

MOSMAN MUNICIPAL COUNCIL

STORMWATER TRUST
STAGE 4 GRANT (SR/G4085)

**Lawry Plunkett Reserve
Environment & Heritage Project**

FINAL REPORT
EDUCATION PROGRAM

July 2003

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EXECUTIVE SUMMARY

PROJECT NAME: Lawry Plunkett Reserve Environment and Heritage Project – Education Program

GRANT NUMBER: SR/G4085

PROJECT MANAGER: Charlie Hewitt
Mosman Municipal Council

PROJECT SUMMARY

Project objective Reduce the amount of pollution entering stormwater flowing into Lawry Plunkett Reserve and Hunters Bay.

Project methodology Develop localised education program in response to evidence base consisting of

- existing data
 - land use analysis
 - catchment demographics
 - documented and observed bushland impacts
 - receiving water quality and composition of waste captured in SQIDs
 - content and success of past education programs
 - results of previous survey
- community pre-survey
- internal consultation within Council
- recommendations from community consultation

Deliver localised education initiatives including

- educational events
- stormwater brochure
- schools program
- catchment tours
- information nights
- information stalls with Oceanworld
- sandwich bags
- eco-gardening workshops
- eco-gardening booklet

Evaluate education program via

- level of community involvement in consultation process
- production of effective and innovative recommendations through community consultation
- feedback from consultation participants
- comparison of pre-survey and post-survey results
- level of participation in talks, stalls and events
- development of a bushcare group for Lawry Plunkett Reserve
- feedback from workshops

Education program

A large launch event for the education program was held at Balmoral Beach on 20 October 2002. This involved displays from Streamwatch, Coastcare, Taronga Zoo, Oceanworld and Mosman Council, and attracted over 400 people.

An information stall was run on four occasions during January and February 2003. The stall was on the Esplanade walkway at Balmoral Beach and included display tanks and touch tanks from Oceanworld. This reached approximately 150-200 people on each occasion.

As part of the Sydney Harbour Foreshore Authority's Sydney Harbour Week, a Harbour Discovery Day was held at Balmoral Beach on 2 March 2003. This involved displays from Oceanworld, the Marine Discovery Centre, and Mosman Council, as well as marine education puppet shows and guided snorkeling tours. Over 400 people attended the event

Over 300 students from five local schools participated in a school-based stormwater education program developed and delivered by the Marine Discovery Centre, Bondi. The program aimed to empowering students to become community educators via pedestrian surveys, business kit delivery, and drain stenciling. Over 300 pedestrians were surveyed, 120 business kits were delivered, and over 40 drains were stenciled.

All businesses in the project catchments received extensive information packs containing general stormwater information as well as information specific to businesses.

An eco-gardening booklet, originally produced by Resource NSW in 2001, was revised and adapted to make clearer connections between gardening practice and impacts on local water quality and bushland. The booklet was also "localised" with specific information regarding Mosman Council services. One thousand copies were produced, and approximately 600 were circulated to households in areas draining directly into Lawry Plunkett Reserve and Balmoral Park bushland.

Eco-gardening workshops were delivered for residents, reaching over 50 local residents from the catchments, but only four commercial gardeners. Fathom Consulting was engaged to develop and deliver the workshops.

A highly “localised” stormwater information brochure was produced and circulated to all residents in the project catchments via a letter box drop.

Sandwich bags for distribution to all take away food outlets in the catchments have been designed and produced with stormwater and littering messages. A total of 50,000 bags will be distributed during busy spring and summer months.

Information regarding gardening practice has been added to the environmental section of the Mosman Council Website. This includes basic eco-gardening techniques, a PDF version of the eco-gardening booklet, and links to key eco-gardening websites.

Two information nights were held to show an audio-visual presentation of the marine life in the Mosman area of Sydney Harbour and Middle Harbour. Overall, approximately 100 people attended. Mr George Evatt was engaged to provide these presentations.

Project Outcomes

Participation in community consultation was positive and productive. Numerous recommendations were made that fed directly into the development of the education program. Feedback from consultation participants confirmed that the process of facilitated meetings was effective and constructive.

Comparison of results of pre-survey and post-survey showed a consistent, but generally slight, improvement of residents knowledge, attitude and behaviour towards stormwater and bushland management.

There was good attendance at stalls, talks and events with approximately 1,500 people reached by this range of education initiatives and numerous deliveries.

Response to eco-gardening workshops was exceptional, with many people being turned away. Feedback questionnaires indicated that the workshops were a positive forum and effective in changing gardening practice for better stormwater and bushland management.

Evaluation from consultants engaged to deliver the schools program and the gardening workshops was also very positive.

Lessons learned

Community consultation provides valuable evidence for design, development and delivery of education program. In this case, members of the community were willing to offer advice, but did not wish to form an on-going local environmental action/consultation group. Promotion of community consultation, especially with large launch events

can be resource intensive, and does not appear to be cost-effective.

Survey development and analysis requires considerable resources and unique skills to be done effectively. While significant savings may have been made by doing it 'in-house', survey design and results, and consequently robustness of project evaluation, may have been compromised.

1 BACKGROUND

Mosman's Lawry Plunkett Reserve is a 4.1 ha area of bushland in a mostly residential, 33 ha catchment which drains to Middle Harbour. The reserve contains a range of significant vegetation communities, however habitat has been heavily degraded by urbanisation, particularly from stormwater discharges and surface runoff. The reserve also contains physical remnants of the Balmoral tramway system that operated between 1922 and 1958, although much of the route is obscured by dense weed growth.

Stormwater enters the reserve from drainage outlets and as surface runoff from adjacent residential properties. Since the deterioration of the tramway's original drainage system, stormwater flows along poorly defined and informal watercourses within the reserve. Stormwater exiting the reserve re-enters piped drainage directed to Hunters Bay.

The main catchment issues identified in the area include:

- ❑ weed infestation of the reserve, caused by stormwater nutrients and weed spores conveyed from the drainage system and practices of residents who live near the reserve (eg. property encroachment),
- ❑ native species dieback and habitat degradation in the Reserve from stormwater impacts,
- ❑ riparian erosion and scouring of creek beds from inappropriate stormwater flow paths,
- ❑ reduced water quality in Hunters Bay from stormwater pollutants.

2 PROJECT CONTEXT

The Lawry Plunkett Environment & Heritage Project has developed from two small Balmoral South creek rehabilitation projects. It was originally proposed in Mosman Council's Community Environmental Contract (CEC), and had become one of Council's largest integrated environmental projects. This is due, in part, to the assistance of NSW Government's Stormwater Trust (Stage 4) Grant Scheme.

The project has been developed to draw on the ideas, issues and recommendations identified in various local and regional studies and reports. These include the Middle Harbour Stormwater Management Plan, the Mosman Flora and Fauna Study and the Balmoral Reserves Plan of Management.

The education program outlined in this report is part of an integrated project that employs both structural and non-structural methods of stormwater management. Structural methods include SQID installation, creek construction, stormwater diversion and rationalisation, and riparian vegetation, all of which are focussed on the reserve and its immediate surrounds. These methods aim to reduce both the levels of gross pollutants in the stormwater and the areal extent of Lawry Plunkett Reserve affected by stormwater.

Non-structural methods in this instance refer to the education program. The education program is designed to compliment the structural works by addressing dissolved pollutants that cannot be managed by structural methods. These pollutants are generally dissolved pollutants, and once in the stormwater are unable to be removed. Hence, the education program is a suite of *preventative* management techniques, whereas the structural works are a suite of *curative* management techniques.

Both the structural works and education program associated with this project were funded by both the NSW Stormwater Trust and Mosman Council's Community Environmental Contract.

The project has been developed to draw on the ideas, issues and recommendations identified in various local and regional studies and reports. These include the Middle Harbour Stormwater Management Plan, the Mosman Flora and Fauna Study and the Balmoral Reserves Plan of Management.

3 PROJECT OBJECTIVES

The environmental and stormwater objectives of the overall project are as follows:

- Reduction in the quantity of gross pollutants and sediments flowing into local creek system and Hunters Bay.
- Reduction in the amount of nutrients and Biological Oxygen Demand in stormwater.
- Reduction in the quantity of sediment eroded from creek and riparian areas.
- Reduction in the percentage of bushland effected by uncontrolled stormwater runoff.
- Reduction in the volume and frequency of domestic garden rubbish dumped in bushland in Lawry Plunkett Reserve
- Level of involvement in process of community engagement for development of non-structural components.
- Community development of action/consultation groups to address local stormwater pollution and bushland degradation.
- Increase in the number of Bushcare volunteers active in Mosman – and formation of a Bushcare group in Lawry Plunkett Reserve.

3.1 Education Program Objectives

The primary objective of the education program is as follows:

- Reduce the amount of pollution entering stormwater flowing into Lawry Plunkett Reserve and Hunters Bay.

This primary objective is not measurable without an extensive water quality testing regime, hence it is supported by a number of secondary objectives that, while still difficult to measure, can be gauged to a degree. They are as follows

- Develop and deliver an effective community consultation process to inform the education program.
- Improve the knowledge, attitude and behaviour of Balmoral South residents in relation to stormwater management.
- Improve the knowledge, attitude and behaviour of staff working in Balmoral South businesses in relation to stormwater management.
- Improve the knowledge, attitude and behaviour of visitors using the Balmoral Beach area in relation to stormwater management.

4 DEVELOPMENT OF EDUCATION PROGRAM

The education program was developed in response to an evidence base consisting of information specific to the catchments. The evidence base was used to determine target audiences, develop key messages, and identify effective delivery methods for education initiatives. It included the following.

- existing data
 - land use
 - catchment demographics
 - documented and observed bushland impacts

- receiving water quality and composition of waste captured in SQIDs
- content and success of past education programs
- results of previous survey
- community pre-survey
- internal consultation within Council
- community consultation

4.1 Land use

Council based GIS mapping was used to develop the following basic land use breakdown within the catchments.

Combined area	96 ha
Shoreline to Middle Harbour	200 metres (approx.)
What is in the catchment?	48% residential 2% commercial 20.5% road/pavement 6.5% bushland 11% park/recreation 12% military
Area of gardens	[Assuming 60% hardstand on residential properties.] 27.6 ha
Impervious area	[Assuming 60% hardstand on residential properties and 100% hardstand on commercial properties.] 51.3% = 49.2 ha
Potential runoff	Annual rainfall 1200mm Impervious area = 49.2 ha = 492,000 m ² Runoff = 492,000 x 1.2 = 590,000 ML
Premises	1376 dwellings including approximately 80 businesses in Mosman Junction & Balmoral areas

4.2 Catchment demographics

The data below was taken from the results of the 2001 census. A local group of six census collection districts correlate closely with the three catchments on which the education program focussed.

main cause for the approximate 30% weed cover suffered by both reserves. Both reserves are considered to have high conservation significance.

Observation of the reserves indicates a number of cases of dieback of native trees (in particular Angophora) that clearly follow stormwater drainage channels. Scouring, litter build-up and high weed density are also associated with these drainage channels. Dumping of rubbish and garden waste is also apparent in secluded parts of the reserve and around parts of the reserve's edge.

4.4 Receiving water quality and SQID capture data

Biophysical data on the quality of the receiving waters of the three catchments, and pollution removed from the stormwater system in the three catchments, is limited to

- a Harbourwatch monitoring site at Balmoral Baths,
- simple analysis of pollution captured in the SQID that treats the stormwater flowing from the Balmoral Park catchment, and
- observational analysis of the waste collected by street sweeping.

The most recent (2001-2002) summary of the findings of the Harbourwatch program states that the Balmoral Baths site reached 87% compliance for faecal coliform contamination and 84% compliance for enterococci contamination over the 2001-2002 summer season, and 100% compliance for both criteria in the corresponding winter season. This bacterial contamination is thought to be mainly due to sewer overflows higher up in the catchment of Middle Harbour, although local stormwater runoff is likely to contribute to an extent.

The Balmoral Park Catchment SQID captured 5.76 tonnes (wet weight) of waste comprising of 87% organic matter, 8% sediments, and 5% litter over the 2001-2002 financial year. The composition of the captured pollutants is very similar to SQID's throughout Mosman, and is therefore considered representative of the three catchments considered in this project.

Observations of the waste collected in street sweeping operations from the three catchments indicate that approximately 95% comprises of leaves, with the remainder being litter.

4.5 Past education programs

Past education programs in the Balmoral area include information sheets, drain stencilling, messages on sandwich bags and information nights. Information sheet topics include water quality, stormwater pollution, structural control measures around Balmoral, Balmoral catchments, Sydney Harbour ecology, and stormwater-safe gardening. Drain stencilling has been undertaken on approximately 25% of the drains throughout the catchments, however many stencils are in need of maintenance.

4.6 Previous survey

In 2000, Taverner Research conducted a telephone survey of 250 Mosman residents, 150 Balmoral residents, and 40 Balmoral retail food outlet owners and managers. Of particular interest to this project, the survey found that

- residents and businesses were concerned with stormwater and had a good understanding of stormwater (in terms of sources, destination and treatment), and
- educational campaigns (information sheets and drain stencilling) had had an effect; however, there was a relatively poor understanding of the full range of environmental impacts associated with stormwater.

The survey did not investigate reported behaviour in relation to stormwater management, or the community's perception of its role in stormwater management.

4.7 Community Pre-Survey

The pre-survey is included in Appendix 4. Results of the pre-survey were entered by means of an Access database and analysed and displayed in Excel. Results are displayed in full in Appendix 5.

To gain a better understanding local subtleties, the existing data was complimented by an extensive community survey on local knowledge, attitude and behaviour associated with stormwater. The pre-survey was distributed and returned before any educational initiatives were delivered.

Of the 1150 surveys distributed, 293 were returned, representing a response rate of 25.5%. This response rate is considered a relatively high, particularly in the light of the length of the survey (five pages).

The high response rate is almost certainly due, in part, to a competition that was run as part of the survey. A \$250 voucher for a meal at any restaurant in Mosman was offered as a prize for responding to the survey. A second prize of a framed picture by a local photographer was offered for the best phrase that captured Balmoral. Respondents were encouraged to enter both competitions, but providing names and details was not mandatory.

The high response rate might also indicate a considerable level of concern in the community around stormwater and bushland management.

All answers outlined in the following summary section were prompted (i.e. a tick box) unless stated otherwise.

4.7.1 Question 1 – General attitude towards environment

Question 1 consisted of six statements which respondents were asked to what degree they agreed with on a scale of one to five.

The response clearly indicated that most residents are prepared to take responsibility for environmental management, and are willing to change their behaviour to improve the environment.

The spread of responses was much more even when asked whether their personal behaviour actually has an effect on the environment, and whether enforcing fines is more effective than education when managing the environment.

Results from this section indicate that while many residents are willing to take part in environmental management, a high proportion feel that they are not necessarily to blame for current environmental problems.

4.7.2 Question 2 – Causes and/or sources of pollution of local beaches and waterways

Residents were asked "What do you think are the main causes, or sources, of pollution of local beaches and waterways", and given 3 numbered lines to answer (unprompted). As a first response, an overwhelming 42.5% replied stormwater, followed by litter (29.1%). First responses tailed off dramatically after that, with only 4.5% replying "visitors" (or some permutation) and 3.1% replying cigarette butts.

In terms of at least one mention, as opposed to first response, stormwater and litter were almost equal at 63.7% and 63.4% respectively, followed by “boats” 22.9%, “visitors” 16.4% and cigarette butts 12.0%.

Results from this section indicate that respondents have a good understanding of sources of pollution around the harbour, although pollution from boats has been shown to be minimal.

4.7.3 Questions 3-6 – Car washing

About 95% of respondents reported that at least one car belongs to their household.

Just over 22% of respondents said they never wash their car at home, with 15% washing weekly, almost 25% monthly, and 32.4% less often than monthly.

Only 8.5% of respondents reported that they wash their car on the grass, with 18.8% replying “on the street” and 44.0% replying “in the driveway”.

When correlated with washing frequency, the survey showed that 35.1% of respondents wash their cars at least monthly either on the street or in the driveway.

Disposal of left-over wash-water was investigated, with 28.3% reporting disposal on grass or garden and 8.2% “in an inside drain”. Disposal in the gutter or outside drain was reported by 32% of respondents.

Almost 30% chose not to answer the questions regarding washing location and wash-water disposal (only 5% or those reported not owning a car).

Results from this section indicate that car-washing practice is frequent and very poor. Considering the low response to location and disposal questions, and the relatively high profile of this pollution issue, this might indicate that residents with poor behaviour are aware that they are polluting.

4.7.4 Questions 7-12 – Gardening practice

Commercial gardeners are employed by 58.7% of respondents.

Despite careful planning, some of the questioning in this section was done poorly, and consequently responses were inconclusive.

Question 8 asked “Are leaves, debris or grass clippings from mowing, collected from around your residence?”, to which 85.3% responded yes, and “no” responses directed straight to question 10.

Question 9 showed a good spread of responses in terms of the disposal of collected waste between “taken by contractor”, “collected by Council” and “composted in garden”.

Question 10 asked “How are leaves and debris cleared from around your residence?”, with 76.8% replying “swept away”. This result clearly contradicts the result of question 9 indicating that 85.3% collect leaves and debris. The question, however, did show that almost 12% of respondents reported hosing leaves away.

Question 11 was concerned with the use of pesticides and herbicides. Occasional use of pesticides and herbicides was reported by around 40% of respondents, with around 15% unsure. Again, around 40% replied that they never use pesticides or herbicides. Only around 1% reported often use of pesticides and herbicides.

In terms of fertilisers, 61.8% reported occasional use, and 13.7% often use, with around 10% never use and 10% unsure.

Only 20.8% of respondents reported using bushland friendly gardening techniques, with the large majority unsure (67.9%).

Despite inconclusive questions, results from this section indicate that there is potential to improve the rate of collection of garden waste from around residences. Pesticide and herbicide use is relatively low, but can be further reduced, while there is more room for improvement in terms of fertiliser use. There is widespread potential for adoption of bushland friendly gardening.

4.7.5 Questions 13-22 – Stormwater

Over 85% of respondents replied that they knew the destination of stormwater flowing from their local area, with over 60% indicating Balmoral, 7.2% indicating Sydney Harbour (unprompted), however, almost 15% did not indicate a specific destination.

In terms of stormwater treatment across Sydney, 69.3% of respondents said, correctly, that “most leaves, litter and sediment are removed in some areas”. Only 6% of respondents said that “most leaves, litter and sediment are removed in all areas”. 7.2% of respondents said stormwater is fully treated, and 15.7% said stormwater is not treated at all.

Over 55% of respondents reported that they felt “a significant amount” of the pollution in Sydney Harbour and on beaches is due to stormwater from residential areas, as opposed to stormwater from commercial or industrial areas.

There was a good coverage of awareness of the range of environmental impacts associated with stormwater, with 88.7% of respondents reporting health concerns when using beaches, 83.6% reporting littered beaches and waterways, and over 70% reporting impacts on marine life. Only 53.9%, however, associated stormwater with impacts on bushland.

Over 75% of respondents replied that they were concerned that stormwater could “affect their recreation, lifestyle or wellbeing”, with most saying swimming was their main concern.

Council's efforts at managing stormwater were recognised by 69.6% of respondents, with SQIDs as the main initiative (50.9%) (unprompted). Unprompted recognition of any other initiative was very poor, however, with only 7.2% reporting drain stencilling, 5.5% reporting education, and 1.0% reporting street sweeping.

Almost 80% of respondents said they would like to know more how they might contribute to local bushland and stormwater management. In terms of learning how, the overwhelming response was for written information such as inclusions with rates notices (53.2%), articles in paper (48.5%), letter box drops (37.5%) and addressed mail (35.5%).

Discussion of stormwater issues in the community was reported by 30.4% with friends and relatives, 17.1% with neighbours, but only 6.1% with gardener.

Out of a choice of the EPA, Mosman Council, residents, builders, businesses, visitors and ‘other’, 38.6% of respondents felt the EPA is most responsible for reducing stormwater pollution, closely followed by Council (36.9%).

A weighted average of rankings, however, placed Council by far the most responsible for reducing stormwater pollution (826), with residents next (659), followed closely by the EPA (657).

The results of this section show that the community is relatively well informed in terms of the sources, destination and impacts of stormwater, however, bushland impacts were not well recognised. There appears to be good potential for community involvement in stormwater and bushland management. The main call for education initiatives seems to be for written material.

4.7.6 Demographics

The demographics of respondents (sex, age and dwelling type) correlated very closely to those found in the census results for the catchments.

4.8 Business pre-survey

The residents pre-survey was adapted for businesses and circulated to all businesses in the catchments (approximately 75). The response rate for the survey was quite high, 26%, but this still only represented 20 businesses. While this is not enough to make statistical analysis viable, the results do provide guidance.

- Most business respondents were positive towards local environmental management, and 40% reporting that they were concerned that environmental damage might affect their business
- There was a poor understanding of the destination of stormwater (relative to resident's understanding). Only 65% of respondents reported they knew where stormwater emptied.
- There was also a relatively poor understanding of the range of impacts that might be associated with stormwater. Possible bushland impacts were only recognised by 30% of respondents.
- Only 20% of respondents reported providing environmental training for employees.

4.9 Internal consultation

A small working group within Council was developed to provide broad advice on appropriate means of consulting and educating the community. The working group consisted of the Project Officer, the Director of Community Development, the Community and Business Relations Manager, the Marketing Officer, and the Environment Officer – Communications. Subsequent to meetings of the working group, all three ward councillors were consulted on ways of working with their constituents.

The working group contributed significantly to interpreting some of the findings of the survey, developing an appropriate consultation process and confirming the suitability of various ideas that stemmed from other parts of the evidence base.

4.10 Community Consultation

Community consultation, under the banner of BEN – the Balmoral Environment Network, was used to develop education messages and delivery methods that were sensitive and responsive to local values and needs.

Providing a process of participation also aimed to contribute to the development of a sense of responsibility in the community for local environmental management, and community ownership of the education program.

4.10.1 Promotion of consultation

To gather a broad and representative cross section of the community, the opportunity to participate in the consultation process was widely promoted via a number of avenues including

- addressed mail to the 1150 households in the catchments,
- two advertisements and a story in the Mosman Daily,

- posters around Balmoral and commercial areas, and
- an educational launch event.

4.10.2 Process and scope

Consultation was in the form of two meetings of approximately two hours duration each. One meeting (26 November 2002) was scheduled for the evening, the other was held at lunchtime (27 November 2002) to accommodate different schedules among members of the community. Over 40 people attended, and represented a good spread of ages and backgrounds.

An independent facilitator hosted the meetings, and the Project Officer supplied participants with background materials and a presentation on stormwater management.

Participants were invited to comment on all aspects of stormwater management, with the facilitator aiming to steer comments towards education initiatives.

4.10.3 Outcomes and recommendations

All comments were noted by the Project Education Officer in full view of all participants on butcher's paper. No other recording of the meetings was made. The comments and recommendations received are noted in full in Appendix 7.

The main recommendations stemming from the consultation process that are within the scope of this project are as follows.

- Provide information and materials to help the community to act as stewards for their local environment.
- Publicise the legislation and fines that apply to inappropriate behaviour.
- Develop "respect" signs around the beach area to encourage visitors and beach users to behave appropriately.
- Address stormwater management and sediment control on building sites.
- Use schools as a means of getting messages into businesses and people's homes.
- Council needs to get environmental management messages to renters through real estate agents.
- Educate community on limitations of SQUID's.
- Continue drain stencilling.

Not all of these recommendations were incorporated into the education program.

A number of the comments received in the consultation process did not refer to education, and, while noted and referred to Council officers and managers, were not considered in this project.

5 EDUCATION PROGRAM

A suite of educational sub-programs were developed in response to the broad evidence base outlined in section 4 and the objectives outlined in section 3.1.

The key messages delivered by the education program were as follows

1. The community has an important role to play in stormwater management (structural and service-based stormwater control is effective but limited).

2. Stormwater has a significant effect on bushland, as well as on the quality of receiving waters.
3. There are close links between everyday behaviour (waste management, gardening practice, dog walking, car washing) and stormwater quality and impacts.
4. There are regulatory procedures and significant fines associated with stormwater management.
5. The Harbour has a rich and diverse ecology that needs to be protected from stormwater impacts.

5.1 Residents

5.1.1 BEN launch event

As outlined in section 4.10, community consultation was done under the banner of BEN – the Balmoral Environment Network. Invitations to join the consultation process mailed out to all households in the catchments were accompanied by an invitation to attend a launch event at Balmoral Beach on 20 October 2002.

While the event aimed at promoting BEN, showing the importance of stormwater as an issue and the need for community involvement required the delivery of the education messages set out above.

Ian Kiernan AO launched the event and the Mayor of Mosman and the project officer also addressed the crowd, all promoting the importance of community consultation in the development of local environmental education programs.

The event included a number of education and entertainment elements, including

- a stall from Mosman Council with native plant tube-stock giveaways and information on the local environment
- a display of marine life from Coastcare
- Oceanworld display tanks and touch tanks (see section 5.2.1)
- an information stall from Streamwatch
- urban bushland animals from Taronga Zoo
- marine creature street performers
- a jazz band
- BBQ

Attendance at the event was around 400 people.

5.1.2 Brochure

Survey results and community consultation indicated that simple written information was favoured by the community as a means of education. Participants in community consultation also indicated that they would like council support to act as stewards for their local environment.

The pre-survey showed there was a need to 'include' residents in their environment and local stormwater management by showing them their responsibilities.

An initial concept of a folder containing information sheets and flyers was developed on the basis of this evidence. Stormwater and catchment management information sheets were existing, and the folder was seen as an attractive package in which to distribute them. The

flyers were intended for residents acting as environmental stewards to hand out to people they saw behaving in a potentially polluting manner. The flyers were to outline fines associated with inappropriate behaviour and the solutions to such behaviour.

Upon reflection on this initial concept with a number of consultants, it was found to be flawed. It was thought that the folder concept attempted to deliver too much information, and provided an ideal means for recipients to dispose of all materials at once. Also, distributing the folders to all residents in the catchments would mean that flyers were being given out to people who already had them.

The concept of a folder was consequently scaled back to a brochure with the following features.

- Title – Where Does Your Harbour Start?
- Overall message – different areas (shops, houses, parks, bushland, waterways) and behaviours are linked by catchment processes (i.e. stormwater).
- A focus on five key behaviours in regard to stormwater source control; car washing, gardening, leaf collection, pet ownership, and stewardship of construction sites.
- Information regarding behaviours and includes issues, solutions, penalties and reporting.

The main distinguishing feature of the brochure was its highly localised nature. The South Balmoral Catchments begin around Mosman Junction, flow through residential and bushland areas, and end at Balmoral Beach. These features, especially Mosman Junction and the Esplanade at Balmoral, are very distinctive, and were clearly incorporated into the illustration used in the brochure.

To further strengthen this local theme, residents were put in the “stormwater picture” by means of an A3 fold-out aerial photograph. At this size, properties are clearly visible, and the photograph incorporated catchment boundaries and indicated stormwater outlets. The poster title asked “The Stormwater Picture – Where do you fit in?”

The brochure also included information on the high value and biodiversity of local bushland and harbour.

The project officer developed content of the brochure. Logic Space Consulting coordinated design and production of the brochure. The brochure cost a total of approximately \$5,500.

Approximately 1200 copies of the brochure were circulated by letterbox drop to all households in the catchments. A further 150 were circulated to businesses, including all businesses in the catchments.

5.1.3 Schools Program

Participants in community consultation clearly indicated that schools and children were considered an ideal means of getting messages into homes and the community.

The Marine Discovery Centre of Bondi Beach (MDC) was engaged to develop, deliver and report on an action-learning stormwater program for schools throughout Mosman. The main objective of the program was to empower students so that they are able to influence the behaviour of their families and the broader community by delivering messages on appropriate behaviour for stormwater and bushland management.

The MDC developed their “Sydney Stormwater and Coastal Kids” program for Waverly and Woollahra Councils as part of a Sydney Water grant. The program is closely linked to the Department of Education and Training 2001 document *Environmental Education Policy for Schools*, as well as the relevant elements of the curriculum. It is designed for students between years 4 and 8 inclusive. The program aims to introduce students to catchments,

stormwater pollution sources and impacts, and, most importantly, the role that they can play in reducing stormwater pollution.

The program allows students to get involved in the management of their local catchments by various means. On the day of delivery, these include researching public awareness of stormwater through pedestrian interviews, visiting local businesses with information kits and discussing stormwater with some business owners, and maintaining community awareness by stenciling stormwater drains.

Following the day of activities, students and teachers are encouraged to further their involvement in catchment management via the EPA Website resources in particular, and other avenues including Streamwatch, Murder under the Microscope, and the Jason Project.

The program was marketed strongly to all nine schools throughout Mosman, with six schools choosing to take part in the program. They were Beauty Point PS, Queenwood High, Mosman Preparatory School, Blessed Sacrament, Sacred Heart and Mosman High. The program was eventually delivered successfully throughout term 2 of 2003 to five schools, including over 300 students. Mosman High chose not to be included in the program at a very late stage.

The program reached around 130 businesses, including all of those within the catchments, delivering extensive business information kits (see section 5.4.1). Over 300 pedestrians were interviewed (including Mosman Council's Manager of Assets and Services). Results of these surveys were not used in the education program, however, they were primarily designed to serve as an environmental/social geography and math's exercise for the students. Approximately 45 drains were stenciled throughout the program, with about one half of them within the catchments. Some activities were carried out in other catchments due to logistical reasons.

Overall, the program development, localisation, delivery and reporting cost approximately \$15,500. A full report of the program is included in Appendix 12.

5.1.4 Catchment tours

Delays in structural works due to poor weather and staff scheduling have meant that this educational element has not been delivered at this stage, however, it is seen as an important activity.

It is proposed that residents be invited on a tour of the works around Lawry Plunkett Reserve, looking at all aspects of an integrated stormwater project. These elements include SQIDs, creek construction, track work, water quality monitoring demonstrations, and the education program. This aims to show how different elements compliment each other, and how they fit together to address a spectrum of stormwater issues.

5.1.5 Information nights

Information evenings on the marine and coastal life found around Mosman were held on two occasions, 9 January 2003 and 14 May 2003. Community consultation and survey results showed that residents were keen to receive information in this way. The evenings were marketed by posters around the cafes and shops of Balmoral, in the Mosman Daily, and also the North Sydney Times for the May event.

The January event was part of the Coastcare Summer Program. Underwater film-maker George Evatt was invited to give an evening presentation of footage of marine life found around Mosman. This was part of his new interactive DVD whereby audience members were able to request footage of particular marine life, and George was able to access footage to answer particular questions. Approximately 30 people attended this event.

The May event was organised with the other education officer at Council and included George Evatt's presentation, along with a talk on Marine Protected Areas and Marine Conservation around Sydney Harbour from NSW Fisheries and NPWS. These talks were complimented by presentations from locals Johnathan Clarke Jones on seahorses of Mosman, and Michael Keats on invertebrates of Chinaman's Beach. This event was attended by over 70 people.

Total cost of both events combined was approximately \$800.

5.1.6 Sand-sculpting

As part of the Coastcare Summer program, a sand-sculpting day was organised on January 7. The day was promoted by means of posters in the cafes and shops around Balmoral.

Approximately 30 people attended, and the day was made educational by the provision of around 25 pictures of creatures found in Sydney Harbour. Children were intrigued by the variety and diversity of harbour life and were easily encouraged to build examples of what they saw in the gallery of pictures.

5.2 Visitors

5.2.1 Information stalls

Community consultation indicated that there is significant concern regarding the impacts associated with visitors to the area, particularly Balmoral Beach.

Users of the beach and Esplanade area were targeted with an information display on the walkway directly beside the beach on four weekends during the busy period of January and February. The stall was set up for around three hours on each occasion.

The display used an extensive range of education materials including those developed in the Stormwater Trust Council Resource Kit, Balmoral catchment postcards (see Appendix 1), catchment maps, information sheets, BUTTsOUT portable ashtrays, POOch Pouches, and a stormwater pollution display tank.

People coming to the stall included both visitors and residents. With the aid of a local catchment map, the project officer was able to discuss with residents their property and local drainage patterns, providing a unique opportunity to put residents and their responsibilities in the "stormwater picture".

Oceanworld Manly was engaged to display marine life found in Sydney Harbour, mainly from Manly Cove, an area directly visible from the information stall. These displays included a large touch tank (kelp, hermit crabs, sea stars, sea urchins, sea anemones, sea snails, shark eggs and other crustaceans) and numerous display tanks (bamboo sharks, octopuses, sea horses, and angler fish).

The Oceanworld display generated a great deal of attention, and served as a highly effective educational tool. Numerous observers commented that they were completely unaware of the diversity of marine life in the harbour, thinking it was more car wrecks and old tyres than anything else.

While playing an important educational role, the inclusion of the Oceanworld display attracted many more people to the stall than would otherwise have responded to the educational materials alone.

A total of approximately 600 people were reached by the information stall.

5.2.2 Sandwich bags

Analysis of waste captured by SQIDs, survey results, internal consultation and community consultation have all indicated that litter associated with take away food is a serious issue in the beach/Esplanade and Mosman Junction areas. Residents are convinced that it is mainly visitors that are to blame, although this is particularly difficult to determine.

Bags for take way food have been designed with messages concerning stormwater and litter (as shown in Appendix 13)

Approximately 50,000 bags are currently being printed. They will be distributed to food shops in the South Balmoral Catchments during upcoming busy summer months.

5.2.3 Harbour Discovery Day

On 2 March 2003, the Sydney Harbour Foreshore Authority launched Sydney Harbour Week, intentionally coinciding with Clean Up Australia Day. Sydney Harbour Week aimed to promote the environmental, heritage and working aspects of the harbour.

A larger educational event was already planned following community calls for educating visitors to the area, and tying such an event to Sydney Harbour Week offered a unique opportunity to gain widespread free publicity. The event included

- an extensive display of educational materials similar but larger than the information stalls
- a large Oceanworld display of Sydney Harbour ecology similar but larger than the information stalls
- two guided snorkelling tours around Balmoral Island (approximately 50 people)
- a marine education puppet show
- a glass blowing exhibition specialising in Sydney Harbour ecology (offering a degree of novelty, and an opportunity to put up pictures of wide range of Sydney Harbour creatures that attendees could request)
- marine orientated face painting and cartoon workshops
- continuous display of Beneath the Blue (acclaimed documentary on Sydney Harbour biodiversity)
- a BBQ

Approximately 400-500 people attended the event between 11am and 4pm, with both snorkelling tours full to capacity. The event cost approximately \$3,000.

5.3 Gardeners

5.3.1 Eco-gardening workshops

Basic analysis of catchment land use, composition of captured pollutants, and survey results clearly indicated that improving the practice of both commercial and 'residential' gardeners has the potential to enhance water quality and reduce bushland impacts.

Fathom Consulting was engaged to develop, deliver and report on a series of eco-gardening workshops for 'residential' gardeners (2 workshops) and commercial gardeners (1 workshop).

The workshops were promoted by the project officer to all households in the catchments, and commercial gardeners, active in the area, via direct mail.

Balmoral Sailing Club was used as a venue for the workshops, although an actual garden would have been ideal. This venue, however, was suitable as it is in the catchments and is

near a large area of creek vegetation that offered many examples of native plants and stormwater management by means of creek construction. These elements were incorporated into the workshop program.

Response to the residential gardeners workshops was very positive, with bookings reaching capacity (50) within two days of residents receiving invitations. The response to the commercial gardeners workshop was positive but smaller with 12 bookings taken.

Both 'residential' workshops were held on Sundays, 15 and 22 July 2003, and the commercial gardeners workshop was held on Monday 16 July 2003. Approximately 50 people attended the residential gardeners workshops, but only four commercial gardeners attended their workshop.

The workshops were facilitated by Lorraine Cairnes of Fathom Consulting, and were delivered in a manner that encouraged a two-way flow of information. They were not intended to be lectures, and it was recognised that many participants had effective eco-gardening ideas and techniques to share with other participants and workshop organisers.

Gardening, by its nature, is a practical exercise, so numerous examples of compost, mulch, native plants and invasive species were included in the discussion.

A full report of the workshops is included in Appendix 11.

5.3.2 Eco-gardening booklet

The full range of eco-gardening techniques could not be covered in a three hour workshop. Combined with the prevalence of gardens as a land use in the catchments, and the limited capacity of workshops to reach a large audience, this warranted a thorough, on-going resource to promote eco-gardening.

In 2001 Resource NSW produced a 36 page A5 booklet entitled *A Guide to Eco-Gardening*. This original version is now out of print and no copies were available, however, Resource NSW retained the copyright on all content of the booklet. This booklet was identified as a dormant resource, that could easily be adapted to highlight connections between gardening practice, stormwater, local water quality and bushland. These connections were implied in the original version, but not made particularly clear.

Adaptation of the booklet also allowed for Mosman 'branding' and the inclusion of specific Mosman content regarding council services and contact numbers. These elements were included to improve uptake among local residents and the increase relevance of the booklet to the local community.

The project officer worked closely with a gardening expert at Resource NSW on improving the content of the booklet, as well as making stormwater and gardening connections clearer and "localising" the booklet.

One thousand copies of the booklet were printed, and approximately 600 were circulated by direct mail and distributed via the eco-gardening workshops.

5.3.3 Website

Census results showed that there is a high level of internet use in the Balmoral South catchments. There were also a number of calls at the eco-gardening workshops to provide advice via the Council website.

As part of a concurrent education program, "Be a Bush Friendly Neighbour", consisting mainly of a brochure, Council already had some eco-gardening information on-line. This was

expanded to form a simple checklist of things that can be incorporated into a garden to reduce impacts on water quality and bushland stemming from gardening practice.

There is currently a wealth of gardening information available on the internet. So rather than developing detailed information, links were provided to a number of sites that were carefully investigated, by both the project officer and the gardening expert at Resource NSW.

This page also provided a point from which to make a PDF version of the eco-gardening booklet widely available.

5.4 Businesses

5.4.1 Information kit

Approximately 130 businesses were contacted through the school based program (section 5.1.3). Part of this program involved students visiting businesses to deliver a business information kit. The kit contained the following.

- A series of existing information sheets (1 – water quality, 2 – stormwater, 3 – Balmoral Stormwater Management Project, 4 – Mosman’s catchments, and 5 – Sydney Harbour ecology)
- Stormwater information brochure outlined in section 5.1.1
- EPA brochure “stormwater: The Difference is You”
- Balmoral South catchments postcard (see section **Error! Reference source not found.**)
- SCCG footpath hosing brochure “Is your Hose Pollution on Tap?”
- Heritage of Mosman’s Bays brochure
- A summary sheet including do’s and don’t
- Existing Mosman Council booklet on environmental management of food businesses (food business kits only)

Although these kits could clearly have been delivered by mail or by a council officer, the use of the schools program was considered more effective in terms of getting people to read the kits. In most cases the classes taking part provided “cover letters” for the kits, and the fact that young students were delivering the kits made them appear much less official. It was assumed that people would not be as positive towards a council officer or council mail.

Having the students deliver the kits also encouraged them to feel they are able to take messages to a broad cross section of the community.

6 Education program budget

The following table outlines the approximate cost (ex GST) of all education program elements.

	Cost
Community consultation	\$5,302
Pre-survey	\$1,115
Residents	
BEN launch event	\$4,510
Brochure	\$5,153
Schools Program	\$16,064
Catchment Tours	nil
Information nights	\$800
Sand-sculpting	nil
Visitors	
Information stalls	\$1,045
Sandwich bags	\$3,000
Harbour Discovery Day	\$3,089
Gardeners	
Eco-gardening workshops	\$14,593
Eco-gardening booklet	\$4,890
Website	nil
Businesses	
Business information kit	(schools program)
Post-survey	\$475
Sundries	\$387
TOTAL	\$56,627

7 EVALUATION – Outcomes of the Education Program

Evaluation in this instance refers to revisiting the initial objectives of the education program and using a range of means to investigate how well those objectives were met.

As outlined in section 3.1, the measurable objectives of the education program were defined as follows.

- Develop and deliver an effective community consultation process to inform the education program.
- Improve the knowledge, attitude and behaviour of Balmoral South residents in relation to stormwater management.

- Improve the knowledge, attitude and behaviour of staff working in Balmoral South businesses in relation to stormwater management.
- Improve the knowledge, attitude and behaviour of visitors using the Balmoral Beach area in relation to stormwater management.

The consultants that were engaged to develop, deliver and report on the eco-gardening workshops and the schools program provide specific evaluation of these elements of the program in their respective reports. See Appendix 11 and Appendix 12.

7.1 Evaluation of consultation process

The consultation process was evaluated by measuring the following.

- the number of residents engaged and their level of involvement,
- the production of effective and innovative recommendations, and
- feedback from participants and interested residents.

Around 64 residents expressed interest in being part of a consultation process, and 42 of those actually attended a meeting. This represents about 1.7% of the population of the three catchments, and although small, the representation of ages, sex and views was quite broad. The independent facilitation of the meetings allowed an appropriate level of involvement of all participants, and discussion was lively and generally positive.

It is considered that the recommendations stemming from the consultation process (see Appendix 7) were not necessarily innovative, but certainly highlighted for Council the particular concerns of the local community. Recommendations were directly responsible for the level of visitor education and the introduction of the schools program.

All of those that participated in the meetings or expressed interest in participating but were unable to attend, were sent a feedback form following the meetings (see Appendix 8).

Thirty three responses to the questionnaire were received. All respondents who participated in the meetings (25) reported that the consultation was “a positive forum for discussing and considering [their] concerns and ideas”. All but 2 respondents said they would like the opportunity to participate in further consultation. Of the majority that would like to participate in further consultation, 22 said they would like to have meetings, 13 said questionnaires, and 8 said e-mail forums (some ticked more than one box).

These results confirm that the process of independently facilitated meetings was an appropriate means of consulting a particular section of the community. Residents who were unable or unwilling to attend the meetings were able to contribute to the development of the education program by way of the survey outlined in section 4.7.

7.2 Evaluation of residents education

Changes in the knowledge, attitude and behaviour of residents and businesses were evaluated by,

- comparison of results of pre-survey (circulated before education program) and post-survey (circulated after education program),
- participation of residents and businesses in talks, workshops and events, and
- development of a Bushcare group for Lawry Plunkett Reserve or an increase in the number of local Bushcare volunteers.

In response to land use and demographics in the catchments, this education program focussed heavily on changing the knowledge, attitude and behaviour of residents. This has

led to an emphasis on the comparison of the results of the pre-survey and the post-survey within the evaluation stage of the program.

7.2.1 Results of pre-survey and post survey comparison

Approximately 1150 pre-surveys were circulated to all households in the catchments in September 2002, with 293 returned (see section 4.7). This was followed by the delivery of the education program, and the subsequent circulation of 1150 post-surveys to the same households in June 2003, with 182 returned.

The response rate for the post-survey (15.8%) is considered reasonable. It is lower than the response rate for the pre-survey (25.4%) because no competition was included in the post-survey.

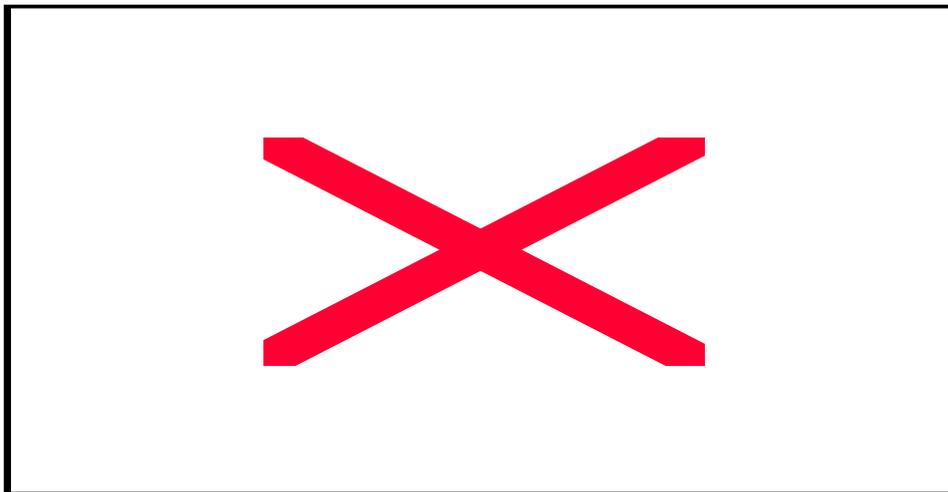
The post-survey was also shorter than the pre-survey as it was intended to measure changes by means of a few key questions, rather than inform the entire education program. It was also shortened in an effort to deliver a good response rate without using a competition.

Overall, comparison of the two surveys shows a consistently positive, but generally slight, improvement in community knowledge, attitude and behaviour over the period during which the education program was delivered.

This project has been unable to uncover to what degree the education program was directly responsible for this change (see section 8.8), however, it is assumed that it did play a significant role in the changes outlined in this section.

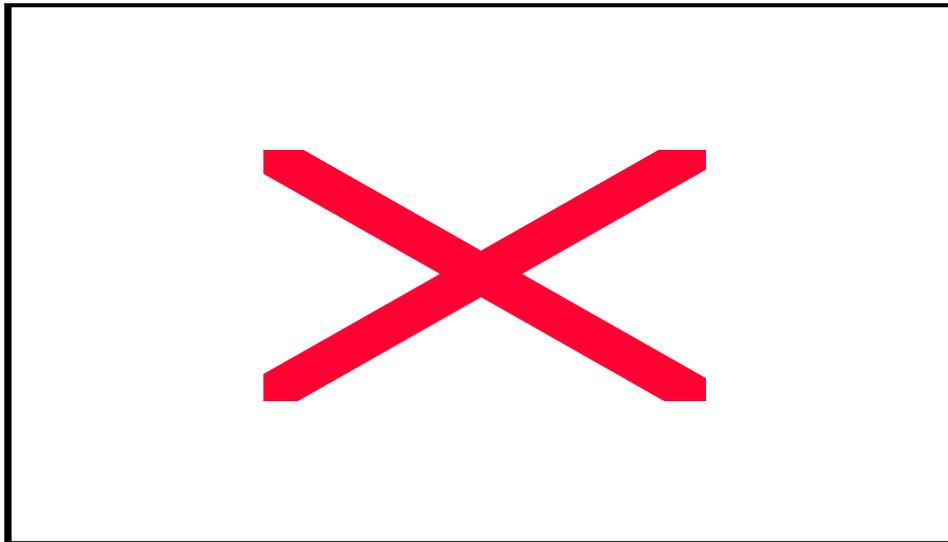
7.2.1.1 Changes in general attitude towards environment

Q1a – “Experts manage pollution problems, so I don’t need to worry”



There is a considerable increase in “disagree” responses, however, this is tempered with a small decrease in “strongly agree” responses. It would appear that more respondents have realised that they should take responsibility for pollution issues.

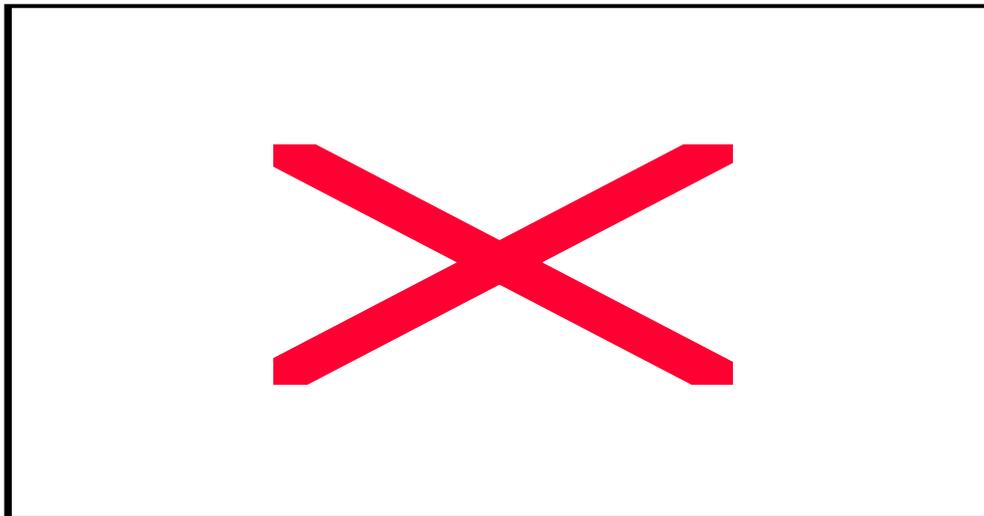
Q1b – Enforcing fines is more effective than education as a means to stop people polluting.



A combination of enforcement and education was promoted in all aspects of the education program.

Spread in this question remained relatively high, although there were small positive changes in increases in “strongly disagree” and “disagree” responses” (slightly exaggerated by scale of graph). There was also an increase in “strongly agree” possibly indicating that respondents have become more concerned with pollution issues, and continue to feel that enforcement measures are more effective than education.

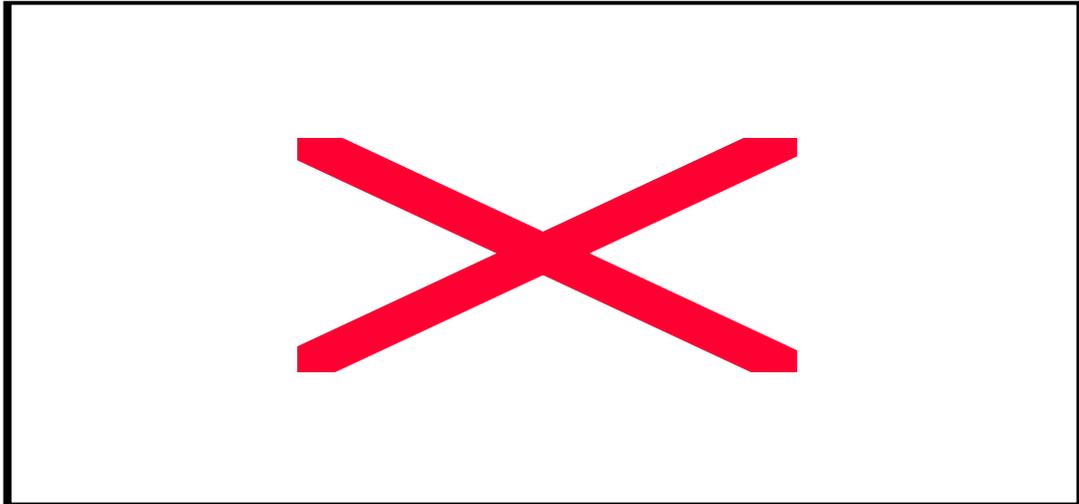
Q1c – My lifestyle and behaviour have very little effect on water quality and bushland.



Results of this comparison are inconclusive, implying that it could have been left out of the post-survey (it did inform the education program however).

Increases in “strongly disagree” and “disagree” responses might indicate that more people feel they do not have an impact on water quality and bushland *despite* the education program. Or, they may have changed their behaviour, as a result of the education program, and as a consequence feel they *no longer* have a significant effect on water quality or bushland.

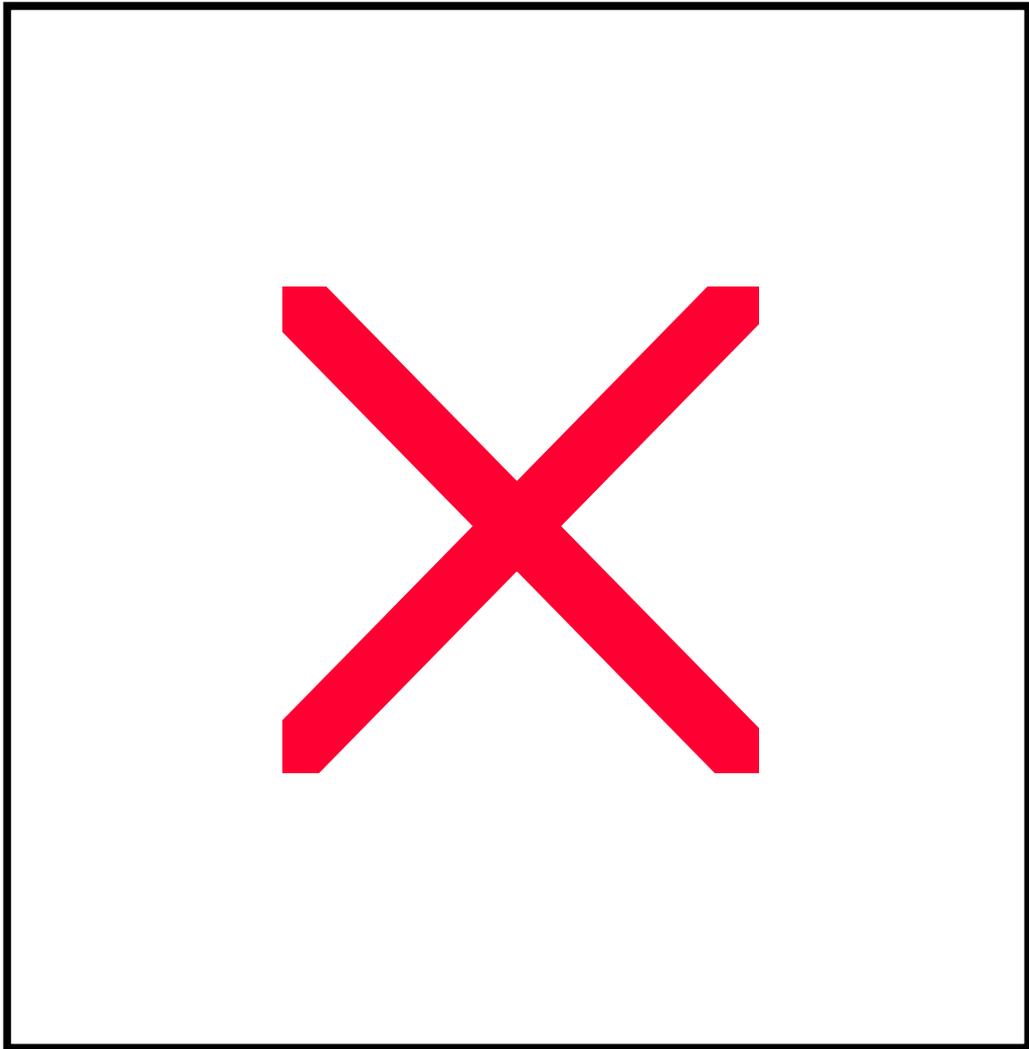
Q1d – I am prepared to change the way I do things if it improves the environment.

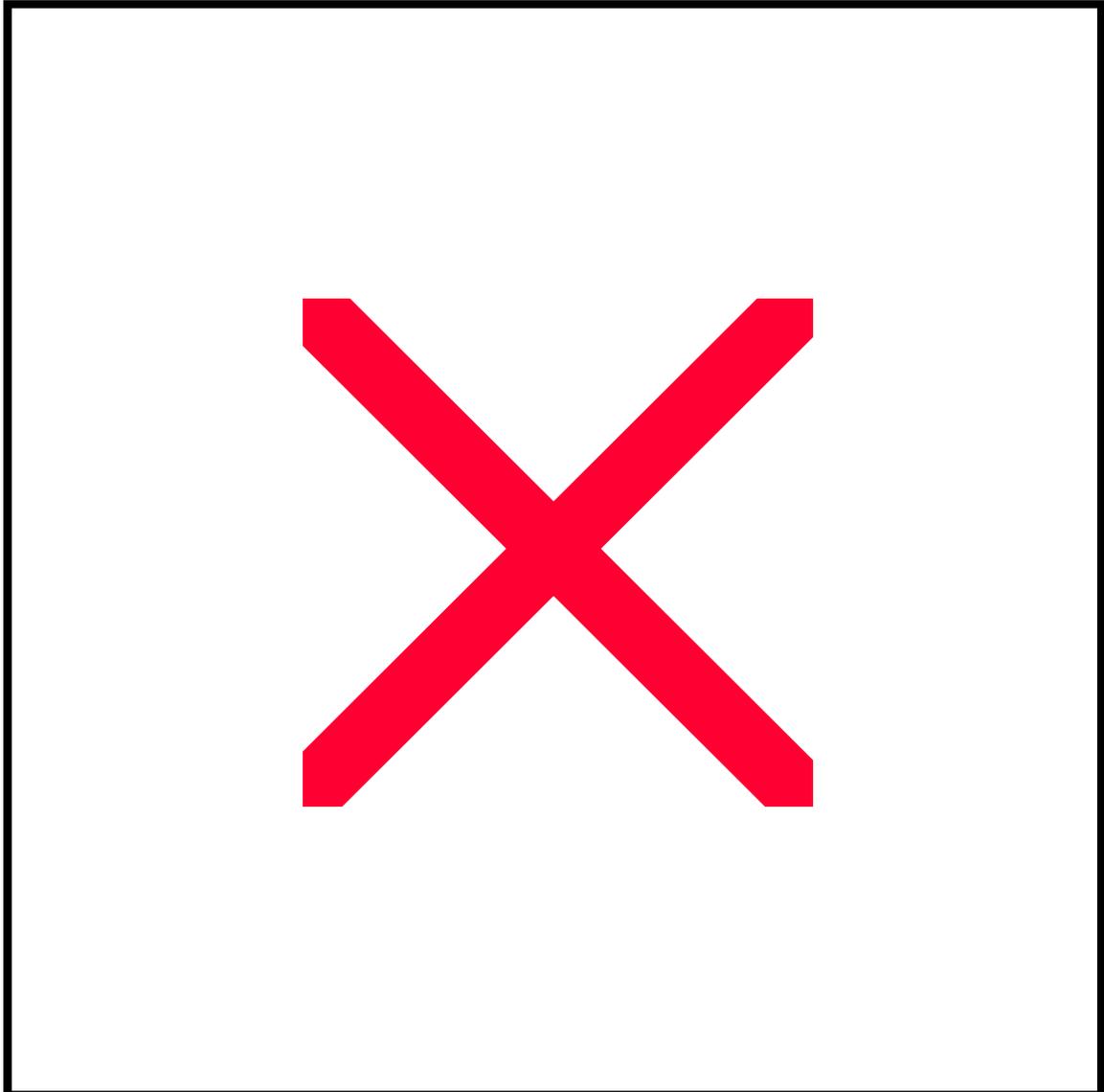


Change in responses to this question was positive but slight, with the emphasis on “strongly agree” and “agree” responses remaining. This indicates that solutions to polluting behaviour offered in the education program are considered easy and effective by respondents, who, as a whole, are generally willing to contribute to environmental management.

Q2 – What do you think are the main causes, or sources, of pollution of local beaches and waterways? (unprompted)

This question was unprompted and respondents were encouraged to write down at least three sources or causes.





[The percentages in the “all responses” graph do not add up. For example, 16.4% of respondents mentioned visitors either first, second or third in the pre-survey.]

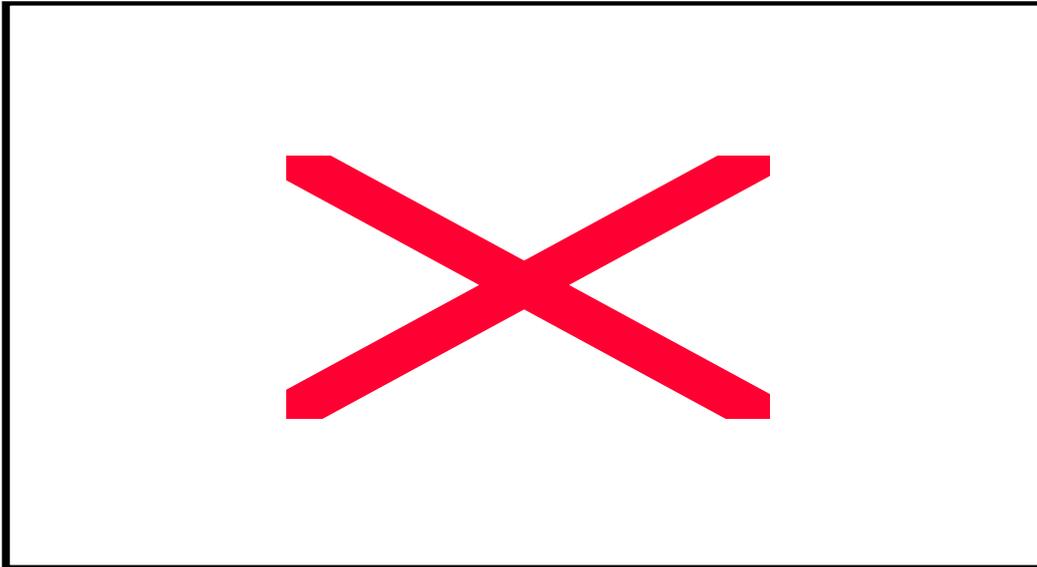
Changes in the responses to this question are quite positive, with some emphasis shifting towards stormwater, although this term encompasses a range of pollutants, some of which were also mentioned by respondents.

Concern over pollution from boats and industrial/commercial sources fell, which indicates that respondents are becoming aware that stormwater from residential and recreational areas is of much greater significance.

A lengthy period of poor weather not long before the circulation of the post survey led to significant discharges of sewerage from overflow points into a number of bays in Mosman. There was a high level of publicity and public concern surrounding these discharges and this is likely to have contributed to the increase in concern over sewerage as a pollutant.

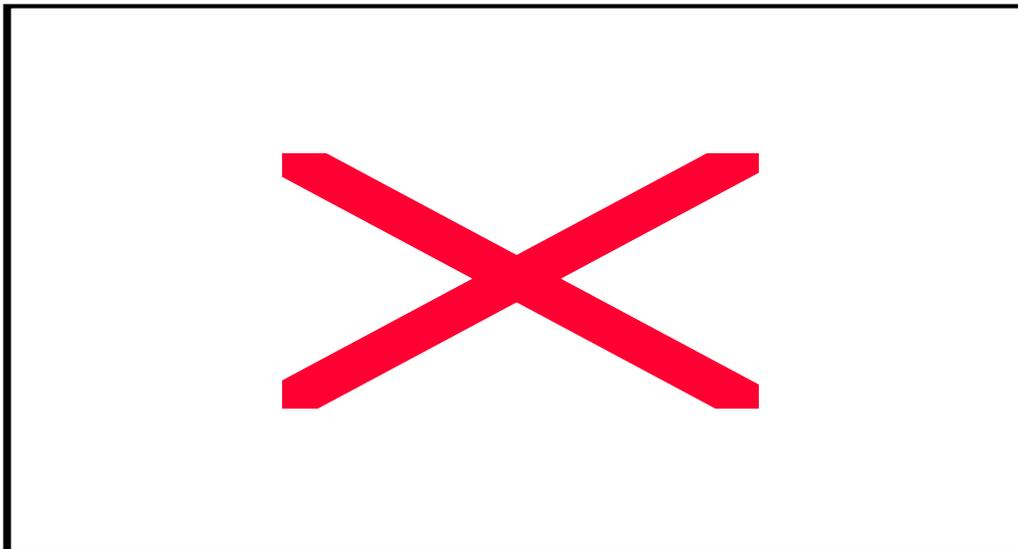
7.2.1.2 Changes in car washing behaviour

Q3 – Where does car washing usually take place at your residence



The minimal change in the high level of poor behaviour reported in both the pre-survey and post-survey is cause for concern. It is possible that the education program did not focus enough on this issue. While neither survey investigated the level of identification in the community of this activity as potentially polluting, anecdotal evidence indicates its profile as possibly inappropriate is high.

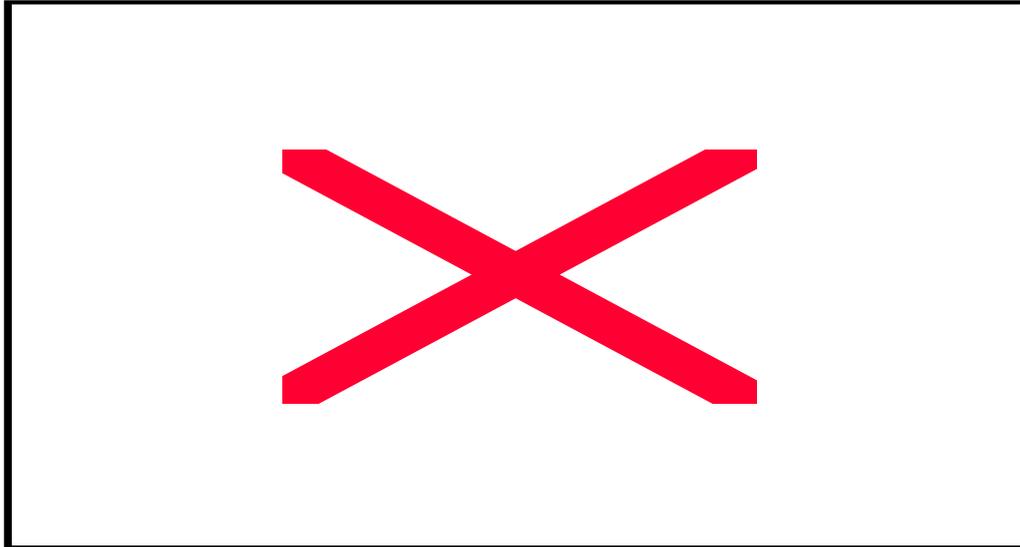
Q4 – Where is left-over car washing water disposed of?



Changes in responses to this question are relatively positive, and definitely more so than to the previous question. This possibly indicates that some respondents do recognise car washing on the street or driveway as polluting, but have no choice (other than a commercial car wash) due to unavailability of a grassed area. Disposal of left-over water is more flexible, than finding a grassed area for washing. The response to this question, however, remains poor, with almost 25% of respondents reporting that they pollute with their left-over water.

7.2.1.3 Changes in gardening practice

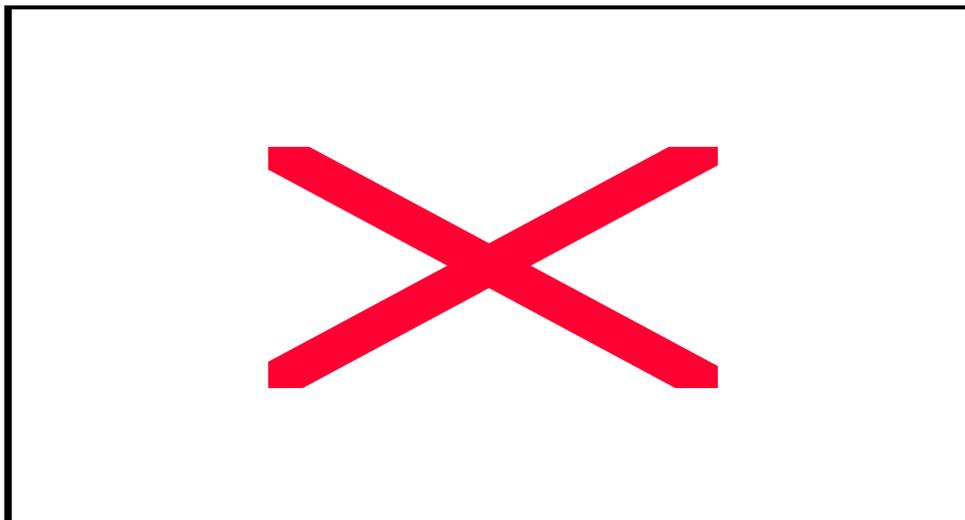
Q5 – How are leaves and debris cleared from around your residence? (asked in post-survey only)



Questioning around this issue was done poorly in the pre-survey (see section 4.7.4), so this question was changed for the post survey.

While no comparison is possible, the response to this question is relatively positive, with significant potential for improvement. Over 54% of respondents report collecting debris, however, almost 1 in 3 send it to the stormwater system, with 1 in 10 using a hose. The high proportion of land given to gardens in the catchments (around 30% - see section 4.1) and the composition of waste collected in SQIDs (over 85% organic matter – see section 4.4) this is a significant issue in these catchments.

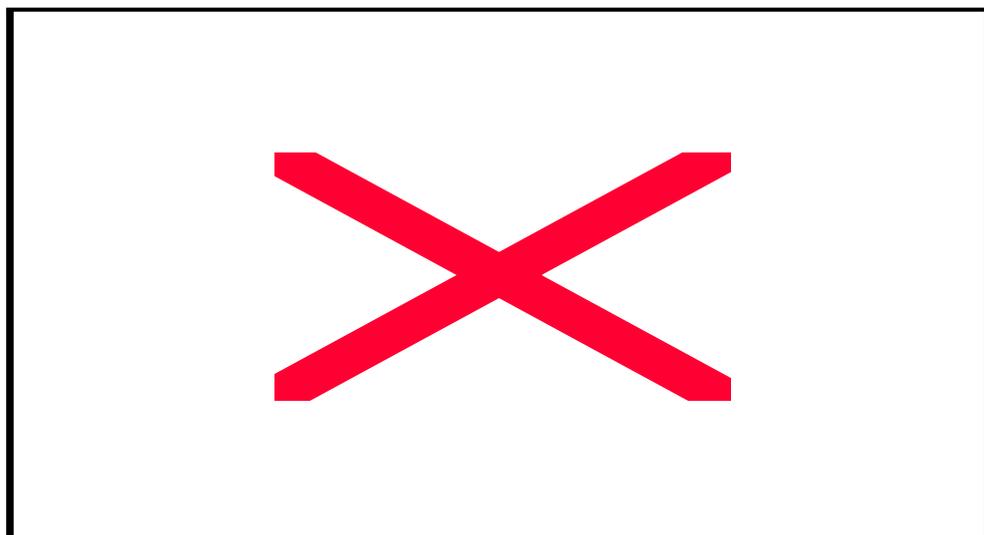
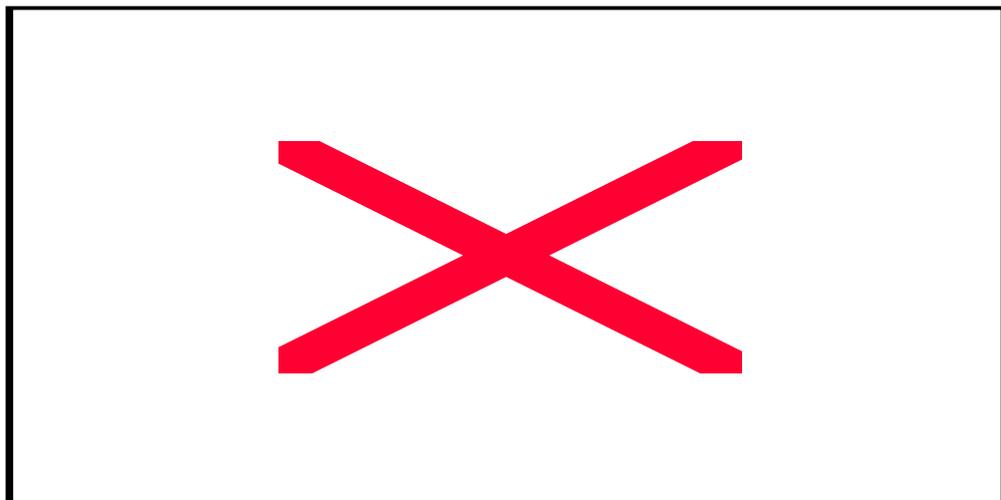
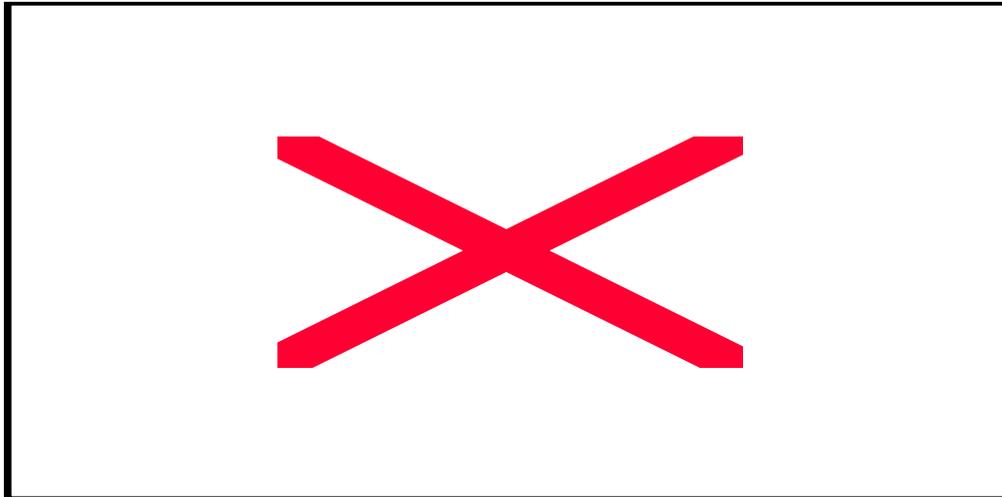
Q6 – What is done with any leaves, debris or garden waste that is collected from around your home?



Changes in the response to this question did not indicate a large uptake of composting, although there was a slight increase. This is possibly due to the time that such action might

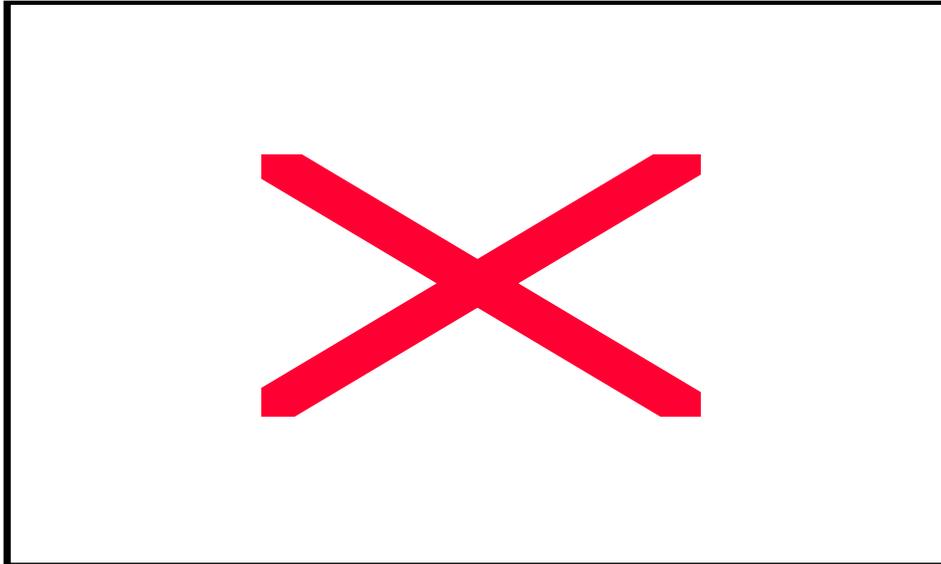
take, and the small period between delivery of relevant education initiatives and the circulation of the post-survey. There is still significant room for improvement around this issue.

Q7 – How often are pesticides, herbicides (weed killers) and fertilisers used in your garden



There was clearly very little change in the reported use of any of these gardening products. Again, this is possibly due to the time that such action might take, and the small period between delivery of relevant education initiatives and the circulation of the post-survey.

Q8 – Are bushland friendly gardening techniques used in your garden (by a member of the household or a contract gardener)?



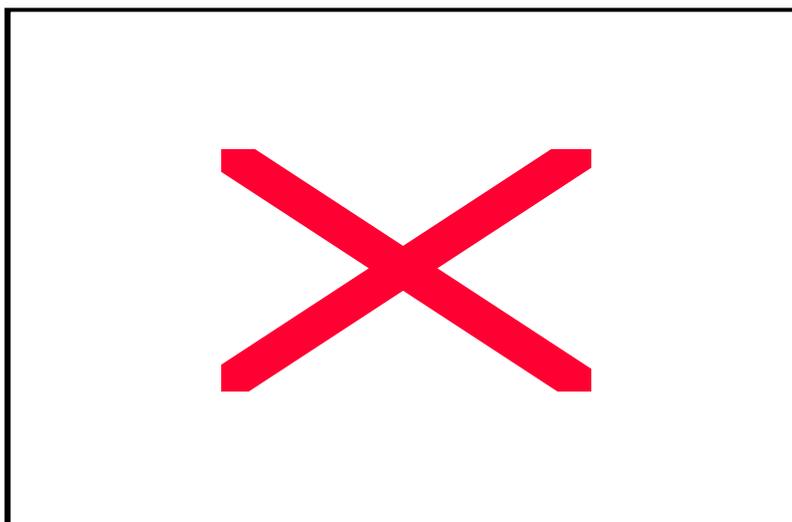
Despite the lack of positive change in terms of the use of gardening products in question 7, this question indicates that there has been a positive change in gardening behaviour in some respects. This change is possibly due, however, to respondents becoming aware of what bushland friendly gardening techniques are, having already adopted them before the pre-survey.

This increase might also be due to the bush friendly neighbor brochure that, although not part of this project, was recently circulated to a number of households in the catchments.

Respondents were asked to elaborate on what techniques were used, with most choosing not to include anything specific. Those that did elaborate were mainly using native plants and mulching.

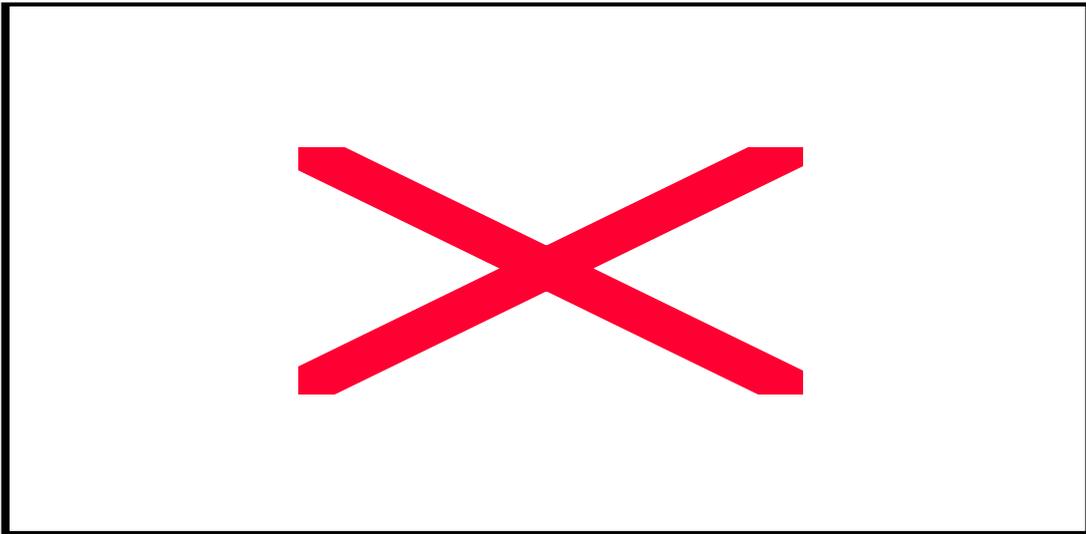
7.2.1.4 Changes in knowledge of stormwater

Q9 – Do you know where the stormwater that flows down the drains of your street finally ends up?



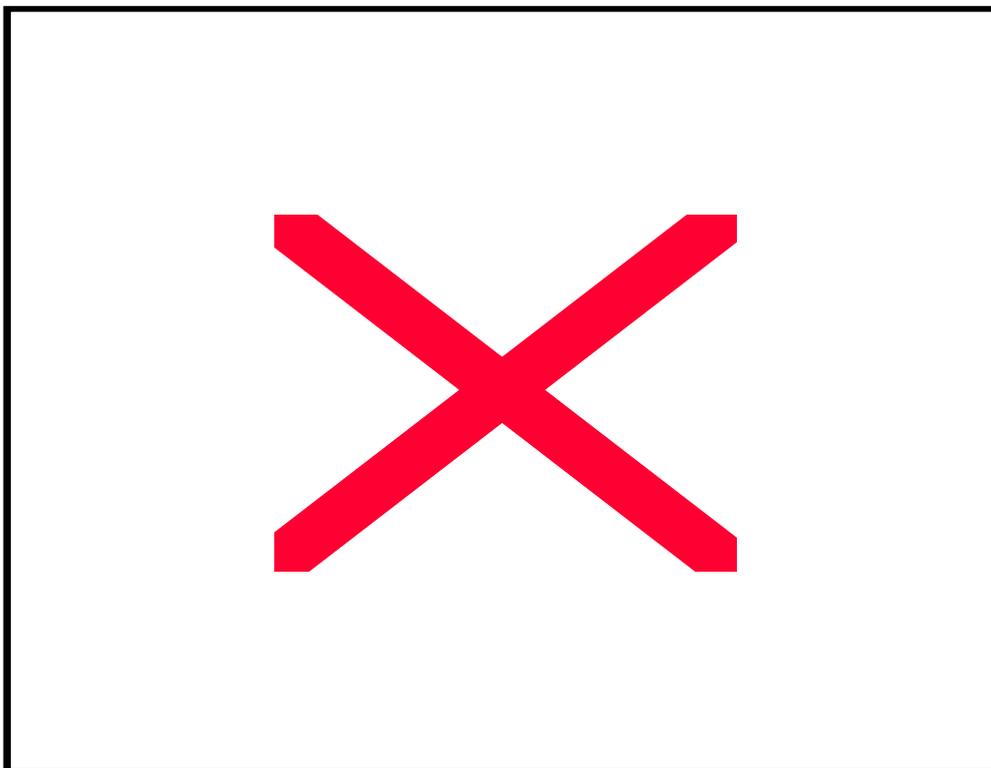
Changes in response to this question were relatively positive, with a considerable increase in those that identify their local beach as the destination of stormwater. The education program used highly localised messages and images in many instances in an effort to get residents to relate personally to the issue of stormwater. There was also a drop in the number of respondents who do not know where stormwater flows to, although there is still room for improvement.

Q10 – Across Sydney, how do you think stormwater is treated?



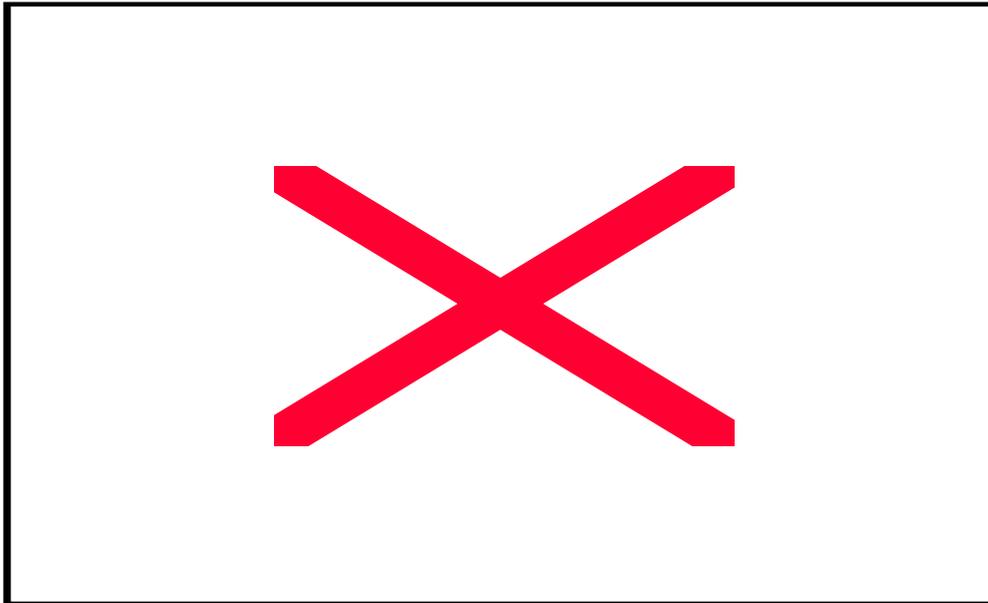
Although changes in the responses to this question were only small, they were generally positive. The proportion of respondents that said stormwater is fully treated was almost halved, and a slight increase in the correct answer of partial treatment in some areas. One of the key messages of the education program (section 5) emphasised the fact that SQIDs do not deal with all pollutants in stormwater, and the results of this comparison indicate that some residents have possibly taken on this message.

Q11 – Which of the following impacts, if any, do you think might result from stormwater?



Comparison of the responses to this question indicate that there has been a general rise in the level of awareness of the range of potential impacts associated with stormwater. Of particular interest is the rise in awareness of bushland impacts. The proportion of respondents who felt stormwater has no environmental impacts was more than halved. While, these results are encouraging, overall the change is only slight, and there is potential to increase awareness.

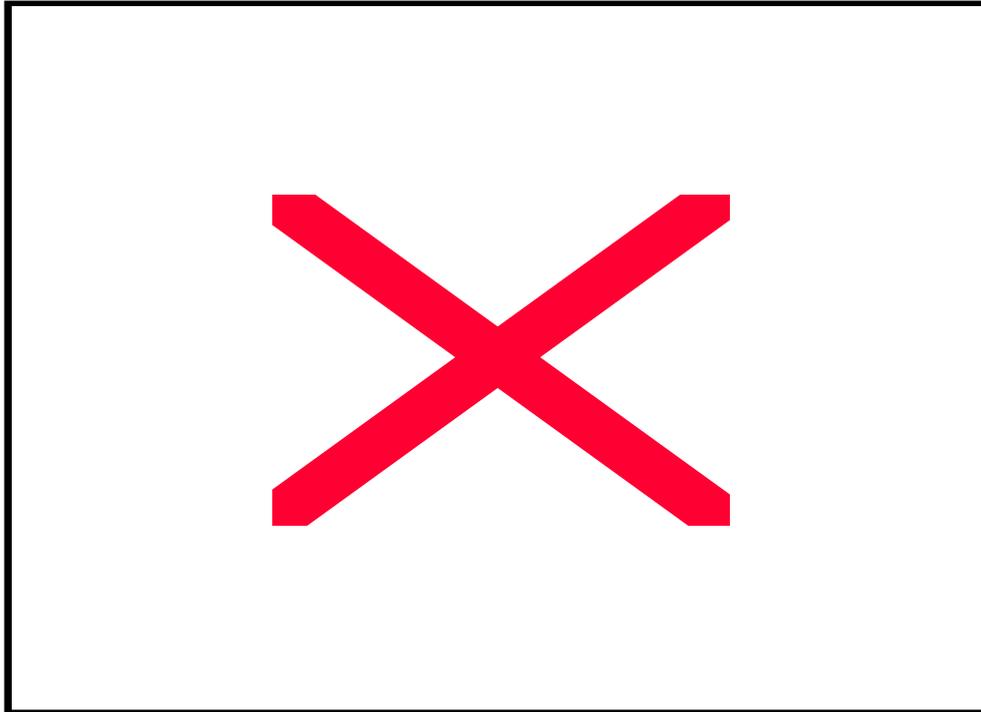
Q12 – Are you aware of any specific educational measures being taken by Mosman Council to reduce stormwater pollution in your area? (post survey only)



Response (unprompted) to this question was relatively good, although less than 2 in 3 respondents were aware of a brochure that was circulated to all households. The eco-gardening booklet seems to have received more attention considering it was circulated to approximately 60% of households in the catchments. Although 25% of residents did not attend the eco-gardening workshops, they are clearly aware of them from the invitation that was sent to all households.

The bushland friendly brochure was not part of this project, and was recently circulated to approximately half of the households in the catchments, although post-surveys had already started returning by that time.

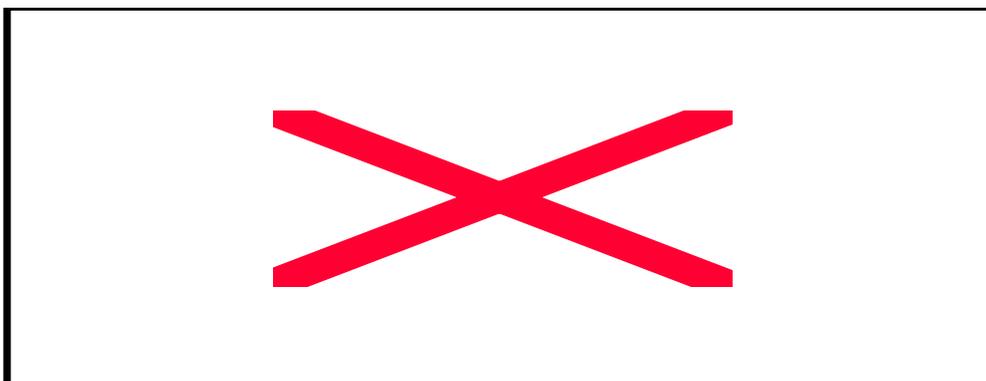
Q13 – Have you discussed stormwater issues with any of the following people in the last 12 months?

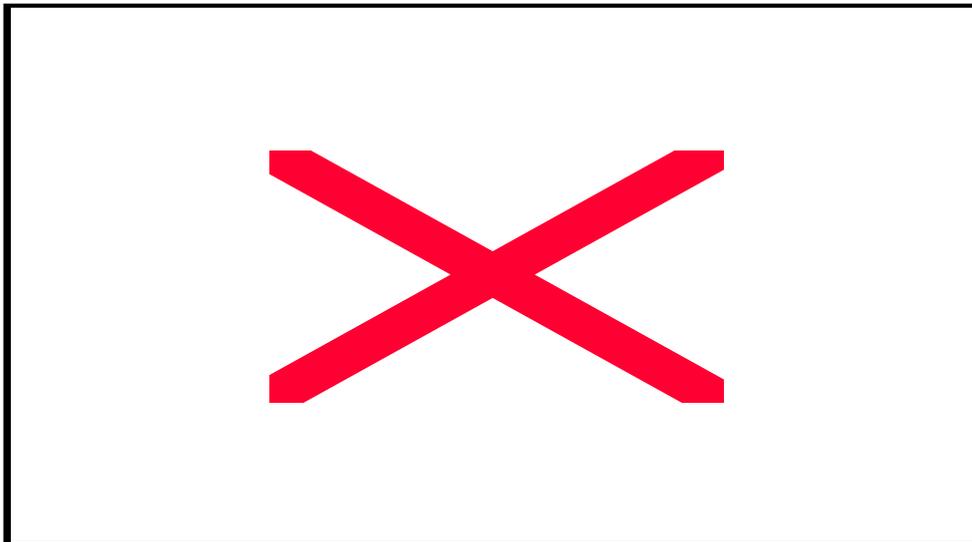
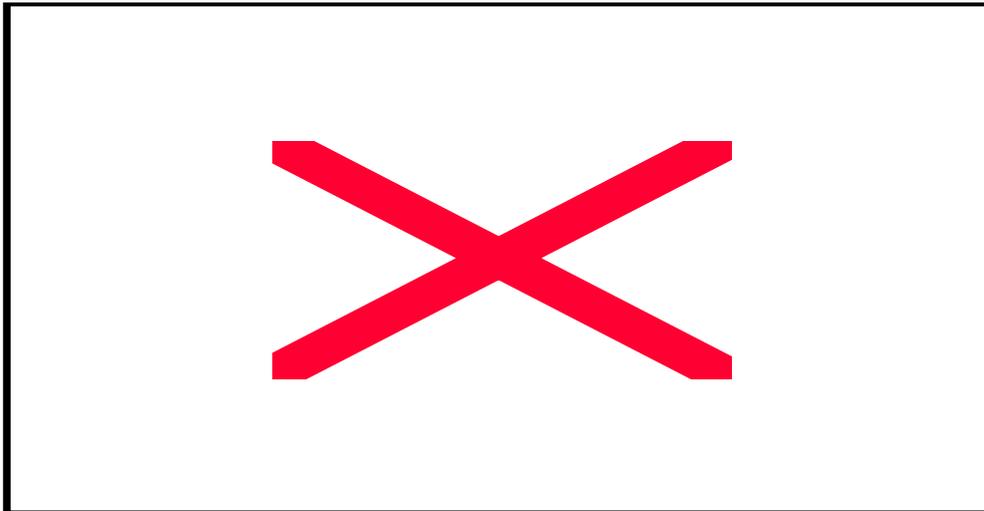


The changes in responses to this question are reassuring. A successful education program gets the community to educate itself, and these results indicate this has been happening to a degree, more so among neighbours over the course of the education program. This “viral education” should be encouraged as it can invoke dramatic multiplier effects on all education messages.

7.2.1.5 Demographics of respondents

The demographics of respondents closely resembled those found by the 2001 census for the catchments, indicating that both surveys were representative of the community. (Question numbers refer to those used in the longer pre-survey.)





7.2.2 Other evaluation of residents education

Other methods of evaluating residents education included

- participation of residents and businesses in talks, stalls and events, and
- development of a Bushcare group for Lawry Plunkett Reserve or an increase in the number of local Bushcare volunteers.

Overall, around 100 residents attended the two information evenings that were presented (see section 5.1.5). The level of interest and questioning at both talks was high, and this level of attendance can be considered very positive.

It is hard to determine how many residents, as opposed to visitors, attended stalls and events. The project officer was present at all stalls and events, and discussed local stormwater issues with residents on many occasions. It is quite possible that by simply being passers-by, a considerable number of residents attended stalls and events.

There has been limited interest in the formation of a bushcare group for Lawry Plunkett Reserve. During the early stages of the education program, a number of Botanic Rd residents discussed the formation of a local bushcare group with the project officer. It was necessary at that stage, to see what level of clearing would need to be done by contractors for the installation of the creek works and walking track, so bushcare work did not begin. The

level of work and consequent changes in the reserve have been dramatic, and those interested in bushcare work have been put off to a degree. The bushcare officer is working with these residents on maintaining the revegetation work that will be done by contractors in the closing stages of the structural works in the reserve.

7.3 Evaluation of visitors education

Evaluating the effect of the education program on visitors is particularly difficult. This education program did not seek to develop a baseline of knowledge, attitudes and behaviour of visitors, as this group is highly diverse and mobile.

Interest in outdoor information displays and educational events, however, provides a highly simplified indication of how effective these activities might have been.

It is estimated that around 600 people in total were attracted to the information stalls outlined in section 5.2.1 (50 people per hour for 3 hours for 4 stalls). Observation of people attracted to the stall indicated that most stayed for a number of minutes, often discussing stormwater issues with the project officer or the biodiversity of the harbour with Oceanworld representatives.

Distinguishing visitors from residents is difficult, however, it is assumed that having these stalls and events during weekend and holiday periods means many of those attending would have been visitors to the area.

7.4 Evaluation of gardeners education

7.4.1 Workshops

A full report of the workshops is included in Appendix 11.

Residents workshops

Response to the residents eco-gardening workshops was very high, with many residents having to be turned away. Overall, over 50 people attended the residential gardeners workshop, and the level of interest, input, discussion and questioning was very high.

It was recognised, and mentioned early by presenters at both workshops, that most of those attending were most likely already keen gardeners who were making an effort to minimise their environmental impacts. Attendees were encouraged to take the messages from the workshop and discuss them with neighbours, and other residents they feel might not be as committed to local environmental management. Any workshop of this nature will suffer from “preaching to the converted”.

Feedback forms filled in by participants were consistently positive, with all respondents reporting that they “strongly agreed” or “agreed” with the statements

- Today’s workshop met my expectations.
- Adopting the recommendations of the workshop will help to reduce stormwater pollution and conserve bushland.
- I will change some aspects of my gardening practice in response to things I learned today.

When asked how the workshops could have been made more effective, only a few responses were received. Dealing with the disposal of chemicals was not covered, and the emphasis on bushland was not received well by one attendee. The presentation on Olympic Park was not seen as relevant by another attendee, and the project officer agrees with this statement.

Commercial workshop

Although 12 bookings were received for the commercial gardeners workshop, only four gardeners arrived on the day. This was quite disappointing, but was probably due to the good weather on the day, and low number of daylight hours during that time of year. Those that did attend provided a lively discussion and a number of excellent suggestions (see Appendix 11).

7.4.2 Eco-gardening booklet

The booklet was delivered to residents very late in the education program, and its recommendations were therefore unlikely to have been implemented, it was well noted in the post-survey (see section 7.2.1.3). Attendees of the workshop, although they might be considered “the converted”, responded very well to the booklet. Councillors and those attending a recent Keep Australia Beautiful Metro Pride Seminar also responded very well to the booklet.

7.5 Evaluation of business education

No evaluation of business education was made. Although pre-survey results indicated that knowledge, attitudes and behaviour in the business community could be considered quite poor, no post survey was conducted. Approximately 5% of properties in the catchments are businesses and only 2% of land in the catchments is given to businesses. Consequently, the majority of this education program focussed on residents and visitors.

8 LESSONS LEARNT – successes and failures

8.1 Pre-survey and post-survey

Development of an effective pre-survey and post-survey combination for informing and evaluating an education program is a subtle art. While significant savings were made by doing it ‘in-house’, a more effective, and perhaps respected, survey process would probably have been developed had this task been handed over to contractors. The process of developing the pre-survey was a highly time consuming process, and the project officer considers that too much time was spent on this element.

The pre-survey was quite extensive, and perhaps could have been more efficient in it’s questioning. Again, this is something that the use of a contractor might have addressed. While it informed the education program well, the length of the survey may have had a detrimental effect on response rate.

Associating a prize with the survey was a cost-effective means of increasing the response rate.

8.2 Internal consultation

Internal consultation was useful in confirming the appropriateness of various aspects of the education program. It may have more effective, however, had the working group been established at the initial stages of the project development.

8.3 Community consultation

While community input is vital for a locally sensitive and relevant education program, in particular for a program of this size, development of a community consultation process was

found to be a very resource intensive exercise. The project officer feels that quite possibly too much time and money was spent on promoting the opportunity of community consultation to local residents. It is unlikely that those that did participate, were swayed by colorful invitations and exciting launch events.

8.4 Residents education

Comparison of the results of the pre-survey and post-survey shows that the residents education program worked in most respects. Organising events was a resource intensive process, however, they generally reached a large number of people.

The 'cut through' of the residents brochure might be considered poor, although community consultation and the pre-survey indicated that written information either mailed or letter box dropped was a favoured means of communication.

8.5 Visitors education

There is very little to gauge how well visitors were educated, and few lessons can be gleaned from this education program.

Oceanworld displays were highly effective in showing the unique biodiversity of Sydney Harbour and drawing attention to information stalls. They were unique, easy to integrate and cost-effective.

As a group, visitors are particularly hard to educate and measure due to their high diversity and mobility. Council should pay careful attention to the results of the research being done in Waverly Council area by Elton Consulting on visitor education as this is an important issue in the Balmoral area.

8.6 Gardeners education

Workshops were well received, but it is not clear how cost-effective they might have been. Around 55 people were reached for over \$13,000, and while contact with these people was intense and effective, this represents almost \$240 per person.

The booklet, on the other hand, seems to have been very cost-effective. Considering it cost less than \$5 a copy, and less for any subsequent reprinting, and the positive response it has received, this appears to be a valuable on-going resource for Council.

8.7 Businesses

As businesses were not an educational focus of this program, few lessons on business education have been learnt.

8.8 Evaluation

Evaluation of education program is clearly a vital part of their on-going development, both generally, and within Council. Establishing methods of quantitatively assessing the outcomes (not simply outputs) of an education program must be done in the very early stages of program development.

Attempting to evaluate an education program that lasted around 8 to 9 months in delivery does seem partially futile. Changes in knowledge and attitude may change within this timeframe, but behavioural change is subsequent to these changes and is likely to occur

over longer timeframes. Behavioural change is what any environmental education program eventually seeks to do, but timeframes must be considered reasonably.

Also, there are extreme difficulties identifying changes that are due to this education program rather than another concurrent education program. For instance, the “Be a Bush Friendly Neighbour” campaign was in Mosman run during this education program but was not part of it. This is likely to have had an influence on responses at least one question in the post-survey. This is one of numerous examples of other environmental education influences (such as EPA – It’s a Living Thing, or Sydney Water initiatives) that would have affected responses to the post-survey.

9 ONGOING COMMITMENT AND RECOMMENDATIONS

Council clearly has an ongoing commitment to community education as part of its management of the local environment and pollution prevention measures.

This project has revealed a number of areas in which Council may be able to make improvements and contributions to this important part of its operations.

- It is recommended that Council provide further eco-gardening workshops for residents. Those provided in this project were very well received and it is certain that any further workshops will be filled to capacity. Informal discussion with professionals involved in gardening education revealed that effective workshops could be provided for a much lower rate than those used in this project. Poor project scheduling combined with a very low response from tenders resulted in the expensive choice made in this project.
- It is recommended that Council communicates with commercial gardeners through their clients (residents). On two occasions (one in this project) Council has provided workshops for commercial gardeners, and both received very low attendance. This audience is clearly hard to educate through workshops, however, their level of activity throughout Mosman warrants attention. Workshops, brochures and even simple checklists could be used to advise residents how they can direct their commercial gardeners to contribute to the management of the local environment.
- It is recommended that Council work through schools to get environmental messages into local homes. While working with teachers can be very demanding due to their scheduling, schools are becoming more environmental active due to policy and curriculum requirements. Council appears to be relatively dormant in terms of its interaction with schools on environmental issues. Local Curriculum Support Units can provide advise and support to Council for working with schools.
- It is recommended that Council deliver stormwater information by means of localised brochures. The brochure used in this project featured a stylised drawing and an aerial photograph of the Balmoral South Catchments. Using the existing wording in the brochure, these elements can be tailored to portray other catchments, creating a localised brochure for a low cost. The use of local features makes the brochure more relevant to a particular community, and gives the issue more importance by “putting them in the picture”.
- It is recommended that Council use direct community consultation to inform further education programs. The main expense behind the community consultation in this project was its promotion. It is thought that the consultation process would have just as effective without such extensive promotion. Consultation can highlight particular ideas and issues that might be immediately apparent to Council, helping to make education programs more locally relevant. Providing consultation also shows engenders a positive relationship between Council and the community, and provides a degree of community ownership to the program. All of these will make any education program more effective.

- It is recommended that Council continues its association with Oceanworld for the use of mobile displays of Sydney Harbour marine life. The use of these mobile displays works as an effective educational tool and also makes information stalls and events unique. The cost of the mobile displays, around \$500, is low considering the impact they provide.
- It is recommended that surveys and project evaluation are done by outside bodies in future projects. This has generally been the case in the past, and appears to have worked well. Bringing these elements 'in-house' in this project proved to be resource intensive. It is likely that surveys and project evaluation would have been more effective, and possibly viewed in a better light by funding bodies, had they been done by a consultant.
- It is recommended that Council use the Mosman Markets as a means of communicating with the wider Mosman community. These markets are clearly very popular and represent an ideal means of reaching a large number of people by means of an information stall. Oceanworld displays and tube-stock give-aways are ways of attracting people to the information stall. The markets were not used in this project as it focussed on the Balmoral South area.
- It is recommended that Council employ an education project officer with an education, communications or marketing background, as opposed to a technical or scientific background. Much of the environmental science behind education programs is relatively simple, and if not, it must be simplified when communicating it to the community. The social science behind education programs, on the other hand, is quite complex. Effective community education is clearly a subtle art that requires a degree of experience.

Appendix 1 Promotional materials

This appendix features the following.

A 'postcard' that was used to promote the community consultation process.

During the early stage of the project it was thought that the consultation group may provide on-going advice to the project, hence this postcard was produced to provide on-going promotion of the opportunity to join community consultation. This did not turn out to be the case, however, the postcard proved to be popular and served as an educational tool also. It was distributed at information stalls and events.

An invitation to join the community consultation group BEN – the Balmoral Environment Network

These were circulated by direct mail to all households in the catchments

An invitation to attend the launch event for BEN

These were circulated by direct mail to all households in the catchments

Appendix 2 Media Coverage

“Barbie to Introduce BEN”, Mosman Daily, page 17, 17 October 2002

“Dedicated volunteer cleans up”, Mosman Daily, page 15, 7 February 2003-07-19

“Keep it out of drains”, Mosman Daily, page 9, 10 July 2003

Appendix 3 Summary of Education Program

Appendix 4 Pre-survey

Appendix 5 Pre-survey results

Appendix 6 Post-survey

Appendix 7 Community consultation recommendations

Appendix 8 Community Consultation Feedback Questionnaire

Appendix 9 Eco-gardening booklet

Appendix 10 Localised stormwater brochure

Appendix 11 Eco-gardening workshop report

Appendix 12 Schools program report

The project officer is still waiting to receive the consultants report, however, a photographic summary of the program is included.

Appendix 13 Sandwich bag