



# **Swan Region Strategy for Natural Resource Management**

## **INVESTMENT PLAN TECHNICAL REPORT No 1 Total Strategy Cost**

**March 2005**

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# Total Strategy Costs

## 1. Overview

A prime purpose in making estimates of the Total Costs of the Strategy is to relate NHT-funded activities to the wider picture of everything that needs to be done if the Strategy is to be a success.

The Swan Catchment Council operates within a complex institutional framework for natural resource management at State and Regional level. This includes:

- State Government Departments: Department of Land Administration (DoLA); Environment (DoE), which covers environmental protection, pollution control, water allocation and licensing; Conservation and Land Management (CALM) with responsibilities spanning the management of reserves, biodiversity, State Salinity Plan, and the coast and marine environment including marine reserves; Agriculture (Agwest); Fisheries (DoF); Planning and Infrastructure (DPI); and Industry and Resources (DIR).
- Swan River Trust, which is the principal agency for regulation and management of the Swan-Canning estuary.
- Other State Agencies: including the Water Corporation of Western Australia and the Forest Products Commission.
- Commonwealth Departments, notably the Department of Defence, which is the holder and manager of several areas of conservation significance.
- Local Government, which expends considerable amounts of ratepayers' money on natural resources and environmental management.
- Private land holders.
- Community Groups and Associations, which undertake a very large amount of environmental restoration work, operating in dialogue with government.

In developing the Investment Plan estimates of costs were developed at three levels:

- Firstly, an account was developed for expenditure on natural resource management by all stakeholders in the Swan Region in 2004-05, termed *Natural Resource Management Expenditures*;
- Secondly, an estimate was made of the costs of undertaking each Management Action that is specified in the Strategy, termed *Total Strategy Costs*; and
- Thirdly, the project set proposed for NHT2 funding was subject to detailed costing.

The difference between the first two of these accounts is that there are many operational, planning, regulatory and management activities undertaken by agencies at all levels of government and by the private sector that are not specifically included in the Strategy, though they certainly have an impact in terms of maintaining natural resources and environmental quality. Thus, there is a rather fuzzy boundary between what can be termed "investment" and what is operational. The Strategy focuses on actions that are directed to changed natural resource condition, but if efforts on normal operations, maintenance, planning and regulation were relaxed, then natural resource condition would undoubtedly worsen.

Total Strategy Costs are significantly larger than the NHT2-funded component of the Strategy. This is because many items mentioned in the Strategy are not NHT2-funded. Obvious examples are the State Government's Bush Forever land purchase scheme, the Water Corporation's Infill Sewerage Program and drainage improvements, the Riverbank and Rivercare Programs administered by the Swan River Trust, and certain initiatives regarding cultural heritage and air quality: none of which

is NHT2-funded, though they are mentioned in the Strategy. Less obvious are a myriad of activities that will need to be undertaken by local governments, community groups and the private sector independently of NHT2 funding. This volume may be usefully read alongside Technical Report No 4 *Evaluation of current project activities and gaps against Strategy Management Actions*, which gives a good impression of the activities that are being undertaken outside of the NHT2 project set. This helps to explain the apparently large differences in cost between the NHT2 investment portfolio and the estimated Total Strategy Cost.

## 2. Natural Resource Management expenditures

*Indicative* estimates were made of expenditure on natural resource management by all departments, agencies and stakeholders within the region in 2004-05.

Sources of information used in compiling these financial estimates included:

- State Budget Papers Vols 1-3 (2004-05);
- Data on all operations supplied by Swan River Trust;
- State Salinity Action Plan;
- Annual Report of the Water Corporation;
- Australian Bureau of Statistics data on Local Government expenditure on natural resources management and environmental protection;
- State-held data on NHT1 grants and matching funds, and NHT2 data on Foundation Funding, Priority Projects and Indicative Funding levels for 2004-05;
- Envirofund project data from the Environment Australia website;
- Information supplied by Western Australian departments, including CALM, Agriculture, Environment, and Fisheries; and
- Indicative project cost estimates provided by *Resource Economics Unit*.

Table 1 shows that approximately \$112 million is being spent annually by all stakeholders. Of this, around \$87 million is being spent by State Government departments or agencies. Members of the Western Australian Local Government Association spend a further \$19 million. It is emphasized that while every effort has been made to be accurate, the estimates are indicative and are presented in order to give some idea of how the Investment Plan relates to this total effort.

**Table 1: Indicative estimate of expenditure on natural resource management in the Swan Region in 2004-05 (\$000s)**

Theme	State Government Departments & Agencies	Local Government	Community & Stakeholders	Commonwealth <sup>5</sup>	Research Organisations <sup>6</sup>	Total	%
NHT Foundation Funding & Coordinators				2,070		2,070	1.8%
NHT -Other (not yet allocated)				2,430		2,430	2.2%
Land	4,251	8,267	0	0		12,518	11.1%
Biodiversity <sup>1</sup>	23,072	2,745	158	85		26,059	23.1%
Water:							
Swan-Canning Estuary & Coastal Plain Streams <sup>4</sup>	10,064	2,645	411	106		13,226	11.7%
Freshwater Lakes	4,041	1,183	33	29		5,287	4.7%
Groundwater	820	0	0	0		820	0.7%
Darling Range Streams	703	350	0	350		1,403	1.2%
Water -General <sup>2</sup>	35,307	0	0	0		35,307	31.3%
Coast & Marine	5,702	605	106	28		6,441	5.7%
Air <sup>3</sup>	2,879	0	0	0		2,879	2.6%
Cultural Heritage	595	2,729	300	755		4,379	3.9%
<b>Total</b>	<b>87,433</b>	<b>18,524</b>	<b>1,009</b>	<b>5,852</b>	<b>7,000</b>	<b>112,819</b>	<b>100.0%</b>

## Notes:

1. Includes (i) \$10M for land acquisition for the Bush Forever Program; and (ii) \$12.5M NRM expenditure of State Government Departments. The Local Government figure is for the Perth Biodiversity Project.
2. Includes (i) \$30M for the Water Corporation Sewerage Infill program; and (ii) \$4.6M representing the Swan Region's share of expenditure of DoE on policy, education and advice; environmental impact services; pollution regulation, waste management, and environmental systems.
3. Includes 8% of statewide expenditure of the DoE on: policy education & advice; environmental impact services; pollution regulation ; waste management); and environmental systems expenditure.
4. Includes all expenditure of the Swan River Trust plus Envirofund projects in 2003-04
5. (i) Excludes expenditure of the Department of Defense; (ii) includes selected NHT2 investments (ii) total NHT2 and Envirofund allocations for 2004-05 are likely to be in the region of \$4.5M
6. Notional estimate for tertiary education departments and CSIRO.

### 3. Total Strategy cost

#### 3.1 Method

In developing the Investment Plan an indicative estimate was made of the “Total Cost” of each Management Action given in the Strategy at 2004 prices. For this purpose, “Total Strategy Cost” is defined in the same way as “Total Cost of Services” in the Western Australian State Government Budget Papers. It includes employee expenses, superannuation, administration, supplies and services, accommodation, and also a number of capital items including capital user charge, depreciation/amortisation, and costs of disposal of non-current assets.

The method used was to estimate (i) the length of time required to implement the Management Action, (ii) the cost of human resources required in terms of Full Time Equivalent staffing (FTEs) at each stage, (iii) the likely operational costs for items such as land vehicles, boats, measurement and recording equipment, fencing, re-vegetation, other works, utility services, costs of meetings, communication/educational materials, computing, mapping, site investigation, sub-contractors, chemicals and so on.

Likely human resource costs were based on Average Gross Earnings of Western Australian State Government employees, from the Australian Bureau of Statistics Cat No 6248.0 March 2004, which provides a figure of \$48,237 on an annual basis for 2003-04. Inflating this figure to 2004-05 values suggests a realistic figure of \$50,650/staff member.

Likely operational costs were estimated using a standard allowance per staff member based on the ratio of the “Total Cost of Services” to “Employee Expenses” in (i) the Swan River Trust, (ii) Department of Conservation and Land Management and (iii) Department of Environmental Protection, using the 2004-05 Budget Estimate given in the 2004 State Budget Papers.

The breakdown of costs for the three selected agencies was as follows.

Employee expenses excl superannuation	45%
Superannuation, Supplies, Services and Accommodation	42%
Capital items	13%
Total	100%

The financial aggregates were as shown in Table 2 . It is seen that the total cost of services over these three agencies was 2.24 times their employee expenses before superannuation payments. This ratio was used in combination with the assumed average cost per staff member to estimate total cost from the estimated human resource input for each Management Action. This gave a figure of  $\$50,650 \times 2.24 = \$113,453/\text{FTE}$ . This was rounded to  $\$115,000/\text{FTE}$ .

For Management Actions involving re-vegetation or pest eradication, the estimates were based on an assumed \$150/ha for revegetation and \$300/ha for pest eradication.

**Table 2: Relationship of Total Cost to Employee Cost in selected WA Government Agencies**

Agency	Employee Expenses (\$000s) (1)	Total Cost of Services (\$000s) (2)	Ratio (1)/(2)
Swan River Trust	1,356	6,455	4.76
CALM	74,872	163,206	2.18
Environmental Protection	16,290	37,583	2.31
<b>Total</b>	<b>92,518</b>	<b>207,244</b>	<b>2.24</b>

### 3.2 Spreadsheet model

A spreadsheet model was developed, which contains:

- 7 “Theme” sheets, listing all Management Actions;
- 7 “Theme Data” sheets, containing the information gathered to estimate total NRM expenditures (see Section 2);
- 4 “Regional Delivery Program” sheets also listing all Management Actions, and generated by formulae from the Theme Sheets;
- 1 “Control Sheet” containing cost factors (\$/FTE, \$/Ha Revegetated, \$/ha for pest eradication);
- 4 “Results” sheets one for each type of Management Action (Resource Assessment, Planning, On-ground and Regional Capacity Building) each containing the relevant list of Management Actions in each Delivery Program and their costs; and
- 3 “Results” sheets containing report tables, some of which appear in the Investment Plan Main Report, and others in this volume.

The spreadsheet model was developed to make the varying of assumptions easy. This was done by listing all Management Actions for each Delivery Program, then specifying (i) a start year and a finish year for each Management Action, and (ii) the number of FTE’s (or in the case of revegetation or pest eradication hectares to be treated). The program then calculated cost as a function of FTEs or Ha, allocated the expenditure to years and summed over the three years considered in this Investment Plan. No use was made of discounting.

Finally the costs of each Management Action were allocated to the responsible Regional Delivery Program. In the case of the Cultural Heritage Theme the costs were shared equally between the Integrated Water Management, Natural Diversity and Coastal & Marine Programs. Regional Capacity Building costs were shared equally across all four Regional Delivery programs.

Summaries of total costs were then calculated for e.g. all actions to be undertaken for a Regional Delivery Program, a particular Matter for Target, or the amount to be spent on resource assessment, planning, on-ground work or capacity building activities.

### 3.3 Total Strategy cost 2004-05 to 2006-07

The estimated Total Strategy Cost for the three years 2004-05 to 2006-07 is shown in Table 3. The total cost of all Management Actions to all stakeholders over the 3-year period 2004-05 to 2006-07, is estimated to be \$121.4 million, excluding the Infill Sewerage Program. Many of the Management Actions to be undertaken during the next three years will need to continue beyond 2006-07.

**Table 3: Estimated total investment required from 2004-05 to 2006-07**

Delivery Program	Total 3-Year Cost (\$000s)	Percent
Sustainable Production	14,569	12.0%
Natural Diversity <sup>(1)</sup>	50,941	42.0%
Integrated Water Management <sup>(2)</sup>	38,853	32.0%
Coastal & Marine <sup>(3)</sup>	16,301	13.4%
Swan Catchment Centre	690	0.6%
<b>Total</b>	<b>121,354</b>	<b>100.0%</b>

Notes:

(1) Includes Bush Forever (\$10M/yr for 3 years)

(2) Excludes Infill Sewerage Program (\$20M/Yr for 3 yrs)

(3) Excludes Beach Health Project (not funded from Regional Budget)

As is shown in Table 4, the Investment Plan emphasises planning and on-ground activities relative to resource assessment and capacity building.

**Table 4: Total Investment by type of Management Action 2004-05 to 2006-07**

Type of Action	Total 3-Year Cost (\$000s)	Percent
Resource Assessment	18,342	15.1%
Planning	41,239	34.0%
On-Ground Action	41,167	33.9%
Regional Capacity Building	20,605	17.0%
<b>Total</b>	<b>121,354</b>	<b>100.0%</b>

#### 4. Natural Diversity Program

The Total Cost of all Management Actions associated with the Natural Diversity Theme is estimated to be \$50.9 million over the three-year period, of which \$34 million is estimated for land acquisition under the Bush Forever Scheme. The investment directly accounted by the Strategy is therefore \$16.9 million. Approximately a half of this is needed for on-ground actions to protect ecological species and communities.

**Table 5: Total Strategy Costs Relevant to the Natural Diversity Program 2004-05 to 2006-07**

Type of Action	Matter for Target				Total 3- Year Cost (\$000s)	Percent
	Vegetation Integrity	Ecological Species & Communities	Invasive Species	Other Themes		
Resource Assessment	1,553	230	690	192	2,664	5.2%
Planning	25,415	1,553	115	182	27,265	53.5%
On-Ground Action	12,420	3,585	2117.5	96	18,218	35.8%
Regional Capacity Building	1,093	748	632.5	321	2,794	5.5%
<b>Total</b>	<b>40,480</b>	<b>6,115</b>	<b>3555</b>	<b>791</b>	<b>50,941</b>	<b>100.0%</b>

The summary of Management Actions shown in Table 6 shows that, in addition to the major expenditure under the Bush Forever Scheme, substantial investments are required for extension of the CAR system (BM1.1: 3.0%), a review of legislation and policy (BM1.3 and BM2.2: 6.4%), establishment of viable land linkages for indigenous species (BM2.3: 6.2%), and initiatives to reduce the use of exotic species (BM3.3: 4.2%).

**Table 6: Costs of Management Actions required by the Natural Diversity Program (\$000s)**

Code	Description	3-Year Cost (\$000s)	%
	<b><i>Native Vegetation Communities Integrity:</i></b>		
BM1.1	100% of priority areas in each IBRA sub region identified for inclusion into CAR system by 2005	1,553	3.0%
BM1.2	25% of priority areas in each IBRA sub region have natural diversity conservation plans developed by 2006	690	1.4%
	Commence Bush Forever, Phase II	23,000	45.2%
BM1.3	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.	1,725	3.4%
BM1.4	100% of priority protected areas have an active conservation management response by 2006	460	0.9%
BM1.5	Develop and implement local natural diversity strategies for priority areas regional information system to enhance natural diversity planning, management, monitoring and evaluation.	460	0.9%
	Complete implementation of Bush Forever Phase 1	11,500	22.6%
BM1.6	30% increase in community participation in education, restoration, protection and management activities for high priority native vegetation in the region by 2009.	1,093	2.1%
	<b><i>Significant Species and Ecological Communities:</i></b>		
BM2.1	100% of critical habitat for significant species and ecological communities identified by 2005	230	0.5%
BM2.2	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	1,553	3.0%
BM2.3	25% of all significant indigenous species have viable linkages established between their populations over their original geographical extent by 2009	3,135	6.2%
BM2.4	100% of priority areas to be reconstructed as buffers to threatened ecological communities and vegetation complexes determined by 2006	450	0.9%
BM2.5	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	748	1.5%
	<b><i>Ecologically Significant Invasive Species:</i></b>		
BM3.1	Identify, prioritize and set targets for the management of significant threatening species to natural diversity	690	1.4%
BM3.2	100% of all priority feral pests and diseases have threat abatement plans established by 2006	115	0.2%

Code	Description	3-Year Cost (\$000s)	%
BM3.3	15% reduction in the use of exotic species in urban landscaping by 2008	2,118	4.2%
BM3.4	30% increase in the effectiveness of control programs for feral animals, pests and diseases by 2009	633	1.2%
	Elements of the Cultural Heritage Theme:		
CHM1.1	Research, record, and publish Nyoongar history of the Swan region by 2009.	192	0.4%
CHM1.2	Review and identification of opportunities in policy and legislation to include Indigenous cultural heritage by 2009.	153	0.3%
CHM1.3	Increase Indigenous employment and participation in NRM activities locally and regionally by 2009.	96	0.2%
CHM1.5	Establish partnerships to further incorporate NRM principles into heritage protection by 2008.	249	0.5%
	Elements of the Regional Capacity Building Theme:		
RCM1.2	Establish sub-regional and local consistency and linkages to the Strategy by 2008.	29	0.1%
RCM1.4	Develop a regional capacity framework supported by an integrated regional management information system by 2006.	72	0.1%
	<b>TOTAL PROGRAM</b>	<b>50,941</b>	<b>100.0%</b>

## 5. Integrated Water Management Program

Total Strategy Costs for items falling within the ambit of the Integrated Water Management Program, shown in Table 7, amount to \$38.9 million over the three years 2004-05 to 2006-07. Actions addressing nutrients (21.4%) and wetland aquatic ecosystems (30.2%) account for a combined 52% of the total. Some 37% of all relevant expenditure is for on-ground actions, and these are spread across all matters for target, with particular emphasis on nutrients.

**Table 7: Total Strategy Costs Relevant to the Integrated Water Management Program 2004-05 to 2006-07**

Type of Action	Matter for Target						Total 3-Year Cost (\$000s)	Percent
	Aquatic Ecosystem Integrity: Steams	Aquatic Ecosystem Integrity: Wetlands	Nutrients in Aquatic Environment	Turbidity & Suspended Particles	Surface Water Salinity	Other Themes		
Resource Assessment	1,208	3,450	690	1323	1380	192	8,242	21.2%
Planning	1,955	2,875	1419	289	518	297	7,352	18.9%
On-Ground Action	2,185	3,335	5175	2070	690	1,131	14,586	37.5%
Regional Capacity Building	2,099	2,070	1035	863	1438	1,169	8,673	22.3%
<b>Total</b>	<b>7,446</b>	<b>11,730</b>	<b>8319</b>	<b>4544</b>	<b>4025</b>	<b>2,789</b>	<b>38,853</b>	<b>100.0%</b>
<b>Percent</b>	<b>19.2%</b>	<b>30.2%</b>	<b>21.4%</b>	<b>11.7%</b>	<b>10.4%</b>	<b>7.2%</b>	<b>100.0%</b>	

**Table 8: Total Costs of All Management Actions Required by the Integrated Water Management Program 2004-05 to 2006-07 (\$000s)**

MAT	Matter for Target/Management Action Target	3-Year Cost (\$000s)	%
	<b><i>Aquatic Ecosystem Integrity: Rivers &amp; Streams</i></b>		
WM1.1	100% of priority rivers and waterways in Region identified for protection by 2005	1,208	3.1%
WM1.2	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	1,955	5.0%
WM1.3	Implementation of Environmental Water Provision Projects in the Canning, Helena and Brockman River catchments by 2007	437	1.1%
WM1.4	Develop and implement management and restoration programs for the Region's major rivers and waterways by 2007	1,748	4.5%
WM1.5	30% increase in community participation in education, restoration, protection and management activities of the major rivers and waterways in Region by 2009	2,099	5.4%
	<b><i>Aquatic Ecosystem Integrity Wetlands</i></b>		
WM2.1	100% of priority wetlands in Region identified for protection by 2005	3,450	8.9%
WM2.2	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	1,265	3.3%
WM2.3	Develop, adapt and/or review allocation limits and management plans for groundwater areas by 2008	1,610	4.1%
WM2.4	Develop and implement management restoration plans for priority wetlands by 2008	3,335	8.6%
WM2.5	20% increase in community participation in wetlands education, restoration, protection and management activities by 2009	2,070	5.3%
	<b><i>Nutrients in Aquatic Environments</i></b>		
WM3.1	100% of the 1-5 year actions of the reviewed Swan Canning Cleanup Program (SCCP) implemented by 2010	690	1.8%
WM3.2	100% of all relevant NRM legislation and policy reviewed and amendments recommended to address nutrient enrichment by 2006	1,419	3.7%
WM3.3	Implement identified remedial actions to address nutrient enrichment by 2007	5,175	13.3%
WM3.4	20% increase in community participation in nutrient intervention education, restoration, protection and management activities by 2009	1,035	2.7%
	<b><i>Turbidity &amp; Particulate Matter in Aquatic Environments</i></b>		
WM4.1	Establish monitoring systems to develop resource condition targets for turbidity/ suspended particulate matter by 2005	1,323	3.4%
WM4.2	100% of all relevant NRM legislation and policy reviewed and amendments recommended to address turbidity / suspended particulate matter by 2006	289	0.7%
WM4.3	Implement identified remedial actions to address turbidity / particulate matter by 2007	2,070	5.3%
WM4.4	20% increase in community participation in managing turbidity / particulate matter by 2009	863	2.2%
	<b><i>Surface Water Salinity in Fresh Water Aquatic Environments</i></b>		
WM5.1	Establish monitoring systems to develop resource condition targets for surface water salinity in the Avon Upper Swan Region by 2005	1,380	3.6%

MAT	Matter for Target/Management Action Target	3-Year Cost (\$000s)	%
WM5.2	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	518	1.3%
WM5.3	Implement identified remedial actions to address surface water salinity in the Avon Upper Swan Region by 2009	690	1.8%
WM5.4	20% increase in community participation in salinity education, mitigation and remediation activities by 2009	1,438	3.7%
	Elements of the Coastal & Marine Theme		0.0%
CMM2.4	100% of Local Governments with ocean outfalls have storm water action plans established by 2008	115	0.3%
CMM2.5	20% increase in marine habitat restoration programs by 2007	1,035	2.7%
	<i>Elements of the Cultural Heritage Theme</i>		
CHM1.1	Research, record, and publish Nyoongar history of the Swan region by 2009.	192	0.5%
CH1.2	Review and identification of opportunities in policy and legislation to include Indigenous cultural heritage by 2009.	153	0.4%
CH1.3	Increase Indigenous employment and participation in NRM activities locally and regionally by 2009.	96	0.2%
CH1.4	Achieve 75% per cent increase in the number of community, LGA's and State government agencies involved in NRM incorporating indigenous cultural heritage included as part of their processes by 2009.	115	0.3%
CH1.5	Establish partnerships to further incorporate NRM principles into heritage protection by 2008.	249	0.6%
	<i>Elements of the Regional Capacity Change Theme</i>		
RCM1.2	Establish subregional and local consistency and linkages to the Strategy by 2008.	29	0.1%
RCM1.4	Develop a regional capacity framework supported by an integrated regional management information system by 2006.	805	2.1%
	<b>TOTAL PROGRAM</b>	<b>38,853</b>	<b>100.0%</b>

## 6. Sustainable Production Program

The Total Strategy Cost of Management Activities falling within the ambit of the Sustainable Production Program will require an estimated \$14.6 million over the first three years of the Strategy. The bulk of the costs would be associated with major on-ground actions particularly in implementing best management practices in catchments of the Darling Range and on the Swan Coastal Plain; and in regional capacity building, including the Program Implementation Framework.

**Table 9: Total Strategy Costs Relevant to the Sustainable Production Program 2004-05 to 2006-07 (\$000s)**

Type of Action	Matter for Target			Total 3-Year Cost (\$000s)	Percent
	Salinity	Soils	Other Themes		
Resource Assessment	748	288	403	1,438	9.0%
Planning	518	345	2,214	3,076	19.3%
On-Ground Action	3,288	230	2,335	5,852	36.8%
Regional Capacity Building	2,185	1,357	2,013	5,555	34.9%
<b>Total</b>	<b>6,738</b>	<b>2,220</b>	<b>6,963</b>	<b>15,920</b>	<b>100.0%</b>

Table 10 gives a breakdown of Total Strategy Costs by Management Action.

**Table 10: Total Costs of All Management Actions Required by the Sustainable Production Program 2004-05 to 2006-07 (\$000s)**

MAT	Matter for Target/Management Action Target	3-Year Cost (\$000s)	%
	<b><i>Salinity:</i></b>		
LM1.1	Priority areas for salinity risk management established in the Avon Upper Swan Region by 2005.	748	4.7%
LM1.2	All local and State government planning agencies using local area land capability and suitability information by 2009.	518	3.3%
LM1.3	Implementation of remedial actions to address land salinity in priority areas the Avon Upper Swan NAP region by 2009	3,288	20.6%
LM1.4	20% increase in community participation in land salinity education, mitigation and remediation actions by 2009	2,185	13.7%
	<b><i>Water erosion, waterlogging and acid sulfate soils:</i></b>		
LM2.1	Establish benchmarks and monitoring at representative sites for water erosion, waterlogging and acid sulfate soils by 2005.	288	1.8%
LM2.2	100% of all relevant current NRM policy and legislation reviewed and recommended amendments to minimise risk of ASS made by 2006	345	2.2%
LM2.3	Regional soil health program developed, with implementation of identified remedial actions in identified priority areas by 2009.	115	0.7%
LM2.4	Industry BMPs sets defined with benchmarks for implementation established by 2009 for eight industry sectors.	115	0.7%
LM2.5	30% increase in land managers, planners and community participation in soil condition education, mitigation and remediation activities by 2009.	1,357	8.5%

MAT	Matter for Target/Management Action Target	3-Year Cost (\$000s)	%
	<b><i>Water Theme:</i></b>		
WM1.4	Continue the implementation of the Swan-Canning Cleanup Program (20%)	207	1.3%
WM1.5	30% increase in community participation in education, restoration, protection and management activities of the major rivers and waterways in Region by 2009	173	1.1%
WM3.4	20% increase in community participation in nutrient intervention education, restoration, protection and management activities by 2009	1,035	6.5%
WM5.3	Implement identified remedial actions to address surface water salinity in the Avon Upper Swan Region by 2009	2,070	13.0%
	<b><i>Natural Diversity Theme:</i></b>		
BM3.2	100% of all priority feral pests and diseases have threat abatement plans established by 2006	230	1.4%
	<b><i>Coastal &amp; Marine Theme:</i></b>		
CMM3.3	Establish a framework for sustainable aquaculture by 2007.	288	1.8%
	<b><i>Air Theme</i></b>		
AM1.1	Establish set of monitoring systems to collect/analyse baseline and trend information, to enable setting of resource condition targets for air quality by 2005.	115	0.7%
AM1.2	Establish a partnership framework to assist in the implementation of the Air Quality Management Plan 1–5 year actions by 2008.	1,208	7.6%
AM2.1	Undertake risk assessment of impacts and develop priority actions for climate change impacts on NRM by 2009.	633	4.0%
	<b><i>Regional Capacity Building Theme:</i></b>		
RCM1.2	Establish sub-regional and local consistency and linkages to the Strategy by 2008.	144	0.9%
RCM1.3	Review and apply a regional governance structure with security of tenure by 2005.	58	0.4%
RCM1.4	Develop a regional capacity framework supported by an integrated regional management information system by 2006.	805	5.1%
	<b>TOTAL PROGRAM</b>	<b>15,920</b>	<b>100.0%</b>

## 7. Coastal and Marine Program

A total 3-year expenditure of \$16.3 million is required to undertake all the management Actions set out in the Coastal and Marine Program. Some 38% of the budget addresses marine habitats, 34% the shores, beaches and frontal dunes, and 18% is for targeting the protection of marine fauna.

**Table 11: Total Strategy Costs Relevant to the Coastal and Marine Program  
2004-05 to 2006-07**

Type of Action	Matter for Target				Total 3- Year Cost (\$000s)	Percent
	Terrestrial Coastal Habitats	Marine Habitats	Marine Fauna protection	Other Themes		
Resource Assessment	2,070	1,955	1668	192	5,884	36.1%
Planning	1,265	1,898	1208	182	4,552	27.9%
On-Ground Action	1,035	1,150	0	96	2,281	14.0%
Regional Capacity Building	1,208	1,208	0	1,169	3,584	22.0%
Total	5,578	6,210	2875	1,639	16,301	100.0%
	34.2%	38.1%	17.6%	10.1%	100.0%	

Table 12 gives a breakdown of the Total Strategy Costs by Matter for Target

**Table 12: Costs of Management Actions required by the Coast and Marine Program (\$000s)**

Code	Matter for Target/Management Action Target	3-Year Cost (\$000s)	%
	<b><i>Estuarine, Coastal &amp; Marine Habitat Integrity (Terrestrial Coastal Habitats)</i></b>		
CMM1.1	100% of priority natural coastal areas identified and assessed by 2005	2,070	12.7%
CMM1.2	100% of priority coastal areas have five-year protection and restoration target defined for wind erosion by 2005	230	1.4%
CMM1.3	100% of Councils adopting or updating local coastal plans and policies by 2009	1,035	6.3%
CMM1.4	20% increase in on-ground community environmental restoration programs addressing coastal dune wind erosion in priority areas by 2007	1,035	6.3%
CMM1.5	30% increase in community participation in biodiversity education, mitigation and remediation actions by 2009	1,208	7.4%
	<b><i>Estuarine, Coastal &amp; Marine Habitat Integrity Marine Habitats</i></b>		
CMM2.1	100% of priority marine habitats identified for protection by 2006	690	4.2%
CMM2.2	100% of all marine habitat areas affected by introduced marine pests in 'at risk' areas identified by 2007	1,265	7.8%
CMM2.3	Action Plan developed to manage the impacts on marine water quality and monitor and evaluate remediation programs by 2006	1,035	6.3%
CMM2.4	100% of Local Governments with ocean outfalls have storm water action plans established by 2008	863	5.3%
CMM2.5	20% increase in marine habitat restoration programs by 2007	1,150	7.1%

Code	Matter for Target/Management Action Target	3-Year Cost (\$000s)	%
CMM2.6	30% increase in community and stakeholder participation in education, mitigation and remediation activities related to marine habitat protection by 2008	1,208	7.4%
	<b><i>Marine Fauna</i></b>		
CMM3.1	Determine key indicator species to protect and conserve viable populations of marine fauna by 2006.	805	4.9%
CMM3.2	Determine level and impact of recreational fishing catch by 2007.	805	4.9%
CMM3.3	Establish a framework for sustainable aquaculture by 2007.	58	0.4%
CMM3.4	100% of marine threatened species identified with recovery plans established by 2009	1,208	7.4%
	<b><i>Elements of the Cultural Heritage Theme</i></b>		0.0%
CHM1.1	Research, record, and publish Nyoongar history of the Swan region by 2009.	192	1.2%
CH1.2	Review and identification of opportunities in policy and legislation to include Indigenous cultural heritage by 2009.	153	0.9%
CH1.3	Increase Indigenous employment and participation in NRM activities locally and regionally by 2009.	96	0.6%
CH1.4	Achieve 75% per cent increase in the number of community, LGA's and State government agencies involved in NRM incorporating indigenous cultural heritage included as part of their processes by 2009.	115	0.7%
CH1.5	Establish partnerships to further incorporate NRM principles into heritage protection by 2008.	249	1.5%
	<b><i>Elements of the Regional Capacity Change Theme</i></b>		0.0%
RCM1.2	Establish subregional and local consistency and linkages to the Strategy by 2008.	29	0.2%
RCM1.4	Develop a regional capacity framework supported by an integrated regional management information system by 2006.	805	4.9%
	<b>TOTAL PROGRAM</b>	<b>16,301</b>	<b>100.0%</b>