WATERSHED Torbay

Watershed Torbay
Catchment Restoration Plan:

SECTION D

MONITORING AND EVALUATION

D1.0 A Framework for Monitoring and Evaluation

The effectiveness of the *Watershed Torbay Catchment Restoration Plan* is to be demonstrated through monitoring and evaluation (M&E) processes. These are to show:

1. Resource condition change
2. Rate of implementation
3. Effectiveness of implementation
4. Acceptance of change by community and partner organisations, and
5. Better understanding of the systems involved.

These measures then need to show **achievement of the aspirational goals and objectives** of the Torbay Catchment Group (TCG) for each of the seven Management Themes through improvement in **indicators of catchment health.**

The efficiency of an M&E program is in ensuring that the measures are adequately indicate the goal, objective or target that they represent. This requires that **representative indicators** are clearly identified. Some indicators for M&E are being measured currently. There will be other actions required.

The Restoration Plan is based on change management. A significant requirement of M&E is show that investment in practice change is resulting in resource condition improvement. However, brokering practice change according to a prepared Restoration Plan is undertaken within a continuously changing 'operating environment' (i.e. the social, economic and environmental factors that influence normal decision-making processes). An important component of change is through improved understanding and knowledge of the systems being managed.

The processes that allow adjustment of decisions in response to a changing operating environment are described as **adaptive management**. Figure D1 shows the adaptive management cycle that is based on planning, action, monitoring and review.

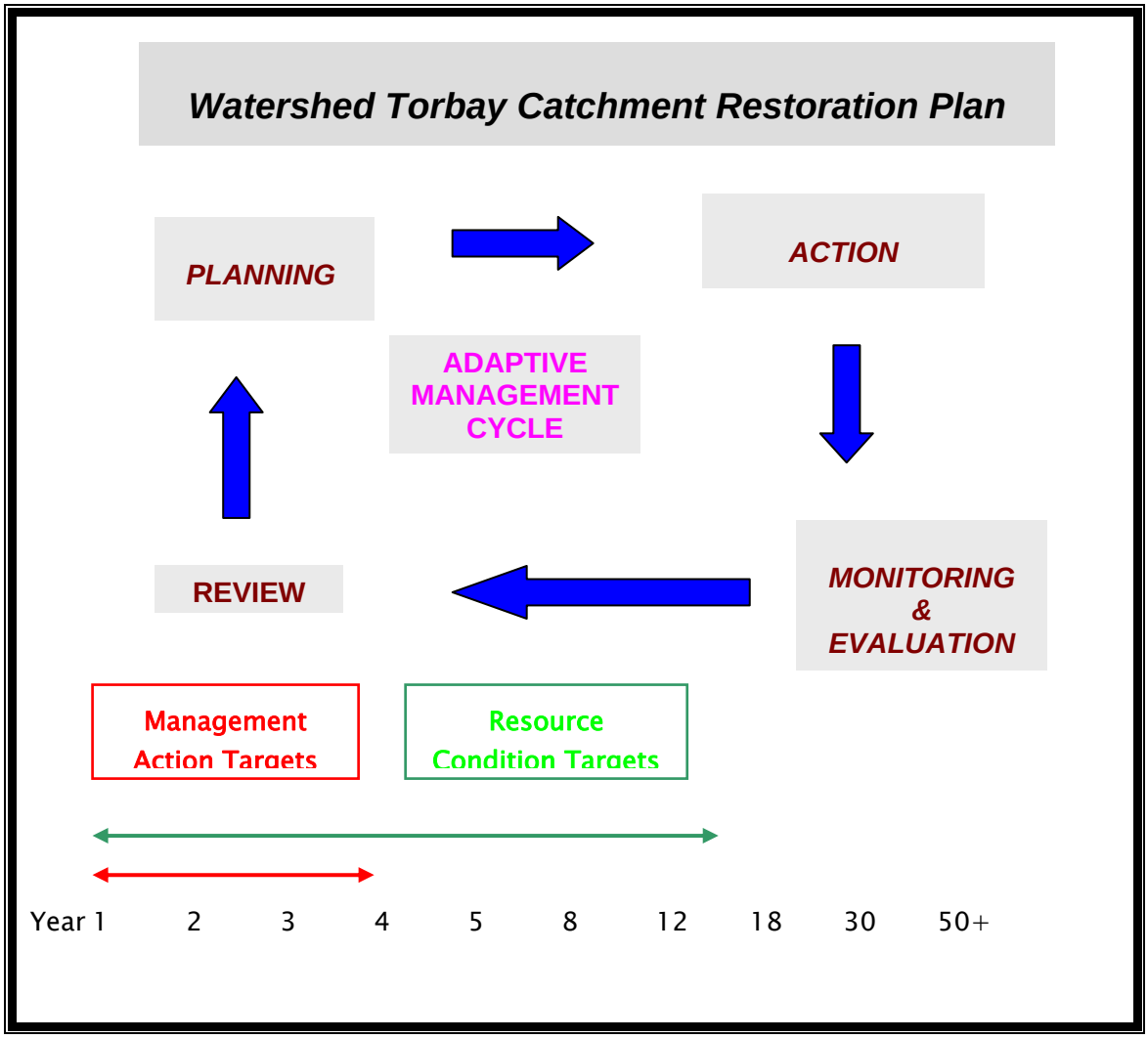

Figure D1 Monitoring and evaluation in the Adaptive Management cycle.

Evaluation of the measures of indicators for change should be delivered into the Adaptive Management Cycle. The performance of the implementation program is measured against the Management Action Targets over time. The effectiveness of the actions in achieving resource condition change is also measured over time.

The review processes are critical to the effectiveness of the adaptive management cycle. Monitoring information is to be evaluated in accordance with the implementation program to enable the Implementation Steering Committee to adjust priorities for investment. It is proposed that this is a specific set of tasks undertaken by the Implementation Steering Committee lead by the Department of Environment on a 6-month basis.

Section D2 with review current monitoring programs. These will be aligned where appropriate with representative indicators for resource condition and management action targets identified in Section D3. The recommended processes for evaluation and reporting are provided in Section D4.

D2.0 Current M&E Measurement

Monitoring within Torbay catchment is continuing to occur in three key areas:

- Surface water (quantity and quality)
- Groundwater (level and quality), and
- Catchment health indicators.

D2.1 Surface water monitoring

There are 6 gauging stations within the Torbay catchment with monitoring records since January, 1997. They are located to measure stream flow in:

- Five-mile Creek
- Seven-mile Creek
- Cuthbert Drain
- Grassmere Creek
- Marbelup Brook
- Torbay Drain

The location of these monitoring stations is shown in Figure B2.

The gauging stations provide measures of Total Nitrogen (TN), Total Phosphorus (TP) and turbidity (T – a measure of sediment load). Each of these are recorded as concentrations (both observed and flow-weighted) although can be converted to annual load measurement (as a product of average concentration and annual stream flow).

An analysis of the trends for TN, TP and T for the 1997-2002 period is provided in the resource kit.

D2.2 Groundwater Monitoring

Groundwater has been monitored at 24 locations in the lower catchment since June 2003. Water level is measured in all wells monthly. Nitrogen and phosphorus concentrations are measured for 12 of the bores every three months. The location of the monitoring wells is shown in Figure B6.

D2.3 Catchment Health Indicators

Catchment Health indicators show achievement of the communities' aspirational goals and targets. The selection of catchment health indicators for the Torbay catchment is described by Duxbury (2003). The environmental, economic and social characteristics for which indicators are proposed were derived from a social survey undertaken during 2002. They are:

- Quality of water in waterways and lakes
- Weed infestation in the catchment
- Level of protection and extent of native vegetation and fauna
- Level of rehabilitation of waterways and drains with vegetation and bank stabilising
- Status of fish stocks in the Inlet and waterways
- Income levels of people living in the catchment
- Level of community participation in local organizations
- Degree of satisfaction about living in the catchment area

The suggested indicators for each of these characteristics are given in the resource kit.

D3.0 Indicators of change

The effectiveness of monitoring is dependent upon having indicators that are representative of the resource condition or practice change that is expected through implementation of the planned actions. Selection of indicators depends on a range of criteria, described by the SMART acronym:

Simple	Easily interpreted, easily monitored, appropriate for community use, mappable.
Measurable	Statistically verifiable, reproducible and comparable, able to be combined with others to forms of indices, able to show trends over time.
Accessible	Regularly monitored, currently used by public and private managers, cost-effective.
Relevant	Indicative of resource condition change or practice change.
Time-bound	Measure that show change within time periods that relate to targets.

Catchment Health indicators are identified for the Goals and Objectives in Table D1. These are to reflect the characteristics for which community expects change (as proposed in Appendix 5). Measurement of these indicators is to be based on measures of community perception of change through periodic social surveys. These indicators are important to demonstrate to the community that their aspirations for a healthy catchment in the future is progressing according to the Vision statement. The indicators for community goals and objectives may not meet all SMART criteria.

Indicators are listed for Resource Condition Targets and Management Action Targets for the seven Management Themes in Table D1. These indicators are identified as measures to be taken that objectively indicate change. The significance of these measures is in providing information for decisions undertaken within the Adaptive Management Framework.

Table D1. Indicators of Change for Goals, Objectives and Targets.

THEME 1 – WATER QUALITY & ALGAL BLOOMS			
	INDICATORS	ACTIONS	COMMENTS
GOAL (2025) Water in Lake Powell, Lake Manarup and Torbay Inlet is suitable for the survival and growth of native aquatic plants and animals and algal blooms are minimal. Water in Marbelup Brook remains suitable for drinking. Other waterways and waterbodies are suitable for recreation, domestic and agricultural use.	Observations of frequency and size of algal blooms. Complaints of mal-odours. Can you drink the water? Can you swim in the water?		
OBJECTIVES The source and pathways for mobile nutrients, sediments and contaminants within the catchment are known and managed so that: • There are no fish kills due to poor water quality, • The incidence of algal blooms is reduced, • The transport of nutrients, sediments and contaminants into waterways and wetlands is minimised, • Management practices are adopted that minimise public health and environmental risks for drinking water from Marbelup Brook.	Records of fish kills. See T1RCT1 See T1MAT1 See T1RCT2	Increase public awareness to ensure fish kill are reported.	Signs about fish kills in the catchment are required

	INDICATORS	ACTIONS	COMMENTS
RESOURCE CONDITION CHANGE TARGET **T1RCT1** Reduce by a third the incidence of algal blooms in Torbay Inlet, Lake Powell and Marbelup Brook by 2025 **T1RCT2** Nutrient loads discharge from the sub-catchments are reduced by the following percentage by 2020: **Sub-catchment** **Current Load** **TN** **TP** **Load Reduction** **TN** **TP** **Torbay Drain:** **Marbelup Brook:** **Seven Mile Creek:**	Routine phytoplankton sampling. Annual flow-weighted measures at existing gauging stations.	Initiate sampling on a routine basis with a frequency that ensures all algal blooms are sampled. Existing monitoring.	The frequency of sampling may alter during the year according to seasonal risk of algal blooms.

Five Mile Creek: **Cuthbert Drain:** **Grassmere Creek:** **T1RCT3** The quality of water in Marbelup Brook meets national criteria for public drinking water supply (NHMRC & ARMCANZ, 1996) by 2015.	Routine sampling of salinity, nutrients and potential pathogens (eg *E. coli* counts).	Standard water quality monitoring procedures.	

	INDICATORS	ACTIONS	COMMENTS
MANAGEMENT ACTION TARGETS **T1MAT1.** Discharge of nutrients to the Torbay catchment from the disposal of wastewater does not increase beyond current levels of x tonnes Nitrogen and x tonnes Phosphorus per annum (as approved through the Ministerial Conditions).	Measurement of TN and TP at Seven-mile Creek gauging station.	Continue with existing measurement.	
T1MAT2(a) All third and fourth-order waterways in Marbelup have permanent vegetated stream buffers established by 2010. **T1MAT2(b)** By 2015, 70% of all first and second order streams have permanent perennial vegetation.	The length (km) of waterways fenced annually. The length (km) of waterways with permanent revegetation established annually.	GIS map to show length of waterways currently fenced and the annual additional length of fencing	Communications should express this indicator as a percentage (%) of all 3rd and 4th –order waterways that are fenced on an annual basis. As above for 1st and 2nd –order waterways.
T1MAT3. Three trials demonstrations of nutrient reduction from stream flow and sediments implemented by 2007.	Implementation of three demonstration sites.		
T1MAT4. Future land use development in the Marbelup Brook catchment complies with public water supply objectives for the catchment.	Audit of compliance of conditions imposed on development approvals.	Initiate compliance assessment processes for the Marbelup Brook catchment as a part of the Public Drinking Water Source Protection Plan.	

THEME 2 – WATER QUANTITY			
	INDICATORS	ACTIONS	COMMENTS
GOALS (2025). Water is allocated for sustainable use while ensuring that adequate water is provided to all waterways and wetlands to protect their environmental values.	Observations of bird populations, fish stock and fringing vegetation condition.	Long-term community-based monitoring of bird species richness and abundance is a valuable indicator of environmental values.	Opportunity for routine involvement by Birds Australia and affiliated organisations in systematic surveys and monitoring.
OBJECTIVES • Flow in Marbelup Brook is adequate to maintain ecological requirements.	Stream flow measurement downstream from future surface water extraction point for public water supply.	This measure to be assessed against objective Environmental Water Requirement criteria – yet to be determined.	
• Water regimes in Lake Powell, Lake Manarup and Torbay Inlet are suitable for the survival and growth of native aquatic plants and animals.	See T2RCT1 SeeT2RCT2		
• The drainage district is managed to meet the needs of current land uses, future land uses, and the environment.			
• Those who benefit from the use of the catchment to provide ecosystem services contribute to the costs of restoration.	Annual fees collected for ecosystem services.	See T6MAT8 for actions.	There is considerable social and administrative change required to meet this objective. The indicator is expected to remain zero for at least 3 years.

	INDICATORS	ACTIONS	COMMENTS
RESOURCE CONDITION CHANGE TARGET T2RCT1 Major wetlands and waterways are receiving adequate water throughout each year to maintain ecological functions by 2015.	Measures of depth and period of inundation in the respective water bodies.	These measures to be compared against minimum water criteria – yet to be determined.	
T2RCT2 **Maximum use of s**urface water and groundwater resources for private and public benefit within identified sustainable yield.	Estimates of water availability according to a water allocation plan.	Prepare a broad water allocation plan which includes Environmental Water Requirements.	
MANAGEMENT ACTION TARGETS **T2MAT1.** Environmental Water Requirements are determined for Marbelup Brook, Lake Powell, Lake Manarup and Torbay Inlet by 2007. **T2MAT2.** Water resources in the Marbelup Brook Catchment are proclaimed under the *Rights in Water and Irrigation Act (1914)* and a Water Resource Allocation Plan is prepared, including an assessment of changing land use and climate change, by 2007.	Peer-reviewed report prepared. Water Resource Allocation Plan is prepared for the proclaimed catchment.	Arrange standard format for assessment of Environmental Water Requirements.	

THEME 3 – DRAINAGE MANAGEMENT			
	INDICATORS	ACTIONS	COMMENTS
GOAL (2025) Drainage in the Torbay district is managed to best meet the needs of current land uses, future land uses, and the environment.	Community acceptance that drainage is well managed.		Complaints from community about mal-odours, risk of flooding, impacts on fishing etc. are a good measure of community acceptance.
OBJECTIVES • The impact of flooding on horticulture is minimised, • Flooding in residential areas is minimised, • The potential adverse effects of drainage management on fisheries in minimised (including commercial fisheries and native fish species), • The impact of drainage management on algal blooms is minimised, and • The drainage system is managed to prevent or minimize sedimentation of receiving water bodies.	Successful production of potatoes. Records of flood impacts. Reduced commercial fish harvest attributed to drainage management. See T1RCT1 See T3RCT2		

	INDICATORS	ACTIONS	COMMENTS
RESOURCE CONDITION CHANGE TARGET T3RCT1 Lake Manarup, Lake Powell and Torbay Inlet are restored as functional wetland ecosystems (as indicated by successful breeding populations of waterbirds) by 2025.	See T2RCT1 and T2 RCT2		
T3RCT2 Sediment transport in drains and sediment deposition in Torbay Inlet and Lake Powell and is reduced by 50% by 2010.	The lake bed level (meters AHD)	Repeat surveys of lake bed bathymetry (standard monitoring transects only, not comprehensive survey).	The detailed bathometric survey provides a basis for measuring increase in sediment deposition in the lake beds.
T3RCT3 The quality of water in all parts of the drainage system is suitable for direct contact recreational use by 2025.	Water quality measures in North Creek and Marbelup Drain.	Routine water quality monitoring sites to be initiated.	Tasks may be suitable for community involvement through 'Ribbons of Blue' program.
MANAGEMENT ACTION TARGETS T3MAT1. Options for change to drainage management to maximise water quality and public amenity in Marbelup Brook (including the section downstream of the Marbelup Plug) and Lake Powell are fully assessed by 2006	Reviewed documentation of the assessment of drainage options.	Actions are listed in Section C.	

	INDICATORS	ACTIONS	COMMENTS
T3MAT2. The required regime for salt water flushing and maintenance of adequate water depth to improve environmental values in Torbay Inlet is identified and agreed between key stakeholders, and is being implemented through management of sandbar openings by 2007.	Record of artificial sandbar openings in comparison with an agreed regime for salt water flushing.	Actions in Section C for developing the agreed sandbar opening regime.	
T3MAT3. Lake Manarup is being maintained with adequate water to ensure ecological function (without disadvantage to Lake Powell and Torbay Inlet) by 2007.	See T2RCT1 and T2 RCT2		
T3MAT4. Public and private drains identified with high risk of erosion or sediment transport are permanently stabilised by 2010.	Length of drain (km) stabilised.	Initial actions to identify the extent of drains at risk to erosion.	The indicator should be communicated as a percentage (%) of the total length of drainage at risk.
T3MAT5. The processes and extent to which sulphuric acid, nutrients and other potential pollutants are released from acid sulphate soils due to the current operating strategy of the drainage systems is known by 2006.	Peer-reviewed report based on field survey and measurement completed.		

THEME 4 – HABITAT & BIODIVERSITY MANAGEMENT			
	INDICATORS	**ACTIONS**	**COMMENTS**
GOAL (2025) Biodiversity values are enhanced through improvement in the habitat of wetlands, waterways, the bush and the coast.	Community perception of biodiversity enhancement.		
OBJECTIVES • Minimum water quality and depth for aquatic ecosystem functions in wetlands is maintained, • The condition of foreshore vegetation and in-stream habitat is maintained or improved, • The habitat value and habitat connectivity for native fauna is improve and increased, • Population sizes and diversity of native freshwater fish and crustacea are maintained, • Requirements for fish passage and spawning in waterways are maintained, • Representative and adequate areas of pre-European vegetation types are retained, • The impact of exotic pest animal species on native fauna is reduced, and • The impact of weeds on native vegetation and aquatic ecosystems is reduced.	See T2RCT1 and T2 RCT2 Foreshore conditions survey scores. The percentage (%) of tree cover in the catchment. See T4MAT7 See T4 MAT7 Percentage (%) of vegetation types in reserves and other protected areas. Relative abundance of exotic pest animals. Measure of relative extent (Ha) of priority weeds.		

	INDICATORS	ACTIONS	COMMENTS
RESOURCE CONDITION CHANGE TARGETS **T4RCT1** Major wetland systems have suitable water quality and adequate water depth for sustainable ecosystem functions by 2025. (NOTE: actions for this target are included in Themes 1, 2, 3 & 5).	See T2RCT1 and T2 RCT2		
T4RCT2 All 'pristine' foreshore vegetation (Class A) is permanently maintained and all 'good' foreshore vegetation (Class B) is returned to 'pristine' condition by 2025.	Foreshore vegetation survey scores (Pen and Scott, 1995)		
T4RCT3 All 3rd and 4th – order waterways have established permanent foreshore vegetation by 2010.	See T1MAT2(a)		
T4RCT4 Identified waterway corridors are established for wildlife habitat as a part of a regional 'macro-corridor' by 2015.	Length (km) of wildlife corridors established.	Macro-corridor plan for the catchment to be finalised. Note links to actions in T1MAT2(b).	Indicator should be communicated as a percentage (%) of the total length of wildlife corridor establishment proposed for the Torbay catchment.
T4RCT5 Sedge lands and other vegetation types with inadequate regional representation are being managed for permanent protection by 2015.	See T4 MAT2	Mapping required to establish the area that requires protection.	
T4RCT6 All major wetlands have permanent functioning foreshore vegetation ecosystems by 2015.	Foreshore vegetation survey score.	Need to establish the required width of foreshore vegetation for ecosystem functions.	

T4RCT7 Populations of native fish and crustacea are maintained or are increasing to sustainable numbers within aquatic ecosystem communities by 2025.	Measures of aquatic species richness and abundance.		
MANAGEMENT ACTION TARGETS **T4MAT1a.** More than 150km of priority waterways within the Torbay catchment currently unfenced are fenced and revegetated according to local 'best practice' for permanent management of foreshore vegetation by 2010.	The length (km) of waterways fenced and revegetated.	Maps to be prepared to show the priority areas for waterway fencing and revegetation.	The indicator is best communicated as a percentage (%) of the total length of waterways on a sub-catchment basis.
T4MAT1b. A further 100km of vegetated stream buffers are established according to priority areas by 2010.	The length (km) of stream buffers established.		The indicator is best communicated as a percentage (%) of the total length of waterways on a sub-catchment basis.
T4MAT3. All viable remnant vegetation patches of regionally inadequate vegetation types greater than 1 Ha are fenced and managed according to local 'best practice' by 2010.	The area (Ha) of remnant vegetation fenced for each vegetation type.		The indicator is best communicated as a percentage (%) of the total area of each vegetation type within the Torbay catchment.
T4MAT4. More than 75% of the length of foreshore for Lake Powell, Lake Manarup and Torbay Inlet have a minimum 20 meter foreshore vegetation margin by 2015.	Length (km) of foreshore vegetation.	Mapping required to establish the current extent and priority areas for restoration.	
T4MAT5. Priority environmental weeds are mapped and have management programs for control to achieve 10% per annum reduction, with total control by 2015.	The percentage (%) annual reduction in the mapped area of priority environmental weeds.	Mapping required for the current extent of priority environmental weeds.	

T4MAT6. The environmental requirements of freshwater and marine fish and crustacea in waterways and wetlands of the Torbay catchment are understood and being managed by 2010.	Measures of aquatic species richness and abundance.		

THEME 5 – FARMING SYSTEMS			
	INDICATORS	ACTIONS	COMMENTS
GOAL (2025) The farming communities have adopted 'best practice' systems for sustainable land use resulting in measurable agricultural and environmental benefits.	Number of farms adopting 'best management practices'	BMP for each industry needs to be defined. Surveys of BMP adoption required.	
OBJECTIVES • Sustainable farming systems are developed to maximise the efficiency of use of fertilisers, chemicals and energy, • Farm nutrient loss is reduced, • Soil loss from farms is reduced, and • The impact of weeds on agricultural production is reduced.	Locally acceptable 'Best Management Practice' information sheets are prepared. Percentage (%) nutrient load reduction shown by voluntary farm nutrient auditing. Turbidity measures at stream gauging stations The percentage (%) annual reduction in the mapped area of priority agricultural weeds.	Action for development of BMPs in Section C. Linked to actions for farm nutrient audits and nutrient budgets in Section C. Mapping required for the current extent of priority agricultural weeds.	Existing monitoring information.

	INDICATORS	ACTIONS	COMMENTS
RESOURCE CONDITION CHANGE TARGETS **T5RCT1** The total catchment nutrient load is reduced by 38% for nitrogen and 24% for phosphorus by 2025.	Analysis of soil test results for Total Phosphorus at 5-year intervals. Analysis of farm nutrient audits for Total Nitrogen at 5-year intervals.	Link to actions for increased adoption of soils testing. Arrange for results to be coordinated on a catchment-scale. Link to actions for adoption of farm nutrient audits and budgets. Arrange for results to be coordinated on a catchment-scale.	See also T1RCT2 for nutrient reduction in stream flow.
MANAGEMENT ACTION TARGETS **T5MAT1**. Intensive animal industries and annual horticulture located in high or medium risk sites have adopted management practices that result in a reduction of the current industry nutrient surplus by 40% by 2010.	On-site monitoring of nutrients according to nutrient management plans.	Link to Action 3 (Section C)	
T5MAT2. More than half of the landholders in the Torbay catchment, who derive more than 50% of their income from farming their properties, have prepared a 'farm nutrient surplus' calculation and response plan by 2010.	Records of preparation of calculations and response plans.	Link to Actions 1-3 (Section C)	Key task for TCG Coordinator.
T5MAT3. More than 30 viable farming enterprises have nutrient management plans and are demonstrating achievement of defined nutrient surplus reduction targets without production loss by 2010.	Response to landholder survey undertaken at 5-year intervals.	Standardise baseline information to ensure surveys are undertaken in a consistent way.	Assessment of current level of adoption to be documented.
T5MAT4. A total of 75% of land used for grazing is established with perennial plants (trees, shrubs or pastures) by 2015.	Response to landholder survey undertaken at 5-year intervals.	As above.	Need to assess the extent of existing perennial plant cover. Proposed actions will assess the benefits for nutrient management by increasing the extent of cover.

THEME 6 – LAND USE PLANNING			
	INDICATORS	ACTIONS	COMMENTS
GOAL (2025) Regional and local planning provides the policies and mechanisms to implement new actions that are beneficial for natural resource condition, ensure that land is used according to its capability and that further agricultural, industrial, commercial or residential development within the catchment does not compromise the environment.	Survey of community perception of sustainable land use practice within the catchment.	Link to community survey processes.	An informed community will provide a clear perception about the extent to which sustainable practices are adopted.
OBJECTIVES • Future land use, including new development proposals, should not exceed the capability of land resources and should demonstrate net nutrient reduction compared to current land use, • Land use intensification and further residential development within defined floodplain and buffer areas for Lake Powell, Ewart's Swamp, Lake Manarup and Torbay Inlet are controlled according to environmental management guidelines, • Construction of new public and private drains and maintenance of existing drains does not increase the risk of flooding, nutrient enrichment, acidification and sedimentation of waterways and wetlands.	See T6MAT1. See T6MAT2 See T6MAT3		

• Priority water resources are protected for beneficial use now and into the future, • Commercial tree plantations are controlled to ensure beneficial groundwater resources are not reduced and that the landscape visual amenity is maintained, • Future townsite growth within the catchment does not result in increased nutrient input to waterways and wetlands, • The area of reserves or other secure arrangements for wetland and biodiversity conservation are increased in priority locations, • The value of 'environmental services' to the City of Albany provided from the Torbay catchment is realised and arrangements are developed for payment by those that benefit, • The current landscape mosaic characterised by agriculture and natural vegetation is maintained, and • Rural lifestyle and social values, including passive and active recreation opportunities, are enhanced.	See T6MAT4 See T6MAT5 See T6MAT6 See T6MAT7 See T6MAT8 Response to community survey about landscape values. Response to community survey about recreational opportunities.		

	INDICATORS	ACTIONS	COMMENTS
MANAGEMENT ACTION TARGETS **T6MAT1** Assessment of all applications for land development or sub-division are based on a revised land capability analysis framework for the Torbay catchment using currently available land resource information and adopt 'Net Nutrient Reduction' principles for planning propo*sals* by 2007.	Compliance audits for conditions for environmental management listed for new develop	Prepare 'check-list' of conditions for compliance auditing.	Arrange for information about the *Watershed Torbay Catchment Restoration Plan* to be provided with all development approvals so that the proponents are informed about the purpose of the audit procedures and support this purpose.
T6MAT2 Assessment of all applications for land development or sub-division are based on a revised land capability analysis framework for the Torbay catchment using currently available land resource information by 2007.	Records of statutory application assessment processes.		Arrange with CoA to maintain records of adoption of land capability by proponents for development applications.
T6MAT3 All proposals for additional deep drainage and significant maintenance works within the Torbay catchment are assessed as Development Applications and on the basis of a presumption against drainage in areas identified at risk by 2007.	Records of statutory application assessment processes.		As above.
T6MAT4. The Water Resource Protection Plan for the Marbelup Brook sub-catchment is recognised as a priority area within the Lower Great Southern Regional Planning Strategy and the Local Planning Strategy and Town Planning Scheme for the City of Albany by 2007.	Adoption within the planning documents.		
T6MAT5 Proposals for commercial tree plantations within identified priority areas of the Torbay catchment are assessed as Development Applications through the TPS for the City of Albany with the presumption	Records of statutory application assessment processes.		Arrange with CoA to maintain records of adoption of land capability by proponents for development applications.

against this development in these areas by 2007.			
T6MAT6. Urban growth in the town of Elleker is planned to ensure no additional risk to waterways and wetlands and that the potential for flooding of residential development is minimal by 2007.	Records of statutory application assessment processes for residential development.		As above.
T6MAT7. Priority areas for conservation protection or enhancement are identified and linked to local government and regional planning processes by 2007.	Adoption of defined priority areas within planning documents.	Link to Actions 1-2 (Section C)	
T6MAT8. The value of ecosystem services is understood and a trial system for compensation under a 'beneficiary pays' principle within the City of Albany is established by 2008.	Survey of community attitude within the City of Albany.	Prepare information for community about 'ecosystem services', particularly with Case Studies and an outline of the proposed trial.	Liaison with the Water Corporation and the City of Albany require through all stages of this target area.
T6MAT9. Priority Agricultural Areas in the Torbay catchment are revised and a preferred landscape description prepared for consideration by regional and planning processes by 2005.	Adoption of revised areas within planning documents.		Development of a preferred landscape description to be undertaken by TCG with close cooperation of CoA and DPI.
T6MAT10. Opportunities for increased social and recreational values within the Torbay catchment have been reviewed through regional and local government planning processes by 2007.	Adoption of revised areas within planning documents.		TCG to propose opportunities for increased social and recreational values to CoA and DPI.

THEME 7 – COMMUNITY EDUCATION AND INFORMATION			
	INDICATORS	ACTIONS	COMMENTS
GOAL (2025) The community and partners understand the values of the catchment and are pro-active in implementing on ground works to achieve the shared vision for the catchment.	Survey of community perception of catchment values and the effectiveness of the Restoration Plan.		This will be a strong indication of the effectiveness of information and communication strategies.
OBJECTIVES • All key stakeholders are willingly involved in implementing the restoration plan.	Landholder survey to show level of adoption of proposed actions at 5-year intervals.		
• There is a high level of community awareness about the values of the catchment and about the best practices for sustainable management.	Survey of community perception of catchment values and the effectiveness of the Restoration Plan.		
• Further research in the catchment addresses priority issues, meeting community needs and is communicated to increase community understanding of environmental processes.	Survey of community understanding of key environmental processes and priority issues.		Effective communication required for this objective.
• There is a significant level of community involvement in reviewing the restoration plan on a five yearly basis.	The attendance/number of responses to processes for reviewing the plan.		Workshop survey processes expected as a part of reviewing the Restoration Plan.

	INDICATORS	ACTIONS	COMMENTS
MANAGEMENT ACTION TARGETS **T7MAT1** More than half of landholders and residents in the Torbay catchment are able to express clear understanding and support for the catchment Vision and restoration plan by 2010.	Response to a landholder and community survey held at 5-year intervals.	Clarify the criteria to measure 'understanding and support' for use in the survey.	Document current information about community understanding and support.
T7MAT2. More than 40% of landholders are attending at least one group event annually and have copies of or direct access to current research and information relevant to actions for implementation of the Restoration Plan by 2010.	Attendance at field days or other information dissemination events. Response to landholder and community survey about access to information.		