Implementing the Action Plan

August 2001

Swan-Canning Cleanup Program

Action Plan Implementation: Year 2 in Review Summary

SWAN RIVER TRUST

The Swan-Canning Cleanup Program

The Swan-Canning Cleanup Program ("the Cleanup Program") was started in 1994. It studied the increasing incidence of algal blooms in the Swan and Canning rivers and established a plan to improve the health of the Swan-Canning river system.

In June 1999 the Swan-Canning Cleanup Program Action Plan was launched. The second year of implementing the Plan's recommendations has now been completed.

State of the rivers 2000-2001

Water quality changes in the Swan and Canning rivers reflected the short but wet winter between June and August and the subsequent prolonged dry summer.

For example, in the Swan River, as fresh water flow diminished, the salt wedge moved relatively quickly up the river. This had a significant influence in the upper reaches by mid November rather than by late December which is more common in wetter winter and spring years.

In the Canning River, weir boards were put in at Kent Street Weir in late October and calm stagnant weir pool conditions became quickly established in the upper Canning.

The river and estuarine system experienced four main water quality warning periods. A toxic blue-green algal bloom in the upper Canning occurred from 24 January to 13 February 2001 from Kent Street to Hester Park.

Warning signs posted during the toxic blue-green algae bloom detected in the Canning River from the Kent Street Weir upstream to Hester Park, Gosnells.

Nuisance algal blooms occurred in the upper Swan from mid February to late March, in the Swan River between the Causeway and Middle Swan from 15 May to 24 May 2001 and in some areas between Guildford and Midland from 8 June to 24 June 2001.

In summary, water quality and the environmental health of the system remains steady and corresponds to similar years experienced during the 1990s.

There has been great progress with implementing the Action Plan but it will take a long time to see obvious signs of improvement in water quality.

Action Plan implementation: Year 2

The 10 major recommendations of the Action Plan (consisting of 44 sub-recommendations) 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**

Coordination

A coordinated approach is essential to secure the Swan-Canning system. Action is necessary in all four areas for effective changes. The Action Plan fosters an Integrated Catchment Management approach where community driven on-ground work is aligned with local government and state and federal government initiatives.

This year, the Cleanup Program involved 24 major projects with more than 50 people from five government agencies as well as increasing support from numerous community based catchment groups. A Senior Officers Group and a Project Managers Group coordinate and guide the projects to ensure the Cleanup Program's objectives are achieved.

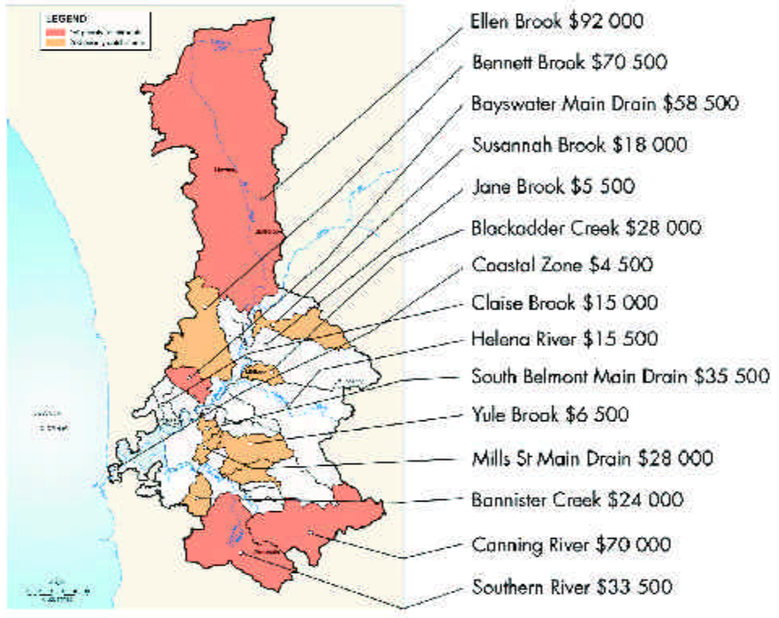
1. Support Integrated Catchment Management to reduce nutrient inputs

Support for catchment groups

Catchment groups are an integral part of the Cleanup Program. These groups have worked hard throughout the year to raise public awareness, take catchment management into the class room, develop management plans and undertake on-ground restoration work.

In 2000-2001, $404 000 was allocated to help various catchment groups with operational costs such as employment of coordinators, project officers, education officers and Landcare trainees, administration support and office supplies.

A further $100 000 was provided for on-ground foreshore restoration and rehabilitation by catchment groups and local governments through the Swan Catchment Urban Landcare Program (SCULP). SCULP also attracted $250 000 funding from Alcoa.



Cleanup Program direct support for catchment groups and SCULP by sub-catchment 2000-2001.

Local Government Natural Resource Management (NRM) policy

The Local Government NRM Policy Development project is managed by the Eastern Metropolitan Regional Council. The project aims to enhance local governments' role in controlling developments, managing current land uses and putting into practice provisions to manage future land uses.

The project enables participating local governments to improve their overall environmental management skills and abilities through a range of policies, strategies, guidelines and checklists.

This year focussed on reviewing existing local government policies and strategies and initial consultation with local government officers.

Farm and property planning

The Department of Agriculture manages a property planning project that works directly with landholders through field days and workshops to help them develop and implement Property Plans and adopt best management practices. Successful uptake of the project is essential to reducing nutrient exports from rural and semi rural lands.

The project continues to mature and develop to meet the market demands of its clients. Many of the smaller lifestyle landholders in the catchment have little if any agricultural background so marketing the project continues to be a major activity.

During year two, about 515 people participated in either a Property Planning field day, workshop and/or seminar.

Landholders participating in a property planning field day.

Swan Catchment Centre

The Swan Catchment Centre provides important information, training, advice, support and resources to the 250 community conservation groups in the Swan region. It is seeking to change the behaviour of the wider community to benefit the environment and most specifically, the Swan and Canning rivers and their tributaries.

Major achievements of the Centre in 2000-2001 include the facilitation of the further development of the Claise Brook and Belmont/Victoria Park Catchment Groups and the establishment of the new Canning Plains Catchment Group.

In response to requests by community groups the Skills for Nature Conservation training program for 2001, in cooperation with the Department of Environmental Protection and Greening Aust. WA, was developed.

The appointment of a Community Education Officer and the launch of the Swan River Action Kit in April 2001 has set the wheels in motion for an exciting program to introduce new people to the Swan and Canning rivers. The Kit has been developed to help people gain the knowledge, skills and values to play an active part in protecting it for the future.

Community Education Officer, Karen Ireland (right), demonstrates the Swan River Action Kit at its launch on 1 April 2001.

Ribbons of Blue/Waterwatch WA

Ribbons of Blue is the Waterwatch program in Western Australia. Ribbons of Blue is an environmental education program aimed at increasing community understanding about water quality and taking action for a better environment.

In 2000-2001, the Cleanup Program continued to support the program by providing $120 000 to help deliver community education outcomes, organise training and data workshops and assist in funding for two local coordinators to help spread the message at a school level. The number of schools in our catchment participating in Ribbons of Blue has increased to 113 with 36 new schools joining the program this year.

During the past year catchment groups were encouraged to link with their local schools to collect water quality data. The initiative has had good uptake, facilitating a more integrated catchment management approach to water pollution at a local level. Sixteen community groups are registered in the Swan Region with eight new groups joining this year.

Constructed wetlands

Well designed constructed wetlands have significant potential to improve the quality of water draining from modified landscapes. In year two, site negotiations and concept design for a major constructed wetland trial at the proposed Albion Townsite began.

The design will be valuable for use in future developments in the catchment.

Drain retrofitting

Established drains in old urban and industrial areas such as the Mills Street Main Drain (MSMD) remain a significant source of nitrogen and phosphorus to our rivers. The Cleanup Program Action Plan recommends retrofitting drains with pollution controlling devices and other catchment measures to reduce these levels.

In year two consultants were contracted to identify all suitable sites for gross pollutant traps throughout the MSMD catchment and the appropriate type of trap, and to provide advice on streamlining options for the open sections of the catchment. A streamlining implementation plan is being prepared by Water and Rivers Commission staff in partnership with the Canning Plains Catchment Group.

Both the constructed wetland and drain retrofitting projects are jointly funded by the Cleanup Program and the Commonwealth's Coasts and Clean Seas Initiative.

Community awareness

Widespread community uptake of measures to reduce export of nutrients to the Swan-Canning river system is essential to the success of the Cleanup Program. A dedicated cross media public awareness campaign began in 1999. Its long term objectives are to raise awareness of river and catchment issues in the Swan-Canning catchment, develop a sense of respect and responsibility for the river and catchment environment and empower individual action, and guide behaviour changes to protect and improve river water quality.

Tools used during the year to meet these objectives included:

- the introduction and extended use of a new, clearly identifiable logo;
- development and reinforcement of the key message: HELP KEEP OUR RIVERS HEALTHY;
- wide distribution of new promotional materials;

- sponsorship of two major public events (Australia Day celebrations and Autumn River Festival);
- developing strategic alliances and partners for environmental restoration projects; and
- reaching new public audiences through participation in public events on or around the rivers.

It has been an important year for the Cleanup Program's public awareness campaign for establishing new relationships as well as strengthening our existing partnerships.

To reinforce the key message to the public a bus shelter advertising campaign was successfully run in March, April and May using a simple but direct visual image.

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

Planning and policy

Appropriately locating land uses in the catchment is the fundamental first step in managing the impacts of land use on water quality. Incorporation of the Cleanup Program objectives into regional planning and town planning schemes is essential to achieving the necessary land use decisions needed for lasting protection of our rivers. Recognition of water resource protection strategies in the town planning schemes also heightens land owner awareness of the measures needed to manage the impacts of their activities on water resources.

In 2000-2001, a partnership agreement was signed with the Ministry for Planning to implement the Action Plan's land use planning recommendations. The first stage of this is a consultancy to review existing town planning scheme provisions and make recommendations on the best suite of statutory measures to use the land use planning process.

Swan-Canning industry training

This project aims to reduce pollution risks from light industry by developing systems for local governments to manage them and by training industry on best practices.

The final report of the Swan-Canning Industry Survey was released this year. Consistent with the recommendations of the report ongoing industrial surveys are being conducted by a number of local authorities represented on the Swan-Canning Industry Working Group.

A cleaner production training course was developed for light industry with the pilot training program completed by seven businesses. The course involved each industry developing a practical Cleaner Production action plan to minimise pollution, waste and emissions.

Further Cleaner Production training courses will be held next year. A priority is to work with industry groups to prepare industry specific environmental education material.

Funding assistance from the Commonwealth's Coasts and Clean Seas Initiative has helped to develop the training programs.

Drain licensing

The Water Corporation and local governments operate significant drainage networks in the Perth area to manage groundwater levels and stormwater flows.

While the drainage networks have an important function in ensuring suitability of land for its intended purpose they are also a potentially significant source of nutrients to the Swan-Canning river system.

As part of the Cleanup Program's objectives to manage nutrient inputs to the river system, the Department of Environmental Protection (DEP) was funded to manage a consultancy to investigate approaches to best regulate nutrient inputs from the drainage networks. A draft report was prepared which found there is potential to improve water quality from drains and suggested options for consideration. Developing the correct mix of regulatory and non regulatory catchment approaches is the next priority.

3. Modify river conditions to reduce algal blooms

Oxygenation

Canning River

Oxygenation aims to improve water quality by improving dissolved oxygen concentrations and preventing the conditions that lead to algal blooms.

Two land-based oxygenation plants have been installed to treat 2.3 kilometres of the Canning River upstream of the Kent Street Weir.

The plants work by drawing oxygen deficient water from the river bottom, mixing it with oxygen gas and then distributing the oxygenated water over the treatment area. Dissolved oxygen sensors in the water and rain gauges are used to automatically operate the plants.

During operation, the river's chemical and physical characteristics are regularly monitored to assess the impact of oxygenation. Monitoring has confirmed the ability of the plant to increase dissolved oxygen concentrations, temporarily suppress nutrient release from sediments and improve conditions for aquatic fauna. Oxygenation is being evaluated as a long term option for improving water quality upstream of the Kent Street Weir.

Swan River

The Swan oxygenation barge project tested the practical application of oxygenation on the relatively large and hydrodynamically complex Swan River using a prototype mobile oxygenation barge. The barge has similar equipment to the land-based oxygenation plants running in the Canning River, but can move to problem areas as required. The project is jointly funded by the Cleanup Program and the Commonwealth's Coasts and Clean Seas Initiative.

This year, in the second and final year of field trials, the barge operated during the summer around Ron Courtney Island and the Guildford Road traffic bridge.

The field trials have shown that the principles of the prototype barge are sound but to properly oxygenate a significant length of the Swan River would require a system with a much greater oxygen injection capacity. A full analysis of the two years' data is being completed to develop design requirements and consider the cost effectiveness of oxygenating the Swan River.

Sediment remediation

This project continues to develop Phoslock™, a modified clay treatment, as an in-river remediation tool. The modified clay binds phosphorus in the sediment so that it is not available for algal blooms.

Last year Phoslock™ was applied to the Canning River in what was its first large scale application. Initial results were very promising but unseasonal rain compromised results of the trial.

A repeat of that trial this year confirmed the promise of Phoslock™ as an in-river remediation tool and provided further experience in its production and application.

This leading-edge research continues to generate national and international interest.

Application of 20 tonnes of Phoslock™ to the Canning River, 20-22 February 2001.

The Canning, Southern and Wungong rivers management plan

"Caring for the Canning", is a river management plan which is being developed for public comment with strong stakeholder input. The plan will address issues relevant to the riparian zone of the river and aims to revitalise the Canning River system to a healthy functioning ecosystem.

The plan includes recommendations which target nutrient and water quality management, drainage management, riparian vegetation and weeds, surface water allocation, erosion and siltation. A detailed environmental water requirements (EWR) study with associated monitoring was also completed. This will lead to the development of environmental water provisions and a formal water resource allocation plan for the Canning River.

Landfill sites

Historically, the wetlands next to the Swan and Canning rivers were progressively reclaimed as part of a strategy to eradicate mosquitos and provide recreational facilities for local residents. The strategy resulted in the "in-filling" of more than 250 hectares of river foreshore and adjoining wetlands covering 13 landfill sites.

This year the Cleanup Program contributed funds to the Water and Rivers Commission to better define the impacts that landfills have as a potential source of nutrients and other contaminants leaching into groundwater and making their way into the river system.

During the year detailed hydrogeological investigations were undertaken at the Centenary Park landfill site in the City of Canning and in Sir James Mitchell Park in the City of South Perth.

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

Monitor river health

The monitoring program now has more than 14 years of nutrient data from the key catchment streams, and seven years of water quality and ecosystem health data from the estuarine portions of the river system.

Continuous monitoring of microalgae (phytoplankton) in the estuarine and riverine portions of the Swan-Canning river system provides public health and water quality information to health and local government authorities and the community.

This year better identification and monitoring procedures for public health and fish killing phytoplankton species were established.

Material published this year includes the River Science series of publications which bring the results of high level scientific investigations to the public in an interesting and digestible way.

Water quality targets

In 2001, the Swan River Trust Board approved estuarine water quality targets for total nitrogen and phosphorus concentrations, oxygen saturation and phytoplankton abundance (ie chlorophyll a) for the lower, middle and upper reaches of the Swan-Canning estuary.

Together with the existing water quality targets for freshwater tributaries, the estuarine targets are used with the monitoring program to accurately report changes in water quality.

Sediment nutrient cycling

The Cleanup Program's Action Plan identified a lack of knowledge about the movement of nitrogen and phosphorus in river sediment as a key information gap needing to be addressed. In response, work began last year to measure actual rates of nitrification and denitrification from the sediments of the Swan and Canning rivers.

This year an intensive three week field program was undertaken. Nine sites in the river system were sampled using benthic chamber experiments and collecting sediment cores. Surface sediment samples were collected from another 30 sites.

Analysis of this data will improve understanding of:

- the role of sediments in the Swan and Canning rivers in nutrient supply to algal blooms;
- the cost and benefits of reducing sediment nutrient sources;
- development of effective remediation methods; and
- calibration and validation of the decision support models summarised below.

Decision support models

A major project to evaluate a range of catchment and estuarine computer models and assess their suitability as tools for a river management decision support system continued this year. Computer modelling can help define issues and assess the effectiveness of possible solutions. Two catchment models have been used in the Ellen Brook catchment to simulate the likely impacts of land use change and land management practices on nutrient loads delivered to rivers. This approach is being expanded to derive a model, which could be applied to all of the Swan and Canning river catchments.

Hydrodynamic and ecological models are being evaluated for the estuarine portion of the Swan-Canning system. Both models are being developed at the Centre for Water Research, University of Western Australia. The modelling will assist decision making processes by examining the effects on the estuary of 25 different environmental scenarios.

Action Plan implementation: the year ahead

This second year of implementing the Swan-Canning Cleanup Program Action Plan focussed on the continued delivery of successful initiatives, and progressing long term initiatives. As we enter the third year, the focus is on continuing the ongoing initiatives and seeing the results of earlier projects. Key initiatives for Year 3 include:

1. Support Integrated Catchment Management (ICM) to reduce nutrient inputs

- The direct catchment group and Swan Catchment Urban Landcare Program funding will continue to provide the logistical support and on ground works to community groups.
- The public awareness campaign will continue to increase public recognition and advocacy for the program.

2. Improve planning and land use management to reduce nutrients

- Ministry for Planning will develop and implement planning tools to incorporate the Cleanup Program's objectives into the land use planning process.
- Strategies to control water quality in drains will be progressed.

3. Modify river conditions to reduce blooms

- Development of Phoslock™ will progress with trials to evaluate an expanded range of applications.
- Oxygenation technologies will continue to be developed with final reporting on the Swan oxygenation trials and continued application and evaluation of in-situ oxygenation techniques in the Canning River.

4. Monitor river health and report progress

- Monitoring program of the Swan-Canning river system will continue.
- The further development of computer models for the catchment, estuary and estuarine ecology will produce valuable results.

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

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