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SWAN RIVER TRUST

RIVERVIEW

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DEPARTMENT OF CONSERVATION
& LAND MANAGEMENT
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River management blueprint announced at interactive event

A comprehensive environmental management plan for the Canning and Southern Wungong rivers was launched by the Minister for the Environment and Heritage, Dr Judy Edwards on 24 August 2002.

The Caring for the Canning Management Plan was presented to the community at the Swan-Canning Cleanup Program's annual Community Forum.

Swan River Trust acting manager Darryl Miller said this year's forum, showcased the first three years of implementing the Cleanup Program's Action Plan, which was launched in 1999.

"During the forum, we reported to the community and reviewed what we have achieved through the presentation of a video and brochure and a series of displays and community group activities," he said.

"A lot of significant work has already been undertaken to improve the health of the Swan and Canning rivers and many valuable cross community partnerships have been established, seeing important projects making excellent progress".



At the Community Forum Matthew and Francesca play the Drain Game and learn about putting rubbish in the right place so that it doesn't make it's way into our rivers.

Mr Miller said there were more than 12 integrated catchment groups in the Swan-Canning catchment and more than \$440,000 had been provided to help them with their river restoration and revegetation projects, as well as with community education and water monitoring activities during the last year.

"It is an enormous task to bring together state and local government agencies, community groups and rural landholders, business and industry, but it's that coordinated approach throughout the catchment that has brought the biggest benefits to the rivers," he said.

The interactive displays included computer modelling of the estuary; algal

species identification; a Canning River restoration project by the Gngangamarran Maarman group; Bennett Brook Catchment Group's Native Plant Nursery; Cleaner Production Training for Industry; Perth Groundwater Atlas and the amalgamation of the Department for the Environment, Water and Rivers Commission and the Keep Australia Beautiful Council.

The Swan-Canning Cleanup Program Action Plan Implementation 2002 video and brochure is being distributed to community groups, local governments and libraries. If you would like a copy please contact Silvana Affolter at the Trust on 9278 0506.

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How does water quality rate in your local tributary? See the tables inside.

How does your tributary rate?

The following tables show progress in each of the tributaries against long-term and short-term performance targets for nitrogen and phosphorus. Black cells show the tributary nutrient level is above both the long and short-term targets; grey means the tributary meets the short-term target but is yet to meet the long-term target; and white cells mean that the tributary meets both targets.

As improvements in water quality rely on land management improvements across the catchment it will take time to see the full effect of many initiatives. Accordingly, short-term and long-term targets have been established for the Cleanup Program's priority catchments to measure progress toward our ultimate goals.



An easy to understand Environmental Education Directory for WA has been released. The Directory was created by the Swan Catchment Centre, in partnership with the Australian Association for Environmental Education (WA) and Murdoch University. The directory contains information on educational programs related to:

- animals,
 - the atmosphere,
 - trees, plants and the land,
 - waste management and recycling, and
 - water.
- The directory outlines the key objectives, main activities, target audience, location, cost, duration and dates of various environmental education programs, as well as contact details for each program.

To access the directory go to www.wrc.wa.gov.au/swanavon. If you would like your environmental education program to be included in the directory or if you have any queries, please contact the Swan Catchment Centre on telephone 9374 3333 or e-mail saicc@wrc.wa.gov.au.

Total nitrogen concentration

The table shows that there has been an improvement in nitrogen in Swan-Canning tributaries over the last five years, especially in the number of tributaries now meeting their long-term targets. In 1998, only 20 per cent of the monitored tributaries had met the Cleanup Program's long-term target for nitrogen, however in 2002, 40 per cent of the monitored Swan-Canning tributaries have met their long-term target.

Tributary	1998	1999	2000	2001	2002
Ellen Brook					
Mills Street Main Drain					
Bannister Creek					
Bayswater Main Drain					
Southern River					
Bickley Brook					
Bennett Brook					
Yule Brook					
Blackadder Creek					
Canning River					
Helena River					
South Belmont Main Drain					
Avon River					
Susannah Brook					
Jane Brook					
Short-term target met (%)	80	80	80	87	93
Long-term target met (%)	20	20	27	33	40

Total phosphorus concentration

In 1998, 80 per cent of the monitored tributaries had met the short-term phosphorus target and 67 per cent had met the long-term target. In 2002, 93 per cent of monitored streams have met their short-term targets and 67 per cent have met their long term targets.

Tributary	1998	1999	2000	2001	2002
Ellen Brook					
Mills Street Main Drain					
Southern River					
South Belmont Main Drain					
Bannister Creek					
Yule Brook					
Bayswater Main Drain					
Bickley Brook					
Blackadder Creek					
Jane Brook					
Avon River					
Bennett Brook					
Canning River					
Helena River					
Susannah Brook					
Short-term target met(%)	80	87	87	93	93
Long-term target met (%)	67	67	67	67	67

Environmental education directory released

The Swan Catchment Centre's revamped website is now live

The new Swan Catchment Centre website is designed to appeal to both new and existing users.

Navigation has been improved by including five main menu items - Services, Funding, Community, Council, Glossary, and a site map.

A key feature of the site is the inclusion of links to other organisations. This allows visitors to make use of other valuable sources of information.

For the first time the Swan Catchment Council is also represented on the site.

Council minutes, agendas and details of the Swan Region's draft NRM strategy can be downloaded from the site.

Visitors to the site will be able to download the Centre's key publications including the newsletter, brochures, training calendar, information sheets and details about the Swan River Action Kit.

Acting Program Manager Liz Western said the site had not been renewed since it was first developed.

"Our existing site was created in 1996 and has become increasingly difficult to

maintain and less relevant to the needs of our customer," she said.

"As the Centre has moved location and some of our services have changed, it seemed timely to revise the site."

"We hope to make full use of the on-line capabilities to help us reduce costs

The address has not changed but the appearance has, so pay a visit to the new improved site at:

www.wrc.wa.gov.au/swanavon

Bassendean rivergum removal a costly exercise

The Swan River Trust is urging people to check with the Trust before removing vegetation on properties and reserves next to the Swan, Canning, Helena and Southern rivers following a recent prosecution.

A Bassendean resident and a contractor were prosecuted by the Trust after they removed several trees from the resident's North Road property in March this year.

A rivergum in the Trust's Management Area was one of the trees destroyed without the Trust's approval, which is required under the Swan River Trust regulations.

The contractor pleaded guilty in the Midland Court of Petty Sessions and

was fined \$400 with \$475.70 costs. The property owner also pleaded guilty and was fined \$300 with \$775.70 costs.

Trust acting manager Darryl Miller said the prosecution should serve as a reminder to residents near the Swan, Canning, Helena and Southern rivers and contractors undertaking such work.

"While most of the Trust's management area consists of public reserves, some of it covers private land. This means that the trees, shrubs and reeds in these areas are protected by Swan River Trust regulations," he said.

"The regulation does not prevent removal of weeds or routine garden

maintenance, but people should contact the Trust before they remove or cut back foreshore vegetation."

Mr Miller said vegetation was an important part of the river landscape that protected riverbanks from erosion.

"Most of the vegetation along the rivers has already been removed so it is increasingly important that what remains is protected," he said.

"It is necessary in some cases for trees to be removed or cut back, but residents living along the rivers can avoid situations like this one by phoning the Trust on 9278 0400 during business hours to find out if an approval is required."

Skills for Nature Conservation training calendar

The Skills for Nature Conservation community training program aims to help Perth's growing and increasingly active community tackle threats facing our unique environment.

Next quarter's training (October to December 2002) includes the following courses, talks and workshops:

Date	Course title	Description
5 October 2002	Down to earth - Understanding the values of soil	This seminar is about understanding soils and how they can influence how we manage bushland and undertake revegetation activities. Participants will gain a greater understanding of the physical, chemical and biological properties of soil and the relationship between soils and native vegetation in Perth.
12 October 2002	Helping our local community protect your bushland and wetland	Find out how to become involved in your local bushland and wetland, by joining a 'Friends' group or starting one up for your local area.
26 October 2002	River processes, ecosystems and management	This seminar will provide participants with an understanding of rivers and the ways they interact with their catchment. The seminar will focus on what is natural in river systems and how those systems have changed or altered by a changing catchment.
2 November 2002	Making the most of fauna tracks and traces	This introductory course is designed to show participants how to undertake basic, non-intrusive observations of fauna and how this knowledge can contribute to bushland, river and wetland management.
16 November 2002	Successful funding applications - sharing the secrets	This half day seminar will help you to obtain the funding you need to get your project underway to ensure its ongoing success.

For more information on these courses or to register your interest please contact Alison Nesbit at the Swan Catchment Centre on 9374 3333.

Out and about with the Trust field crew

The community places a high priority on ensuring that the Swan and Canning rivers are well maintained and kept free of rubbish, debris and pollution. Cleaning beaches, removing hazards, reshaping eroded beaches, foreshore protection

works and responding to pollution incidents are all part of the continuous work undertaken by the Trust's field crew to meet those expectations.

Most rubbish, debris and pollution are the result of irresponsible human behaviour.

As well as removing this material, the Trust works to reduce these problems by encouraging people and industries to change the way they deal with rubbish and other material that may cause pollution.

Material collected during 2000–2001

Summary of material removed by field staff from waterways and foreshores

Material collected	Units	95/96	96/97	97/98	98/99	99/00	00/01	01/02
Domestic rubbish collected from beaches	Tonne	123	80	87	85	46	56	77
Logs and timber from fallen trees	Tonne	253	152	109	150	109	101	121
Rotting weed removed from foreshores	Tonne	347	460	612	350	197	390	529
Derelict and abandoned boats salvaged	Each	4	5	6	1	1	3	7
Dead fish left by prawning parties	Tonne	12	11	11	10	7	5	4
Dead birds	Each	26	31	176	120	123	158	83
Syringes left on beaches and public places	Each	109	146	242	118	232	169	144
Dead animals (cattle, goats and sheep)	Each	5	9	8	6	4	11	7

Chemical fire pollutes Bickley Brook



New cooperative arrangements between the Department of Environmental Protection (DEP) Pollution Response Service and the Trust's Response Crew worked well during a recent hazardous materials fire at a large swimming pool factory in Kenwick.

Contaminated water was entering Bickley Brook which runs along one side of the factory. The DEP Pollution Emergency Response Section was called in by the Fire and Rescue Service at 10.45am Friday, August 9. A HAZMAT emergency incident was declared.

Pollution Response Officers headed off to the scene in the emergency response vehicle with air monitoring and water

sampling gear. The Trust's Response Crew were also activated.

Dark coloured water and waste were entering drains connected to Bickley Brook. As the waste appeared soluble, floating booms installed by the Water Corporation crew could not stop the contaminants, so Trust response crew lay hay bales into the creek to filter the water.

Pollutant concentrations in water samples taken from Bickley Brook were below detection levels. The Canning River was also sampled about 30 metres downstream of the Bickley Brook confluence. Pollutant concentrations were again below the level of detection.

The Bickley Brook had a high flow rate at the time of the incident and therefore most of the chemicals were quickly broken down and diluted.

A field notice has been served on the company, requiring the site to be cleaned up and the waste water and solids to be disposed of properly.

Hot off the press

- [Swan-Canning Cleanup Program general brochure](#)
- [Swan-Canning Cleanup Program Action Plan Implementation 2002 brochure and video](#)
- [Caring for the Canning: a plan to revitalise the Canning, Southern and Wungong rivers \(final report\)](#)
- [Seasonal water quality patterns in the Swan River estuary, 1994-1998, technical report](#)



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Protecting the Swan-Canning river system for the future

August 2002



Implementing
the Action Plan

August 2002

Swan-Canning Cleanup Program

Action Plan Implementation: 2002



HELP KEEP OUR RIVERS HEALTHY

The Swan-Canning Cleanup Program

The Swan-Canning Cleanup Program Action Plan was launched in June 1999 to tackle the increasing incidence of algal blooms in the Swan and Canning rivers.

The third year of implementing the Action Plan's recommendations has now been completed.

Progress in implementing the Cleanup Program was acknowledged with a High Commendation at the Premier's Awards 2001 for Public Sector Management in the new Sustainable Environment category. The entry had to meet the criteria of having been developed to ensure a long-term sustainable environment, balancing environmental and economic objectives, transparent and consultative processes, strong partnerships, community participation and cost effective delivery.

State of the river 2001-2002

There is a consistent seasonal pattern to water quality and the development of algal blooms in the Swan-Canning river system. The main factors driving the pattern are:

- freshwater flows from winter rainfall
- intrusion of saline marine water as these flows decline
- warm temperatures and sunshine in summer, and
- nutrients entering the system from surface and groundwater flows.

The estuary

The dry winter in 2001, with rainfall approximately half of a normal year, strongly influenced conditions in the Swan and Canning rivers. In the Swan River, saline marine water moved quickly up the river after a short period of fresh water flow and was a significant influence in the upper reaches by November. In normal years, this occurs between December and early January. In the Canning River, weir boards at Kent Street Weir which are usually installed in October or November to prevent saline water moving upstream of the weir, were installed in early September.

A bloom occurred with a green and red tide species between Maylands and Success Hill in early November 2001. Another red tide between the Swan Brewery and East Perth on the Swan River and at Salter Point on the Canning River occurred in September 2001.

While there were several nuisance algal blooms which occurred in the upper Swan during summer, the algae normally responsible for fish kills and public health alerts were only detected in low numbers.

Action Plan implementation: 2002

The 10 major recommendations of the Action Plan are summarised into a four-point Action Plan.

Four-point Action Plan

1. **Support Integrated Catchment Management to reduce nutrient inputs**
2. **Improve planning and land use management to reduce nutrient inputs**
3. **Modify river conditions to reduce algal blooms**
4. **Monitor river health, fill critical gaps in knowledge and report progress to the community**

The catchment

As improvements in water quality rely on land management improvements across the catchment it will take time to see the full effect of many initiatives. Accordingly short-term and long-term targets have been established for the Cleanup Program priority catchments to measure progress toward our ultimate goals.

The following tables show progress in each of the tributaries against long-term and short-term performance targets for Total Nitrogen and Total Phosphorus. Red cells show the tributary fails both the long and short-term target, blue means the tributary meets short-term targets but is yet to meet the long-term target and green cells mean that the tributary meets both targets.

1. Support Integrated Catchment Management to reduce nutrient inputs

Support for catchment groups

Catchment groups are an integral part of the Cleanup Program. These groups work hard throughout the year to raise public awareness, develop relationships with school groups to take catchment management into the classroom, develop management plans for catchments and undertake on-ground restoration work. Catchment groups are key to achieving the collective community action necessary to effectively improve water quality discharging into the Swan and Canning rivers.

In 2001-2002, \$415 000 was allocated to help eight catchment groups with operational costs. An additional \$25 000 was provided to the Swan Catchment Council to assist catchment groups to continue their activities during the Council's review of catchment group boundaries and operations. The funding targets the priority catchments highlighted in the Cleanup Program Action Plan. By

providing support for catchment groups' operational needs, the Cleanup Program aims to give groups security to pursue other funding opportunities and allows officers to work directly with community members and local governments in their on-ground activities.

Total nitrogen concentration

The table shows that there has been an improvement in nitrogen in Swan-Canning tributaries over the last five years. At the start of the reporting period only 20 per cent of the monitored tributaries had met the Cleanup Program's long-term target for nitrogen however by 2002, 40 per cent of the monitored tributaries are within their long-term target.

Tributary	1998	1999	2000	2001	2002
Ellen Brook					
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Canning River					
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Avon River					
Susannah Brook					
Jane Brook					
Short-term target met (%)	80	80	80	87	93
Long-term target met (%)	20	20	27	33	40

Total phosphorus concentration

At the start of the reporting period, 80 per cent of the monitored tributaries had met the short-term phosphorus target and 67 per cent had met the long-term target. In 2002, 93 per cent of monitored streams are within their short-term target and 67 per cent within their long-term targets.

Tributary	1998	1999	2000	2001	2002
Ellen Brook					
Mills Street Main Drain					
Southern River					
South Belmont Main Drain					
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Yule Brook					
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Blackadder Creek					
Jane Brook					
Avon River					
Bennett Brook					
Canning River					
Helena River					
Susannah Brook					
Short-term target met (%)	80	87	87	93	93
Long-term target met (%)	67	67	67	67	67

■ Tributary fails both long and short-term targets
 ■ Tributary meets short-term targets but fails long-term target
 ■ Tributary meets both short-term and long-term targets

Swan Catchment Urban Landcare Program

The Cleanup Program, in partnership with Alcoa, supports the Swan Catchment Urban Landcare Program (SCULP), which provides funds to community groups and local government for a range of restoration and environmental protection projects.

In 2001-2002, 46 groups received funding for 66 restoration projects through SCULP. The Cleanup Program contribution of \$100 000 directly supported 31 of these projects. Contributions of funds and labour from project partners and community means that the total value of these projects is far greater.

Local Government Natural Resource Management (NRM) policy

The Local Government NRM Policy Development project is conducted through the Eastern Metropolitan Regional Council. It recognises the essential role local government has to play in reducing nutrient and other pollutants through controlling development, managing current land uses and developing town planning schemes to guide future land uses.

The project gives environmental support to local governments in the Swan-Canning catchment through policies, guidelines and checklists on different land activities available for direct adoption by local governments. The project also provides training in environmental areas to local government staff.

The project has achieved several significant milestones including:

- review of existing local government policies and strategies in the Swan-Canning catchment;
- agreement between 11 local governments and agencies on the range of policies, guidelines and checklists to be prepared to meet their environmental management needs;
- draft guidelines for stormwater management based on Australian best practice; and
- draft guidelines for intensive animal industries.

Farm and property planning

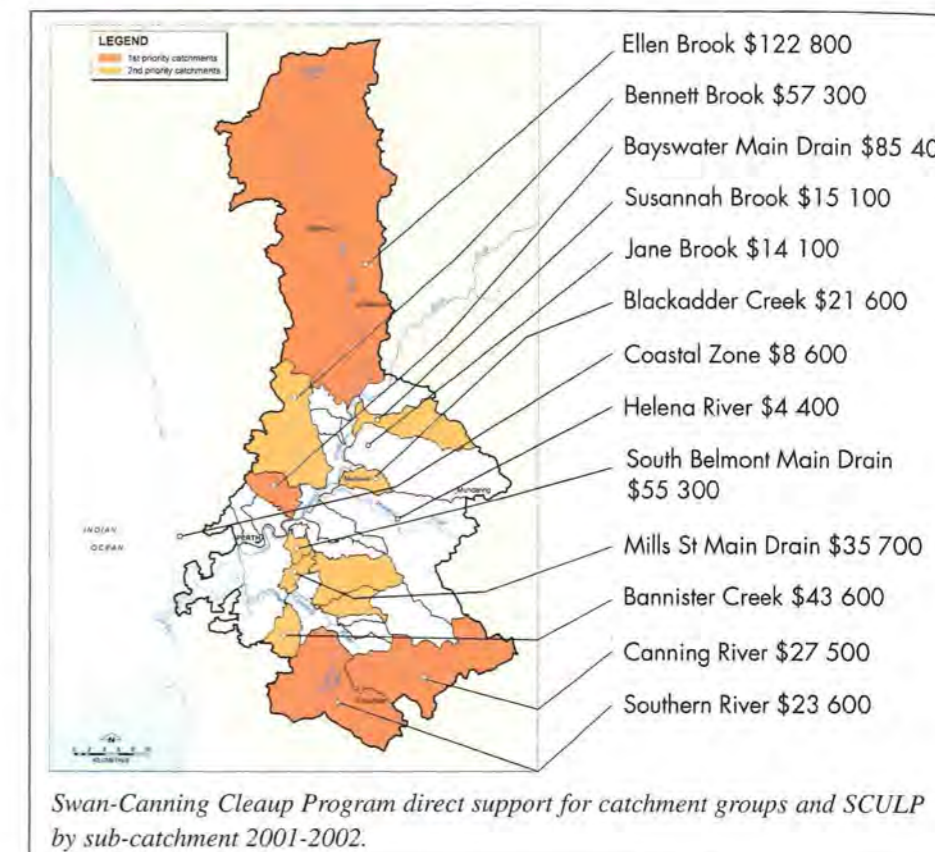
The Property Planning project is conducted through the Department of Agriculture. It helps rural landholders improve their land management to avoid nutrient and soil losses, and improve lifestyle and property values. The project recognises the increasing number of small landholdings in the Swan-Canning catchment and the potentially significant nutrient losses from poor land management practices. The number of small landholdings in the catchment is forecast to double from 1999 levels by 2005.

This project works directly with landholders through field walks and workshops. A wide range of topics are covered including weed identification and control, pasture establishment, revegetation techniques and stock management. 2001-2002 was an extremely successful year with 1 776 landholders participating in learning events such as the Heavenly Hectares seminar series.

Swan Catchment Centre

The Swan Catchment Centre provides the resources for community participation in the Cleanup Program through catchment management. Its services include:

- information, technical resources, advice and training to the community, catchment groups, local government and other organisations;
- development and support of catchment groups;
- implementation of the Swan River Community Action Program, based on the Swan River Action Kit.



Swan-Canning Cleanup Program direct support for catchment groups and SCULP by sub-catchment 2001-2002.

Use of the Swan River Action Kit through learning circles and information presentation was a highlight in 2002. 540 people were involved in learning events with 130 kits distributed to groups and individuals across the Swan-Canning catchment. A network was established for trained facilitators using the kit to educate adults in the community.

Another highlight was the Skills for Nature Conservation Community Training Program. 404 participants attended 23 sessions during the 2001 calendar year. The program awarded *Outstanding Program Award* at the West Australian Adult Learners Awards, 2001.

Ribbons of Blue/Waterwatch WA

Ribbons of Blue/Waterwatch WA was initiated as a school environmental water quality monitoring program in 1989. This network raises awareness and develops skills and understandings about water quality in a whole of catchment context. This leads groups to initiate and participate in on-ground action for a better environment. Since becoming part of the Australia-wide Waterwatch network in 1994, the strong association with schools has continued, while the program increased its community involvement.

In 2002, 27 new school groups joined the program bringing the total to 140 in the Swan Region. There was greater emphasis on using the data collected and linking with other schools, community and government groups.

Minister for the Environment and Heritage launches the Ribbons of Blue "Indicator Aquatic Macroinvertebrates - an identification key for students" on World Environment Day.



A highlight for the year was 'AquaFest' held during National Water Week. School and community groups came together to discuss water and environmental projects at the inaugural event.

Another highlight was the identification flipchart "*Indicator Aquatic Macroinvertebrates – an identification key for students*" which helps identify macroinvertebrates.

Artificial wetlands

An artificial wetland is being designed for the proposed Albion townsite. The design comprises of various zones that will breakdown and remove nitrogen and phosphorus compounds from stormwater entering from urban developments on the Swan Coastal Plain.

Extensive site investigations have been conducted to obtain detailed information on soil types, surface contours, surface features, seasonal variations in the depth to groundwater and the movement of nutrients in groundwater. This will be used to develop a site-specific design suitable for construction. The project team also advises the development industry and Government on the siting and design of artificial wetlands to best achieve nutrient reduction objectives.

Drain retrofitting

The Mills Street Main Drain contributes high levels of nitrogen and phosphorus to the Swan-Canning river system and the Cleanup Program Action Plan recommended drain retrofitting to reduce these concentrations. This process has involved detailed snapshots of water and sediment quality throughout the drainage system coupled with analysis of catchment and drainage information to develop a drainage improvement strategy.

The strategy includes an assessment of options for installing gross pollutant traps to target sub-catchments with high nutrient loading and identifies revegetation, recontouring and reshaping options for improving the nutrient stripping, ecological and aesthetic functions of the drainage system. The strategy will be packaged as an interactive web-based information system incorporating mapping information to help develop the Canning Plain Catchment Management Plan.

Community awareness and involvement

With so many people living in the catchment, community participation is essential. The community awareness campaign focuses on community involvement in the Cleanup Program. The ongoing reinforcement of the program's Clean Swan badge and key message "Help keep our rivers healthy" has maintained a consistent public profile. Targeted communication strategies have successfully raised awareness of river and catchment issues and increased community involvement and corporate support for activities that protect the Swan-Canning river system. They include:

Media strategy

The Cleanup Program has featured in an increased number of metropolitan and community press articles as well as achieving extended radio and television coverage as a direct result of the program's increased involvement with community and corporate events.

Interactive activity strategy

The Drain Game was successfully launched at the 2001 Perth Royal Agricultural Show and proved highly popular with the community. The colourful, community education activity helps people to understand how their actions affect the health of the rivers and was used at 16 community events during the year.

Corporate involvement strategy

During 2001-2002 corporate care workdays were organised with four major city-based corporations. This new program connects the corporate sector with the community in the catchment and gives private business the opportunity to make a significant contribution to environmental restoration projects, and learn about river management issues.

Public participation strategy

The Cleanup Program has been represented at an increasing number of public and audience specific events, where detailed information has been distributed and the staff have engaged the public in conversation about river management issues.

The Cleanup Program also supports targeted public events focused on the river including the Australia Day celebrations and the Autumn River Festival

Community service announcement strategy

A new series of television community service announcements (CSA) was negotiated this year with sponsorship received from Channel 7, enabling the Cleanup Program to target two specific audiences.

The two CSAs focused on urban garden fertiliser awareness and light industry cleaner production. The CSAs asked that the community "Fertilise Wise" and that the industrial community "Protect Your Profits. Protect Your River".

2. Improve planning and land use management to reduce nutrient inputs

Statutory mechanisms

The Cleanup Program Action Plan makes key recommendations to use the regional planning framework to establish the land use plan for the Swan-Canning catchment and guide local government on measures that need to be built into town planning schemes to keep our rivers healthy. Critical areas of land planning legislation include land zoning, assessment of development applications and subdivision proposals.

A project team with representatives from Department for Planning and Infrastructure, Water and Rivers Commission and the Swan River Trust is guiding this long term project.

Swan-Canning industry project

The Swan-Canning Industry Survey found small to medium industry was a major contributor of pollutants to the rivers. It recommended training and legislative measures to avoid these pollution risks.

In 2001-2002 training support in Cleaner Production was provided to 18 local government officers, eight priority catchment group coordinators and seven industry operators.

The Cleaner Production Industry Training package was developed together with the Centre for Excellence in Cleaner Production. It addresses industry needs and encourages the development of cleaner production environmental management action plans.

Investigation into licensing drains

State and local government together operate drainage networks in the Perth area which are significant sources of nutrients to the Swan-Canning river system. In 2000-2001, the

Swan River Trust considered a report commissioned by the Department of Environmental Protection as part of the Cleanup Program, which found there is potential to better manage water quality from drains.

To follow on from the report the Trust concluded that establishment of a working group with a broad range of stakeholders is needed to ensure the right mix of regulatory and non-regulatory approaches in drain management. Ensuring formation of the working group to progress this important area of work will be a priority in 2002-2003.

Water Quality Protection Notes

The Cleanup Program contributes to the Water and Rivers Commission's program to prepare Water Quality Protection Notes that recommend approaches to manage the impacts of land activities on water quality. There are now more than 40 Water Quality Protection Notes for a range of activities including nurseries and analytical laboratories.

3. Modify river conditions to reduce algal blooms

Oxygenation

Oxygenation improves water quality by increasing dissolved oxygen concentrations and reducing the supply of nutrients that lead to algal blooms. The oxygenation plants work by drawing water low in oxygen from the river bottom, mixing it with dissolved oxygen and then distributing the oxygenated water over the treatment area. Dissolved oxygen sensors in the water and rain gauges are used to automatically control the operation of the plant.

In the Canning River two oxygenation plants upstream of the Kent Street Weir treated 2.3km of the Canning River by injecting oxygen rich water at the base of the river. The approach continued to successfully treat the water conditions that cause algal blooms.

In the Swan River efforts in 2002 focussed on analysing the data collected during earlier field trials to report on the feasibility of oxygenating the Swan River. While the field trials have shown that the principals of the prototype barge were sound, large scale oxygenation of the Swan River is not justified.

Modified clay to bind phosphorus

Phoslock™ is a modified clay treatment that binds phosphorus in sediments so that it is not available for algal uptake. 2001-2002 was the third year of trials. Having established that this effectively reduces dissolved phosphorus in the water column, the current focus is on finetuning the dosage and timing to have maximum effect on algal growth. Phoslock™ was applied to 1 500 metres of a previously untreated area of the Canning River upstream of the Kent Street Weir and was used in a combined trial with the Canning oxygenation plant. Overall the treated area had consistently lower filterable reactive phosphorus (FRP) concentrations, compared to the untreated area.

Caring for the Canning River management plan

Public comments have been obtained on the draft river management plan "Caring for the Canning" and a final plan will be released in August 2002. 20 public submissions were received on the draft. Initial priorities for implementing the plan are development of environmental water provisions for the rivers and a sedimentation study. The Caring for the Canning Stakeholder Working Group guides the plan's implementation.

4. Monitor river health, fill critical gaps in knowledge and report progress to community

Monitor river health

Monitoring programs are necessary to measure performance against targets and to track trends in water quality and river health. The Water and Rivers Commission, through the Cleanup Program, has developed an extensive water quality monitoring and analysis program to provide information on catchment and estuarine water quality.

Water quality targets

In 2002, for the first time, the Trust is reporting the Cleanup Program's progress against short-term targets for nitrogen and phosphorus in the freshwater tributaries of the Swan-Canning catchment.

Targets to judge the health of the estuary have also been recommended. These recognise the Cleanup Program's focus for the estuary on decreasing the frequency of nuisance phytoplankton blooms and fish kills caused by a lack of oxygen in the water.

Computer models to support decision making

For several years the Centre for Water Research and the University of Western Australia, with funding support from partners to the Western Australian Estuarine Research Foundation, has been developing computer models to simulate catchment and estuary conditions in the Swan-Canning river system. The project involves three models.

- The Large Scale Catchment Model (LASCAM) models the hydrology, and the associated salt and nutrient loads in the streams and rivers of the catchment.
- The Estuary, Lake and Coastal Ocean Model (ELCOM) models the hydrodynamics of the Swan Estuary.
- Computational Aquatic Ecosystem Dynamics Model (CAEDYM) models the ecology of the Swan Estuary.

The computer modelling approaches test the behaviour of the estuary in response to changes in catchment and estuary water quality conditions. 18 different scenarios are planned to test the effectiveness and relative cost benefit of different treatment approaches.

Sediment nutrient cycling

Most estuaries and lakes suffering the symptoms of excessive nutrient enrichment have accumulated large

stores of nutrients in sediments, which may play an important role in triggering and sustaining algal blooms. The Australian Geological Survey Organisation, now Geoscience Australia, was contracted to employ 'benthic chamber' technology to investigate the amount of nitrogen and phosphorus in the sediment, in the water spaces within the sediment and the amount released into the overlying water.

The results showed that the particulate part of the sediments contained over three times more nitrogen and phosphorus than the overlying water. The study found there is continual recycling of nitrogen and phosphorus in plant available forms and that both nitrogen and phosphorus are recirculated between phytoplankton and sediments many times before they are eliminated from the estuary.

Community reporting

Each year the technical data and analyses are reported in a variety of forms such as information on the internet, technical reports, new publications and the RiverScience series. In addition, progress is reported via an annual video and this annual brochure. The Cleanup Program's annual Community Forum provides the opportunity for community members to make suggestions on the future directions of the program.

Public support and participation in initiatives to protect the rivers is vital to the Cleanup Program. A telephone survey in February 2002 found that 55 per cent of people surveyed were aware of the Swan-Canning Cleanup Program. The Trust will continue to monitor progress in raising awareness of the Cleanup Program.



Volunteers for Deloitte Consulting taking part in a Corporate Care Day.

Action Plan implementation *the year ahead*

Since the Cleanup Program began we have seen an increase in community awareness and an enthusiasm to participate in reducing nutrient levels in the rivers.

Priorities for 2003 include:

- to make information on artificial wetland design and drain retrofitting widely available through the Manual For Managing Urban Stormwater Quality in WA;
- extending the property planning project;
- involving more industries in Cleaner Production;
- progressing Riverplan;
- providing environmental policies, guidelines and training to local government;
- working with the Swan Catchment Council in developing the Swan Region Strategy to guide Natural Resource Management in the catchment;
- continuing support for community involvement in catchment management results;
- investigating results of the decision support modelling; and
- undertaking a comprehensive evaluation of the Cleanup Program to improve effectiveness measurement and guide the program's development.



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Department of Agriculture
Western Australia

Department for Planning
and Infrastructure



EASTERN METROPOLITAN
REGIONAL COUNCIL

*For more information contact the Swan River Trust
or check out our website.*

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