



Swan Region Strategy for Natural Resource Management

INVESTMENT PLAN TECHNICAL REPORT No 4

Developing Projects to Implement the Strategy's Management Actions: A Gap Analysis

March 2005

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Developing Projects to Implement the Strategy's Management Actions: A Gap Analysis

1. From Strategy to project plans

1.1 Overview

The *Swan Region Strategy for Natural Resource Management* specifies all the Matters for Target and Management Actions that are needed to implement the Strategy. These have been separated into four main types of action: Resource Assessment, Planning, On-Ground Works and Regional Capacity Building. The Strategy Investment Plan gives an indicative costing of all Management Actions. But the Management Actions themselves are expressed in general terms. To give them effect they have to be formulated, sometimes broken down into different parts, and sometimes aggregated into projects having an identified team to carry out the work, precise objectives, methodologies, timelines, budgets, and monitoring and evaluation provisions. Projects will often address several types of management action: e.g. resource assessment leading to management plans and on-ground works.

State Government departments and agencies, Local Governments, and the wider community are both proponents and substantial providers of funds for many of these actions independently of the NHT. See Investment Plan Table 1 for a breakdown of fund sources. Thus, the *Swan Region Strategy for Natural Resource Management* will be implemented through a variety of both NHT-funded and non-NHT-funded projects.

1.2 The “Gap Analysis”

In order to translate the comprehensive set of Management Actions required by the Strategy into “bankable” projects for funding by NHT and other sources a “Gap Analysis” was undertaken. Its objectives were to:

- Determine what activities are currently taking place for each Management Action;
- Whether existing activities (whatever their funding source) are adequate to give full effect to the Management Actions listed in the Strategy;
- What new activities are needed to fill the “gaps”, where there is either (i) no current activity or where (ii) current activity is inadequate to reach the Strategy’s objectives; and
- What would be an appropriate method for funding new or expanded activities.

This analysis was undertaken through a series of seven Program Workshops dealing respectively with:

- (i) Natural Diversity,
- (ii) Integrated Water Management,
- (iii) Sustainable Production – Agriculture,
- (iv) Sustainable Production – Industry,
- (v) Coastal & Marine,
- (vi) Cultural Heritage, and
- (vii) Regional Capacity Building.

The outputs from the Gap Analysis were then used to develop a portfolio of projects, which the Swan Catchment Council can use to stimulate investment, including submitting proposals to NHT.

This report describes the Gap Analysis, and its conclusions in terms of an account of current activities addressing natural resource management issues in the Swan Region, and a set of projects that are needed to address the gaps. Technical Report No 5 gives the project summaries and technical assessments. Technical Report No 6 gives full Project Statements, and Technical Report No 7 gives the results of an analysis of funding priorities.

1.3 Methodology

The “Gap Analysis” identified current activities within the region that are already addressing the Strategy Management Actions, to assess their adequacy and to highlight where new or additional work is needed.

A stakeholder workshop approach was used as this was considered to most efficient way of collecting information on current activities leading to a discussion of gaps and projects that could fill the gaps. Possible funding sources were also discussed.

By the end of the workshops, participants had:

- identified current activities against Management Actions;
- assessed adequacy and identified gaps;
- suggested new activities, funding and linkages; and
- recommended a suite of NHT and other project proposal areas.

1.4 Report outline

The following chapters give, for each Regional Delivery Program:

- A summary of the projects that are recommended by stakeholders and their suggested funding sources;
- An account of current activities against each Matter for Target. Current activities are reported as either “NHT Funded” or “Other Funded”. They serve as a valuable database of the level of current activity against each Management Action Target. From this level of activity, participants were able to make judgement about the adequacy of activity, identify gaps and suggest projects to meet those gaps;
- Stakeholders’ assessments of the adequacy of current activities given the Targets and Management Actions required by the Strategy;
- Key Gaps; and
- Identified opportunities for new or expanded projects to fill the identified gaps.

2. Natural Diversity Delivery Program

2.1 Summary of recommended projects

The recommended set of projects for **NHT Regional Funding** is shown in Table 1.

Table 1: Natural Diversity Projects Recommended for NHT2 funding

	Matter for Target/Project Description	Indicative Budget
	Native vegetation communities integrity	
1.	Audit and stock-take of existing plans, strategies and NRM documents.	
2.	Gap analysis of NRM legislation and other related legislation.	
3.	Biodiversity Network development (seed money).	\$5,000
4.	Increasing skills and knowledge.	
5.	Agreed methodology.	
6.	Partnership development.	
7.	General education to raise biodiversity profile.	
8.	On-ground works.	
	Significant species and ecological communities	
1	Western Swamp Tortoise (existing project)	
2.	TEC's (9) (existing project)	
3.	Perth Biodiversity Project (links to BR1 & BR3) (existing project)	
4.	Perth Fungi Project.	\$500,000/ 3 yrs
5.	Additional support for soil microbiology studies in support of threatened species activities.	\$500,000/3 yrs
6.	New project for threatened species and communities, including flora, fauna and migratory species.	\$1,000,000/5 yrs
7.	Support to Local Governments for further ecological assessment of natural areas (ecologists needed).	\$150,000/5 yrs
8.	Predictive mapping of threatened species and communities.	\$450,000/5 yrs
9.	Expanded Threatened Species Network funding for site-specific management plans having threatened species (competitive).	Covered under Project 6
10.	Regional delivery of grants and incentives for private land conservation (on-ground works and protection).	
	Ecologically significant species	
1.	Guidelines for rural landscaping (based on Local Plant package).	
2.	Capacity building for government and community – knowledge (network events, training).	
3.	Dedicated Officer for weeds and pests in the region.	

The recommended set of projects for **Other Sources Funding** for this Program is:

Table 2: Natural Diversity Projects recommended for non-NHT funding sources

	Matter for Target/Suggested Project	Indicative Cost
<i>Native vegetation communities integrity</i>		
1.	Regional Biodiversity Strategy.	\$250,000
2.	Regional Biodiversity Toolkit (extension of National Biodiversity Toolkit).	\$120,000
3.	Biodiversity Network development (matching).	
1.	Reconciliation of WA and Commonwealth Threatened Species and Communities lists.	\$300,000
2.	Writing of Recovery Plans for remaining species.	\$200,000
3.	Statutory planning protection mechanisms for conservation outcomes.	\$300,000
<i>Significant species and ecological communities</i>		
1.	Discovery Program (desktop) (Threat Abatement Plans).	
2.	Model local law development for weeds and local plant species.	
<i>Ecologically significant species</i>		
1.	Guidelines for rural landscaping (based on Local Plant package).	
2.	Capacity building for government and community – knowledge (network events, training).	
3.	Dedicated Officer for weeds and pests in the region.	

Table 3: Suggested Fund Sources for non-NHT2 Natural Diversity Projects

No	Name of Project	Funding Required	Tick Likely Fund Sources					
			Strategic Reserve	Cross-Regional	Enviro Fund	NLP	Other Public	Private Sources
<i>Native vegetation communities integrity</i>								
1.	Regional Biodiversity Strategy.	\$250,000			✓	✓	✓	✓
2.	Regional Biodiversity Toolkit (extension of National Biodiversity Toolkit).	\$120,000	✓	✓	✓			
3.	Biodiversity Network development (matching).						✓	✓
<i>Significant species and ecological communities</i>								
1.	Discovery Program (desktop) (Threat Abatement Plans).							
2.	Model local law development for weeds and local plant species.							
<i>Ecologically significant species</i>								
1.	Reconciliation of WA and Commonwealth Threatened Species and Communities lists.	\$300,000				✓		
2.	Writing of Recovery Plans for remaining species.	\$200,000				✓		
3.	Statutory planning protection mechanisms for conservation outcomes.	\$300,000	✓					

2.2 Native vegetation communities integrity

Current projects and activities under this Management Action Target were assessed for adequacy to ensure that the MAT is achieved. Major needs are seen in the areas of:

- Lack of coordination between agencies;
- A consistent monitoring and evaluation framework, for numerous agencies and organisations, operating at various levels; and
- The Region needs input into State Biodiversity Strategy, with Local Government, State Government and Regional Body.

2.2.1 BM 1.1 Priority areas included in CAR System

2.2.1.1 Current Activities

BM1.1	MAT	100% of priority areas in each IBRA sub-region identified for inclusion into CAR reserve system by 2005	<ul style="list-style-type: none"> • Review CAR reserve system by major landform element in each IBRA sub-region • Develop natural diversity condition assessment framework and methodology • Determine extent and condition of native vegetation complexes in each major landform element • Identify priority native vegetation complexes in each major landform element • Determine priority natural diversity areas for inclusion to CAR reserve system • Determine priority natural diversity areas for protection to be retained outside the CAR reserve system
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NHT Funded Activities	Non-NHT Funded Activities
<ul style="list-style-type: none"> ➤ Perth Biodiversity Project (ALL) ➤ Perth Plant Biodiversity Project. ➤ PBP Steering Committee (also 1.2, 1.3). ➤ Conservation Auctions – other region, Bush Tender (NHT funded?) ➤ Foreshore Condition Assessment. 	<ul style="list-style-type: none"> ➤ Bush Forever (ALL). ➤ System 6 Update (ALL). ➤ Wildflower Society – Plant Survey. ➤ System 6 Update. ➤ Sub-regional group – reserve assessment. ➤ State Biodiversity Audit (CALM). ➤ WWF Wetland Watch – threatened species grants. ➤ Fungi Map. ➤ Funding schemes – grants – Ribbons of Blue. ➤ In preparation: WA Biodiversity Strategy. ➤ Conservation Reserves. ➤ WALIS Project – data. ➤ DIA – Asset audit of ALT (Aboriginal Lands Trust). ➤ Covenanting schemes. ➤ Perth Urban Bushland Fungi Project (also 1.2). ➤ Bush Brokers. ➤ State of the Environment Reporting (Local Government) (also 1.2, 1.3).

2.2.1.2 Adequacy

- Not currently adequate
- Timeframe is way too short.
- Quality of data collected.
- No set method for condition assessment at the regional level.

2.2.1.3 Gaps

- Timeframe for the assessment framework (ie: 2005) is too short;
- Natural diversity condition – how do you assess it? (this will determine how much time you need to meet the target).
- Lack of adequately skilled people to do this.
- Tertiary institutions, etc. need to increase their skill base in this area.
- Don't know yet exactly what we are trying to manage.

2.2.1.4 Responses

Regional Natural Diversity Strategy Project:

- Prepare Regional Natural Diversity Strategy.
- Input from State Biodiversity Strategy and Sub-regional Biodiversity Plans.
- Include cross regional activities (with State Biodiversity Strategy).
- Standard methodology for monitoring and evaluation.
- Framework.
- Not static, based on adaptive management.
- Outcome focussed.
- Depends on in-kind input from State, experts etc.

Audit and Stock-take Project:

- Map and stock-take/audit of existing plans, strategies and documents.
- Web accessible: not static; interface needed; to be updated by Biodiversity Network; GIS format – both biodiversity and management information layers; spatial representation to show gaps and overlays.
- Online database needed.

Coordination Project:

- Need stakeholder involvement and buy-in.
- Link for access to funding sources.
- Roles and responsibilities of key biodiversity stakeholders and program outcome.
- Organisational diagram with links and connections.

2.2.2 BM1.2 25% of priority areas in each IBRA sub-region have natural diversity conservation plans developed by 2006.

2.2.2.1 Current Activities

BM1.2	MAT	25% of priority areas in each IBRA sub-region have natural diversity conservation plans developed by 2006	<ul style="list-style-type: none"> • Review and prioritise existing conservation management actions for natural diversity areas, significant species populations, and threatened ecological communities • Identify new reserves for locally and regionally significant natural diversity areas based on biodiversity values and principles of ecological viability • Review area management plans and threat abatement plans and practices for the reserve system (including formal reserves and off-reserves) • Develop guidelines and plans for sustainable natural diversity management • Commence Bush Forever Phase II
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NHT-Funded Activities	Non-NHT Funded Activities
<ul style="list-style-type: none"> ➤ CALM Threatened Species. ➤ Indigenous start-up grants (partially NHT funded). ➤ Bush Bank. 	<ul style="list-style-type: none"> ➤ Urban Nature EcoPlan. ➤ Bush Forever Plan. ➤ Volunteers – “Friends Of”, Green Corps. ➤ Private efforts – land managers (EnviroFunded). ➤ Indigenous Protection Area Program (possibly in management category). ➤ Indigenous Land Corps Enviro Program (management category?).

2.2.2.2 Adequacy

- Include Local Government as land managers in increasing their capacity.
- All land managers (not just community) need to have increased capacity.
- “Community” means more than just volunteers, eg: all land managers.
- 30% is it just community – what community?
- Lots of projects happening but gaps of skilled people and uncertainty about scope of community.

2.2.2.3 Gaps

- Lack of skilled people to understand natural ecosystems and manage them on-ground in this region.

2.2.2.4 Responses

2.2.3 BM1.3 Legislation & Policy Review

100% of all relevant NRM legislation and policy reviewed and amendments recommended for the protection and management of the Region’s natural diversity by 2006. **Not Currently Adequate**

- Targets are felt to be ambitious.
- Potential for greater coordination.
- Lots of work progressing legislation but not likely to be achieved in tight timeframe.

2.2.3.1 Current Activities

BM1.3	MAT	100% of all relevant NRM legislation and policy reviewed and amendments recommended for the protection and management of the Region’s natural diversity by 2006	<ul style="list-style-type: none"> • Establish and gain agreement on an urban growth boundary • Review land planning process and identify cleared land suitable for development • Review design codes for new urban areas • Develop recommendations for local and regional structure planning processes • Develop mechanisms to preferentially locate new developments on previously cleared land • Develop area management plans • Prepare local natural diversity strategies and action plans in accordance with <i>Local Government Biodiversity Planning Guidelines for the Perth Metropolitan Region</i>
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NHT-Funded Activities	Non-NHT Funded Activities
<ul style="list-style-type: none"> ➤ Perth Biodiversity Project Guidelines – Local Government. 	<ul style="list-style-type: none"> ➤ NRM Policy Project ➤ State Sustainability Strategy. ➤ Local government – local management plans (also 1.2, 1.4). ➤ Local Government - district conservation strategies, enviro plans (also 1.1, 1.2). ➤ WA Urban Bushland Council. ➤ City of Belmont Natural Area Assessment. ➤ Shire of Mundaring Town Planning Scheme. ➤ Planning and Policy – Aboriginal Heritage Act legislation, EPBC Act. ➤ WALGA Enviro Policy Branch. ➤ Statutory Process – assessment process. ➤ Swan Coastal Wetland EPP – needs to be passed. ➤ Network City – Neighbourhood. ➤ Review: Swan River Trust Legislation. ➤ Town Planning Scheme provisions – zoning and vegetation protection. ➤ Environmental Offset Discussion Paper.

2.2.3.2 Adequacy

2.2.3.3 Gaps

2.2.3.4 Responses

2.2.4 BM1.4 Management response for Priority Protected Areas

100% of priority protected areas have an active conservation management response by 2006.

2.2.4.1 Current Activities

BM1.4	MAT	100% of priority protected areas have an active conservation management response by 2006	<ul style="list-style-type: none"> • Preparation and implementation of management plans and/or threat abatement plans where required
<i>Not adequate</i>			

NHT-Funded Activities	Non-NHT Funded Activities
<ul style="list-style-type: none"> ➤ Perth Biodiversity Project – devolved grants, technical officer. ➤ Dieback Working Group (also 1.5). 	<ul style="list-style-type: none"> ➤ Urban Nature. ➤ Tuart and Wandoo Response Group. ➤ Bushland Management Plans by local government, approximately 20/year. ➤ CALM Nature Reserve Plans. ➤ Regional Park Plans.

2.2.4.2 Adequacy

- Not Adequate
- Target is completely unrealistic (2006?).
- Not sure what the priorities are?
- Cannot put anything in place that will meet that target adequately.

2.2.4.3 Gaps

- Lack of knowledge, standards and agreed methodology for bush management plans.
- Lack of standards for contract management, ie: Bush Regeneration and Herbicide Contracts for both LGA's and State Government, eg: need for development of Australian Standards system for contract design.

2.2.4.4 Responses

Active Conservation Management (covering BM 1.4 and BM 1.5)

- Resource assessment – standards
- Management planning – consistency
- Implementation (best practice) for on-ground results.
- Monitoring and evaluation – feedback to region.

2.2.5 BM1.5 Local natural diversity strategies

10 local natural diversity strategies for priority areas outside the CAR reserve system implemented by 2006.

2.2.5.1 Current Activities

BM1.5	MAT	10 local natural diversity strategies for priority areas outside the CAR reserve system implemented by 2006 (PBP definition?)	<ul style="list-style-type: none"> • Develop and implement local natural diversity strategies for priority areas • Complete implementation of Bush Forever Phase I (<i>move to 1.4?</i>)
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NHT-Funded Activities	Non-NHT Funded Activities
	➤ Environment Strategies by local government (various stages of implementation).

2.2.5.2 Adequacy

- Not Adequate
- There are other plans not related to CAR system that will help achieve this MA.
- Depends on definition of natural diversity strategies.
- For the timeframe of 2006 – not adequate.
- MA - “Complete implementation of Bush Forever Phase 1” should be in BM1.4.

2.2.5.3 Gaps

- Biodiversity not recognised as core business for Local Government.
- Lack of standards and knowledge for on-ground management works, including research on weed management, fauna management, etc.
- Resources and State Government commitment for 1.5.2. (Bush Forever).

2.2.5.4 Responses

On-ground Works

- Large gap.
- Link to education and increasing skills and knowledge.
- Priority funded biodiversity conservation sites.

- Targeted and supported by action plan.
- Funded by NHT.
- Providing incentives for land managers to undertake biodiversity conservation (eg: funding, information, community support).

2.2.6 BM 1.6 30% Increase in Community Participation

30% increase in community participation in education, restoration, protection and management activities for high priority native vegetation in the Region by 2009.

2.2.6.1 Current Activities

BM1.6 <i>Adequate but need to address skills gap</i>	MAT	30% increase in community participation in education, restoration, protection and management activities high priority native vegetation in the Region by 2009 (include land managers e.g. local government?)	<ul style="list-style-type: none"> • Develop and implement incentive mechanisms for private landholders to protect natural diversity (<i>including formal mechanisms, such as conservation covenants, and informal agreements, such as Land for Wildlife</i>) (Gap: focus motivation) • Develop regional information system to enhance natural diversity planning, management, monitoring and evaluation • Continue and expand community natural diversity training programs (e.g. <i>Skills for Nature Conservation, Urban Nature, Land for Wildlife, Greater Gardens, Grow Us A Home</i>) • Promote inclusion of natural diversity restoration and management training through tertiary institutions and TAFE's • Develop natural diversity management operational policy and training programs for Local Government Authorities and State agencies with bushland management responsibilities
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NHT-Funded Activities	Non-NHT Funded Activities
<ul style="list-style-type: none"> ➤ Community Education and Training. River Restoration (NHT). ➤ Incentive mechanism – WWF's Wetland Watch Program. ➤ Eco Plan. ➤ Skills for Nature Conservation Program. ➤ Local Landowner Incentive Packages (local biodiversity strategies). ➤ Local government Biodiversity Training Project (PBP). ➤ WA Herbarium (flora base). ➤ WA Museum (fauna base and database). 	<ul style="list-style-type: none"> ➤ Regional Information Systems: Perth Region Plant Biodiversity Project; Flora Base; Flora Bank. ➤ Tertiary Institutions Nat. Div. Training - TAFE Greenskills etc. "Conservation Land Management" Training Package. ➤ Wildflower Society, Bushland Plant Survey. ➤ Great Gardens. ➤ Perth Urban Bushland Fungi Project. ➤ Urban Nature. ➤ Wandoo Response Group; Tuart Response Group. ➤ Land for Wildlife. ➤ Tertiary Inst. Nat. Div. Training – Challenger TAFE Weed Short Course. ➤ Biodiversity Hotspots Program. ➤ Regional Herbarium Network. ➤ Bold Park EM Plan (also BM 1.1). ➤ Training in Nat. Div. – CALM – Urban Nature's Weed Management short course (in house). ➤ Birds Australia Birds Survey. ➤ National Trust Covenanted. ➤ CALM Covenanted Program. ➤ CALM Recovery Plans. ➤ Training – APACE – Bush regeneration and seed collection courses.

2.2.6.2 Adequacy

- Generally adequate

2.2.6.3 Gaps

- Needs to address skills gap

2.2.6.4 Responses

- Provide increased funding and support for existing programs that are effective.
- Cross promotion of existing education and skills programs.
- Review existing extension programs.
- Skills audit and needs assessment of existing NRM biodiversity practitioners.
- Coordinate education programs.
- Establish working opportunities for biodiversity.
- Need to gain high-level commitment from State Government and land managers for partnership development
- Need to raise the profile of biodiversity.
- Need more promotion events.
- Local Government needs to be more involved.

2.3 Significant species and ecological communities

2.3.1 BM2.1 Critical habitat identified

2.3.1.1 Current Activities

BM2.1 <i>Not adequate</i>	MAT	100% of critical habitat at regional and local scale for significant species and ecological communities identified by 2005	<ul style="list-style-type: none"> • Develop methodology to identify significant species populations for monitoring, protection and habitat management • Initiate program for prioritisation of significant species and their conservation and management , including • all vegetation complexes with less than 10% of original extent; • Threatened Ecological Communities (TECs); • habitats of threatened species; • list of wetlands of international importance, ie Ramsar Convention; and - migratory bird habitat.
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NHT Funded Projects	
<ul style="list-style-type: none"> ➤ Perth Biodiversity Project: Local Government Biodiversity planning guidelines - field assessment methodology - process for prioritisation at all levels (includes significant species). ➤ Recovery plans written and being written for species and ecological communities – not all - resources needed - at population/site level (part NHT funded). 	

2.3.1.2 Adequacy

- Not currently adequate

2.3.1.3 Gaps

- There is a difference between Commonwealth and State TSC (Threatened Species and Communities) lists. NHT funds are not available for writing plans for TSC that are not Commonwealth listed (writing plans and implementing).
- There is inadequate predictive mapping for threatened species and communities.
- There is a CALM process to identify and rank threatened species and EC's; and there is recovery planning for population levels; but this is not the case for other significant species.

- Most information is available but resources are needed to carry out site assessments
- Gap is insufficient knowledge on microbiology and fungi relationships to TEC's.

2.3.1.4 Responses

Reconciliation of WA and Commonwealth Threatened Species and Communities Lists

- Reconciling TSC lists across Commonwealth and State.
- 2 FTE's required.
- This should be a national program of NHT2.

Predictive mapping of threatened species and communities

- Identifying those natural areas likely to have threatened species or communities, to allow detailed survey of target areas to identify threatened species or communities.
- This can include identification and mapping of buffers and linkages.
- Process or project to ensure and assist decision makers at Local Government and State Agency level to access information on TSC and request proponents to provide appropriate information to allow decisions (as part of B7 and/or B8?).

2.3.2 BM2.2 Legislation & Policy Reviewed

100% of all relevant NRM legislation and policy in State and local planning systems reviewed and amendments recommended to provide increased consideration and protection for significant species and ecological communities by 2006

2.3.2.1 Current Activities

BM2.2 <i>Not adequate</i>	MAT	100% of all relevant NRM legislation and policy in State and local planning systems reviewed and amendments recommended to provide increased consideration and protection for significant species and ecological communities by 2006	<ul style="list-style-type: none"> • Prepare local natural diversity strategies and action plans in accordance with <i>Local Government Biodiversity Planning Guidelines for the Perth Metropolitan Region</i> • Review and prioritise existing conservation management actions for significant species and threatened ecological communities, and threat abatement plans • Develop and implement recovery plans/interim recovery plans and threat abatement plans for priority significant species and ecological communities
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NHT-Funded Projects	
<ul style="list-style-type: none"> ➤ ➤ ➤ 	PBP – 2 pilot projects to prepare local biodiversity strategies. NHT2 funding assistance for writing plans for some TSC. Recovery plans written for most listed flora and CR TEC and fauna – resources to implement? (part NHT) (Dot point 3).

2.3.2.2 Adequacy

2.3.2.3 Gaps

- There are conflicts within statutory planning processes.
- The Perth Biodiversity Project is good, but how many LG's are involved and what resources are needed?

- Process and resources need to be established for a review of conservation management actions.

2.3.2.4 Responses

Statutory Planning Protection Mechanisms for Conservation Outcomes

- Resolving conflict and issues between statutory planning protection and conservation outcomes (TSC and vegetation) e.g. covenants, TPS zoning, land tax and incentives.
- Needs real commitment from State Government to make change:
- therefore driver from DPI or DPC;
- has relevance to BR1 and others;
- other regions, therefore Strategic Reserve Funding.

2.3.3 BM2.3 25% of all significant indigenous species have viable linkages established between populations over their original geographical extent by 2009

2.3.3.1 Current Activities

BM2.3 <i>Not adequate</i>	MAT	25% of all significant indigenous species have viable linkages established between populations over their original geographical extent by 2009	<ul style="list-style-type: none"> • Establish a regional ecological linkage program • Establish mechanisms to protect areas required for ecological linkages • Revegetate cleared areas designated as ecological linkages • Develop and implement recovery plans/interim recovery plans and threat abatement plans for priority species and ecological communities • Implement local natural diversity strategies and action plans prepared in accordance with <i>Local Government Biodiversity Planning Guidelines for the Perth Metropolitan Region</i>
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NHT-Funded Activities

- PBP – Regional Ecological linkages identified.
- NHT2 funded project to implement IRPs for some TECs.

2.3.3.2 Adequacy

- Not currently adequate

2.3.3.3 Gaps

- Bush Forever and the Perth Biodiversity Project are important programs, but no regional ecological linkage program or mechanisms currently exist to guide it.
- Recovery plans have been done for most *critical* species and ecological communities, but there is no funding for implementing recovery plans for a number of critically endangered species, and there are no projects in Swan Region for recovery of *threatened* species, or for *non-critical* TEC's or any flora.
- A regional threatened flora plan has been prepared.
- Resources are needed to write and implement further recovery plans eg: 7 critical flora - \$30,000-\$40,000 each year.

2.3.3.4 Responses

New funded projects are needed for

- Critical fauna;
- Carnaby's Black Cockatoo (Swan or Cross Regional: Swan component \$50,000-\$80,000);

- several endemic invertebrates;
- other threatened fauna;
- all threatened flora, ie: 7 critical species = \$30,000-\$40,000 each year; 30 other DRF species;
- other TEC's.
- other significant species and ecological communities:
- migratory, etc,
- <10% vegetation.

Recovery Plans for Remaining Species

- Writing recovery plans for other threatened species and communities that currently don't have plans.
- 16 plans - \$200,000.
- National Program.

Perth Fungi Project

- Additional Support for Soil Microbiology Studies in Support of Threatened Species Activities

2.3.4 BM2.4 Buffers reconstructed

100% of priority areas to be reconstructed as buffers to threatened ecological communities/vegetation complexes determined by 2006

2.3.4.1 Current Activities

BM2.4 <i>Not adequate</i>	MAT	100% of priority areas to be reconstructed as buffers to threatened ecological communities / vegetation complexes determined by 2006	<ul style="list-style-type: none"> • Develop and implement revegetation plans for reconstruction of buffers to threatened ecological communities / vegetation complexes
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No current activities were identified against this MAT

2.3.4.2 Adequacy

- Not Adequate.

2.3.4.3 Gaps

- Inability to specify adequate buffers and maintain them for TSC.
- Lack of identification of critical habitat for TSC and need to get this on database of DEH (EPBC).

2.3.4.4 Responses

Expanded Threatened Species Network for Site-Specific Management Plans

- Competitive program for management plans for individual sites and implementation of them.
- Linked to Recovery Planning.
-

Regional delivery of grants and incentives for private land conservation

- Priority is to implement existing Recovery Plans and Threat Abatement Plans.
- Protect existing habitat.
- Regeneration through bushland management.

- Then reconstruction for linkage or buffers, etc.

2.3.5 BM 2.5 30% increase in community participation

(30% increase in the participation of the community and stakeholders in education, mitigation and remediation activities to conserve and protect significant species and ecological communities by 2008.)

2.3.5.1 Current Activities

BM2.5 <i>Not adequate</i>	MAT	30% increase in the participation of the community and stakeholders in education, mitigation and remediation activities to conserve and protect significant species and ecological communities by 2008	<ul style="list-style-type: none"> • Coordinate, facilitate and support community involvement • Establish collaborative partnerships to ensure the conservation management and recovery planning of significant species and significant ecological communities • Develop partnerships to determine research project to develop a landscape plan for ecological linkages
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NHT-Funded Projects	
➤	Biodiversity officers – 1FTE per sub-region (NHT).
➤	TSN Projects re: TSC.

2.3.5.2 Adequacy

- Not Adequate.

2.3.5.3 Gaps

- Missing overall prioritising and coordination.

2.3.5.4 Responses

Ecology support for Local Government

- There is a need to assist Local Government to verify ecological information provided by development proponents where natural areas are to be affected.

2.4 Ecologically significant invasive species

2.4.1 BM3.1 Set targets for significant threatening species

Identify, prioritise and set targets for the management of significant threatening species to natural diversity by 2005.

2.4.1.1 Current Activities

BM3.1	MAT	Identify, prioritise and set targets for the management of significant threatening species to natural diversity by 2005 (<i>sharing and prioritising information will help to identify gaps</i>).	<ul style="list-style-type: none"> • Identify priority weed species and determine percentage elimination, reduction and containment targets for priority weed populations (<i>Gap</i>) • Determine percentage elimination, reduction and containment targets for <i>Phytophthora cinnamomi</i> (dieback) (<i>continued funding – expanded?</i>) • Identify priority pest/feral species (<i>Gap</i>) • Determine of percentage elimination, reduction, containment targets for priority ferals and pests (<i>Gap</i>)
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NHT Funded Activities	Non-NHT Funded Activities
<ul style="list-style-type: none"> ➤ Perth Biodiversity Project (also BM3.4). 	<ul style="list-style-type: none"> ➤ APB? ➤ Enviro-Weeds Strategy. ➤ State Weed Plan. ➤ State Coordinating Committee (Weeds). ➤ Bird Atlas. ➤ Urban Nature, EWAN, Research Weeds. ➤ LGA trials on weeds. ➤ Rainbow Lorikeet monitoring (Birds Australia). ➤ Rural Weed Priority (done) (AgWA). ➤ List of garden escapees? ➤ Feral Pigeon Study, Rockingham Environment. ➤ Marine pests identification. ➤ Aquatic and Riparian Weed Control Group (AgWA). ➤ CALM Florabase.

2.4.1.2 Adequacy

- Not yet adequate

2.4.1.3 Gaps

- State Weed Strategies need ‘action’ component; no larger picture to fit management.
- No real picture of feral species identification and prioritisation.
- Dieback project is good, needs continuing funding.
- Loss of knowledge from Department of Agriculture (WA) due to retirements.
- Critical gap is sharing and prioritising the information that is already there.

2.4.1.4 Responses

Discovery Program (ie: covering BM3.1 and BM3.2)

- Person to develop situational analysis (desktop, talking to people) with regional groups (SW only) to define what we know, and how it relates to each region.
- Identify gaps.
- Strategic Reserve funding?
- This will allow prioritisation in the Swan region.
- Scope stakeholders, ie: right person in organisations.
- Include MA’s from BM3.2 and any information on capacity building.
- CRC or CSIRO project?

General

- Gather information on feral animal control programs and effectiveness.
- Develop targets and implementation plan for State Weed Plan and Environmental Weeds Strategy.
- Strategic Reserve funding.

2.4.2 BM3.2 Threat abatement plans for priority feral pests and diseases

100% of all priority feral pests and diseases have Threat Abatement Plans established by 2006.

2.4.2.1 Current Activities

BM3.2	MAT	100% of all priority feral pests and diseases have threat abatement plans established by 2006	<ul style="list-style-type: none"> • Develop and implement threat abatement plans for feral animals and pests linked to National Threat Abatement Strategies (Probably gap, need situation analysis) • Develop management response improvements to ensure no new introduction of potential feral/pest animals/plants/disease (Gap)
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NHT Funded Activities	Non-NHT Funded Activities
	<ul style="list-style-type: none"> ➤ 1080 Baiting Program. ➤ Biosecurity Plan Template (AgWA). ➤ Methodology for Weed Prioritisation (AgWA). ➤ “Weedwatcher” Weed Mapping Tool (AgWA). ➤ CRC Methodology for identifying new pests. ➤ Quarantine controls. ➤ Frogwatch. ➤ Heavenly Hectares Property Planning.

2.4.2.2 Adequacy

- Not yet adequate

2.4.2.3 Gaps

- Need to know what has been done, what has worked

2.4.2.4 Responses

2.4.3 BM3.3 Reduce use of exotic species

15% reduction in the use of exotic species in urban landscaping by 2008.

2.4.3.1 Current Activities

BM3.3	MAT	15% reduction in the use of exotic species in urban landscaping by 2008	<ul style="list-style-type: none"> • Develop and implement guidelines for rural landscapers (Gap) • Support implementation of <i>Local Plants Landscaping Policy and Landscaping with local plants guidelines for Local Government</i> (continue support) • Implement priority programs for feral animal control by State and Local Government and other stakeholders (eg western shield, and identified priority local and site feral animal control) (Gap – more info) • Regional implementation of State Weed Plan and Environmental Weed Strategy for Western Australia (Gap) • Continued implementation of Dieback management programs in the Region at Local regional, and State Government levels (continue to expand funding)
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NHT Funded Activities	Non-NHT Funded Activities
<ul style="list-style-type: none"> ➤ Dieback Working Group (also 3.2, 3.4) 	<ul style="list-style-type: none"> ➤ Bridal creeper, heat hopper and rust (CSIRO) (also 3.4). ➤ Patterson’s Curse bug (AgWA) (also 3.4). ➤ Community Weed Control (SALP, Enviroweed, LGA). ➤ Private landscaping training. ➤ Local Plants Landscaping (NECC, EMRC) (also 3.4). ➤ CRC Weeds for information, training and research (also 3.1, 3.2, 3.4). ➤ LGA Weed Control. ➤ Declared species grants (AgWA). ➤ CALM Weed Control. ➤ Western Shield (CALM).

2.4.3.2 Adequacy

- Not yet adequate

2.4.3.3 Gaps

2.4.3.4 Responses

Guidelines for Rural Landscapes

- Develop guidelines for rural landscapers (based on the Local Plants Education Strategy and LGA Policy for landscaping).
- Needn’t be restricted to LGA laws.
- Could also include things like common template on managing (weed) contractors effectively (ie: Kingsley Dixon model in Kate Brown’s book).
- Link to Heavenly Hectares.
- NHT funded.

2.4.4 BM 3.4 Improve effectiveness of control programs

30% increase in the effectiveness of control programs for feral animals, pests and diseases by 2009.

2.4.4.1 Current Activities

BM3.4	MAT	30% increase in the effectiveness of control programs for feral animals, pests and diseases by 2009 (needs coordination, promotion and increased funding)	<ul style="list-style-type: none"> • Facilitate, coordinate and support community and stakeholder involvement in mitigation and remediation actions • Promote wider regional community, land manager and Local Government education and awareness and training programs on feral animal, pest and disease management • Provision of training in feral, pest animal and disease identification, mapping and management
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NHT Funded Activities	Non-NHT Funded Activities
<ul style="list-style-type: none"> ➤ Perth Biodiversity Devolved Grants. ➤ SFNC Skills for Nature. 	<ul style="list-style-type: none"> ➤ Support to community on weeds (AgWA). ➤ TAFE training ➤ Toolkit for community weed control (future) (AgWA). ➤ Australian Association of Bush Regenerators. ➤ LGA Vermin Control and Education Program.

2.4.4.2 Adequacy

- Probably addressed but may benefit from more coordination.
- Adequate.

2.4.4.3 Gaps

2.4.4.4 Responses

Overall

- Critical gap is sharing and prioritising information, leading to identified gaps in knowledge.
- Prioritise issues and Implementation Plan for Weed Strategies for the Swan Region (possibly work with SWCC).
- Prioritise feral species; pull together what's happening.
- Model local law on weed and pest control (and landscaping).
- Coordination of BMP's and identification of gaps.
- Minimising duplication.
- Develop synergies and linkages.
- Incentives for weed and pest control.
- Training may just need better promotion and communication (Communication Strategy).

Capacity Building

- Provide increased funding for community training and networking.
- NHT funded.

3. Integrated Water Management Delivery Program

3.1 Summary of recommended projects

The recommended set of projects for **NHT Regional Funding** for this Regional Delivery Program is shown in Table 4.

Table 4: Integrated Water Management Projects recommended for NHT2 funding

Matter for Target/Description	Indicative Budget
Aquatic Ecosystems Integrity: Major Rivers and Waterways	
1. Appoint staff to implement existing management plans: on-ground works and volunteer coordination.	
2. Fund a position to investigate and set up environmental service units / arm of sub-regional groups.	NHT seed funding.
3. Develop a regional information system.	NHT seed funding \$500,000 over 3 years
Aquatic Ecosystems Integrity: Priority Wetlands	
1. WM2.1 – Decide on priority wetlands for conservation, restoration and protection at sub-regional level.	Federal and Commonwealth
2. WM2.5 – Broaden Perth Biodiversity Program to include wetlands.	1 x FTE \$80,000
3. Continue Wetland Watch and include an incentive for protection and conservation of wetlands (2.4 on-ground management and 2.5 building capacity).	1 x FTE \$90,000 \$100,000+
4. Funding for SALP for wetlands.	\$100,000+
Nutrients in Aquatic Environments	
1. Behavioural change in the household.	\$100,000
Turbidity/Suspended Particulate Matter in Aquatic Environments	
1. Monitoring and evaluation framework project. (NB: for all RCT's including water and marine).	Approx \$300,000
2. Sediment sourcing study	\$150,000
3. River Bank Extension (with external funding).	
Surface Water Salinity in Freshwater Aquatic Environments	
1. Regional information system (all programs).	\$250,000
2. Community participation benchmark.	\$20,000
3. Scoping educational institutions partnerships.	\$25,000

The recommended set of projects for Other Sources Funding for this Program is shown in Table 5.

Table 5: Integrated Water Management Projects recommended for non-NHT funding sources

Matter for Target/Description	Indicative Budget
Aquatic Ecosystems Integrity: Priority Wetlands	
1. WM2.2 – Audit and review of environmental planning process for protection of priority wetlands.	
2. WM 2.5 – Officer to liaise with developers and consultants and link DoE and WSCD.	
3. Jandakot groundwater work (WM2.3.1)	
4. ASS mapping.	
Nutrients in Aquatic Environments	
1. Review / assessment of existing BMP demonstration sites to a standardised criteria.	
2. Publish information on design standards for engineers, drainage practitioners and planners.	
3. Groundwater monitoring program.	
4. Drainage Reform finalisation.	
5. Legislative controls.	
Turbidity/Suspended Particulate Matter in Aquatic Environments	
1. Sediment controls in Avon.	See Avon Investment Plan
2. Legislation, policy and codes of practice review.	\$60,000
Surface Water Salinity in Freshwater Aquatic Environments	
1. Cross sub-regional groundwater monitoring. (2 years)	\$250,000
2. Review NRM legislation.	\$100,000
3. Regional information system.	\$250,000
4. Large scale remediation project. (4 – 5 years)	\$2,000, 000

Table 6: Suggested Fund Sources for non-NHT2 Integrated Water Management Projects

No	Name of Project	Funding Required	Tick Likely Fund Sources					
			Strategic Reserve	Cross-Regional	Enviro Fund	NLP	Other Public	Private Sources
1.	WM2.2 – Audit and review of environmental planning process for protection of priority wetlands.						✓	
2.	WM 2.5 – Officer to liaise with developers and consultants and link DoE and WSCD.						✓	
3.	Jandakot groundwater work (WM2.3.1)						✓ DoE	
4.	ASS mapping.						✓ DoE	
1.	Review / assessment of existing BMP demonstration sites to a standardised criteria.			✓	✓		✓	
2.	Publish information on design standards for engineers, drainage practitioners and planners.		✓				✓	✓
3.	Groundwater monitoring program.						✓	✓
4.	Drainage Reform finalisation.						✓	✓
5.	Legislative controls.							
1.	Sediment controls in Avon.	See Avon Investment Plan		✓				
2.	Legislation, policy and code of practice review.	\$60,000	✓					
1.	Cross sub-regional groundwater monitoring. 2 years	\$250,000		✓ NAP				
2.	Review NRM legislation. 1 year	\$100,000	✓					
3.	Regional information system. 1 year	\$250,000		✓ NAP		✓	✓ Lotteries NAP	
4.	Large-scale remediation project (4 – 5 years)	\$2,000, 000		✓ NAP		✓	✓ Lotteries	SALP

3.2 Aquatic ecosystem integrity: Rivers and waterways

3.2.1 WM 1.1 100% of priority rivers and waterways in the Region identified for protection by 2005.

3.2.1.1 Current Activities

WM1.1 <i>Not adequate</i>	MAT	100% of priority rivers and waterways in the Region identified for protection by 2005	<ul style="list-style-type: none"> • Consolidate baseline data and analyse priority rivers and waterways condition (<i>Gap: inconsistent</i>) • Continue Foreshore Condition assessment project • Investigate extent and impact of marine pests in the Swan-Canning estuary and develop appropriate management response mechanisms • Determine water and flow dependency for surface and groundwater ecosystems (<i>Gap: Accessible and useable knowledge</i>) • Establish baseline and consolidate ecosystem integrity condition (<i>Gap re: ecosystem</i>) • Consolidate and analyse water quality monitoring baseline and trend data for priority rivers and waterways • Develop and implement catchment report card program to monitor changes in resource condition over time
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NHT-Funded Projects	Non-NHT-Funded Projects
<ul style="list-style-type: none"> ➤ Consolidate baseline data – CoA monitoring in 2004 of drains flowing into Canning and Wungong Rivers. ➤ Foreshore Condition Assessment – SRT/AGLG. ➤ EMCMP (NHT/EMRC) – sub-catchment implementation plans (SCIP) to establish baseline data re: condition of sub-catchment. ➤ AGLG-UCSWCT Management Plan NHT/CoA/CoG funded. Done for our area (Gosnells and Armadale) Also in CoA SoE Report. 	<ul style="list-style-type: none"> ➤ SCCP Water Quality trends – 15 of 31 catchments (SCCP). ➤ DPI resumption of riverfront property. ➤ Water Quality Monitoring Programs – Sub-regions, SRT/DoE, LGA’s, ROB, Universities. ➤ Local Government State of Environment and Green Plan Monitoring. ➤ DoE Catchment Management Branch – EWPs, Gnaragara and Jandakot wetlands and groundwater. ➤ Catchment Report Cards for SCCP priority catchments (SCCP).

3.2.1.2 Adequacy

- Not Adequate.

3.2.1.3 Gaps

- The need for further extension into additional ecosystem health indicators needs to be established such as macro-invertebrate, fish studies and carbon cycling. With the vast amount of catchment focus that has previously occurred within the region throughout many projects (SCCP, SALP etc), there is a gap in knowing if the rehabilitation of river foreshores and stream realignment is reducing nutrient input to the river systems. Nutrient reduction and sediment loss may take some time to be detected by the conventional way of water quality monitoring, but increased habitat and biodiversity may be detected sooner rather than nutrient reduction. It is important that baseline data is collected in this area to be able to quantify improvement and a benchmark or target be set for this work, until nutrient reduction is detected.
- Lots of water monitoring but gaps in the data that indicates baseline ecosystem integrity.
- Lack of consistency in water quality monitoring across the region – methodology.
- Inconsistent water quality monitoring across sites in the region.
- Foreshore condition assessment needs to be expanded.

- Gap in accessing knowledge and how to use knowledge in flow dependency for surface and groundwater ecosystems.

3.2.1.4 Responses

3.2.2 WM1.2 100% of all relevant NRM legislation and policy reviewed and amendments recommended

3.2.2.1 Current Activities

WM1.2	MAT	100% of all relevant NRM legislation and policy reviewed and amendments recommended for the protection and management of the Region's major rivers and waterways by 2006 (<i>Ambitious!!</i>)	<ul style="list-style-type: none"> • Support the review of the policy and legislation, including Environmental Protection Policies and, Statements of Planning Policy (<i>Consolidation of information required, and assessment against criteria/forcefeed analysis</i>) • Assist in the development and implementation of decision support tools for planners, identifying land use change scenarios and predicting impacts (<i>Gap re: planners, land use change</i>) • Continue to develop and implement subregional and local action plans (<i>Gap re: implement</i>) • Assess and establish need for additional EWPs (<i>Caring for the Canning</i>) • Continue the implementation of Riverplan (<i>Yes: Framework exists, time issues</i>)
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NHT-Funded Projects	Non-NHT-Funded Projects
<ul style="list-style-type: none"> ➤ Brockman River Management Plan. ➤ Two Rivers ICM Plan (also 1.1)(part NHT). ➤ Action: implement sub-regional and local action plans. NHT1/COA/COG funded Plan is UCSWCT Management Plan – implemented by AGLG. 	<ul style="list-style-type: none"> ➤ Wetland EPPs. ➤ Local Government NRM Policy Manual (SCCP, EMRC). ➤ Water Resources SPP. ➤ Currently reviewing NRM plans and NIMPs for priority sites (CoB). ➤ Environmental Guidelines for Planners – Draft since 1997. ➤ Ellen Brook Management Plan. ➤ LASCAM model by DoE (SCCP). ➤ Sub-regional and local action plans – facilitated by sub-regional groups and LGAs.

3.2.2.2 Adequacy

- Not Adequate.

3.2.2.3 Gaps

- 100% is ambitious for the timeframe.
- Information needs to be consolidated:
- Absence of decision support tools;
- EWPs need to be considered in this;
- Caring for Canning leads the way for other plans to be established.
- funding is needed for the implementation of plans.
- Riverplan needs to be speeded up and implemented; framework is there but not the capacity.

3.2.2.4 Responses

3.2.3 WM1.3 Implementation of Environmental Water Provision (EWP) projects in the Canning, Helena and Brockman River catchments by 2007.

3.2.3.1 Current Activities

WM1.3 <i>Not adequate</i>	MAT	Implementation of Environmental Water Provision (EWP) projects in the Canning, Helena and Brockman River catchments by 2007 <i>(too slow compared with commercial development)(re: Canning: gap in implementation of target. Urgency for Canning due to influences).</i>	<ul style="list-style-type: none"> • Continue to develop and implement sub-regional and local action plans. • Continue Canning River EWP project (<i>short term funding is a priority</i>) • Establish and implement project for Helena River EWP • Establish and implement project for Brockman River EWP
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NHT-Funded Projects	Non-NHT-Funded Projects
<ul style="list-style-type: none"> ➤ Caring for Canning, Environmental Flows Project. NHT/SCCP. 	<ul style="list-style-type: none"> ➤ Continue to develop and implement sub-regional plans. UCSWCT Management Plan, NHT1/CoA/CoG funded. ➤ SALP, SCULP. ➤ Lotteries.

3.2.3.2 Adequacy

- Not Adequate

3.2.3.3 Gaps

- The Canning EWP project is currently being operated through SCCP and NHT contributions. The project is a response to a recommendation from the Caring for the Canning River Management Plan, and has been running for the past ~2 years. Additional support and funding needs to be provided to this project to increase its progress and to get water releases for environmental purposes. It is known that the system is being significantly affected by the reduction of flows and aquatic diversity will continue to decline unless this matter is addressed. As outlined in the MAT actions, further rivers such as the Helena and the Brockman are dependent on the findings of the Canning EWP to produce guidelines that can be implemented into these other river systems. This project needs to be addressed so the other rivers can benefit before their ecosystem health declines further.

3.2.3.4 Responses

- Continue, and if possible accelerate, the Canning EWP project and broaden its funding base

3.2.4 WM1.4 Develop and implement management and restoration programs for the Region's major rivers and waterways by 2007

3.2.4.1 Current Activities

WM1.4 <i>Not adequate</i>	MAT	Develop and implement management and restoration programs for the Region's major rivers and waterways by 2007	<ul style="list-style-type: none"> • Implement strategic programs in areas identified in WM1.1 to manage and restore priority rivers and waterways (<i>Gap: prioritising existing plans</i>) • Continue the implementation of the Swan-Canning Cleanup Program Action Plan (<i>Gap: capacity</i>) • Implement prioritised actions from Swan River Trust Foreshore Condition project (<i>Links to 1.1 time issue – match time frames</i>) • Continue large scale implementation of Riverbank and Swan Alcoa Landcare Program foreshore projects (<i>Gap: funding inadequate. Community support</i>)
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NHT-Funded Projects	Non-NHT-Funded Projects
	<ul style="list-style-type: none"> ➤ Implement strategic river restoration and riverland projects. AGLG doing it. NHT1/CoA/CoG. ➤ NIP Program. ➤ City of Armadale to do river revegetation as “compensation” for Champion Drive Bridge (about 300m of river). ➤ Reviewing CoB Foreshore Management Plan in 2005/2006 financial year. ➤ Local rehabilitation/restoration projects: Living Streams, Drainage/wetlands (Sub-regional groups and LG). ➤ Implementation of SALP and SCCUP projects by Community Catchment Groups. ➤ South Perth ICM Management Plan (also 1.5). ➤ CALM Regional Park Grants.

3.2.4.2 Adequacy

- Not Adequate

3.2.4.3 Gaps

- All Management Actions inadequate.
- Existing management plans need reviewing and prioritisation of recommendations is still occurring
- Foreshore condition needs to be finished: the Management Action timing needs to be linked to progress with the foreshore condition project.
- No funding for implementation. SCCP – needs more funding needs to be doubled to meet demand for this work.

3.2.4.4 Responses

3.2.5 WM 1.5 30% increase in community participation in education, restoration, protection and management activities of the major rivers and waterways in the Region by 2009.

3.2.5.1 Current Activities

<p>WM1.5 <i>Not adequate</i></p>	<p>MAT</p>	<p>30% increase in community participation in education, restoration, protection and management activities of the major rivers and waterways in the Region by 2009 (1. <i>Baseline required – Gap</i> (2. <i>Staffing, wider community awareness</i> (3. <i>Information sharing</i> (4. <i>Rural/urban interface</i> (5. <i>Burnout</i>)</p>	<ul style="list-style-type: none"> • Coordinate, facilitate, support and motivate community groups (<i>links with 1.5.3 re: teaching, mentoring</i>) • Support development, resourcing and implementation of restoration plans to protect major rivers • Facilitate the inclusion of stormwater education, water use efficiency and water conservation into the regional training and education program (<i>LG support, frameworks – implementation, resourcing</i>) • Continue existing strategic community training programs such as SCCP Education program, Ribbons of Blue, Waterwise, Skills for Nature Conservation, Urban Nature and Land for Wildlife through the integrated regional education and training program (<i>Consolidate across region. Gap: mentoring skills, community education. Is it meeting the needs?</i>) • Develop and implement industry awareness BMP's for priority sectors of small-medium sized industries (SME's) • Support water resources restoration and management training through tertiary institutions and TAFE's (and other. <i>Gap: what is available? Is it applicable? Learning providers – jobs at end</i>) • Form strategic partnerships with the Urban Development Institution of Australia (UDIA) and the Stormwater Industry Association (SIA) for protection of the waterways (<i>Gap: important to form strategic partnerships</i>) • Develop a Memorandum of Understanding between the Council and Swan River Trust to implement Riverplan (<i>by 2009!</i>)
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NHT-Funded Projects	Non-NHT-Funded Projects
<ul style="list-style-type: none"> ➤ SCCP/NHT/EMRC: Creepline Restoration Workshop. Support catchment groups/friends groups through on-ground work and Bush Skills for Hills Workshop. ➤ Light Industry: NHT/SCCP – geographic/ catchment based projects, industry specific. 	<ul style="list-style-type: none"> ➤ AGLG doing all dot points except MOU between Council and SRT. NHT1/CoA/CoG funded. ➤ Ribbons of Blue. ➤ CoB: Environmental Fact Sheets (website and hard copy), Revegetation Days, Carbon Neutral Program. ➤ Regs, Manuals – stormwater. ➤ COSN. ➤ SCCentre. ➤ River Restoration, Groundwater, Community Education & Training sub-projects. ➤ SCCP/EMRC Yellowfish Road on-campus program for schools. ➤ Victoria Park Storm Water Management Plan. ➤ Waterwise Schools, CALM Bush Rangers, Greening, etc. (other school and community education programs). ➤ PAG. ➤ CoB: Reviewing CoB foreshore management plan; Water ICLEI Campaign, Waterwise Schools Program. ➤ SERCUL organisation for community support/capacity. ➤ Light Industry. Group Programs: Greenstamp, Pilot Projects (BMP), Industry Fact Sheets, Audit Programs. ➤ Two Rivers ICM Plan. ➤ Naregubup NMCG, EMRC, SMRC, WESROC. ➤ Public Service group talks, SRA kit. ➤ WESROC Stormwater Education Strategy (LG other funded). ➤ Friends Groups, especially Eastern Hills (130+ groups, 20,000 hours/year). ➤ Local Plants Community Education Strategy. ➤ Catchment Groups – FoGs, LCDCs. ➤ Corporate Care Days; Drain Game. (SCCP).

NHT-Funded Projects	Non-NHT-Funded Projects
	<ul style="list-style-type: none"> ➤ Industry Sector Programs ➤ Clean sites building industry (DOE). ➤ Turf Sustain (SCCP). ➤ Industry based education and accreditation, e.g. NIA. ➤ Waterwise – Plumbers and Nurseries (Water Corporation). ➤ Greenstamp Accreditation Program. ➤ Bigger Policies and Groups ➤ Light Industry Working Group (SCCP). ➤ Green Smart (HIA). ➤ WESROC Storm Water Strategy. ➤ Stormwater Management Manual (DOE). ➤ Green Procurement. ➤ LGA, NRM Policy Manual. ➤ Training and Information ➤ Cleaner Production Centre for Excellence. ➤ Fertilise Wise (SCCP, PAG). ➤ Southern Wungong Implementation Workshop (Water Corporation). ➤ TAFE training for industry. ➤ BMP for Air Conditioner Discharge. ➤ Water Quality Protection Notes (DOE). ➤ Fertiliser Types – BMP (Water Corporation). ➤ Geographic Programs ➤ Local Government Industry Capacity Building, Wangara and Bayswater. ➤ Cleaner Streams, South River. ➤ Neighbourhood Industry Project, Bayswater. ➤ Industry Precinct Waste Project, Bellevue. ➤ Monitoring ➤ Water Quality Monitoring of Industry Outfalls. ➤ Capacity and Involvement ➤ Corporate Care Days (SRT). ➤ Regulations ➤ Licensing and permitting. ➤ UDRs.

3.2.5.2 Adequacy

- Not Adequate.

3.2.5.3 Gaps

- Human resources and therefore capacity to coordinate on-ground works. Engaging the wider community eg: church, 4WD groups can only be done through paid coordinators. School and university students and new volunteers want to get experience but regional groups don't have the capacity to facilitate this.
- Lack of funding for: human resources (staff); capacity building and training of staff and mentors; coordinating volunteers; marketing and promotion of upcoming on-ground works (especially through Universities); administration costs, including employment costs. Consolidation of existing information feeding into addressing gaps.

- Useability and accessibility of existing information and knowledge. Knowledge gap: there is no database of existing information in one place – GIS, Web-based, interactive, with consolidated and cross sector accessible information. But there are already information sources including GIS and Riverplan, which need to be gathered in one place and updated regularly. No consistency in database use across Agencies.
- Lack of information sharing – how to keep growing without burning out?
- There is a gap in the capacity of regional groups to monitor and evaluate capacity building projects.
- Need to measure baseline community involvement so 30% increase can be measured. “Friends of groups” – 5% of Mundaring population involved in one event a year, 20,000 volunteer hours and their contribution is increasing. No way of monitoring activities on private land – this is not captured. Industry awareness – captured at industry workshop. Existing programs: tend to attract the converted not most land owners or the unconverted. We do not teach people how to manage natural areas
- Issue with capacity of new NRMO structure to manage and implement projects.
- Reduce dependency on volunteers, more paid staff. SCMC groups eg: EBICG work one-on-one, therefore, don’t have the capacity to significantly increase community involvement eg: they don’t have “Friends of” groups?

Issues

- Managing point source threats and diffuse source threats such as insecure job tenure and burnout.
- Frameworks exist that we can use, need to be utilised.
- Knowledge of what is being offered by universities, TAFE’s and other providers.
- No jobs at end of TAFE/university degrees, no work experience available.
- Partnership to UDIA needs to be strengthened.
- MOU on Riverplan - very soft, should be met by 2005.

3.2.5.4 Responses

Human Resources and Organisation

- Appoint staff to implement existing management plans, ie: do on ground work and coordinate volunteers (*seed funding from NHT*) and set up on-ground Works Business Units in sub-regions (similar to NMCG / EMRC models).
- Work in balanced partnership with volunteers.
- Models: business unit integrated with sub-regional groups, eg: North Metropolitan Catchment Group; EMRC – employing local, skilled people to do on-ground (economic opportunities) philanthropy.
- Mixed funding (including NHT)

Information

- Consolidate existing information
- Select target audience carefully so that a database can be designed properly, and address specific gaps.
- Develop and design the database.
- Set up MOUs, agreements.
- Maintain, manage and update the database

3.3 Aquatic ecosystems integrity: Wetlands

3.3.1 WM 2.1 100% of priority wetlands in the Region identified for protection by 2005

3.3.1.1 Current Activities

WM2.1 <i>Not adequate</i>	MAT	100% of priority wetlands in the Region identified for protection by 2005 (Category CCW need to be ground proofed (??))	<ul style="list-style-type: none"> • Consolidate baseline data and analyse priority wetland condition (<i>Category CCW need to be ground proofed</i>). • Develop an integrated regional information system to enhance planning, implementation, monitoring and evaluation • Continue to update the Dept of Environment’s Geomorphic Wetland Mapping data set for classification and evaluation of wetland resource condition • Survey priority groundwater dependent ecosystems of the Region • Conduct research into acid sulfate soil risk potential and existing groundwater contamination plumes • Support the further development of groundwater-modelling programs for priority areas (<i>needs further work; only being done for very specific sites</i>)
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NHT-Funded Projects	Non-NHT-Funded Projects
	<ul style="list-style-type: none"> ➤ Identify areas for increased stormwater pollution education by BCCG, City of Melville and Canning, e.g., Blue Gum Lake. ➤ Identify stormwater basins/drains that could benefit from increased management in Bannister Creek Catchment (e.g. weed management) (BCCG). ➤ Southern Wungong Hydro modelling (Water Corporation). ➤ Limited Risk Assessment and site surveys for acid sulphate soils (DoE).

3.3.1.2 Adequacy

- Not Adequate.
- Gnangara Mound project will identify priority wetlands.
- Won’t be achieved by end of 2005.

3.3.1.3 Gaps

- EPP should cover this; still a gap to prioritise the wetlands. Need to put resources into ground truthing EPP/CC wetlands.
- CC wetlands a priority; are restoration wetlands a priority?
- Gap in Hills re geomorphic mapping
- Targeted groundwater modelling needs more funding and manpower to cover regional survey adequately. ASS mapping and groundwater plumes not done adequately.

3.3.1.4 Responses

- Decide on a process needed to recognise priority wetlands: e.g RAMSAR, layered DoE
- Consider relevant assessment criteria eg: conservation value; which under threat; “bang for buck”.
- Sub-regions could do this, as it is a part of sub-regional planning.
- Check existence of wetlands: ground truth already (role of DoE).

3.3.2 WM 2.2 100% of all relevant NRM legislation and policy reviewed and amendments recommended

3.3.2.1 Current Activities

WM2.2 <i>Not adequate</i>	MAT	100% of all relevant NRM legislation and policy reviewed and amendments recommended for the protection and management of the Region's priority wetlands by 2006	<ul style="list-style-type: none"> Undertake a strategic review of Planning Policies (<i>and legislation</i>) and include requirements for hydrological assessments of development proposals near priority wetlands (<i>Not being addressed</i>) Finalise and implement Environmental Protection Policy (Swan Coastal Plain Wetlands)
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NHT-Funded Projects	Non-NHT-Funded Projects
	<ul style="list-style-type: none"> ➤ Bannister Creek Reserve Management Plan (BCCG, City of Canning). ➤ LG NRM Policy Project (Wetland Policy Guidelines) (Manual) (SRT/EMRC). ➤ NRM included in Local Planning Strategy and TPS Land Use Control. ➤ Cottesloe: Development of policies/5 year programs for control of reticulation, reduction of bore water use, reduced verge watering. ➤ City of Canning Town Planning Scheme Review – including wetland conservation status land. ➤ SPP for water resources (DPI). ➤ Licensing near wetlands requires hydro assessment. ➤ Environmental Protection Policy on wetlands being finalised (EPA). ➤ Ellen Brook, Brockman River Management Plans (EBICG).

3.3.2.2 Adequacy

- Not Adequate.
- Challenge the timeframe as the process for this moves very slowly; 2006 is unrealistic.
- Planning processes are failing to adequately protect wetlands.
- The need to review planning policies vis a vis hydrological requirements is not being addressed.

3.3.2.3 Gaps

- Not enough resources have been allocated for the Environmental Protection Policy for Swan Coastal Plain Wetlands to be implemented correctly i.e. policing, evaluation, influencing LGAs and private landholders.

3.3.2.4 Responses

- Need to prioritise gaps in legislation.
- Increase funding
- Coordinate DPI; WALGA; DoE; WAPC; EPA; Environment and Planning Ministers.
- Review current legislation and policy
- Review subdivision development process
- State Wetlands Coordinating Committee.
- Conduct an independent audit and review to find where the gaps are in current environmental protection and planning policies and processes for the protection of “priority” wetlands and generation of recommendations.

3.3.3 WM 2.3 Develop, adapt and/or review allocation limits and management plans for groundwater areas by 2008.

3.3.3.1 Current Activities

WM 2.3 <i>Limited viewpoint Not adequate</i>	MAT	Develop, adapt and/or review allocation limits and management plans for groundwater areas by 2008	<ul style="list-style-type: none"> • Incorporate sustainable limits and allocations for resource use through new Water Source Protection Plans and Land Use and Water Management Strategies (<i>Gnangara is the focus as present – does not include other areas</i>) • Monitor commercial bores to ensure the development of sustainable allocations (<i>all bores, not just commercial</i>) • Review and document allocation limits, and include the principles of sustainable natural resource management.
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NHT-Funded Projects	Non-NHT-Funded Projects
<ul style="list-style-type: none"> ➤ Canning EWP (NHT). 	<ul style="list-style-type: none"> ➤ Canning Plain CMP and Investigation into MSMD (Rachel Spencer). Recommendations for CB and wetlands. ➤ Gnangara Mound Metering Project (DoE) (large private bores, target Carabooda) (also 2.4). ➤ LG License re-applications for bores require strategic plan (City of Belmont). ➤ NLP Waterwise on farm – target water use efficiency/nutrients large horticultural users. ➤ WSP Plans for hills sources drinking water. (water quality protection only) (DoE/Water Corporation). ➤ DoE Gnangara Mound Groundwater Management Planning – sustainable limits EWR/EWP. ➤ Development of Council GIS layer for road drainage, soak pits, sumps (Cottesloe). ➤ Cottesloe Council monitoring of salt levels and volumes pumped for Council bores and wells. Gap: private bores? ➤ DoE – formation of Gnangara Mound WRM Committee

3.3.3.2 Adequacy

- Not Adequate– limited view point.
- Gnangara project (DOE) will address this in one area (North of the River), but not in this timeframe.

3.3.3.3 Gaps

- Needs to look at all bores not just commercial: extraction from other private bores and unlicensed bores needs attention.
- Monitoring of private/household bores for volume removed.
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3.3.3.4 Responses

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3.3.4 WM 2.4 Develop and implement management restoration plans for priority wetlands by 2008.

3.3.4.1 Current Activities

WM 2.4 <i>Not adequate</i>	MAT	Develop and implement management restoration plans for priority wetlands by 2008	<ul style="list-style-type: none"> • Implement strategic programs in areas identified in WM2.1 to protect, manage and restore priority wetlands • Further development and implementation of Wetland Watch program (<i>Only going until 2005. Landcarers looking after their own wetlands</i>) • Compliance surveys of licenses in priority groundwater areas (<i>Focusing C3 and C4 – over-allocated resources</i>) • Metering implementation in priority groundwater areas
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NHT Funded Activities	Non-NHT Funded Activities
	<ul style="list-style-type: none"> ➤ Licensing and abstraction/surface water use compliance with water allocations (DoE) (also 2.3). ➤ LG management plans for EPP listed wetlands being implemented, e.g., Tomato Lake, Garvey Park (City of Belmont). ➤ Liege Street wetland - riparian restoration, wetland creation. ➤ Strategic programs to protect, manage etc. – Coolgardie Living Stream. ➤ Liege Street – DNIP – Drainage Nutrient Intervention Program (SRT)(\$1m/year). ➤ DoE priority inspections of C3/C4 areas. ➤ DoE/Gnangara Mound Groundwater Management Plan. ➤ Wetland Watch Project (WWF). 12 month Project April 2004-5 (1FTE). Wetland conservation project providing assistance to private landholders with wetlands to achieve improved conservation management and protection of wetlands. Not funded after April 2005. ➤ Envirofund for wetland rehabilitation in floodplain of Canning River – Pioneer Park (\$27,000). ➤ TRCG sits on WAC (Westralia Airport Corporation) Environmental Committee (also 2.1). ➤ Voluntarily metering bores to assess groundwater use (City of Belmont). ➤ Revegetation and weed control of Bannister Creek floodplain (BCCG & City of Gosnells) (also 2.5). ➤ Hydrocotyl control and looking at research into its biology (in Bannister Creek Reserve). ➤ Bannister Creek Streamlining Project with City of Canning and Bannister Creek Catchment Group. ➤ Compensating Basin revegetation Canvale Lake – working with Bannister Creek Catchment Group. ➤ Station Street Wetland (other funding) with previous SCULP funding. Includes Friends of Queens Park Bushland. Local Government and Main Roads funded. ➤ SRT Riverbank Program. ➤ SALP funding Wilson Lagoon CRAWLS Project with Wilson Wetland Action Group. Within Canning River Regional Park.

3.3.4.2 Adequacy

- Not Adequate.
- Timeframe too short to implement change to “initiate implementation”.
- Metering is happening at priority areas of the Gnangara Mound.
- Have not defined priority: is it conservation or resource enhancement?
- Planning system needs to protect areas we know are priority now.

- Wetland conservation priority has not been a major driver for current programs.
- Groundwater licenses don't cover all bores, e.g., private bores.
- There is usually a 3-year period once license issued before management plan is needed for that groundwater license.

3.3.4.3 Gaps

- Wetland Watch currently not funded for 2006.

3.3.4.4 Responses

- Ensure Wetland Watch is adequately funded

3.3.5 WM 2.5 20% increase in community participation in wetlands education, restoration, protection and management activities by 2009.

3.3.5.1 Current Activities

WM 2.5 <i>Not adequate</i>	MAT	20% increase in community participation in wetlands education, restoration, protection and management activities by 2009	<ul style="list-style-type: none"> • Facilitate, support and motivate community groups • Support development, resourcing and implementation of restoration plans to conserve and protect wetlands • Facilitate the inclusion of stormwater education, water use efficiency and water conservation into the regional training and education program • Continue and expand existing community-training programs such as Wetland Watch, Skills for Nature Conservation, Urban Nature and Land for Wildlife through the integrated regional education and training program • Support wetland restoration and management training through tertiary institutions and TAFE's • Form strategic partnerships with the Urban Development Institution of Australia (UDIA) and the Stormwater Industry Association (SIA) for protection of wetlands • Implement a framework for incentive schemes and revolving funds for protection and conservation of priority wetlands by 2005
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NHT-Funded Projects	Non-NHT-Funded Projects
	<ul style="list-style-type: none"> ➤ Community input to water resource management (also 2.3). ➤ Wetland Workshop in partnership with WWF Australia, GA(WA) and AGLG (other funded). ➤ Wetland Mitigation (MRWA) Tonkin Highway Extension (other funded). ➤ Wetland Watch Project (WWF) (1FTE). Unfunded beyond April 2005. Promote incentive schemes, strong community awareness component regarding values of wetlands, and wetland management issues and skills. ➤ BCCG Part-time Project Officer. Funding and technical support for landholders and "Friends Of..." groups. ➤ City of Belmont involved in educating schools in wetland protection and drainage restoration. ➤ City of Belmont LG officers supporting Water Corporation Waterwise Program for Schools. ➤ Points 1-7 all done through SERCUL and TRCG. ➤ Stormwater and N/P pollution intervention into Whaleback Lake/BCR (Bannister Creek CG, City of Canning). ➤ SRT Swan River Action Kit – adult education. ➤ SFNC Training Program – ASS, Groundwater Management. ➤ Regional action for public education to improve drainage water quality before soakage into groundwater (WESROC). ➤ Yellow Fish Drain Stencilling (AGLG)(other funded). ➤ Swan Alcoa Landcare Program (funding for restoration).

NHT-Funded Projects	Non-NHT-Funded Projects
	<ul style="list-style-type: none"> ➤ City of Belmont employ Landcare trainees through Agencies whilst they are at TAFE (on-job training). ➤ Ribbons of Blue (SRT/DoE). ➤ City of Belmont – LG’s actively restoring priority wetlands in partnership with catchment groups (TRCG).

3.3.5.2 Adequacy

- Not Adequate.
- Where did 20% come from?
- Do we know where we are starting from?
- There is still a lack of understanding about wetlands by private landholders.

3.3.5.3 Gaps

- Need input into planning stage.
- Targeted education is needed for developers, consultants, private landowners and Local Government (town planners) on locations, importance and management of wetlands and associated groundwater systems.
- Adequate staffing and knowledge to support community capacity.
- No incentive schemes for wetland protection and conservation.
- Stormwater education, not across entire Swan Region.

3.3.5.4 Responses

- Local Government: Structure Plans; PBP link – broaden the focus of PBP to address wetlands.
- Developers and consultants: UDIA: Project Officer to liaise with their members; links to water sensitive urban design, DoE and DPI.
- Private landowners: Wetland Watch – could include incentive (SALP Incentive).
- Establish a comprehensive groundwater monitoring program to determine groundwater quantity and quality entering the priority waterways and wetlands in the region.

3.4 Nutrients in aquatic environments

3.4.1 WM 3.1 100% of the 1-5 year actions of the reviewed Swan-Canning Cleanup Program (SCCP) implemented by 2010

3.4.1.1 Current Activities

WM3.1 <i>Adequate</i>	MAT	100% of the 1-5 year actions of the reviewed Swan-Canning Cleanup Program (SCCP) implemented by 2010	<ul style="list-style-type: none"> Continue implementation of SCCP including priority actions related to resource assessment, research and monitoring and evaluation Support identification of point-source nutrient export in priority areas to identify existing and potential sources of nutrients (<i>inadequate – gaps – not linked to MAT</i>)
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NHT-Funded Projects	Non-NHT-Funded Projects
<ul style="list-style-type: none"> ➤ Foreshore Condition Assessment (NHT & SCCP) (Dot point 1) . 	<p>Dot Point 1</p> <ul style="list-style-type: none"> ➤ SCCP Catchment Report Card. ➤ Catchment snapshots (SCCP). ➤ SCCP Decision Support Modelling. ➤ Estuary monitoring (SCCP). ➤ Tributary Monitoring Program (SCCP). ➤ SCCP – Monit. & Eval. Framework. <p>Dot Point 2</p> <ul style="list-style-type: none"> ➤ Catchment Groups Monitoring. ➤ Ellen Brook ICM Plan. ➤ Claise Brook Historical Land-use Mapping (SRT). ➤ Water Corporation Monitoring Main Drain. ➤ Drainage Reform, Aquatic Science Branch – DoE. ➤ Local Government (WESROC). ➤ DPI Land Assessment. ➤ Contaminated Sites EPA. ➤ Liege Street. ➤ Mill Street Main Drain (SCCP).

3.4.1.2 Adequacy

- Adequate

3.4.1.3 Gaps

- Monitoring of surface and groundwater must include diffuse pollution sources
- Baseline data – needs co-ordination

3.4.1.4 Responses

3.4.2 WM 3.2 100% of all relevant NRM legislation and policy reviewed and amendments recommended to address nutrient enrichment by 2006

3.4.2.1 Current Activities

WM3.2 <i>Not adequate</i>	MAT	100% of all relevant NRM legislation and policy reviewed and amendments recommended to address nutrient enrichment by 2006	<ul style="list-style-type: none"> • Support the review of the policy and legislation, including Environmental Protection Policies and, Statements of Planning Policy • Assist in the development and implementation of decision support tools for planners, identifying land use change scenarios and predicting impacts • Continue to develop and implement sub-regional and local action plans • Adoption by Local Government Authorities of the Local Government NRM Policy Manual • Swan River Trust legislation review and implementation • Implementation of Riverplan – Swan and Canning River EPP
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NHT-Funded Projects	Non-NHT-Funded Projects
<ul style="list-style-type: none"> ➤ Legislation – new – Swan and Canning Rivers (Discussion Paper to Minister, 4 months feedback). 	<ul style="list-style-type: none"> ➤ Catchment Groups Policy Manuals. ➤ State Water Strategy. ➤ Drainage Reform Process. <p>Dot Point 1</p> <ul style="list-style-type: none"> ➤ SPP, EPP. ➤ River Plan. ➤ Sustainability Strategy. <p>Dot Point 2</p> <ul style="list-style-type: none"> ➤ Darling Range (Jim Davies). ➤ SCCP Decision Support (Lascam). ➤ Ag? MUSIC?. ➤ Ag Maps. ➤ Stormwater Management Manual. <p>Dot Point 3</p> <ul style="list-style-type: none"> ➤ Catchment Groups. ➤ Sub-Regional Planning Process. ➤ Underway (Dot points 4, 5 and 6). ➤ Unauthorised discharge regulations. ➤ Light Industry Survey – local governments (Wangara, Bayswater, Armadale). ➤ Swan and Canning River SPP. ➤ MOU – Refining Water Resources SPP, Southern River (also addresses turbidity). ➤ Industry Survey (done). ➤ Water Quality Protection Notes (DOE/SRT). ➤ Decision Support Modelling – Landuse and Impact. ➤ Local Government Policy Development Project (SRT) (includes a BMP guidelines for SME's). ➤ Canning Plain CMP. ➤ Riverplan – assessing CRG, environmental values, criteria and targets. ➤ Greenstamp (also turbidity). ➤ New version of Industry Working Group (also turbidity).

3.4.2.2 Adequacy

- Not adequate

3.4.2.3 Gaps

- Need improved legislative land use controls

3.4.2.4 Responses

3.4.3 WM 3.3 Implement identified remedial actions to address nutrient enrichment by 2007

3.4.3.1 Current Activities

WM3.3 <i>Not adequate</i>	MAT	Implement identified remedial actions to address nutrient enrichment by 2007	<ul style="list-style-type: none"> • Implement strategic programs, including nutrient intervention structures, in priority areas identified in WM3.1 to remediate nutrient enrichment • Incorporate Water Sensitive Design and Total Water Cycle management principles in all new developments and/or retrofits • Incorporate Water Sensitive Design into priority areas of the drainage network • Design, develop and implement nutrient intervention structures • Completion of the Sewerage In-fill Program
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NHT-Funded Projects	Non-NHT-Funded Projects
<ul style="list-style-type: none"> ➤ NHT, WESROC, SCC. 	<ul style="list-style-type: none"> ➤ Water Cycle Project (all). ➤ SCC Information/Motivator. <p>Dot Point 1</p> <ul style="list-style-type: none"> ➤ Drainage Nutrient Intervention Program (Canning Plain). ➤ Local Government Intervention (Structures). ➤ Catchment Management Plans. <p>Dot Point 2</p> <ul style="list-style-type: none"> ➤ DPL. ➤ Water Corporation Southern River Integrated Implementation Plan. ➤ Water Corporation Mosman Park. ➤ Claisebrook Drainage Improvement Program. ➤ Catchment groups providing information. <p>Dot Point 3</p> <ul style="list-style-type: none"> ➤ Baseline data. ➤ Southern River. <p>Dot Point 4</p> <ul style="list-style-type: none"> ➤ Tony Wong Workshop. ➤ Southern River. ➤ Rachel Spencer.

3.4.3.2 Adequacy

- Not adequate

3.4.3.3 Gaps

- Riverplan implementation
- Lack of evaluation/data of effective nutrient intervention BMP's
- Stakeholder involvement in preparation of action plans
- Raising awareness of benefits of water sensitive design.
- Parameters for good TWC management have not been set (BMP tool box needed).

- Suite of options to produce the RCT outcome is not available.
- Sewerage infill.
- Nutrient intervention structures (no real evidence of the effectiveness) (tool box). Structures need work.

3.4.3.4 Responses

BMP Demonstration Sites

- Review of existing BMP demonstration sites to standardised criteria.
- Ability for sub-regions to establish BMP's specific to their areas with EnviroFunds.
- Design Standards
- Publish information on design standards for easy, useable access for engineers, drainage practitioners, developers, planners and community.

3.4.4 WM 3.4 20% increase in community participation in nutrient intervention education, restoration, protection and management activities by 2009

3.4.4.1 Current Activities

WM 3.4	MAT	20% increase in community participation in nutrient intervention education, restoration, protection and management activities by 2009	<ul style="list-style-type: none"> • Facilitate, coordinate, support and motivate community groups • Develop and implement industry awareness BMP's for priority sectors of small-medium sized industries (SME's) • Continue implementation of rural landholder education and support programs such as Heavenly Hectares, property planning to address nutrient export in high risk areas • Include stormwater education, water use efficiency and water conservation into the regional training and education program • Continue and expand existing community training programs such as Swan-Canning Cleanup Program education initiatives, Great Gardens workshops, Ribbons of Blue, Wetland Watch and Skills for Nature Conservation, through the integrated regional education and training program • Continue to provide incentives for landholders and land managers such as the Swan Alcoa Landcare Program • Support wetland restoration and management training through tertiary institutions and TAFE's
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NHT-Funded Projects	Non-NHT-Funded Projects
<ul style="list-style-type: none"> ➤ Environmental Information Sheets for SMEs – under development (Tony Soterious). ➤ LG, Volunteers, SCCP, NHT. 	<ul style="list-style-type: none"> ➤ Nutrient Research Group (Department of Agriculture) (Rob Summers). ➤ Best Practice Manual and Guidelines Manual for vegetable industry. ➤ BMPs for industry, Greenstamp program. ➤ Light Industry Project from Cleanup Program. ➤ State Water Strategy. ➤ Statutory Assessments and creation of NIMPs. ➤ Tifix – phosphate binding (by Tiwest). ➤ Water Quality Protection Notes. ➤ Swan Canning Cleanup Program continued projects, e.g., Great Gardens, Ribbons of Blue, SALP. ➤ DoE Stormwater Management Manual. ➤ Waterwise Schools (program). ➤ Waterwise. ➤ Gardening Gurus. ➤ Water Campaign. ➤ Heavenly Hectares & Property Program (Dot point 3). ➤ Skills for Nature (Dot point 4). ➤ WESROC Community (Dot point 4). ➤ Great Gardens (Dot point 4).

NHT-Funded Projects	Non-NHT-Funded Projects
	<ul style="list-style-type: none"> ➤ Groundwater Festival (Dot point 4). ➤ Catchment Groups TAFE (Dot point 7). ➤ Drain Management – Liege Street, Mills Street – drainage intervention (also turbidity). ➤ Centre for Excellence – Large Industry, Training for Local Government (University). ➤ WA Sustainable Industry Group – learning by sharing, best practice.

3.4.4.2 Adequacy

- Adequate

3.4.4.3 Gaps

- Lack of funding.
- Lack of ability of co-ordinators to assist community
- Lack of effective evaluation or data on BMP's for nutrient reduction and TWC management
- SALP – oversubscribed
- Fertiliser supplier and retailer education
- Small and medium enterprises - inadequately addressed.

3.4.4.4 Responses

Behavioural Change

- Personalised Marketing – community based social marketing.
- Behavioural change (like TravelSmart) for nutrient (household) reduction (possible link to Waterwise) (NHT funded).

Drainage Reform

- Drainage reform finalisation to incorporate Swan NRM Strategy.
- SCC funded to ensure that this is bought to finalisation.

Other Suggested Initiatives

- Balance – reuse of water, grey water; develop a risk map on re-use of grey water taking account of the potential impact of grey water on groundwater.
- Provide more funding to provide support to local groups and community education.
- Upscale Heavenly Hectares.
- Decision Support tool.
- Household actions
- SCCP should include broader ecological monitoring.
- Monitoring of surface and groundwater must include diffuse pollution sources.
- Legislate land use controls for nutrient reduction

3.5 Turbidity / suspended particulate matter in aquatic environments

3.5.1 WM 4.1 Establish monitoring systems to develop Resource Condition Targets for turbidity / suspended particulate matter by 2005.

3.5.1.1 Current Activities

WM4.1 Not adequate	MAT	Establish monitoring systems to develop Resource Condition Targets for turbidity/ suspended particulate matter by 2005	<ul style="list-style-type: none"> Establish baseline and trends and set targets Facilitate the integration of water quality monitoring programs Support the inclusion of biological indicators and an index of river condition in the development of monitoring systems Support undertaking of a sediment sourcing study to identify and assess active erosion areas and their impact on the Swan-Canning River system
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NHT-Funded Projects	Non-NHT-Funded Projects
➤	<ul style="list-style-type: none"> ➤ Ribbons of Blue – snapshots. ➤ SRT monitoring of major tributaries. ➤ Aquatic Science (DoE) & SRT Riverplan working on consistent, Integrated Water Quality monitoring program. ➤ City of Armadale study of erosion sites, Darling Scarp and coastal plain. ➤ DoE/SRT 15 sub-catchments monitored fortnightly (Turbidity & TSS). ➤ Sub-catchment implementation plans – Eastern Hills – Erosion/sediment sources (Dot point 4).

3.5.1.2 Adequacy

- Not adequate

3.5.1.3 Gaps

- Water Corporation and Health Department don't monitor everything that's needed for NRM.
- Coordination and data sharing including Water Corporation.
- Monitoring of minor tributaries and drains.
- Don't know ecological impacts of different levels of turbidity (large sediment loads are coming from Avon and Upper Canning)

3.5.1.4 Responses

3.5.2 WM 4.2 100% of all relevant NRM legislation and policy reviewed and amendments recommend to address turbidity / suspended particulate matter by 2006.

3.5.2.1 Current Activities

WM4.2	MAT	100% of all relevant NRM legislation and policy reviewed and amendments recommended to address turbidity / suspended particulate matter by 2006	<ul style="list-style-type: none"> • Adoption by Local Government Authorities of the Local Government NRM Policy Manual and Darling Range Erosion Manual • Assessment of existing regulations for minimising erosion from urban and rural land uses • Develop decision-making tools for land use planners to identify and address turbidity/particulate matter impacts
Not adequate			

NHT-Funded Projects	Non-NHT-Funded Projects
➤	<ul style="list-style-type: none"> ➤ LG NRM Manual is being continued as part of Cleanup Program. ➤ Local Government ICM plans. ➤ Local Planning Strategy – based on environment. ➤ Town Planning Schemes, Land Use Power (lots of power). ➤ Retention of productive soils for agriculture/horticulture. ➤ Prevention of non-compatible land uses impinging on agricultural practices. ➤ Waterway Management and Modelling (LAMCAM, SRT/DoE) (also WR3, W4). ➤ Local Government NRM Policy Development Project (Guidelines). ➤ City of Armadale Town Planning – Erosion Policy for new development.

3.5.2.2 Adequacy

3.5.2.3 Gaps

- Regulations and legislation are non-existent, eg: developments and infrastructure construction, fire breaks.
- Erosion manual for coastal plain as well.

3.5.2.4 Responses

3.5.3 WM 4.3 Implement identified remedial actions to address turbidity / suspended particulate matter by 2007.

3.5.3.1 Current Activities

WM4.3	MAT	Implement identified remedial actions to address turbidity / particulate matter by 2007	<ul style="list-style-type: none"> • Implement strategic programs in priority areas identified in WM4.1 to remediate turbidity / particulate matter • Develop and implement program foreshore and riparian restoration on waterways • Develop and implement best management practice for minimising waterways and land erosion
Adequate			

NHT-Funded Projects	Non-NHT-Funded Projects
➤	<ul style="list-style-type: none"> ➤ Riverbank (SRT) Swan/Canning foreshore assessment and rehabilitation. ➤ SALP foreshore revegetation. ➤ Foreshore Management Policy and Guidelines for Local Government. ➤ Local Government stormwater management plans and infrastructure. ➤ DoE Stormwater Manual (Dot point 3). ➤ Local Government Foreshore Management Plans (Dot point 2).

3.5.3.2 Adequacy

- Adequate Existing programs good but need expansion, increased resources and legislative backing.
- Key targets are stock access to streambanks, riparian vegetation and erosion controls.

3.5.3.3 Gaps

3.5.3.4 Responses

3.5.4 WM 4.4 20% increase in community participant in education, restoration, protection and management activities for managing turbidity / suspended particulate matter by 2009.

3.5.4.1 Current Activities

WM4.4 Not adequate	MAT	20% increase in community participation in education, restoration, protection and management activities for managing turbidity / particulate matter by 2009	<ul style="list-style-type: none"> • Coordinate, facilitate and support community groups (need to ensure funding continues) • Develop and implement restoration plans to conserve and protect waterways and wetlands • Develop an integrated regional information system to enhance planning, implementation, monitoring and evaluation. • Continue and expand existing community training programs such as River Restoration training, Wetland Watch, Skills for Nature Conservation, Urban Nature and Land for Wildlife through the integrated regional education and training program • Support waterways and wetland restoration and management training through tertiary institutions and TAFE's • Form strategic partnerships with the Urban Development Institution of Australia (UDIA) and the Stormwater Industry Association (SIA) for best practice management
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NHT Funded Activities	Non-NHT Funded Activities
	<ul style="list-style-type: none"> ➤ M&E Framework being established for Cleanup Program (to be developed). ➤ SRT – Riverbank Project; restore, rehabilitate waterway. ➤ Country Lifestyle magazine – Countryman – new information services. ➤ Small Landholder Information Service (also LM2.5). ➤ Soil Preservation Workshops. ➤ Four day River Restoration Course. ➤ Eastern Hills GIS and Resource Condition Assessments. ➤ NRM Regional Coordinators and NRM Officers. ➤ BWCG Inc. 5-Year River Management Plan. ➤ Natural Area Managers – Local Government (“Friends Of” Group Coordinators). ➤ Bush Skills for the Hills Environmental Workshop Series. ➤ SCC River Restoration. ➤ Wetland Watch – limited wetlands; address causes; TSS doesn’t monitor. ➤ AGLG & SERCUL – both actively support community group formation and development, as does City of Armadale BEAC (Dot point 1). ➤ SRT Riverplan – gathering and making available on database information on existing activities, programs by everyone in relation to river management (Dot point 3). ➤ SRT funding of Heavenly Hectares Property Planning Workshops (Dot point 4). ➤ Foreshore restoration – river bank. Funding for local government, industry. ➤ DoE Stormwater Manual. ➤ SALP Gap – funding for industry.

3.5.4.2 Adequacy

- Not adequate

3.5.4.3 Gaps

- BMP development not very advanced.
- Adequate set of activities, but needs more resourcing, eg: community groups are losing NHT funding.
- Three communities need to be targeted: action on revegetation by urban; development industry and utilities and Government, rural landowners.
- Incentives needed in some places (rural).
- Can achieve with community volunteers but need new and stronger guidelines.
- Need incentives?

3.5.4.4 Responses

3.6 Surface water salinity in fresh water aquatic environments

3.6.1 WM 5.1 Establish monitoring systems to develop Resource Condition Targets for surface water salinity in the Avon Upper Swan Region by 2005

3.6.1.1 Current Activities

WM5.1 GAP	MAT	Establish monitoring systems to develop Resource Condition Targets for surface water salinity in the Avon Upper Swan Region by 2005	<ul style="list-style-type: none"> Evaluate and coordinate available data and establish adequate monitoring systems Evaluate extent of rising water tables, salinisation of currently freshwater bodies, area affected by secondary salinity, and the risk of further salinity in the Ellen Brook, Brockman River, Wooroloo Brook and Helena River catchments Identify, map and develop mgt plans for all salinity risk areas
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NHT-Funded Projects	Non-NHT-Funded Projects
	<ul style="list-style-type: none"> ➤ State Salinity Strategy (also 5.2, 5.3, 5.4). ➤ Brockman River Catchment NRM Management Plan. ➤ Waterwise/Saltwise Rural Towns Program (Department of Agriculture). ➤ Risk areas mapped. "Salinity in Chittering Shire". ➤ WBLCDC Salinity Project. ➤ DoE Helena Study. ➤ Gauging stations on Wooroloo/Ellen (DoE) and snapshots DoE data. ➤ List of bores that DoE have but don't collect. ➤ CALM Piezometers – but not accessible. ➤ Margaret Smith Hydrogeological Report, Brockman Salinity. ➤ Margaret Smith Report on Ellen Brook Catchment.

3.6.1.2 Adequacy

- Not Adequate

3.6.1.3 Gaps

- New NAP MOU needs signing (to include Helena River) between SCC & ACC
- Monitoring of groundwater and rising water tables to evaluate salinity risk to freshwater bodies not being done.
- Data and information system to develop a decision making tool for planners, land use managers and landholders, related to improving surface water salinity.

3.6.1.4 Responses

Cross-Regional groundwater project (WM 5.1)

- Establish a cross-regional program to monitor changes in the quality and quantity of groundwater.
- Includes: drilling; piezometers; quarterly monitoring; evaluate existing data.
- Monitoring design.
- Expertise and analysis.
- Contractors.
- Responsibility – Project Manager, DoE.
- Partners: Department of Agriculture, Western Australia; Sub-regional groups.
- Link: water allocation; Avon CC Strategy.
- Funding: NAP – Avon CC; \$250,000.

3.6.2 WM 5.2 100% of all relevant NRM legislation and policy reviewed and amendments recommended to address surface water salinity in the Avon Upper Swan Region by 2006

3.6.2.1 Current Activities

WM5.2 GAP	MAT	100% of all relevant NRM legislation and policy reviewed and amendments recommended to address surface water salinity in the Avon Upper Swan Region by 2006	<ul style="list-style-type: none"> Assessment of existing regulations for addressing surface water salinity in the Avon Upper Swan Region Decision-making tools for land use planners to identify and address surface water salinity impacts
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NHT-Funded Projects	Non-NHT-Funded Projects
	<ul style="list-style-type: none"> ➤ Native vegetation legislation, DoE. ➤ State Salinity Strategy. ➤ Swan Canning EPP. ➤ Avon Arc Planning Strategy. ➤ Land Monitor. ➤ EPP, SPP, Salinity Action, EPBS, Ag Management.

3.6.2.2 Adequacy

- Not Adequate

3.6.2.3 Gaps

- No current scheduled review of NRM legislation and policy.
- Data and information system to develop a decision making tool for planners, land use managers and landholders, related to improving surface water salinity.

3.6.2.4 Responses

Cross Regional Project

- Review of NRM-related legislation and policy covering Acts, Policy and Regulations
- \$100,000 Strategic Reserve funding.
- Project Manager Environmental Defenders Office;
- Reporting to NRM Council, Regional Chairs and Regional Groups.

3.6.3 WM 5.3 Implement identified remedial actions to address surface water salinity in the Avon Upper Swan Region by 2009

3.6.3.1 Current Activities

WM5.3 GAP	MAT	Implement identified remedial actions to address surface water salinity in the Avon Upper Swan Region by 2009	<ul style="list-style-type: none"> Implement strategic large-scale surface water salinity remedial actions in priority areas identified in WM5.1 Implement strategic large-scale surface water management programs in priority areas identified in WM5.1
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NHT-Funded Projects	Non-NHT-Funded Projects
	<ul style="list-style-type: none"> ➤ SALP Projects. ➤ Gordon Reid Foundation (Lotteries). ➤ Envirofund Projects. ➤ See also 1.3.

3.6.3.2 Adequacy

- Not Adequate

3.6.3.3 Gaps

- There is a lack of funding for large scale projects

3.6.3.4 Responses

Large-scale on-ground Salinity Remediation (WM5.3 and WM 5.4)

- Partners: Sub-regional groups; Swan Catchment Council; Avon Catchment Council
- Includes Surface water control; Strategic revegetation; Incentive schemes (remnant vegetation, alternative tree cropping, property planning, perennial pastures)
- Funding: \$2,500,000 over 5 years; NAP and Lotteries; NLP SALP

General Comment

- Use contractors/professionals to implement restoration plans.

3.6.4 WM 5.4 20% increase in community participation in salinity education, mitigation and remediation activities by 2009.

3.6.4.1 Current Activities

WM5.4 <i>GAP</i>	MAT	20% increase in community participation in salinity education, mitigation and remediation activities by 2009	<ul style="list-style-type: none"> • Coordinate, facilitate and support community groups • Develop and implement restoration plans to address surface water salinity • Develop an integrated regional information system to enhance planning, implementation, monit'g and eval'n. • Continue & expand existing community training programs eg River Restoration training, Ribbons of Blue, Wetland Watch, Skills for Nature Conservation, Urban Nature & Land for Wildlife thru' integrated regional education & training program • Support land mgt, waterways and wetland restoration and management training through tertiary institutions and TAFEs
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NHT-Funded Projects	Non-NHT-Funded Projects
➤ Ribbons of Blue SCCP & NHT.	<ul style="list-style-type: none"> ➤ Sub-Regional Catchment Coordinators/Officers. ➤ SALP Projects. ➤ Waterwise & Saltwise (Department of Agriculture, Water Corporation). ➤ Community Training Programs. ➤ Salinity Education Package (Department of Agriculture). ➤ TAFE Land Management courses. ➤ Waterwise Schools Program. ➤ See also LM1.4.

3.6.4.2 Adequacy

- Not Adequate

3.6.4.3 Gaps

- No community participation benchmark.
- Data and information system to develop a decision making tool for planners, land use managers and landholders, related to improving surface water salinity.
- Training: Links between sub regions and tertiary institutions/TAFE's (coordinated). Need to establish pathways, partnerships. Crucial to maintain and retain linkages/partnerships.

3.6.4.4 Responses

Integrated regional information system (Refer to LMI.3 Project)

- GIS using existing data sets; including monitoring data and information linkages (see AgMaps model)
- This will provide a decision support tool for landholders and Local Government to assist in project evaluation, project reporting etc
- Web based and landholder friendly
- Links: Department of Agriculture, Western Australia; DoE; SCC
- Funding – multiple funding sources: NHT, NLP, NAP, GRF

Evaluation of community participation to set benchmark

- Links with all other Regional Programs.
- Needs one person for two months to collect data.
- \$20,000.

Partnership and capacity building project with tertiary institutions and TAFEs, Education Department

- Mapping exercise to identify gaps.
- Partnerships to fill gaps.
- \$25,000 – contractor.

General Comments on Required Approach for Salinity

- Support training through tertiary institutes/TAFE's.
- Should be delivered through development of partnerships.
- Evaluate the effectiveness of community participation in salinity education.
- Look nationally for how salinity education has been evaluated.

4. Sustainable Production Delivery Program

4.1 Summary of recommended projects

The recommended set of projects for **NHT Regional Funding** for this Program is:

Table 7: Sustainable Production Projects recommended for NHT2 Funding

No	Matter for Target	Indicative NHT Regional Funding
	<i>Salinity</i>	
1.	Multi-user information system decision-making support tool for salinity and land management.	\$110,000
	<i>Nutrients in the Aquatic Environment: Industry</i>	
1.	Promote NRM Manual for Local Government to Local Governments.	
2.	Industry to continue and increase Information Sheets.	
	<i>Estuarine, Coastal & Marine Habitat</i>	
1.	Assessment Gaps:	Current
	– behavioural change caused by current programs	new project
	– audit;	(Commonw
	– designed program.	earth)

The recommended set of projects for **Other Sources Funding** for this Program is:

Table 8: Sustainable Production Projects recommended for non-NHT2 Funding

	Project Title	Indicative Funding
	<i>Nutrients and Sediments</i>	
1.	Risk Mapping in Eastern Hills.	\$150,000
2.	Alternative revegetation method for workshops and other issues (information sharing).	\$60,000
3.	BMPs for Bush Foods, Sandalwood.	\$10,000
4.	Baseline data collation to monitor 30% increase (benchmarking).	\$5,000
5.	“Big project” multifaceted approach to a recovery catchment.	\$2,000,000
6.	Resources to work with stakeholders.	\$100,000 per annum
7.	Information coordination. (One Stop Shop for business, farmers and industry sector.)	
8.	Onsite farm / business audits.	
9.	Business demonstration sites.	
10.	Incentive scheme for business to purchase monitoring equipment.	
11.	Regional baseline data for groundwater.	
12.	Economic assessment for productivity.	
13.	BMP Nutrient Management Plans for farmers.	
14.	Industry change – Technology Officers and expanded Greenstamp program.	
	<i>Air Quality</i>	
1.	Benchmark survey to establish sustainable light industry attitudes about best management practices. (Sustainable light industry to assess knowledge and attitudes, to help promote behaviour change.)	Budget very dependent upon scope \$20,000 to \$50,000
2.	Establish environmental values for existing coastal environments that have not yet been identified. (CMR1 and CMR2.)	\$50,000
3.	Point source light industry emissions study (air).	\$200,000 per year for 3 years
4.	Education and awareness raising project.	\$100,000 per year
5.	Stakeholder engagement workshops to progress issue.	\$50,000 per year

Table 9: Suggested Fund Sources for Non-NHT2 Sustainable Production Projects

No	Name of Project	Funding Required	Tick Likely Fund Sources					Private Sources
			Strategic Reserve	Cross-Regional	Enviro Fund	NLP	Other Public	
1.	Risk Mapping in Eastern Hills.	\$150,000					✓ Ag W/C	
2.	Alternative revegetation method for workshops and other issues (information sharing).	\$60,000		✓				
3.	BMPs for Bush Foods, Sandalwood.	\$10,000			✓			
4.	Baseline data collation to monitor 30% increase (benchmarking).	\$5,000						
5.	“Big project” multifaceted approach to a recovery catchment.	\$2,000,000	✓	✓			✓	✓
6.	Resources to work with stakeholders.	\$100,000 per annum						
	Benchmark survey to establish sustainable light industry attitudes about best management practices. (Sustainable light industry to assess knowledge and attitudes, to help promote behaviour change.)	Budget very dependent upon scope \$20,000 to \$50,000					✓	✓ (industry already)
	Establish environmental values for existing coastal environments that have not yet been identified. (CMR1 and CMR2.)	\$50,000					✓	✓
	Point source light industry emissions study (air).	\$200,000 per year for 3 years		✓			✓	✓
	Education and awareness raising project.	\$100,000 per year				✓	✓	✓
	Stakeholder engagement workshops to progress issue.	\$50,000 per year					✓	✓
	Assessment gaps – comparison, “what, who, where, is happening now”. (Survey audit.)						✓	
	Co-ordination gaps – One Stop Shop (can also be SCC Program Manager).						✓	

No	Name of Project	Funding Required	Tick Likely Fund Sources					
			Strategic Reserve	Cross-Regional	Enviro Fund	NLP	Other Public	Private Sources
	Incentive Scheme; possible devolved grant; champions.				✓			✓ (NB: investigate private sources to provide funds – legislative change)
	Review Industry Pilot Survey to target industries and continue incentive programs.						✓	
	Unauthorised Discharge Regulations training and resourcing (investigate way that this can occur).						✓	
	Develop program for Local Government to ensure that owners provide tenants with proper facilities that relate to the industry involved.							

4.2 Surface Water Salinity in Fresh Water Aquatic Environments

4.2.1 LM1.1 Priority areas for salinity risk management established in the Avon Upper Swan Region by 2005

4.2.1.1 Current Activities

LM1.1	MAT	Priority areas for salinity risk management established in the Avon Upper Swan Region by 2005	<ul style="list-style-type: none"> Facilitate salinity risk mapping, integrated surface and groundwater water quality monitoring and establishing salinity trends Assist interpretation of results and ground-truthing with land managers Identify priority areas for protection and remedial actions based on risk assessment, including areas of high biodiversity value, high value water resources, and land of high value for primary production 1-5 year priority Salinity Actions from the WA State Salinity Strategy (2000) implemented by 2009 Develop and implement an integrated regional information system to enhance planning, implementation, monitoring and evaluation
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NHT-Funded Projects	Non-NHT-Funded Projects
	<ul style="list-style-type: none"> ➤ Salinity Risk Mapping (Martin Wells, Land Capability). ➤ Hydrogeological, Woorooloo Brook Demonstration sites (Alinta Gas, Water Authority). ➤ Ken Angel Salinity Report. ➤ Salinity Risk to Road Infrastructure (Main Roads Department). ➤ Helena River (Water Corporation). ➤ Integrated Regional Information (Ag Maps). ➤ North East Corridor (DPI). ➤ Avon Arc (DPI). ➤ Risk Mapping (Fetdozew, CSIRO).

4.2.1.2 Adequacy

4.2.1.3 Gaps

- Research into alternative crops – alternative to annual agriculture and grazing.
- Possibility of Agriculture having information but human resources do not allow the time to find information.

4.2.1.4 Responses

Salinity Risk Mapping (ie: covering LM1.1)

- Salinity risk mapping for Woorooloo Brook area (including Helena River Catchment and Talbot area).
- One third of catchment has been mapped.
- Potential in 50% of catchment for salinity, so additional mapping required, approximately \$150,000.
- Link to MA which talks about high biodiversity, water resources and land of high production value.
- Check if Rapid Catchment Assessment is covering Woorooloo.

4.2.2 LM1.2 All Local and State Government planning agencies using local area land capacity and suitability information by 2009.

4.2.2.1 Current Activities

LM1.2	MAT	All Local and State Government planning agencies using local area land capability and suitability information by 2009	<ul style="list-style-type: none"> Facilitate the inclusion of land salinity risk assessments as a component of the planning approval process Support the review of the policy and legislation, including Environmental Protection Policies and, Statements of Planning Policy Assist in the development and implementation of decision support tools for planners, identifying land use change scenarios and predicting impacts
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NHT-Funded Projects	Non-NHT-Funded Projects
	<ul style="list-style-type: none"> ➤ Shire Chittering Town Planning Scheme & Ellen Brook Management Plan. ➤ Advice to Chittering Shire on development and land management. ➤ SPP 2.

4.2.2.2 Adequacy

4.2.2.3 Gaps

4.2.2.4 Responses

Decision Support Tool (ie: covering LM1.2)

- Decision support tool to enable plans to be developed for surface water management and remedial action (affects land).
- Tool for land use planners, managers and landholders.
- Identifier for areas for targeting landholders for high effort.
- This needs to lead to the establishment of a centralised (sub regional) data base accessible by all – community and government.
- Web based “tool kit” to allow a landowner to access risk for salinisation.

4.2.3 LM1.3 MAT Implementation of actions to address land salinity in priority areas of the Avon Upper Swan NAP Region by 2009.

4.2.3.1 Current Activities

LM1.3	MAT	Implementation of actions to address land salinity in priority areas of the Avon Upper Swan NAP Region by 2009	<ul style="list-style-type: none"> Implementation of large scale land salinity remedial actions in priority areas identified in LM1 Implement land use and management support programs (e.g. planning decision support tools, best practice guidelines, workshops, education and training, demonstrations) addressing land salinity and restoration. Assist development and implementation of management strategies for saline sites or those at risk, including property and catchment planning
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NHT-Funded Projects	Non-NHT-Funded Projects
	<ul style="list-style-type: none"> ➤ Grassed waterways. ➤ Perennial pastures. ➤ Tree planting. ➤ SCULP, SALP. ➤ Awareness raising. ➤ Property planning and catchment planning. ➤ Surface water control.

4.2.3.2 Adequacy

4.2.3.3 Gaps

4.2.3.4 Responses

- Forest Products Commission.

4.2.4 LM 1.4 30% increase in community participation in land salinity education, mitigation and remediation actions by 2009.

4.2.4.1 Current Activities

LM1.4	MAT	30% increase in community participation in land salinity education, mitigation and remediation actions by 2009	<ul style="list-style-type: none"> • Facilitate, support and motivate community and stakeholder involvement in land salinity actions • Facilitate best practice training in land salinity management, through community-training programs such as Property Planning and Heavenly Hectares through the integrated regional education and training program • Develop a landholder information service on sustainable land management • Develop and implement two new sector specific primary and secondary industry best management practice
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NHT-Funded Projects	Non-NHT-Funded Projects
<ul style="list-style-type: none"> ➤ Fencing waterways (SCCP/SALP, NHT). ➤ Forest Production Commission; Grove planting to achieve water table reduction (NHT). 	<ul style="list-style-type: none"> ➤ Landcare Group Field Days. ➤ Field Days. ➤ Heavenly Hectares. ➤ BMP – through Landcare Groups. ➤ Schools. ➤ Catchment Groups. ➤ BMP Manuals by Catchment Group. ➤ On Property Field Days (LCDC, Landcare Centre staff). ➤ New Sector: Native Grasses, Perennial Pastures, Floriculture, Sandalwood.

4.2.4.2 Adequacy

- Not adequate.

4.2.4.3 Gaps

- Resources (human) to enable willing participants to be assisted in remedial and other work.
- Include co-ordination of information available on alternative methods of revegetation.

4.2.4.4 Responses

- Commitment to undertake rehabilitation.
- Smaller landholders do not have tree planters/machinery so need assistance to plant.
- Larger landholders can undertake rehabilitation and do.
- Baseline data would be relatively easy to establish but time commitment to do this is unavailable.
- Lack of resources.
- Although the community is willing to be involved, there is a constraint in terms of coordinator capacity.

Additional staff – there will be a 0.4 FTE available next year.

Information Sharing (ie: covering LMI.4)

- Information service development across regions on workshops, training, ideas, etc. (sharing of information across regions on all programs).

Bush Foods (ie: covering LMI.4)

- Developing BMP's for new crops, and demonstration sites, eg: bush foods, etc.

Monitoring Participation (ie: covering LMI.4)

- Baseline data is available on community participation.
- Time and human resources are not available to collate.
- New Landcare Coordinator (0.4) next year may fill this role.

Recovery Catchment (ie: covering LMI.4)

- A major remediation project to reverse the salinisation of the Wooroloo/ Brockman (Upper Avon).
- It would incorporate all the issues of:
 - surface water control mechanisms;
 - strategic drainage revegetation;
 - incentive schemes for landholders to retain or enhance remnant vegetation;
 - biodiversity revegetation;
 - ground water pumping;
 - alternative tree cropping;
 - perennial pastures;
 - farming (property planning) to soil types;
 - evaporation basins (disposal).
- Can we identify this as a Recovery Catchment?

4.2.5 WM 1.5 30% increase in community participation in education, restoration, protection and management activities of the major rivers and waterways in the Region by 2009.

4.2.5.1 Current Activities

4.2.5.2 Adequacy

- Not Adequate

4.2.5.3 Gaps

- Perhaps need more industry specific programs.
- Resourcing issue (human and informational)
- Little understanding of how effective each program is in bringing about behavioural change.
- Assessment needed on a number of businesses involved.
- Timescales necessary for programs to meet their objectives.
- Resources spread too thinly to be effective.
- Co-ordination of all programs is a gap.
- Gap in number of industries and industry sectors .
- Incentives
- Disincentives.
- To get a 30% increase, the baseline has not been established.

4.2.5.4 Responses

Assessment of effectiveness (ie: covering WM 1.5)

- Assessment gap:
- defined outcomes;
- behavioural change;
- number of businesses involved;
- timescales;
- ongoing m&e plan.
- Vegemite approach?
- Set outcomes and deliverables.
- Consistent monitoring and auditing of existing programs and behaviour change.
- Existing NHT project on behaviour change monitoring and barriers.

Coordination of existing programs and projects (ie: covering WM 1.5)

- Coordination gap:
- involve more industry sectors;
- involve more industry numbers.
- Program Manager at SCC can fill this role – Web information potential.
- Existing NHT project.
- compliance and move beyond.

BMPs (ie: covering WM1.5)

- Incentives:
- green procurement;
- UDR's.
- BMP's dissemination and collation; ability to assess cumulative impact.
- Review and ground-truth the industries in SCCP Light Industry Report to re-prioritise industry sectors.

Local Government (ie: covering WM1.5)

Investigate options to resource LGA's to enforce UDR's and assist SME's to reach

4.2.6 WM 5.1 Establish monitoring systems to develop Resource Condition Targets for surface water salinity in the Avon Upper Swan Region by 2005.

4.2.6.1 Current Activities

4.2.6.2 Adequacy

4.2.6.3 Gaps

4.2.6.4 Responses

- No adequate coordinated database.
- Monitoring inadequate.
- Data collected but not dispensed.
- Would be a very useful tool if information gathered was collated.

4.2.7 WM 5.2 100% of all relevant NRM legislation and policy reviewed and amendments recommended to address surface water salinity in the Avon Upper Swan Region by 2006.

4.2.7.1 Current Activities

4.2.7.2 Adequacy

4.2.7.3 Gaps

4.2.7.4 Responses

- Decision making tool.

4.2.8 WM 5.3 Implement identified remedial actions to address surface water salinity in the Avon Upper Swan Region by 2009.

4.2.8.1 Current Activities

4.2.8.2 Adequacy

4.2.8.3 Gaps

- Large scale surface water remedial action not happening.
- Management action happening.

4.2.8.4 Responses

4.2.9 WM 5.4 20% increase in community participation in salinity education, mitigation and remediation activities by 2009.

4.2.9.1 Current Activities

4.2.9.2 Adequacy

- Plenty of programs happening.
- Willing participants.

4.2.9.3 Gaps

- Lack of resources, human and funding.

4.2.9.4 Responses

4.3 SOIL CONDITION: NUTRIENTS IN AQUATIC ENVIRONMENTS

4.3.1 WR3 Nutrients in Aquatic Environments

4.3.1.1 Current Activities

4.3.1.2 Adequacy

4.3.1.3 Gaps

- 20% increase, but what is the starting point?
- Industry awareness of BMP's needs further support to the Greenstamp program.
- Better understanding of groundwater nutrient movements.
- Dissemination of information
- Collection of information from all sources.
- Passing of information between industry, state and local government and vice versa
- Service Providers to rural Industry (contractors and suppliers) need to be educated about the right products.
- Best Practice Demonstration Farms
- Financial impact
- Understanding of nutrient export from different land uses.

4.3.1.4 Responses

Information Coordination

- Seek all relevant information.
- Package information in a user friendly format.
- Extension of environmental assessment.
- Pull together information.
- Learn from South West Region's Nutrient Smart project.
- Plain language.
- One Stop Shop: physical shop, not just internet (Web and / or GIS).

Onsite farm audits

- business (horticulture, light industry);
- private (lifestyle);
- consultant business – upper end,
- farm audit – lower end.

Business Demonstration sites.

- Commercial Best Practice (eg: 5 farm demonstration sites).

Incentive Scheme

- Incentive scheme to support business to purchase monitoring equipment (data to community and organisations).

Nutrient Management Plans

- In particular, it would be beneficial to have an understanding of total nutrient and water budget for different land uses (predominantly agriculture) throughout the region. This may involve extensive site specific demonstration farms that can determine inputs of water/nutrients, fertiliser application rates, utilisation of nutrients by the relevant crop types and export of nutrients via surface runoff, sediment loss, and groundwater leaching. Could build on existing information, for example work done on dairy farms import and export rates for the Peel Harvey area.
- BMP - Nutrient Management Plans for farms to meet targets.
- Currently driven by fertiliser applications for economic and productivity gains.

Environmental Nutrient Management in Irrigation Farms

- There is information available to farmers on best practice for fertiliser type and usage relevant to the crop type (would be collated in the information project) with the focus being economic (eg: wastage of fertiliser is loss of money to farmers). A nutrient irrigation management plan needs to be developed to provide farmers and land users (eg: turf aligning river edging) the suitable fertiliser type and application rate to meet the resource condition target of meeting 0.1mg/L of TP and 1mg/L of TN. An extension to this project would be then to provide best practice for herbicide and pesticide usage, although this does not directly meet this RCT but rather other water resource targets such as aquatic integrity.

Economic Assessment

- Economic summary of gross productivity / yield to give an understanding of different land uses for the Swan Region (eg: horticulture, viticulture, forestry, semi-rural).

Groundwater Research

- Better understanding of groundwater nutrient movement.
- Region-wide baseline data.

4.3.2 WM 3.2 10% of all relevant NRM legislation and policy reviewed and amendments recommended to address nutrient enrichment by 2006.

4.3.2.1 Current Activities

4.3.2.2 Adequacy

- Adequate

4.3.2.3 Gaps

4.3.2.4 Responses

- NRM Manual (ie: covering WM3.2)
- Councils adopting NRM Manual for Local Government.
- Officer to talk to Councils and sell policies.

4.3.3 WM 3.4 20% increase in community participation in nutrient intervention education, restoration, protection and management activities by 2009.

4.3.3.1 Current Activities

4.3.3.2 Adequacy

- Not Adequate

4.3.3.3 Gaps

4.3.3.4 Responses

4.3.4 WM 3.2 All relevant NRM legislation and policy reviewed and amendments recommended to address nutrient enrichment by 2006

4.3.4.1 Current Activities

4.3.4.2 Adequacy:

- Adequate
- Depends on legislation

4.3.4.3 Gaps

- Needs coordination and financing.
- Needs commitment at Ministerial level. Getting Councils to adopt NRM Manual (In progress)
- No enforcement.
- Water quality targets but no BMP or Management targets.
- Need a better approach to improving performance in existing light industry areas.

4.3.4.4 Responses

Information Sheets (ie: covering WM3.2)

- Information Sheets continued.
- Properties leased – landlords need to take responsibly.
- Site specific management needed.
- Trucks – haulage is a problem.
- MRD and Transport.

4.3.5 WM 3.4 20% increase in community participation in nutrient intervention education, restoration, protection and management activities by 2009

4.3.5.1 Current activities

4.3.5.2 Adequacy

- Not adequate.
- Can't get away from their work place.
- Too busy making money – industry
- Local Government officers – to pick up powers of UDRs

4.3.5.3 Gaps

- Face to face approach for industry awareness
- BMP stimulation; pick key areas first.
- Compliance first, then go on to BMP (Local Government limited to compliance).
- Not enough resourcing going into implementation.
- Baseline data for 20% community participation.
- State and Local Government to provide technical support for BMP implementation of intervention of nutrient and other contaminants.

4.3.5.4 Responses

Industry Change (ie: covering WM3.4)

- Technical support for face-to-face industry awareness; changing industry behaviour.
- Industry change:
 - one on one – face-to-face;
 - talk to industry peak bodies.
- Leveraging off existing programs.

4.4 Turbidity / suspended particulate matter in aquatic environments

4.4.1 W4 Turbidity/Suspended Particulate Matter in Aquatic Environments.

4.4.1.1 Current Activities

4.4.1.2 Adequacy

- Not Adequate

4.4.1.3 Gaps

- Monitoring of sediment.
- WM 4.2 – 100% of all NRM legislation by 2006; setting up to fail as NRM policies changing etc.; should prioritise what legislation or policies will be relevant to the RCT.
- Concern that targets will be met by 2005; known information for TSS but not turbidity.
- ‘Representative sites’ - have they been set now and if so, is there enough data or information to set the targets by 2005?
- WM4.2 – Landuse planner overload.
- WM4.3 – unsure of any current projects.

4.4.1.4 Responses

Possible Projects – no consensus reached:

- Landuse Planner Overload.
- Succession planning.
- Certification guidelines for industry and local government agencies.

4.4.2 WM 4.4 20% increase in community participation in education, restoration, protection and management activities for managing turbidity / particulate matter by 2009.

4.4.2.1 Current Activities

4.4.2.2 Adequacy

- Not adequate.
- A lot of the current activities for WM3.2 and WM3.4 will address WM4.4.

4.4.2.3 Gaps

- Refer to WM3.4.
- Acceptable level of turbidity.

4.4.2.4 Responses

4.5 Soil Condition

4.5.1 LR2 Maintain and improve soil condition as measured at representative sites, including extent of water erosion, waterlogging and acid sulfate soils, by 2020 (with a quantified targets set by December 2005)

4.5.1.1 Current Activities

LM2.1	MAT	Establish benchmarks and monitoring at representative sites for water erosion, waterlogging and acid sulfate soils by 2005	<ul style="list-style-type: none"> Identify areas of agricultural land affected by water erosion and waterlogging and the level of application of best management practice Identify priority areas for remedial actions based on risk assessment, including areas of high biodiversity value, high value water resources and land of high value for primary production <ul style="list-style-type: none"> Assessment of areas of acid sulfate soils risk, and implementation of Framework for Acid Sulfate Soils Support and integrate development of monitoring systems to analyse and set baseline and trend information for land condition parameters Develop an integrated regional information system to enhance planning, implementation, monitoring and evaluation
LM2.2	MAT	100% of all relevant current NRM policy and legislation reviewed and recommended amendments to minimise risk of water erosion, waterlogging and acid sulfate soils made by 2006	<ul style="list-style-type: none"> Support the review of the policy and legislation, and recommend changes to Environmental Protection Policies, Statements of Planning Policy local planning policies to address water erosion, waterlogging and acid sulfate soils risk Facilitate the inclusion of ASS risk assessments as a component of the Local and State Government agencies planning approval process Assist in the development and implementation of decision support tools for planners, identifying land use change scenarios and predicting impacts

NHT-Funded Projects	Non-NHT-Funded Projects
	<ul style="list-style-type: none"> DoE – measuring of loads from 4 sites within Swan Region. DoE – mapping with WAPC on acid sulphate soils. Land capability analysis – appropriate land uses over soil types. Statement of Planning Policy for Acid Sulphate Soils. Acid sulphate soil modelling and workshops on mapping.
	<ul style="list-style-type: none"> SRT – foreshore assessment of Swan-Canning Rivers, identifying erosion and water erosion.

4.5.1.2 Adequacy

- Partly adequate

4.5.1.3 Gaps

- Education of decision makers.
- Information reticulation by authorities and organisations (between authorities and land owners).
- Regional approach needed but keep contact with landowners.
- Poor appreciation by authorities of land users.
- Lip service to sustainability model (economy, social and environment).
- Concern to set targets by 2005.
- ASS is a major issue throughout Swan Canning Rivers system, unknown to set target by 2005 (environmental impacts).

- Setting targets like 100% (LM2.2)
- Planning – TPS and land use modelling are major gaps.
- Information on waterlogging?
- Evaluation of industry initiatives and programs as well as developing education package for local government to understand industry drivers, business realities and environmental improvements.
- Awareness between decision makers and industry.

4.5.1.4 Responses

BMPs (ie: covering LR2)

- Usage of BMP's by industry: question usefulness; question attitude (behaviour change).
- Need professional marketing of BMPs.
- Need support by Local Government - By-laws and business associations (not a shared responsibly approach). State and local cost shifting.

Education

- Establish and expand education programs.

4.5.2 LM 2.3 Regional soil health program developed, with implementation of identified remedial and preventative actions in identified priority areas by 2009.

4.5.2.1 Current Activities

LM2.3	Regional soil health program developed, with implementation of identified remedial and preventative actions in identified priority areas by 2009	<ul style="list-style-type: none"> • Develop and implement programs for priority areas for water erosion control, waterlogging remediation and management of acid sulfate soils risk, including implementing industry best practice guidelines • Implementation of State Weed Strategy (2001)
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NHT-Funded Projects	Non-NHT-Funded Projects
<ul style="list-style-type: none"> ➤ Stormwater Manual currently being developed (DOE) (also LR2). 	<ul style="list-style-type: none"> ➤ ASS mapping in the Swan Coastal Region and limited inland area. ➤ LMBE project for inland acidity, funded by Commonwealth. ➤ Sub-catchment Implementation Plans – identify erosion and waterlogging. ➤ Perth Groundwater Atlas (contaminated sites mapping) (also LR2). ➤ Local government policy re: contaminated sites, etc. ➤ Local Government Industry Audit Program. ➤ SPP for Acid Sulphate Soils. ➤ Wetlands nutrient stripping assists in the prevention of river contamination.

4.5.2.2 Adequacy

4.5.2.3 Gaps

4.5.2.4 Responses

4.5.3 LM2.4 Industry Best Management Practices (BMP's) defined with benchmarks for implementation established by 2009 for eight land use / industry sectors.

4.5.3.1 Current Activities

LM2.4	MAT	Industry Best Management Practices (BMP's) defined with benchmarks for implementation established by 2009 for eight land use / industry sectors	<ul style="list-style-type: none"> • Define current industry BMP's and support implementation of sustainable BMP programs for primary industry and small-medium enterprise sectors • Define current industry BMP's and support implementation of sustainable BMP programs for secondary industry sectors
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NHT-Funded Projects	Non-NHT-Funded Projects
<ul style="list-style-type: none"> ➤ Part-funded: Nursery Fact Sheets; Bayswater Local Government Audit Program (NHT). ➤ Pilot projects – Wangara Catchment (NHT). 	<ul style="list-style-type: none"> ➤ BMP for vegetable crops. Nutrients and irrigation (plus works with pests R&D)(DAWA). ➤ A Web-based expert system for efficient vegetable irrigation on sands(WAVGA). ➤ Greenstamp: Motor, cleaners, printers (also LR2). ➤ Oil contamination of soil and stormwater. ➤ River contamination. ➤ Develop stormwater health.

4.5.3.2 Adequacy

4.5.3.3 Gaps

- Item 2.4 lacking.
- BMP's limited to membership of organisations on non related industry organisations.
- Conflicting BMP's?
- Who takes responsibility for implementing BMP's?
- Who monitors BMP's?

4.5.3.4 Responses

4.5.4 LM 2.5 30% increase in land managers, planners and community participation in soil condition education, mitigation and remediation activities by 2009

4.5.4.1 Current Activities

LM2.5	MAT	30% increase in land managers, planners and community participation in soil condition education, mitigation and remediation activities by 2009	<ul style="list-style-type: none"> • Facilitate, coordinate, support and motivate community groups • Develop and implement a training and support program for best management practices relating to soil condition and remediation, including through tertiary institutions and TAFEs • Facilitate implementation of soil health management protocols, guidelines and training • Continue and expand existing community training programs such as Property Planning and Heavenly Hectares through the integrated community education and training program • Rural, semi-rural and special rural zone landholders have access to market based instruments/incentives for sustainable land management by 2007 • Form strategic partnerships with the Urban Development Institution of
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			Australia (UDIA) for protection of land assets • Assist identification of information needs / gaps in quality of land resource information
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NHT-Funded Projects	Non-NHT-Funded Projects
➤ Small landholder project (SCCP).	➤ BCCG, TRCG, SERCUL Stormwater and Nutrient Education across City of Canning and Melville (also 2.4).

Questions from discussion

- Impact of drainage into marine environment?
- Construction sector?
- Small scale waste disposal (eg. BMP for small industry)

4.5.4.2 Adequacy

4.5.4.3 Gaps

4.5.4.4 Responses

4.6 Sustainable production aspects of air quality

4.6.1 AR 1 Continue to progress towards improved air quality, with Resource Condition Targets to be set for air quality by 2005

4.6.1.1 Current Activities

AM1.1	MAT	Establish set of monitoring systems to collect/analyse baseline and trend information, to enable setting of Resource Condition Targets for air quality by 2005	<ul style="list-style-type: none"> Collect/analyse baseline and trend information Work with DoE and associated partners to set Resource Condition Targets for air quality
AM1.2	MAT	Establish a partnership framework to assist in the implementation of the Air Quality Management Plan 1–5 year actions by 2008	<ul style="list-style-type: none"> Initiate inventory of small-medium sized enterprise emissions linked to the National Pollution Inventory by 2008 Establish partnership linkages with Air Quality Coordinating Committee (AQCC) Working Group for information transfer and progress reporting Support wider regional community and stakeholder participation in programs relating to air quality improvement

4.6.1.2 Adequacy

- Probably Adequate (subject to the Perth Air Quality Management Program being implemented)

4.6.1.3 Gaps

- Lack of jointly developed projects – not based on partnerships.
- Who should be monitoring air quality data?
- Gap in knowledge / data of point source light industry emissions.

4.6.1.4 Responses

4.6.2 AR 2 Set Resource Condition Targets to manage climate risk and reduce risk of major environmental, economic or social outcomes from drought or coastal land impacts

4.6.2.1 Current Activities

AM2.1	MAT	Undertake risk assessment of impacts and develop priority actions for climate change impacts on NRM by 2009	<ul style="list-style-type: none"> Support research risk of climate change to NRM Support Research into climate variability Support an education program on Climate Change and long-term climate variability
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Non-NHT Projects

- DOE (EPA Act) Air Quality Branch.
- Perth Air Quality Management Plan.
- CALM burn-offs and car emissions.

4.6.2.2 Adequacy

4.6.2.3 Gaps

4.6.2.4 Responses

4.6.3 AM 1.2 Establish a partnership framework to assist in the implementation of the Air Quality Management Plan 1-5 year actions by 2008

4.6.3.1 Current Activities

4.6.3.2 Adequacy

4.6.3.3 Gaps

4.6.3.4 Responses

4.7 Sustainable Production Aspects of Coastal and Marine

4.7.1 CMR1 Maintain and improve the condition of marine habitats in the Region, as measured at representative sites by 2020 (with a quantified target set by 2005).

? (low priority)

4.7.2 CMR2 Maintain and improve the condition of marine habitats in the Region, as measured at representative sites by 2020 (with a quantified target set by 2005). Action plan developed to manage the impacts on marine water quality and monitor and evaluate remediation programs by 2006.

4.7.2.1 Current Activities

4.7.2.2 Adequacy

- Not adequate

4.7.2.3 Gaps

4.7.2.4 Responses

4.7.3 CMM1.5 30% increase in community participation in biodiversity education, mitigation and remediation actions by 2009.

4.7.3.1 Current Activities

4.7.3.2 Adequacy

- CMM1.5 – Question whether it is relevant to light industry targets given that there is almost no light industry on the coast within the Swan Region and highly unlikely to ever be, so very little point source pollution. (This contrasts with the interpretation of CMM 1-5 to mean light industry impact from the region, on the coast and marine.)
- Sewerage treatment plant and Water Corporation release of effluent into marine environment – not captured in targets. Future urban development is likely to have an impact if not managed now.
- Mineral sand mining – still pressure to mine areas along the coast that must be managed.

4.7.3.3 Gaps

- Resource Condition Targets are interpreted differently.

4.7.3.4 Responses

4.7.4 CMM2.3 Action Plan developed to manage the impacts on marine water quality and monitor and evaluate remediation programs by 2006.

4.7.4.1 Current Activities

4.7.4.2 Adequacy

4.7.4.3 Gaps

- Where there are no standards available – there should be.

4.7.4.4 Responses

- Social, Economic, Environmental Values in Strategy.

5. Coastal & Marine Delivery Program

5.1 Recommended projects

The recommended set of projects for **NHT Regional Funding** for this Program is:

Table 10: Coastal and Marine Projects recommended for NHT2 Funding

	<i>Name of Project</i>	<i>Indicative NHT Regional Funding</i>
1.	Monitoring and information systems projects	\$80,000
2.	Protection and restoration targets for coastal areas.	\$100,000
3.	Maps of existing information of marine fauna.	
1.	Maps of existing information on marine fauna.	

The recommended set of projects for **Other Sources Funding** for this Program is:

Table 11: Coastal and Marine Projects Recommended for Funding from Non-NHT2 Sources

	<i>Name of Project</i>	<i>Indicative Funding</i>
1.	Monitoring and information systems project (m&e part).	\$100,000
2.	Situational analysis of marine habitats.	\$100,000
3.	Key indicator species.	
4.	Listing of threatened species.	
5.	Collaborative research on the impacts of recreational fishing.	
6.	Framework for sustainable aquaculture.	

Table 12: Suggested Funding Sources for non-NHT2 Coastal and Marine Projects

<i>No</i>	<i>Name of Project</i>	<i>Funding Required</i>	<i>Tick Likely Fund Sources</i>						
			<i>Strategic Reserve</i>	<i>Cross-Regional</i>	<i>Enviro Fund</i>	<i>NLP</i>	<i>Other Public</i>	<i>Private Sources</i>	
1.	Monitoring and Information Systems project (m&e part).		\$100,000						
1.	Situational analysis of marine habitats (CMM2.1, 2.2, 2.5 + 2.6)	\$100,000	✓		✓		✓	✓	
1.	Key indicator species (highest priority)		✓	✓					
2.	Collaborative research on impacts of recreational fishing		✓	✓					
3.	Framework for sustainable aquaculture (lowest priority)		✓	✓					
4.	Listing of threatened species (highest priority)		✓	✓					

5.2 Maintain and improve the condition of terrestrial coastal habitats in the Region, as measured at representative sites, by 2020

5.2.1 CMM 1.1 100% of priority natural coastal areas identified and assessed by 2005.

5.2.1.1 Current Activities

CMM 1.1	MAT	100% of priority natural coastal areas identified and assessed by 2005	<ul style="list-style-type: none"> Establish monitoring systems to collect/analyse baseline and trend data Identify adequate buffer zones to protect coastal biodiversity from predicted sea level rise Identify areas requiring wide setbacks, where ecosystem processes may be impaired by sea level rise Compile, document and forecast current and predicted human usage of coastal resources Develop an integrated regional information system to enhance planning, implementation, monitoring and evaluation
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NHT-Funded Projects	Non-NHT-Funded Projects
	<ul style="list-style-type: none"> ➤ Perth Coastal Planning Strategy is looking at 1.1. (DPI - \$300,000) by December 2005. ➤ Bush Forever has identified 1.1 coastal priority areas (P&R) – (DPI / CALM / DoE \$10 million per year). ➤ PBP – more detailed (NHT). ➤ Local Council Biodiversity Strategies, eg: Wanneroo, Cambridge, Joondalup, Kwinana.

5.2.1.2 Adequacy

- Not adequate for the integrated regional information system.
- WALIS is being reviewed.

5.2.1.3 Gaps

Action point one:

- Monitoring systems to collect and analyse data.
- Quantified target for 2005 is needed soon

Action point five:

- Needs integration.

5.2.1.4 Responses

Monitoring and Information Systems Project (i.e. covering CMM1.1)

- Current and existing data, what exists, where held, formats, review of information – Cathy Ronald's meta database.
- Vegetation condition mapping and weed mapping exists for some Local Governments; Northern metropolitan suburbs have more areas completed; this information needs to feed into something.
- Review of WALIS is currently occurring.
- More guidance for this may come from the terrestrial biodiversity targets and program.
- What needs to be monitored?
- Statewide database?
- Develop logical framework for data.
- Identify custodian for data.

5.2.2 CMM 1.2 100% of priority coastal areas have five year protection and restoration targets defined for wind erosion by 2005.

5.2.2.1 Current Activities

CMM 1.2	MAT	100% of priority coastal areas have five year protection and restoration targets defined for wind erosion by 2005	<ul style="list-style-type: none"> • Determine extent of wind eroded coastline • Develop strategies to meet targets to reduce coastal dune areas affected by coastal wind erosion
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No current activities were identified.

5.2.2.2 Adequacy

- Not Adequate
- Needs to be modified to capture all issues. New wording suggested as: “100% of priority coastal areas have five year protection and restoration targets by 2005 to determine the extent of degraded coastline and develop strategies to meet targets to reduce coastal dune areas affected by degradation”. This modification will allow for priority areas to be identified.

5.2.2.3 Gaps

- Other pressures **cause** wind erosion and related degradation (eg weeds), therefore: remove ‘wind’; remove ‘for wind erosion’; change ‘wind erosion’ to ‘degradation’.

5.2.2.4 Responses

Protection and Restoration Targets for Coastal Areas (ie: covering CMM1.2)

- Use PBP framework.
- Add in social information.
- Ideas: possibility of (i) delivery through PBP and grant program to get Local Government to do work; delivery through PBP – use PBP framework, maybe PBP staff or contract work out;
- \$100,000 would mean one officer full time for twelve months to do this work.

5.2.3 CMM 1.3 100% of Councils adopting or updating local coastal plans and policies by 2009.

5.2.3.1 Current Activities

CMM 1.3	MAT	100% of Councils adopting or updating local coastal plans and policies by 2009	<ul style="list-style-type: none"> • Support National and international effort into sea level rise modelling and research • Promote the Coastal SPP 2.6 widely to Councils to ensure consideration is given to issues such as sea level rise when establishing appropriate setbacks for new developments • Develop and implement Perth Coastal Planning Strategy
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NHT-Funded Projects	Non-NHT-Funded Projects
	<ul style="list-style-type: none"> ➢ Bureau of Meteorology. ➢ ICAG. ➢ UWA. ➢ CSIRO.

5.2.3.2 Adequacy

- Adequate
- Local governments are undertaking coastal plans and policies but not addressing sea level rise.

5.2.3.3 Gaps

- Adequate.

5.2.3.4 Responses

5.2.4 CMM 1.4 20% increase in on-ground community environmental restoration programs addressing coastal dune wind erosion in priority areas by 2007.

5.2.4.1 Current Activities

CMM 1.4	MAT	20% increase in on-ground community environmental restoration programs addressing coastal dune wind erosion in priority areas by 2007	<ul style="list-style-type: none"> • Develop and implement local natural diversity strategies and revegetation works for priority areas
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NHT-Funded Projects	Non-NHT-Funded Projects
<ul style="list-style-type: none"> ➤ EnviroFunds (NHT). 	<ul style="list-style-type: none"> ➤ Coastwest (DPI). ➤ SALP (SRT / Alcoa). ➤ Local Government (individuals). ➤ Corporate. ➤ Management of terrestrial portions of Island Reserves: <ul style="list-style-type: none"> • CALM Reserves; • Rottnest Island; • Garden Island. ➤ Includes: <ul style="list-style-type: none"> • implementation of Management Plans; • erosion mitigation and repair.

5.2.4.2 Adequacy

- Adequate
- Needs to be modified to capture all issues. New wording suggested as:
- “20% increase in on-ground environmental restoration programs addressing coastal degradation in priority areas by 2007”.
- There is concern that this MAT won’t acknowledge large projects towards meeting the 20% increase. For example, one large program may be better than 10 small programs but won’t necessarily be acknowledged as a 20% increase.

5.2.4.3 Gaps

- Local government should be included: for example ‘community and local government’; **or** cross out ‘community’ as too specific. (*preferred.*)
- Remove ‘dune wind erosion’ and change to ‘degradation’ to fill gap of degradation.

5.2.4.4 Responses

5.2.5 CMM 1.5 30% increase in community participation in biodiversity education, mitigation and remediation actions by 2009.

5.2.5.1 Current Activities

CMM 1.5	MAT	30% increase in community participation in biodiversity education, mitigation and remediation actions by 2009	<ul style="list-style-type: none"> • Coordinate, facilitate and support community and stakeholder involvement • Training and capacity building for Local Government Authorities and community on coastal biodiversity/ecology • Include stormwater education, water use efficiency and water conservation into the regional training and education program • Continue and expand existing community training programs such as Swan-Canning Cleanup Program education initiatives, Great Gardens workshops, Ribbons of Blue, Wetland Watch and Skills for Nature Conservation, through the integrated regional education and training program • Continue to provide incentives for landholders and land managers such as the Swan Alcoa Landcare Program
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NHT-Funded Projects	Non-NHT-Funded Projects
<ul style="list-style-type: none"> ➤ NRM Officers – NHT. ➤ Beach Health, Stormwater, DoE, SCC, NHT, Water Corporation and Department of Health. 	<ul style="list-style-type: none"> ➤ Great Gardens (SRT). ➤ ICLEI Water Use Efficiency - Water Campaign for LG. ➤ Water Resources SPP (DPI, DOE).

5.2.5.2 Adequacy

- Adequate
- Existing training programs need modification so they include coast and marine.
- Remove the word ‘community’ from the MAT.

5.2.5.3 Gaps

- Extend Skills for Nature program to include coast or new program focusing on coast.

5.2.5.4 Responses

5.3 Maintain and improve the condition of marine habitats in the Region, as measured at representative sites, by 2020 (with a quantified target set by 2005)

Situational Analysis Project (i.e. covering all of RCT2)

- General observation: lack of coordination between projects.
- The gaps across all 6 Management Actions point to one key project that is a Situational Analysis Project, to assist project management, scoping and coordination.
- First need is for map of what is happening – a project?
- High priority research project for Program Manager and Reference Group to inform this process.

5.3.1 CMM2.1 100% of priority marine habitats identified for protection by 2006.

5.3.1.1 Current Activities

CMM 2.1	MAT	100% of priority marine habitats identified for protection by 2006	<ul style="list-style-type: none"> • Identify regionally representative marine habitat types using the Comprehensive Adequate Representative (CAR) approach • Develop habitat map and undertake threat analysis to those habitats, including critical habitats for significant species • Determine priority areas for management/protection based on threat analysis. • Develop an ecological monitoring program • Review and expand ecological reference sites • Compile, document and forecast current and predicted human usage of estuarine and marine resources, focusing on priority marine habitats
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NHT-Funded Projects	Non-NHT-Funded Projects
<ul style="list-style-type: none"> ➤ Literature Review conducted for SCC on previous and existing coastal and marine research; should be considered for more information. 	<ul style="list-style-type: none"> ➤ CALM marine conservation reserve program. Swan, Shoalwater, Marmion - \$41,500. ➤ Development of management plans with MATs specific to each Marine Park. ➤ Murdoch University Benthic Habitat Project (ARC grant 4 years). ➤ CSIRO – Habitat Mapping Project (Strategic Research Fund for Marine Environment) – (\$7 million – 2007). ➤ Coastal CRC / UWA / FUGRO Habitat and Sea Floor Mapping Project. ➤ Current Marine Monitoring Programs: <ul style="list-style-type: none"> • CALM established sites in Shoalwater Island Marine Park, Swan Estuary, Marmion Marine Park (including sanctuary zone effectiveness). • ECU monitoring, DALSE (Cockburn Cement – Owen Anchorage) and Marmion Marine Park (Water Corporation). ➤ Indigenous Fishing Strategy.

5.3.1.2 Adequacy

- Probably not adequate.
- Cross check with literature review.
- How much collaboration between these projects?
- Who are the key contacts?

5.3.1.3 Gaps

- Need map.
- Need more information on scope (gap is our knowledge)

5.3.1.4 Responses

- Speed up existing projects.
- Timeline needed for the recording of baseline data.
- Need to clearly scope what the MAT actually means.

5.3.2 CMM 2.2 100% of all marine habitat areas affected by introduced marine pests in ‘at risk’ areas identified by 2007.

5.3.2.1 Current Activities

CMM 2.2	MAT	100% of all marine habitat areas affected by introduced marine pests in ‘at risk’ areas identified by 2007	<ul style="list-style-type: none"> • Identify ‘at risk’ areas and sources with potential for infestation and establish monitoring program (in collaboration with Action Plan for marine water quality) • Support the preparation of the State framework for management response to marine pests • Respond to suspected incursions in accordance with the National and State framework for management response to marine pests
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NHT-Funded Projects	Non-NHT-Funded Projects
	<ul style="list-style-type: none"> ➤ Introduced Marine Pests. Fred Wells (F&FHP). Fisheries (?). ➤ CSIRO (National). Centre for research of Introduced Marine Pests (5 years prior, now published).

5.3.2.2 Adequacy

- Clearly insufficient.
- Component of CMM 2.1.

5.3.2.3 Gaps

5.3.2.4 Responses

- Coast and Marine Reference Group to coordinate project with key agencies.
- scoping;
- set parameters;
- set time lines;
- how to resource.

5.3.3 CMM2.3 Action Plan developed to manage the impacts on marine water quality and monitor and evaluate remediation programs by 2006.

5.3.3.1 Current Activities

CMM 2.3		Action Plan developed to manage the impacts on marine water quality and monitor and evaluate remediation programs by 2006	<ul style="list-style-type: none"> • Develop a monitoring and evaluation action plan consistent with the Perth Coastal Waters (2000) • Develop research and monitoring to define natural variability of marine quality measures in conjunction with existing monitoring programs (ongoing) using priority and reference sites • Develop regional information system to enhance planning, management, monitoring and evaluation • Update the Contaminated Inputs Inventory annually • Define the impacts of stormwater on nearshore marine habitat • Define the impacts of boat sewage discharge in heavily used areas
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NHT-Funded Projects	Non-NHT-Funded Projects
<ul style="list-style-type: none"> ➤ Beach Health Project. NHT @ \$230,000. (second last dot point). ➤ Waste oil and boat battery recycling project at Hillaries Boat Harbour (NHT). 	<ul style="list-style-type: none"> ➤ CCL (DALSE) WQMP for Owen Anchorage (Dec.- Mar.) ➤ CSMC: WQMP for Cockburn Sound (December. – March.) ➤ UWA / CWR groundwater flux to Cockburn Sound (Alicia Loveless PhD.) ➤ Water Corporation: WQM Sepia Depression Swanbourne, Ocean Reef. ➤ SRT: WQM Swan Estuary. ➤ Rottnest Island Authority: Impacts of boat sullage on WQ (SRFME?). ➤ Cockburn Sound Seagrass Mapping and Management (also CMR2).

5.3.3.2 Adequacy

- Not Adequate
- Monitoring

5.3.3.3 Gaps

- Coordination needed of existing programs in relation to SCC and gap analysis.

5.3.3.4 Responses

- Focus on 2.1 and 2.2, then 2.3 will flow from these prior steps.

5.3.4 CMM 2.4 100% of Local Governments with ocean outfalls have stormwater action plans established by 2008.

5.3.4.1 Current Activities

CMM 2.4	MAT	100% of Local Governments with ocean outfalls have stormwater action plans established by 2008	<ul style="list-style-type: none"> • Facilitate the development of a Memorandum of Understanding (MoU) between Local Governments to ensure stormwater is managed collaboratively • Implementation of existing stormwater management plans (including the WESROC’s Strategy) • Establish partnerships with Agencies and Local Government for implementation of the Beach Watch program
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NHT-Funded Projects	Non-NHT-Funded Projects
<ul style="list-style-type: none"> ➤ Beach Health Project. [excludes Water Corporation drain outfalls] \$230,000 (approx.) 	<ul style="list-style-type: none"> ➤ Local Governments (various specific and individual stormwater activities.) (More information needed).

5.3.4.2 Adequacy

- Not Adequate (caveats)
- Beach Health project: does it do CMM 2.3 (last dot point)? It’s a trigger.
- Diffuse versus point source – needs to be carefully considered.

5.3.4.3 Gaps

5.3.4.4 Responses

- Is dependent upon outcomes of the Beach Health project.

5.3.5 CMM 2.5 20% increase in marine habitat restoration programs by 2007

5.3.5.1 Current Activities

CMM 2.5	MAT	20% increase in marine habitat restoration programs by 2007	<ul style="list-style-type: none"> • Implement 1-5 year groundwater quality targets outlined in the Cockburn Sound Management Plan • Implement the remaining recommendations for the State Marine Parks and Reserves Authority (MPRA) marine conservation reserve system • Support the extension of Shoalwater Islands Marine Park • Develop and implement management program for priority areas, including protection and restoration of habitat for significant species • Provide management facilities to reduce the impacts of boat sewage discharge in heavily used areas
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NHT-Funded Projects	Non-NHT-Funded Projects
	<ul style="list-style-type: none"> ➤ Cockburn Cement – seagrass restoration project. Work done by Murdoch University. \$120,000 per year. Ongoing – 3 years. ➤ CALM – priority; <ul style="list-style-type: none"> • Swan Estuary Marine Park. Protection of wader bird habitat for migratory species; • On-ground works including fencing, Management Plan, implementation (and other wildlife – little penguins, sea lions). ➤ RIA study (see note under 2.3).

5.3.5.2 Adequacy

- Adequate (check CALM).
- A lot of on-ground action.
- CALM works closely with Local Governments.
- With CALM management plans – if CALM is OK – then OK.

5.3.5.3 Gaps

5.3.5.4 Responses

- Scope MAT.
- Check with CALM.
- Questions on the achievability of existing management plans.
- Link to 2.1 + 2.2.
- Option: use Reference Group to action.
- Need to assess logic flow for this process.

5.3.6 CMM 2.6 30% increase in community and stakeholder participation in education, mitigation and remediation activities related to marine habitat protection by 2008.

5.3.6.1 Current Activities

CMM 2.6	MAT	30% increase in community and stakeholder participation in education, mitigation and remediation activities related to marine habitat protection by 2008	<ul style="list-style-type: none"> • Coordinate, facilitate and support community and stakeholder involvement in protection of marine habitat • Support community initiatives to protect marine habitat, through Marine Community Monitoring Program and Fish Habitat Protection Areas • Establish partnerships with agencies and Local Government for implementation of the Beach Watch program • Increase community and boat user understanding about introduced marine pests • Promote inclusion of marine habitat restoration and management training through tertiary institutions and TAFE's • Investigate and promote mechanisms for Local Government to support management of marine habitat
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NHT-Funded Projects	Non-NHT-Funded Projects
<ul style="list-style-type: none"> ➤ CALM (NHT funded) Marine Community Monitoring Program (end 2004). 	<ul style="list-style-type: none"> ➤ Community involvement and education, eg: Marine Community Monitoring Program through CALM. ➤ DOF – Fish and Fish Habitat Protection Program. ➤ Community DOF involvement in F & FHP areas (COASTWEST funded – may just be for SW). ➤ Capacity building for sustainable fisheries and marine conservation – Conservation Council.

5.3.6.2 Adequacy

- Not Adequate.

5.3.6.3 Gaps

5.3.6.4 Responses

- First step: measure benchmark/baseline of community stakeholders' participation (potential that MAT is difficult to achieve).
- Establish project team.
- Prioritise. Which 30% to target? eg: particular programs.
- Investigate the role of Local Governments in managing marine habitats (to achieve CMM 2.6).

5.4 Maintain and improve the condition of marine fauna in the Region, as measured at representative sites, by 2020 (with a quantified target for key indicator species set by 2005)

5.4.1 CMM3.1 Determine key indicator species to protect and conserve viable populations of marine fauna by 2006.

5.4.1.1 Current Activities

CMM 3.1	MAT	Determine key indicator species to protect and conserve viable populations of marine fauna by 2006	<ul style="list-style-type: none"> • Develop scientific methodology to identify key indicator species • Develop marine fauna mapping project, including significant species and fish, for use as a decision-making support tool • Develop and implement integrated marine wildlife management and monitoring program including threatened species • Develop regional information system to enhance planning, management, monitoring and evaluation
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NHT-Funded Projects	Non-NHT-Funded Projects
<ul style="list-style-type: none"> ➤ CALM recently completed the NHT funded fauna mapping project. Wildlife ONLY, not fish. 200 page DRAFT document and map produced (Belinda Cant, CALM-GIS): <ul style="list-style-type: none"> • need for other marine fauna, invertebrates and fish. 	<ul style="list-style-type: none"> ➤ Each of the management plans – Swan Estuary, Shoalwater Island and Marmion Marine Park have strategies and targets for wildlife management. Other marine fauna are covered in Biodiversity Management Targets.

5.4.1.2 Adequacy

- Not Adequate
- More work needed.

5.4.1.3 Gaps

- Identify key indicator species from **all** functional groups (invertebrates, birds, recreational and other fish species, marine mammals).
- Gap in mapping project includes: invertebrates, fish (recreational species **and** others), birds (waders and migratory). (Swan Estuary only).
- Little Penguins, whales, Australia sea lions have been done (CALM/NHT Draft report).
- Dot point 3 – priority.
- Dot point 4 – regional system in place (CALM part of).
- Needs populating with data (Dot points 1-3 above).

5.4.1.4 Responses

Key Indicator Species Project (i.e. covering CMM 3.1)

- Identify key indicator species from different functional groups, assess suitability and implement monitoring and evaluation framework.
- Digitise and produce maps of existing information on marine fauna (should not be limited to commercially viable species but all species for biodiversity considerations).
- Partners:
 - CALM;
 - Universities;
 - CSIRO;
 - Department of Fisheries.

- Other stakeholders: Department of Tourism, WAFIC, RecFish West, Conservation, (WWF, Conservation Council).
- NHT funding required for production of maps.

5.4.2 CMM3.2 Determine level and impact of recreational fishing catch by 2007.

5.4.2.1 Current Activities

CMM 3.2	MAT	Determine level and impact of recreational fishing catch by 2007	<ul style="list-style-type: none"> • Consolidate existing information to better understand the combined effects of recreational and commercial fishing • Investigate recreational fishing catch on the Swan-Canning River (NB: Resulting data feeds into second dot point of CMM3.1 MAT). • Investigate the boat and on-shore line catch of recreational fishers across Perth metropolitan waters • Investigate fish stocks and populations that are under threat (Perth Herring, Dhufish, Bream) from human impacts (NB: Resulting data feeds into second dot point of CMM3.1 MAT). • Compile existing information about fish biology and ecology
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Non-NHT Projects	
<ul style="list-style-type: none"> ➤ Swan River Recreational Fisher Log Book Surveys (DOF) Kim Smith. ➤ CREEL Survey Recreational Fishers Rottnest Island. (Murdoch University and Rottnest island Authority). ➤ Recreational Fisher Human Usage Survey (Rottnest Island Authority and Murdoch University). ➤ Need to ask DOF and Murdoch University about other work. Fred Wells DOF, Lynath Beckley, Murdoch University. ➤ CALM – studies (including one PhD) looking at the effectiveness of sanctuary zones (BAKI study) on fish populations. Also Shoalwater Water Islands Marine Park and Marmion Marine Park. Similar studies form a component of the Management Plan Action Targets (MATs). 	

5.4.2.2 Adequacy

- Not adequate.

5.4.2.3 Gaps

- Needs coordination between stakeholders (Department of Fisheries., CALM, Murdoch University, RecFish West).
- Need for research on effects of sanctuary zones in Swan Region (i.e. Shoalwater Island MP, Marmion, MP & Rottnest) – CALM & CSIRO currently monitoring.

5.4.2.4 Responses

Impacts of Recreational Fishing (i.e. covering CMM3.2)

- Collaborative research program to establish the level of impacts of recreational fishing.
- Assess current research activities into the level of impact of recreational fishing and identify the best approach.
- Identify priority areas for ongoing research (eg: above and beyond Rottnest and Swan estuary).
- Map level of impacts (from existing and ongoing research).
- Develop a database of information on regional fish biology and ecology (to be publicly available).
- Project Partners:
 - Department of Fisheries;
 - Murdoch University;

- RecFish West;
- CALM.

5.4.3 CMM3.3 Establish a framework for sustainable aquaculture by 2007.

5.4.3.1 Current Activities

CMM 3.3	MAT	Establish a framework for sustainable aquaculture by 2007	<ul style="list-style-type: none"> • All future proposals of land based aquaculture to Local Government Authorities to undergo land capability assessment • Support ongoing research into sustainable aquaculture • Consider suitable area/s for land based aquaculture with land/sea areas zoned for special use for aquaculture activities
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Non-NHT Project

- Aquaculture proposals in Marine Parks (3 metro parks) require independent assessment through MPRA (CALM).

5.4.3.2 Adequacy

- Not adequate.
- Consider the Federal framework.
- Should be State Government assessment.

5.4.3.3 Gaps

- Social assessments need consideration in assessments of aquaculture proposals (eg: conflict of interest with well used recreational beaches – swimming and families versus fish farms).
- Consider involvement with Indigenous Aquaculture Unit (DAFF) and Aquaculture Council of WA (WAFIC).

5.4.3.4 Responses

Framework for Sustainable Aquaculture (i.e. covering CMM3.3)

- Scope existing frameworks for sustainable aquaculture.
- Review of WA processes and gap analysis (eg: social issues).
- Produce draft framework; consult on.
- Finalise with consultation.
- Project Partners:
- Department of Fisheries;
- CALM;
- Indigenous Aquaculture Unit (DAFF).
- Funding from NHT under Strategic Reserve.

5.4.4 CMM3.4 100% of marine threatened species identified with recovery plans established by 2009.

5.4.4.1 Current Activities

CMM 3.4	MAT	100% of marine threatened species identified with recovery plans established by 2009	<ul style="list-style-type: none"> • Implement existing recovery plans for threatened species (State and Federal-listed species) • Support the development of recovery plans for threatened and significant species • Establish regional agreement about future suitable locations and practices/guidelines of marine based aquaculture activities (NB: should this be under third dot point of CMM 3.3?).
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Non-NHT Projects
<ul style="list-style-type: none">➤ DEM (Commonwealth) / CSIRO / CALM.➤ Of concern in Swan: Little Penguin monitoring, migratory bird populations and Australian Sea lions.

5.4.4.2 Adequacy

- Not adequate.

5.4.4.3 Gaps

- Currently very few WA species are listed as threatened.
- Priorities would be to **get** WA endemics and threatened species actually **listed**.
- Regional agreement for future suitable locations, practices and guidelines for marine based aquaculture activities belongs in MAT CMM3.3 above.

5.4.4.4 Responses

Marine Threatened Species Project

- Get suspected threatened species listed. (Do this through baseline data collection to determine status).
- Develop recovery plans.
- Propose implementation methods for recovery plans.
- Project partners:
- all state agencies; Aquaculture Council, DPI, CALM, Department of Fisheries, Universities, Conservation Council, WWF, TSN, SeaNet.
- Funding from NHT under Strategic Reserve.