

# Stormwater awareness in urban coastal centres of the Burnett Mary region

## A summary report

This is a summary of findings and recommendations from a study to investigate community awareness of the impacts of stormwater in urban coastal areas of the Burnett Mary Region. The study involved surveys in 2008 in Bundaberg, Maryborough and Hervey Bay, held before and after a stormwater awareness campaign coordinated by the Burnett Mary Regional Group for Natural Resource Management (BMRG).

© Ken Keith and Helen Ross, The University of Queensland,  
and W R (Bill) Carter, University of the Sunshine Coast



Findings and conclusions for this study of stormwater awareness have been reliant on the goodwill of residents from Bundaberg, Maryborough and Hervey Bay who received phoned requests to participate in the study, and were obliging enough to do so.

We thank them for their contribution.

# Background

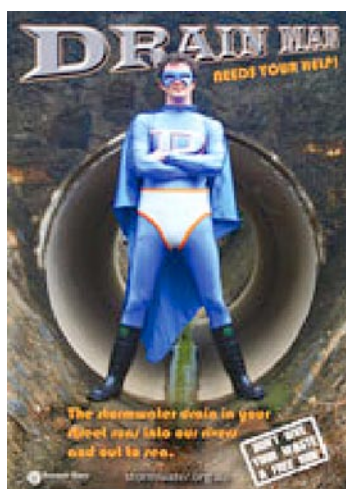
The stormwater awareness campaign consisted of community service announcements on television featuring Duey Dugong and Drain Man, visits to schools, web based fact sheets, posters and fridge magnets and appearances of Duey and Drain Man at public events.

The surveys had two objectives:

1. Identify before and after campaign knowledge and awareness of stormwater and its impacts on waterways and beaches.
2. Identify how people living in the coastal zone find out about stormwater and recommend ways to improve knowledge and information access on specific stormwater issues.

The pre and post campaign surveys were conducted by telephone, using a prepared question schedule. Telephone numbers for resident samples from Bundaberg, Maryborough, and Hervey Bay were obtained from the relevant telephone directory (White Pages) using selected suburbs for Hervey Bay and Bundaberg (260 interviews for the pre campaign survey; 261 post campaign).

As the campaign started later than anticipated, the post survey was undertaken just 4 months after the campaign commenced. It was thus a 'during campaign' rather than a true 'post campaign' survey, as awareness raising activity continued throughout the survey period.



Poster messages featuring Duey Dugong and Drain Man

# Findings about campaign impact

## Nature of stormwater

In both surveys, interviewees were asked five true/false questions about the nature of stormwater. Although 12% more post campaign interviewees correctly identified stormwater as water that runs over the surface of the ground during any rainfall event, there was also an increase in the percentage stating that some false statements were true and a slight fall (though not significant) in the mean score over the five true/false questions. Taken together, these findings do not point to a post campaign improvement in knowledge about what constitutes stormwater.

## Material polluting stormwater

Interviewees differentiated reasonably well between residential areas (house and garden), streets and parks, and business areas when asked to list potential stormwater pollutants. We compared the number of pollutants mentioned by each interviewee in both surveys.

For house and garden, the post campaign scores were significantly higher than the pre campaign scores for the total sample. (More post campaign interviewees named 6, 7 or 8 items and fewer named 0, 1 or 2 items than did pre campaign interviewees.) This should mean greater awareness of stormwater. Increases in the number of pollutants mentioned were highest for interviewees under 45 years of age (compared with 45 and over), for males and for primary/secondary school leavers (compared with TAFE and university educated). The age-related difference is consistent with the campaign's early focus on young people. The gender and education level differences could perhaps be linked to the campaign if we assume that males and primary/secondary school leavers watched more television at the timeslots and channels where community service announcements ran most frequently.

Hervey Bay showed increased recognition of soil and oil, Maryborough showed increases for vegetation and pesticide (but a decrease for fertiliser), and Bundaberg for chemicals. Together with other modest increases, an accumulated positive trend suggests some improvement in awareness of what goes into stormwater from houses and gardens.

For streets, parks and business areas however, there was no significant change to understanding.

There was no substantial indication of change for streets and parks or for business areas.

The post campaign interviewees offered more ideas on harm from things carried by stormwater into waterways than the pre campaign sample (an average of 2.54 per person compared with 1.94 for the pre campaign survey). Most of these were suggestions about harm to wildlife or habitat. There was a high level of awareness in both pre and post campaign samples that litter and other pollutants threaten wildlife in various ways. More than 80% from both surveys agreed or strongly agreed that pollution from stormwater is a significant threat to waterway health.

Younger people (under 45) appeared to show proportionately higher recognition that polluted stormwater harms marine creatures and other wildlife as well as their habitat (Figure 1); however this difference was not statistically significant.

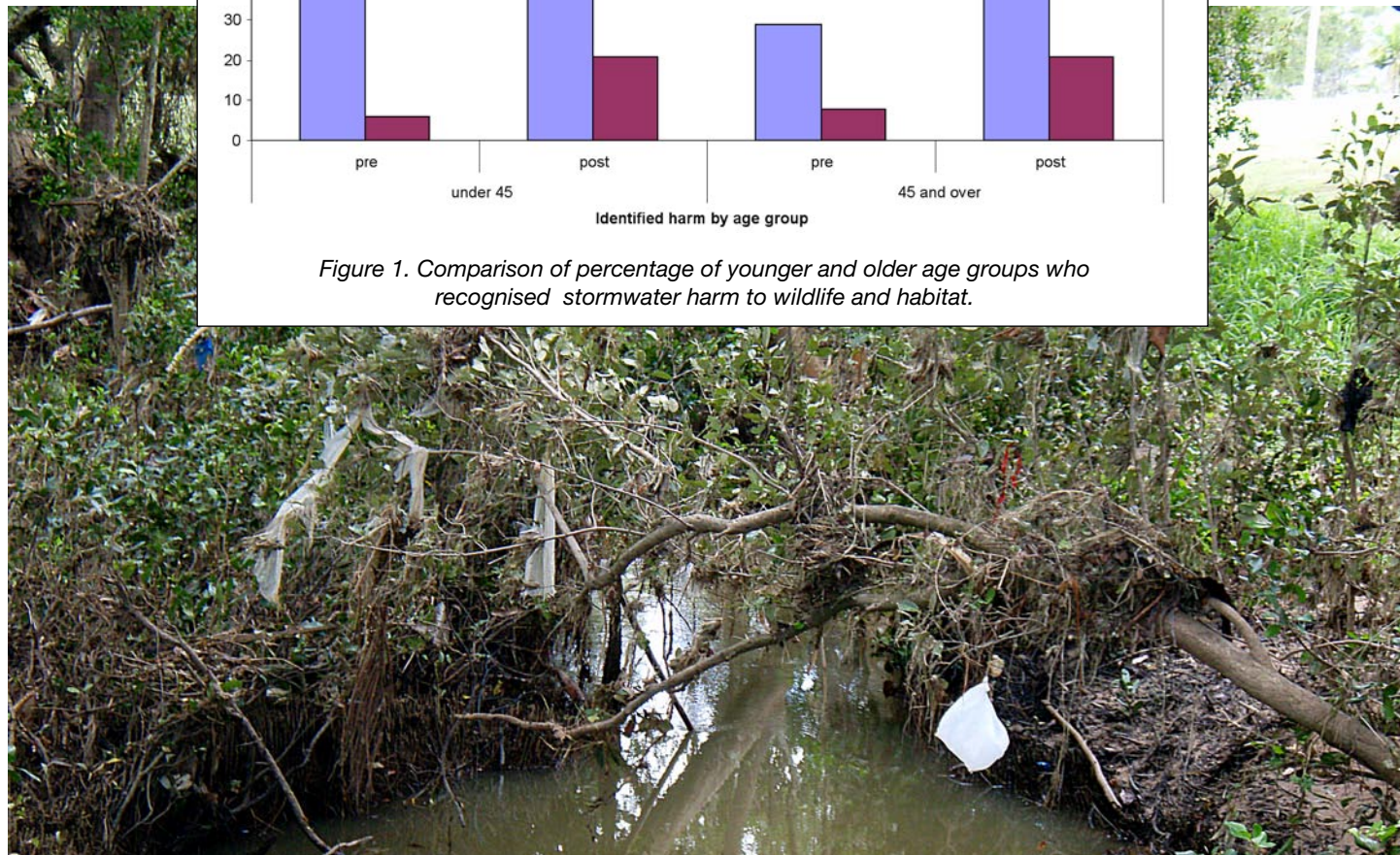
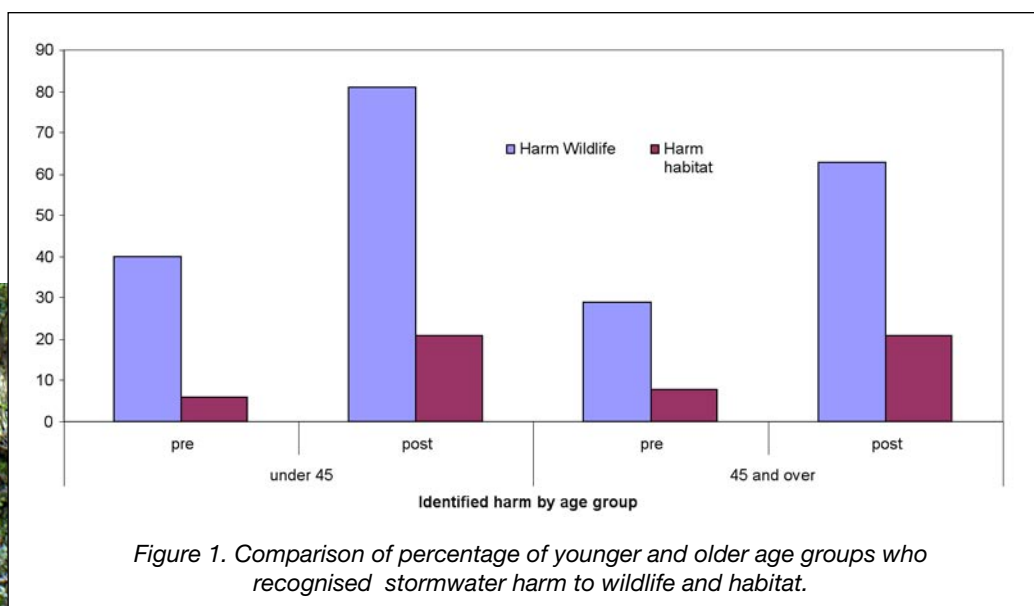
### Connection between stormwater drainage and local waterways

The high percentage of correct responses to the true/false statement 'Stormwater drains unfiltered to our creeks, rivers and

oceans' (75% before and 77% after the campaign), with another roughly 15% saying partly or sometimes true indicate that both samples showed sound general understanding that stormwater ends up in waterways, and carries undesirable materials with it.

### Local requirements for reducing litter and protecting quality of stormwater

We asked what could be done to reduce pollution in both residential and business areas. Post campaign interviewees provided more suggestions related to filtration, and general cleanliness in residential areas. There were fewer suggestions than expected in each survey about covering soil and reducing use of fertilisers and pesticides. In both surveys, interviewees often suggested more education about stormwater (about 17% for the pre campaign and slightly more, 25%, for the post campaign survey). For business areas (including shopping centres) post campaign interviewees made a stronger call for policing and fining (though it is unlikely that this could be attributed to the campaign).



## Recognition of the BMRG stormwater campaign

Figure 2 summarises interviewees' recall of channels for information about stormwater. Television was the main source mentioned. Television also showed the greatest increase from pre campaign to post campaign survey (from about 20% pre campaign to about 32% post campaign). Although the percentage of interviewees claiming to have seen information about stormwater on television during the previous two years increased at all three locations, few mentioned the community

service advertisements. (The increase may have been due to news items about stormwater issues caused by heavy rains that fell during the study period.)

However, some who did not believe they had seen anything about stormwater during the previous two years could describe the adventures of Duey or Drain Man when asked specifically whether they had seen them. It is likely that they saw but did not take enough notice about what Duey or Drain Man were demonstrating, so that when asked about stormwater, they did not link the campaign champions to stormwater.

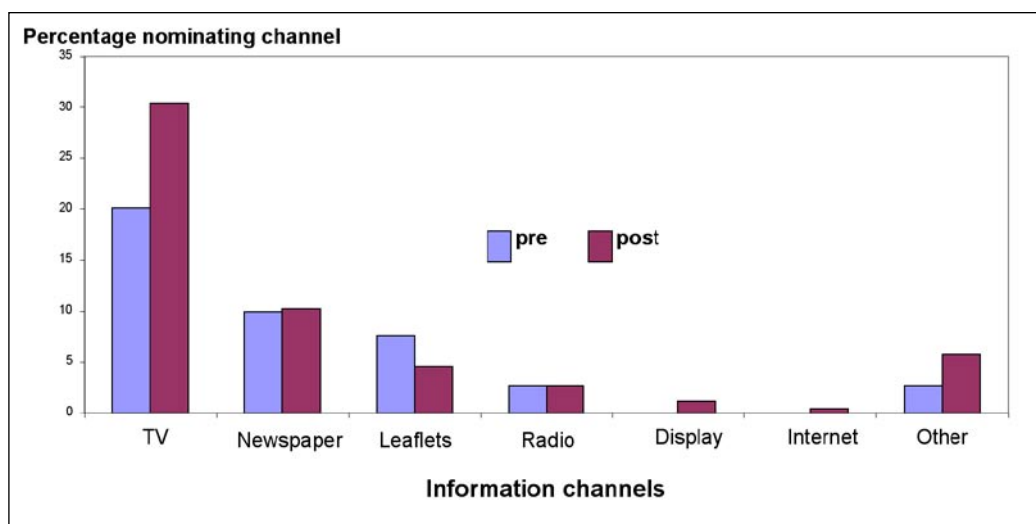


Figure 2. Perceived communication channels for stormwater information, past two years (whole samples pre and post campaign).

## Other findings

### Pollutants and their impact

There is general awareness that stormwater pollutants harm wildlife, highest amongst younger (under 45) and higher educated interviewees. This generalized recognition (pollutants harm wildlife) needs to be built upon to develop more detailed awareness about specific sources of harm and means to avoid them. There is a lack of recognition of harm caused by excess nutrients and sediment - few mentioned excessive weed growth, blue-green algae or oxygen deficit from nutrients, or smothered sea grass beds or other impacts of sedimentation.

### Reducing pollution

The main solution offered to reduce stormwater pollution was better filtration or filtration and re-use, for example through retention basins. Presumably then, communities would endorse expenditure of tax and rate dollars on installation of filtration and recycling systems. 'More education' was a popular proposal for achieving pollution reduction from residential areas (an

endorsement for extending the campaign). 'More policing' and 'heavy penalties' were popularly proposed solutions for commercial and industrial areas. A few respondents, perhaps in industry themselves, believe that current requirements and audits of businesses are quite adequate, no more is needed, while many in the community believe that pollution is a considerable concern in business/industrial areas. Reduction in use of fertilisers, pesticides and other chemicals around the house and garden were not mentioned frequently (even though they had been mentioned as pollutants collected by stormwater). About 60% indicated that they use alternatives to herbicides or pesticides.

There were many calls for residents to clean up but also calls for councils to lead the way by taking more action with street sweeping, providing more bins and more regular removal of rubbish from bins.



## Communicating stormwater information

When asked for recommended ways to deliver information about stormwater, over 50% of interviewees in both surveys recommended television (providing justification for the heavy use of television in the campaign). Local newspapers were recommended by the older age groups (55-64 and 65 and over) more often than by younger interviewees. Mail-outs or letter-box-drops were recommended by over 20% of interviewees, although the box-drop was criticized by some.

A question about channels for accessing information (rather than for promulgation) showed that Internet was considered a very important way to access information (Figure 3).

Nearly 60% of young people (18-24) nominated Internet as their preferred way to access information, while only about 6% of the 65 and over group saw it as the preferred information access method. (However Internet was not seen as a major means of getting information out to those not necessarily looking for it).

Nearly 40% of the total sample for both surveys preferred mail as the means of accessing information, while about 20% favoured going to an information source and asking. Neither BMRG nor environmental groups were recognised as sources of information about stormwater.

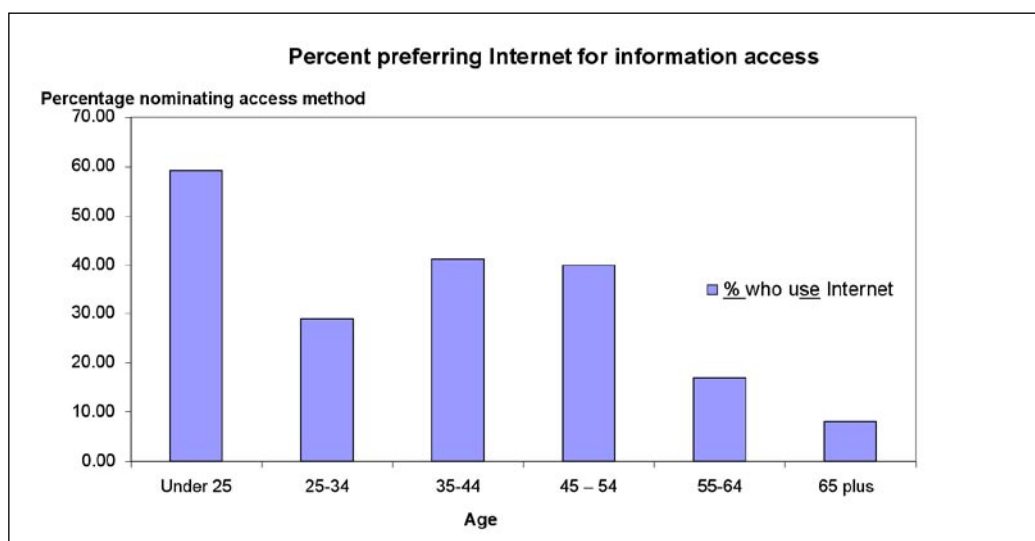


Figure 3. Age profile of preference for internet for information access.

# Conclusions

## Did the campaign work?

Because of the timing of the survey in relation to the campaign (undertaken before completion of the campaign), we believe that respondents had insufficient exposure for us to ascertain whether or not the campaign messages worked. The campaign had at that stage concentrated heavily on young community members, who were not included in the survey. There had been heavy exposure in schools and coverage on television at times when young people were likely to watch, but little opportunity for people to learn from the factsheets. Additionally we were over-optimistic if hoping to measure changes in practice in this short time period even if awareness had increased.

## How do people gain knowledge about stormwater impacts?

Perceived sources of past information about stormwater were television, followed by local newspaper and then leaflets. Interviewees' recommendations for best ways to get messages out were television, then local newspaper and radio. Thus television has been strongly endorsed by interviewees as a channel for getting messages to the community. For people wanting to access information, Internet is now a widely-used method, though a high proportion of the population would like to have information sent to them in the mail, with a reasonable willingness also to go and ask for information. Recommendations to improve knowledge acquisition are included in the study recommendations that follow.



# Recommendations

Although results about increased awareness are not conclusive, the survey has provided information about gaps in awareness and preferred information access methods, enabling the following recommendations about extension of the current campaign or development of future educational initiatives.

- Make pollutants that received low mention in this survey the subject of new campaign material or activities.
- Collect local evidence as a basis for demonstrations of how various unwanted materials get into stormwater, and the downstream impacts.
- Disseminate new information material on the impacts caused by excessive organic matter and nutrients entering waterway systems, since these were rarely mentioned.
- Build on the general recognition that stormwater pollution harms wildlife, to develop understanding of specific effects and processes.
- Local governments step-up community expectations of a clean environment through increased street sweeping, increased bin placement and more frequent rubbish removal from places where it may build up quickly.
- Generate community understanding of what is currently required of business, to reinforce community expectations of business while keeping expectations realistic.
- Provide all residents with a checklist for a clean local environment and some reasons for making a special effort to keep litter and other pollutants out of the path of stormwater.
- Keep the Duey image alive and use Duey to expand the messages and the detail of how stormwater pollutants harm wildlife.
- Maintain the use of television (popular across age groups); but move on from rubbish and 'harm to wildlife' to specific messages about harm by specific pollutants; and provide a complementary image to Duey that might engage older people better.
- Use regular local newspaper articles backing up television announcements to reinforce the messages with older people.
- Aim for a balanced knowledge of the role of stormwater, with appreciation of the requirements of streams and estuaries for environmental flows.
- Continue interaction with school children but move on from packages with posters and fridge magnets to learning activities embedded in curriculum objectives.
- Change the focus of the stormwater website so that it becomes a place to go for more detailed information on stormwater impacts and solutions, and a forum for discussion of local issues.
- Work with environmental groups, developing a coordinated strategy to take messages to local communities and to specific target groups.
- Develop a monitoring and reporting system matched against indicators of litter build-up and stream health (or illness) to help evaluate success of education programs.
- Given the limited time between the campaign and post campaign survey, a further survey should be undertaken to ensure full market exposure to the campaign.

Information about the stormwater campaign is available at [www.stormwater.org.au](http://www.stormwater.org.au)

The reference for the full report on the stormwater surveys is:

Keith K, Ross, H & Carter, R W 2008, *Stormwater awareness in urban coastal centres – Burnett Mary Region*, School of Integrative Systems, The University of Queensland.

Please contact Sue Sargent at Burnett Mary Regional Group, email: [Sue.Sargent@bmrp.org.au](mailto:Sue.Sargent@bmrp.org.au)

***Photos courtesy of:***

Oceanwatch Australia Ltd (p 2, p5);

*and finalists in the BMRG Stormwater Photographic Competition, 2008:*

Nathan Freeman for photograph 'Barolin Street drain' (cover page)

Megan Gibbes for photographs 'Trolley' (p 5) and 'Froth' (p6)

Andi Hazlewood for photograph 'Overflowing Gutter' (p6)

Chris Raymond for photograph 'A New Journey Begins' (p6)

Catherine Riggs for photograph 'Littered drain' (p6)

This study was supported through Australian and Queensland Government funding administered through the Burnett Mary Regional Group for Natural Resource Management (BMRG).

