2025.	W4MAT 8.1 A regional groundwater monitoring strategy for the Avon River Basin is developed and being implemented by 2007 (Cross Regional). W1MAT 2.1 Areas of high-risk nutrient loss in the "Avon Arc" and Mortlock River System are identified and mapped by 2007 (Cross Regional). W1MAT 2.4 A report of the predicted long-term potential for increased frequencies of 1-in-25 year probability flood events considering both rising water tables and climate change is prepared by end 2005. W1MAT 2.5 Flood risk modelling and mapping for non-urban floodplain areas is complete by 2006 and is being adopted through statutory processes for assessment of development proposals to ensure that long-term flood impedance is not more than 5% of present conditions. W1MAT 2.9 The Northam Waste Water Treatment Plant has zero nutrient release to the Avon River by 2009. W1MAT 5.2 By 2009, 95% of agricultural land adjacent to the Avon River is fenced both sides. W27.3 Fencing 200km of priority sections of major tributaries is complete by 2009. L2MAT 6.2 Basin wide extension program ensures that 80% of land managers have an understanding of the benefits and impacts of the application of alternative water management techniques and a systems-based approach by 2009 (Cross Regional).
W4T201 Groundwater aquifers suitable for domestic or productive use are identified by 2010 and are maintained at a defined suitable level and quality. W4T202 Regional groundwater aquifers managed to minimise the impacts of salinity and flooding according	W4MAT8.1 A regional groundwater monitoring strategy for the Avon River Basin is developed and being implemented by 2007 (Cross Regional). L2 MAT8.1 Benchmark groundwater levels and quality consistent with National Land and Water Resource Audit standards by 2008 (Cross Regional). W4MAT 4.1 The 20-year resource condition targets for regional groundwater aquifer management are set by end 2006. W4MAT 1.1 A report on surveys of groundwater resource with potential productive yield within the region is prepared by 2009.

to sub-regional groundwater management plans (Note: 20 year target to be set in 2005 following regional groundwater and surface water assessment currently undertaken as a part of the EEI program)	W4MAT 7.1 Significant groundwater resources are managed for maximum community benefit by adoption of water allocation "best management" criteria by 2009. L2MAT 6.2 Basin wide extension program ensures that 80% of land managers have an understanding of the benefits and impacts of the application of alternative water management techniques and a systems-based approach by 2009
I3T20 1 By 2025, 10 rural towns in the Avon Region have the risk of damage to infrastructure and heritage values due to salinity and flooding reduced by 50% compared with 2004 risk assessments. W5T201 Known heritage and cultural values are maintained and enhanced by 2025.	W5MAT7.1 A report is prepared that outlines protocols to ensure heritage and cultural values identified in local and regional plans are considered in NRM programs and projects by 2006. I3 MAT 2.2 Geophysical surveys are completed for 5 priority rural towns (RTLA program) by 2006. I3 MAT5.1Prepare"implementation Plans" for 5 priority rural towns (RTLA program) by 2009. I3 MAT 7.1 Implement "Integrated Water Management Systems" demonstration projects in two towns by 2006. I3 MAT 6.1 Complete 5 "Waterwise" education and training programs as a part of implementation planning for the 5 priority rural towns by 2009. I3 MAT 1.1 Rural town assets at risk within the region are identified by 2006. I3 MAT 6.2 Prepare a "Water Sensitive Urban Design" Manual suitable for rural towns in the region by 2006. I3 MAT 3.1 Complete a feasibility study for each of a waste/ storm water recycling process and for desalinisation of pumped groundwater in the region by 2006. L2MAT 6.2 Basin wide extension program ensures that 80% of land managers have an understanding of the benefits and impacts of the application of alternative water management techniques and a systems-based approach by 2009.
I1T20 1 By 2025, the percentage of roads at risk due to high water tables and flooding is reduced to 10% (2, 520 km) or less of the total road network in the Avon River Basin.	I1 MAT 1.1 An inventory of transport assets, including roads, rail, airstrips and associated assets (e.g. culverts, bridges) is prepared for LGA's within the region by 2005. W5MAT 7.1 A report is prepared that outlines protocols to ensure heritage and cultural values identified in local and regional plans are considered NRM programs and projects by 2006 I1 MAT 2.1 The risk of high water tables and flooding for transport infrastructure is known within each Local Government Area by 2009. I1 MAT 6.1 By end of 2005 an education package is developed for LGA's, Main Roads, catchment or conservation groups and land managers, to encourage an understanding of the links between catchment management and the protection of key

	infrastructure. I1 MAT 3.3 Methods of road risk assessment are evaluated by 2005. I1 MAT 3.2 Assess alternative culvert materials and designs to suit changed catchment hydrology by 2007. I1 MAT 4.1 Priority roads for preventative action identified through regional transport policy development processes by 2007. I1 MAT 6.1 More than one full-time employee (or equivalent) with technical skills for transport infrastructure management integrated with landscape management is working with LGA's within the region by 2005. I1 MAT 7.1 Ten sites are implemented demonstrating preventative management options for transport assets by 2007. L2MAT 6.2 Basin wide extension program ensures that 80% of land managers have an understanding of the benefits and impacts of the application of alternative water management techniques and a systems-based approach by 2009.
L2T201 Reduction in the average rate of groundwater rise on land in middle and upper catchment areas from 15-30mm to 10-20mm by 2025. (The target for middle and upper catchment area refers to very significant reductions in groundwater rise. This action is considered essential to allow recovery and containment and ongoing utilisation of the land resources). L2T202 The extent of valley floor salinity is less than 12% of land used for agriculture by 2025. (Note the area affected in currently over 5.4%. This is expected to eventually increase to over 27%)(The target for the valley floor recognises that saline land has a value in its own right and the intent is to contain salinity in these areas and utilise	W4MAT 8.1 A regional groundwater monitoring strategy for the Avon River Basin is developed and being implemented by 2007(Cross Regional). L2 MAT 8.1 Benchmark groundwater levels and quality consistent with National Land and Water Resource Audit standards by 2008 (Cross Regional). L2 MAT 2.1. High-risk groundwater recharge landscape zones identified for all shires, linked to priority assets by 2009. L2 MAT 7.1 At least 50% of the landscapes identified within Local Area Plans (with a focus on managing local flow systems and points of high recharge e.g. the base of granite outcrops) managed using best management practice options for salinity by 2009. L2 MAT 7.4 More than 20,000Ha of commercial tree crops are established in areas where groundwater control benefits will occur by 2009. W4MAT 3.4 Assessment of treatment methods for safe disposal of acid groundwater by 2008. W4MAT 5.4 Management plans and demonstration for 10 areas identified as being of high risk due to groundwater abstraction and disposal prepared and implemented by 2009. W2MAT 7.1 Local priority waterways identified within Local Area Plans with modified drainage have demonstrated 'net benefit' (to be determined)(not expected to be retrospective) L2MAT 6.2 Basin wide extension program ensures that 80% of land managers have an understanding of the benefits and impacts of the application of alternative water management techniques and a systems-based approach by 2009 (Cross

saline land as a resource) W4T203 Disposal of groundwater from mining operations is managed according to statutory licence conditions by 2009. W4T204 Disposal of groundwater from agricultural operations is managed according to acceptable 'best practice' guidelines by 2009.	Regional).
W3T201 By end 2025, 50% of agricultural properties in the 'Wheatbelt' zone and 50% of agricultural properties in the 'Avon Arc' have zero annual water deficits. W3T202 Environmental surface water requirements are maintained within the 'Avon Arc' zone until 2025 and beyond.	W3MAT4.1 The volume of water used annually for farm and town supply from reticulated schemes is identified within 30 Local Area Plans and targets for reduced use are set by 2007. W3MAT 6.1 More than 10 accredited people with farm water planning skills are providing services within the region by 2009. W3MAT 5.1 By 2007, 5 integrated plans are prepared to demonstrate on-farm self-sufficiency for water supply. W3MAT 7.1 50% of landholders within demonstration projects have a self-sufficient water supply by 2009. L2MAT 6.2 Basin wide extension program ensures that 80% of land managers have an understanding of the benefits and impacts of the application of alternative water management techniques and a systems-based approach by 2009
Program: Sustainable Industries	
Principle Resource Condition Target/s	Priority MATs
L3T201 A 50% reduction in the economic and environmental impacts of all priority animal and plant pests across the region by 2014.	L3MAT 6.1 A regional policy, planning and information framework will be developed by 2007 to ensure that regional responses are coordinated with state and national pest and disease strategies. L3MAT 6 .1 By 2009, the extent of rabbits, cats, dogs and foxes, their economic and environmental impacts and management options will be understood by 80% of land managers. Note: Surrogate measures will include the uptake of actions for control, such as '1080' poison usage, attendance at field days and targeted group surveys. Natural Diversity Asset Class 5. Threats that need to be addressed at bioregional scales, such as high water tables,

	altered hydro periods, habitat loss and fragmentation, declining water quality, sedimentation, weeds, pests and diseases are quantified by Dec 2005.
L1.1T201 Soil acidity levels (top and sub-surface) at or above pH 5.5 ($CaCl_2$), in all soils with low capacity to buffer pH change by 2020.	L1.1 MAT 2.1 Regional database established to record the status of top and sub-soil pH documented for all Land Resource Sub-Regions by 2008. L1.1 MAT 6.2 80% of land managers have knowledge of BMP for soil acidity (including economic benefits) by 2008.
L1.5T201 100% of soils with recognised fertility issues (elements, organic matter and microbial activity) are identified within 5 years and a 30% improvement over benchmarked fertility levels is achieved by 2020.	L1.5 MAT 2.1 Six representative land resource areas (catchment scale) with complete soil fertility mapping and linked criteria by 2009. L1.5 MAT 3.1 By 2008, 10 training courses will have been held with the intended outcome being that 70% of land managers will have an understanding of the benefits of the sustainable management of soil fertility in a resource management context.
Program: Natural Diversity	
Principle Resource Condition Target/s	Priority MATs
All	B1MAT1.1abc An inventory (including estimates of current distribution and abundance of species in the region known to be viable, declining and threatened established by Dec. 2009 for viable species, by Dec. 2007 for declining species, and by Dec. 2006 for threatened species. B1MAT1.2bc Priority declining and threatened species and priority locations (areas containing high numbers or unique occurrences of declining or threatened species) identified by Dec. 2006 for threatened species and by Dec. 2007 for declining species. B1MAT 2.1abc A threat assessment for viable, declining and threatened species in the region completed and results included into 30 LAPs by June 2006 for threatened species, by June 2007 for declining species and by June 2008 for currently viable species B2 MAT 1.1abc An inventory of the current extent and integrity of all natural ecological communities (terrestrial and aquatic) completed by Dec. 2007. B2 MAT 2.1abc A threat assessment for currently viable, declining and threatened NECs designed and applied and results incorporated into 30 LAPs by December 2006 B2 MAT 3.1abc Priority viable, declining, threatened NECs (terrestrial and aquatic) and priority locations (areas containing

	multiple NECs or unique occurrences of uncommon NECs) identified by Dec. 2006. B3 MAT 1.1ab An agreed classification of Avon ecosystems, and an inventory and map of the distribution, extent / condition integrity of vulnerable and threatened ecosystems completed by Dec. 2007. B3 MAT 2.1ab A threat assessment for ecosystems completed and results incorporated into 30 LAPs by December 2006 B3 MAT 2.2ab The threat to major low lying ecosystems due to rising groundwater and potential discharge from drainage schemes is predicted by Dec 2006 B5 MAT 1.1 Classification of distinct regions within the Avon River Basin that have similar biophysical and human land-use patterns completed by Dec. 2005. B5 MAT 1.2 Biodiversity survey program for all asset classes implemented by Dec. 2005. B5 MAT 2.1 Threats that need to be addressed at bioregional scales, such as high water tables, altered hydro periods, habitat loss & fragmentation, declining water quality, sedimentation, weeds, pests & diseases are quantified by Dec. 2005. B5 MAT 8.1 Regional biodiversity monitoring program for high water tables, altered hydro periods, habitat loss and fragmentation, declining water quality (nutrient, acidity, salinity and sediments), sedimentation, weeds, pests & diseases developed and initiated by 2005. W2 MAT 2.1 The extent of salinity risk, flooding and sedimentation, threatening processes is mapped for 13 major tributaries within the "Ävon Arc" and Mortlock River System by 2009. W2 MAT 2.2 A report identifying the extent of threatening processes, including salinity risk, flooding and sedimentation to major tributaries and associated wetland systems within the Lockhart and Yilgarn catchments is complete by end 2006.
All native species that naturally occur in the Avon region persist in viable populations. Maintain the extent and integrity (structure and composition) of all natural ecological communities that occur in the Avon Region	B1 MAT 5.1b Conservation plans for priority locations which contain high numbers, or unique occurrences, of known declining species completed by Dec 2007. B1 MAT 5.1c Conservation plans for priority threatened species commenced by June 2005 and completed by Dec 2007 B1 MAT 6.1b Action based training provided to individuals undertaking restoration programs for priority declining species by June 2008. B1 MAT 6.1c Biodiversity implementation teams established and trained to undertake species restoration work in all priority locations containing the 27 "critically endangered" and "endangered" species by June 2008. B1 MAT 7.1c Conservation actions for 27 'critically endangered' and 'endangered' species that have existing conservation

	plans commenced by Dec 2005. B1 MAT 8.1b Long term monitoring sites and protocols for assessing status of declining species designed and established by June 2006. B1 MAT 8.1c A monitoring program established for high priority 'threatened species' by end 2007. B2 MAT 6.1c Biodiversity implementation teams established and trained to undertake restoration work for all threatened NECs by June 2006.
Vulnerable" Ecosystems (ecosystems whose current extent in good condition exceeds 15% of their pre-European extent and their current extent exceeds 2000 ha) retain their current extent and integrity and have at least 15% of their pre-European extent formally protected for conservation (reserve system or legally binding management agreement). "Threatened" Ecosystems (ecosystems whose current extent in good condition is less than 15% of their pre-European extent, or have <2000 ha total extent remaining, retain their current extent and retain/improve their integrity, and have at least 60% of their remaining extent formally protected for conservation (reserve system or legally binding management agreement). W2T201 Priority sections of major and minor tributaries, identified for sediment and nutrient management purposes. Or for salinity control have improved by at least one 'foreshore condition' class ((Pen &	B3 MAT 3.1ab Review and adapt / adopt existing criteria to identify priority terrestrial and aquatic ecosystems by 2007 B3 MAT 3.2ab Options for retaining and improving the integrity of vulnerable and threatened ecosystems are assessed for feasibility and cost benefit by Dec 2005 B3 MAT 5.1ab Biodiversity conservation plans for vulnerable and threatened terrestrial and aquatic ecosystems developed and incorporated into 30 Local Areas Plans by 2009 B3 MAT 6.1ab LGA-based biodiversity implementation teams established and trained to undertake and mentor retention/improvement of priority vulnerable and threatened ecosystems within each LGA by June 2008 B3 MAT 7.1ab Conservation programs implemented in priority vulnerable and threatened ecosystems in each Local Area by Dec 2009 W1 MAT 2.10 Priority for restoration of major river pools is established by 2005. W1 MAT 3.2 Sediment management plans for 12 priority river pools are complete by 2009. (Note: Sediment management plans have been prepared for Beverley, Blands, Gwambygine, Boyagarra, Burlong, and Northam Town pools) W1 MAT 5.4 Commercial operations are removing more than 20,000m3 of sediments annually from priority river pools by 2009. W2 MAT 1.1 Foreshore and channel assessment surveys are complete for 13 major tributaries within the "Avon Arc" and Mortlock River System by 2009 W2 MAT 1.2 A report on reconnaissance-scale surveys of the major tributaries in the Lockhart and Yilgarn catchments is complete by end of 2006. W2 MAT 1.3 Priority minor tributary assets are identified within 30 Local Government Plans by end 2005. W2 MAT 2.1 The extent of salinity risk, flooding and sedimentation, threatening processes is mapped for 13 major tributaries within the "Avon Arc" and Mortlock River System by 2009. W2 MAT 2.2 A report identifying the extent of threatening processes, including salinity risk, flooding and sedimentation

Scott, 1995) by 2025. (Note: priority sections to be identified and a specific 20-year target to be set by 2007 based on MAT's W1.3.1. W1.3.2 and W1.3.3) W1T202 The current hydrological capacity[1] of the Avon River Pools is not reduced by more than 20% by 2025. Linked 20 year Targets W1T201 The average monthly concentration of total nitrogen and total phosphates and total suspended solids will not exceed targets of 1 mg/l (N), 0.1mg/l (P), (TSS to be determined) at Walyunga gauging station	major tributaries and associated wetland systems within the Lockhart and Yilgarn catchments is complete by end 2006. W2 MAT 3.1 A tool kit with "Best Practice" guidelines for tributary restoration based on ecological and hydrological principles is developed through consultative processes by 2006. W2 MAT 5.1 Management Action Plans to be prepared for 13 priority sections within tributaries in consultation with local communities in the "Avon Arc" and Mortlock River System by 2009. W2 MAT 5.2 Management Plans are prepared for 10 priority sections of major tributaries within the Lockhart and Yilgarn catchments by 2007. W2 MAT 6.1 Local capacity for priority waterway assets management is built through 10 river restoration workshops completed by 2009. W2 MAT 7.4 Revegetation, including commercial tree crop options, of 2000ha adjacent to priority major tributary sections by 2009. W2 MAT 8.1 Stream flow monitoring requirements for major and minor tributaries reviewed on the basis of threat assessment and new facilities installed by 2009.
Conserve the extent and integrity of the natural diversity (species, NECs and ecosystems) within 12 landscapes/ecoscapes, which best represent, the natural diversity of the Avon River Basin.	B4 MAT 1.1 Two ecoscapes that best represent the natural landscape diversity (ecosystems, NECs and species) and are best able to retain that diversity identified in each bioregion by Dec 2005 B4 MAT 3.1 Options for conservation of representative ecoscapes assessed for feasibility and cost benefit by Dec 2005 B4 MAT 5.1 Biodiversity conservation plans developed for representative ecoscapes (1 per IBRA region) by June 2006 with an additional 1 per IBRA region developed by June 2008 B4 MAT 6.1 Bioregional biodiversity teams established and trained to undertake mentoring and project management skills to conserve representative landscapes by June 2008 B4 MAT 7.1 Actions identified in conservation plans for representative ecoscapes (including fencing, regeneration, revegetation, weed and animal pest management, surface water management, drainage, groundwater pumping and other actions) implemented by 2009 W2 MAT 8.1 12. Strategic regional monitoring program for water quality (nutrient, acidity, salinity and sediments) developed and initiated by 2005.
The Avon River Basin contains a connected and functional network of vegetation that represents the natural	B1 MAT 3.1 Conservation options for viable are assessed for feasibility and cost benefit by June 2007 for viable species B1 MAT 4.1 MATs reviewed for viable species by Dec 2009, following completion of threat assessments and assessment of

diversity of the regions and supports regional scale ecological functions.	management options B1 MAT 5.1a General biodiversity conservation guidelines developed and incorporated into 30 Local Area Plans by June 2006 and conservation plans for the five remnants with highest biodiversity values in each local area developed by Dec 2006 B1 MAT 6.1a Information packages containing conservation guidelines for remnant vegetation provided to each LGA by June 2008 B1 MAT 7.1a Priority biodiversity conservation actions based on guidelines in the 30 Local Area Management Plans implemented by 2010 B1 MAT 7.2a Conservation actions for the five highest-value remnants in each LGA that currently do not have a threat management plan, commenced by Dec 2006 B1 MAT 7.3 Implement public awareness and participation programs for viable, species by June 2006 B1 MAT 8.1a Long term monitoring sites and protocols for assessing status of currently viable species designed and established by June 2006 B1 MAT 8.2 Status of selected viable species reviewed at 3 yr. intervals. B2 MAT 3.1 Priority viable NECs (terrestrial and aquatic) and priority locations (areas containing multiple NECs or unique occurrences of uncommon NECs) identified by Dec 2006 B2 MAT 3.2 Conservation options for viable NECs are assessed for feasibility and cost benefit by end 2005 B2 MAT 4.1a MATs for currently viable NECs reviewed and updated by Dec 2007 B2 MAT 5.1 Biodiversity conservation guidelines for viable NECs incorporated into 30 Local Area Plans by Dec 2006 B2 MAT 6.1a Training in conservation of viable NECs provided for all private landholders engaged in covenanting and other incentive schemes by Dec 2006 B2 MAT 7.1a Priority conservation actions for viable NECs (based on guidelines in the 30 Local Area Plans) implemented by 2009 B2 MAT 7.2a The area of priority viable NECs under conservation agreements is increased by 500 ha annually for 5 years B2 MAT 8.1 Long term monitoring sites and protocols for assessing status (extent and integrity) of currently viable NECs designed and established by June 2006 B2 MAT 8.2 Status of selected viable NECs reviewed at 3 year intervals B5 MAT 2.1 Threats that need to be addressed at bioregional scales, such as high water tables, altered hydro periods, habitat loss & fragmentation, declining water quality, sedimentation, weeds, pests & diseases are quantified by Dec 2005.

All	Fire management plans developed for each bioregion by Dec 2007.

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