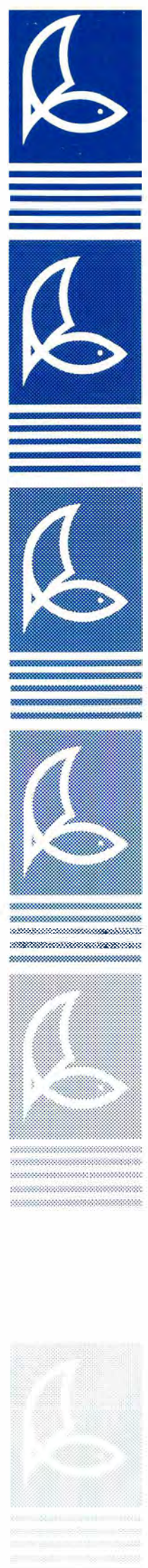


Swan River Landscape Conference



Papers and Workshop Summary

Swan River Trust
Report No 1
1991



Swan River Landscape Conference

Friday 26 October, 1990

at

NEDLANDS YACHT CLUB

and

RIVER INSPECTION BY FERRY

Fremantle - Guildford

Saturday 27 October

SWAN RIVER TRUST

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Objectives of the conference

The Swan and Canning River system is one of the most important landscape features of the Perth Metropolitan Region. The Swan River Trust believes that effective protection and proper management of the river landscape is essential if the community is to retain its benefit in the long term.

The river landscape is affected by the activities of several State government departments, 20 local government authorities, many hundreds of people who own private property near the river and a variety of clubs which lease sites on the river banks.

These State and local authorities, clubs and landowners all undertake work from time to time which affects the landscape. Sometimes these works are carried out in accordance with a plan but often they occur without thought for how they may affect the river landscape. In addition, where a landscape plan does exist it will have been prepared in isolation so there is no consistency of approach.

In 1988 the Government of W.A. released the Swan River Management Strategy which is its policy and blueprint for the future care and management of the river. The Strategy contains six recommendations relating to landscape management including a proposal to prepare an overall landscape plan for the river. To succeed, such a plan must have the support of the community. This seminar brought interested people together to help the Trust identify:

- the main landscape components of the river,
- issues affecting the river landscape,
- interest groups,
- solutions to landscape problems and where we go from here.

The conference was well attended by approximately 150 people. Participants were from a wide range of interest groups including state and local government, ratepayer groups, landscape consultants, teachers and university lecturers and interested individuals.

The conference involved a seminar and workshop and a river inspection by ferry. The workshop findings will be used to prepare a consultant's brief for the preparation of landscape plan for the Swan and Canning Rivers. It is intended that the brief be prepared by a working group of government and local government representatives. Funding for the project will be a joint state and local government initiative.

Welcome

Mr Jack Howson
Chairman
Swan River Trust

Ladies and Gentlemen, welcome to the Swan and Canning River Conference.

I think it is indicative of the significant general public interest in the subject of this conference, the Swan and Canning Rivers, that we have in the vicinity of one hundred and fifty acceptances to attend here today, and hopefully tomorrow also.

Since the Swan River Trust was formed in March 1989, it has been extremely busy in its involvement with concepts and proposals which affect the river landscape. I think that everyone has been surprised by the extent of involvement which we have had, particularly in relation to local government. I believe that we have a wonderful asset in these rivers and their associated landscapes and I'm sure that most people in WA are very keen that we should endeavour to follow on from the work undertaken previously by the Swan River Management Authority, whose members did, in my opinion, such a wonderful job. It is up to us to build on their work.

Now it is with a great deal of pleasure that I ask our Minister, the Honourable Bob Pearce, to address you. We are very fortunate to have as our State Government Minister for Waterways a gentleman who is not only interested in what we are doing but who also takes a most active part in the on-going work of the Swan River Trust and the Waterways Commission.

Opening Address

Mr R J Pearce M L A

Hon. Minister for the Environment

It gives me great pleasure to open the conference today and particularly great pleasure to acknowledge the very large number of people who have taken time to participate.

As most of you are aware, the Swan River Trust is proposing a landscape plan for the Swan River. This plan will be prepared on behalf of the Trust by a consultant. The seminar this morning is designed to give both the general community and authorities interested in the area an opportunity to have a substantial level of input into the plan. Ideas and opinions generated through the course of the conference will provide a basis for the terms of reference for the plan. When the consultant's review is prepared, it is planned to give the public a further opportunity for consultation.

In a Cabinet reshuffle earlier this year, I was given a much wider environment portfolio than previously. At the time of this reshuffle, I made the joke that I was now responsible for Perth's two sacred sites, the Swan River and Kings Park. I believe these areas are sacred in the sense that there are probably no two areas of the metropolitan area that excite more controversy or strongly expressed points of view, or which are more jealously guarded by a greater proportion of the population. I think that is not only an accurate statement but its a good thing, as there can be no doubt that Kings Park and in particular the Swan River are very very important parts of both the landscape and heritage of Perth.

The Swan River landscape that we see now of course is dramatically different from the Swan River landscape that those who came here in 1829 would have seen. There has been a tremendous amount of modification of the river landscape. If you have a look at the old maps and plans of early Perth, you can see how dramatic modifications to the river have been.

In the early days of the colony the matter of aesthetics was not of primary importance. The river provided the main transport route for food and produce for the colonists - a vital lifeline which brought the colony together. Names such as Hastings Landing still invoke an image of the days when the Swan River was the most important economic aspect of the colony, which we now know as Perth.

The history of the river has left its mark in people's attitude toward it, which of course can vary over time. Reclamation of the river flats is one example of this change in attitude. One of the things that you cannot do in the present day is to fill in any part of the Swan River, without the approval of Parliament. This attitude is a response to the willy nilly filling in of the river that went on twenty or thirty years ago, when huge areas of the foreshore were resumed in order to make way for our current freeway system. I believe that there has been a public reaction to this infilling, and people quite rightly now feel too much of the river was taken for many of those activities. This has resulted in a general public attitude of "no development at all" along the river foreshore.

I personally believe that we must look after and care for the river environment, and also learn from the experiences of other cities in Australia. If you compare human activities on the Swan River with, for example Sydney Harbour, you will notice a huge difference in terms of people participation and use of the waterway.

Personally I find much of Sydney Harbour to be a really fascinating and interesting place, not just in the "scenic areas" but often also the industrial areas up harbour from Circular Quay, and the semi-industrialised areas such as Balmain and Birchgrove, which are now being "yuppyised". There is still a fascination and human connection with the on-going activities which occur on the waterway.

I feel that this water/land connection in relation to the urban areas of Perth and the Swan River has been lost to a certain extent. Admittedly there are many water oriented activities which combine a range of uses which contribute to an interesting river landscape. In fact I like the little strip of foreshore between the two bridges in Fremantle for this reason, and consider it to be one of the most interesting areas of the river. I say this quite deliberately, as I am aware that many of you will not agree with me. The point I am trying to make is that we don't make enough use of the river as part of our day to day life. Hopefully this idea will generate some stimulating discussion this afternoon.

I believe that the river should be part of the lives of the people of Perth, not just something we drive by, or see in photographs, or maybe look at from a distance in high rise buildings. I think that people's use of anything is always a two edged sword, as obviously the more use of the resource, the greater the risk of damage. Therefore, the greater need for management and control, and a balance must be struck. In my view, we could encourage more people to use the river, while still protecting its essential characteristics. However I believe the defence of the Swan River ought to be one of the fundamental things that drives all of our planning decisions for the metropolitan area.

I would like to congratulate the Swan River Trust on its moves to prepare and implement a landscape plan for the whole of this river system. When we set up the Swan River Trust a couple of years ago, it was on the basis that there were so many authorities, state and local, government and non-government, and ordinary land owners who have had involvement and the potential to effect what happens on the Swan River. However, there was no overall co-ordination, and no formal means of looking after that river system as a whole. The Swan River Trust was formed to help establish a formalised management regime, to prepare management plans and draw these threads together. I think what we did then was fine, as far as it went, however what we were particularly doing was drawing on what was already there. The Swan River Trust is now taking a more regional approach, and to this end it is in the process of preparing a back up landscape plan for the next half century. I think this is going to be a hard thing to do, and it will be even harder to get a consensus about the various views. However, it is an important thing to aim for and I think we should congratulate the Trust in its aim to achieve this goal. I also thank you for being involved in this process.

I hope, from our different points we can reach an agreement about preserving it, and using it together. I hope also that we can get something like a community consensus in favour of the Swan and in favour of the key part that it plays in the landscape of our lives. If this conference is able to determine a means by which this discussion will emerge over the next year or two, then it will be a day well worth being spent by all those who have come here today. So the best of luck for your conference, thank you very much for coming.

Swan River Landscape: Revisited

Speaker: Professor G Seddon

Background

George Seddon was Dean of the Faculty of Architecture and Planning at the University of Melbourne from 1982-1988. He was Director of the Centre for Environmental Studies from its inception in 1974 until the end of 1981, when it was amalgamated with the Department of Town and Regional Planning to form the School of Environmental Planning. From 1972-1974 he was head of the School of History and Philosophy of Science at the University of New South Wales, and before that he was in the English Department and Philosophy Department at the University of Western Australian. He has also taught at the Winchester College in England, The British Institute, The University of Lisbon in Portugal, The University of Toronto and the University of Western Australia. In 1970 he spent a year as Professor in the Department of Geology and Geophysics at the University of Oregon, and has also given courses in environmental planning at the Institution Universitario Di Architettura in Venice.

He was born in Berriwillock, Victoria, in 1927, took an Honours degree in English at the University of Melbourne, studied science at the University of Western Australian, and completed a M. Sc. and Ph D at the University of Minnesota (in Geology).

Professor Seddon has published books and papers on a wide range of literary and scientific subjects. His books include: Swan River Landscapes; Sense of Place; A Landscape Assessment of the Southern Mornington Peninsula; An Open Space System for Canberra; Somewhere to go on Sunday; A Guide to Outdoor Melbourne; A City and its Setting; Images of Perth. His latest book (in press) is an environmental history of the Snowy River.

In 1970, the University of Western Australia Press published 'Swan River Landscapes', reflecting some fifteen years experience of the river from the mid-1950s and 60s. We lived in Victoria Avenue, Claremont, at the time, so the lower estuary, from the Causeway to Fremantle, was the area we knew best, and this is reflected in the book. Stirling and Fraser called these estuarine reaches 'Melville Water', and they regarded the Swan River proper as terminating at the Heirisson Islands. These mudflats can reasonably be seen as the deltaic deposits of the river, and the western reaches as a marine embayment, but tidal effects reach beyond Guildford, and a surface skin of fresh water extends west of the Narrows in winter, so it is a complex system.

In reviewing my own book twenty years on, I regret that I did not pay more attention to the upper Canning and to the Swan east of the Causeway: in my view these two segments are both the most endangered, and yet at the same time, offer the greatest opportunities for advances in management and in making the best of the landscape resource. Fortunately, later speakers today are well able to develop this theme.

What has changed since 1970, in the river, our perceptions of it, in my own landscape philosophy, in the demands our society makes on it, now and in the future, and in our management resources and attitudes?

In 1970, I set out to do two things. The first was to celebrate the beauty of the river, by word and illustration, as many have done before me and since, but especially to identify the *genius loci* of the river, its own special character, above all the beauty of the limestone cliffs, and of the natural vegetation, especially the paperbarks, *Casuarina obesa*, the Swan River Cypress (*Callitris preissii*), the peppermints (*Agonis flexuosa*), the rushes at the river's edge (*Isolepis nodosa*), the cliff-face shrubs such as Cockies' Tongues (*Templetonia retusa*) which was still hanging on at Rocky Bay, and *Melaleuca huegelii* whose creamy spikes still adorn the south-facing cliffs of Kings Parks in November. Upstream, of course, a different vegetation, with great Marri on the alluvial soils, and flooded gum (*Eucalyptus rudis*), and the rich wetlands of the Canning beyond Riverton Bridge.

This vegetation was often undervalued by the local authorities of the day; the paperbarks, for instance, were disappearing at a great rate. I found a lone specimen of *Casuarina obesa* at The Combe. It is still there, but now has been quite extensively replanted, as of course it should be, as it is a fine foreshore tree, and well adapted to that demanding environment. The local authorities should not bear all the blame for this lack of appreciation of the endemic flora. To some degree it represented the values of the day, those of a European society that still had not come to terms with the natural environment, and it was also in part an engineering response to public outcry against what were long perceived as major nuisances derived from the river: the mosquitoes and midges, and the stink of decaying algae. For instance, the site of Perth City was described in the last century as '*swarming with fleas and mosquitoes; in fact a more perfect purgatory cannot be devised*'. This complaint recurs regularly until the turn of the century. As for the algae, the following is typical, from 'The Inquirer and Commercial News', March 23, 1870.

'Our attention has been called to the accumulation of large masses of sea-weed in the river, extending from Mill Street to William Street jetties from which most intolerable stenches arise. This is a matter requiring the immediate attention of the Inspector of Nuisances.'

The intolerable stenches continued well into the 1960s. I well remember how the shores of Freshwater Bay stank in the summer, and the gentle reproof, to a relative newcomer who complained, by a long-time resident on Victoria Avenue: '*My dear, it is the smell of money.*' The response of the local authorities of the day was, predictably, an engineering response rather than a biological or ecological one:

'Algae in the River are a natural phenomenon. They have an important function to perform and any increase that has taken place in their numbers is largely due to agricultural development, and cannot be obviated. There is no practicable means of removing them, and total removal is undesirable. Their nuisance value, however, is largely concerned with their death and decay on the foreshore and in shallow waters. It would therefore seem that the only solution is in carefully planned reclamation, and construction of retaining banks in such a way that dead algae do not accumulate in these places, and where this is unavoidable, to remove the algae before decay takes place.'

This recommendation comes from a 1953 Report to the Swan River Reference Committee, which was instrumental in establishing the need for a Swan River Authority, now the Swan River Trust. The Committee was in fact relatively enlightened, but it had to cope with inconsistent community values, as is so often the case. Many people wanted the river to be as natural as possible, but hardly anyone was prepared to put up with the inconveniences of a natural river, like the rotting algae, nor to accept the disciplines necessary to maintain the natural system, such as controlling urban runoff, or limiting access to the more fragile

areas. So the engineers took over, filling and straightening the river. Thus Millers Pool at South Perth was filled in 1938, leaving the Mill itself improbably high and dry, without any visible historical context. Point Fraser was obliterated in 1921 - 1925, and concrete embankments, buffalo-grass lawns, coral trees and the like began to take over right round the river. Some of these landscapes are quite attractive in themselves, but they have replaced landscapes that were unique.

So I tried to celebrate the beauties of the natural landscape in 'Swan River Landscapes', but it was also apparent in the 1960s that some adaptations of the river to new needs were much more successful than others: for example, the Kennedy Spring segment on Mounts Bay Road with plane trees and limestone embankment seems to 'fit in' naturally with the cliff of Kings Park, whereas the public toilets on the Nedlands foreshore were glaringly inappropriate in both design and location (they have since been re-designed and re-located). My concern, however, was not so much to express my own aesthetic preferences - this is good, that is bad - as to try to spell out the kind of criteria by which such judgements might be made, to get beyond personal preference. In doing this, I used two words, 'transformationist' and 'Arcadian', to describe two ways of adapting the environment to changing needs or desires. 'Transformation' is the wholesale making-over of one environment into another: the City of Perth site, for example, is wholly transformed, necessarily so, as is the Como foreshore. But the urge to transform is so strong that our predominantly British (or Anglo-Celtic) forebears have tried to recreate the environment they left behind wherever possible. This has succeeded in parts of New Zealand, a little of Tasmania, Vancouver Island, perhaps. It could never succeed here, because the natural environment is too different, and it is a mistake to try in the broader landscape, which has to be accepted on its own terms. I offered instead an 'Arcadian' approach to landscaping, by which I meant the understanding of local colour, land form, vegetation and soils, modifying them only within that ecological framework.

I shall illustrate that concept presently. My main concern in this paper is to review the concept and its relevance to today, but since landscape design is trivial - a form of exterior decoration - unless it is seen in social context, I shall first review a few of the changes since 1970, and also discuss the nature of change, to open a door on the future.

First, we might note some of the good things that have happened, if only because the press and public are so often preoccupied with the problem areas. One that is outstanding by international standards is that there are now 52 kms of bicycle paths/walkways around the Swan/Canning, and this does not include the feeder paths and spurs. They are well used, both for functional transport and for recreation, and are a resource that few other cities can match. Public access to the river has also improved: twenty years ago it was impossible to walk around Point Resolution from Claremont, for example, because adjoining landowners had run fences right down to the water. The right to public access is now accepted around most of the foreshores, whose combined length totals almost 200 kilometres. Western Australians take this for granted, without realising that they are exceptionally privileged. Garrett Eckbo, a notable professor of Landscape Architecture from Berkeley, made a comparative study of public access and foreshore parkland and reserves around Sydney. Sydney-siders are very much better off than the Californians - yet Sydney Harbour probably has the poorest public access of any Australian estuary, and is certainly far less well served than Perth and the Swan. Perhaps the most important change is the creation of a single authority to assist the various municipalities and government agencies in managing the river. It has to deal with the new problems that follow increasing urbanisation, and we have come a long way from those innocent days of 1953 when the smell of decaying algae was seen to be the main problem of pollution in the river. The new poisons are far more deadly. Yet - without wishing to play down the problems of chemical pollution in parts of the river, especially east of the Causeway, it is perhaps worth telling you of the near incredulity that my slides of the estuarine reaches evoke in my class of graduate students in environmental planning in Venice. 'Are those colours real?', they say.

The truth is that the river has undergone massive changes in the last 20 years, yet it is still our pride and joy, and should long remain so. The forces of change are both natural and social. From a geographer's point of view, estuaries are ephemeral features of the earth's surface; their normal fate is to silt up with sediment unless the land rises relative to the sea, in which case they are deepened or re-excavated, or the sea rises relative to the land, and they are then more broadly flooded. What they do not do is to stay the same.

But rivers may also be manipulated on a grand scale without ill effects, provided that natural processes are understood. The sediment regime of the Swan-Avon has been changed by dams on all the major tributary streams, and by increased erosion in the Avon catchment. Removal of the bar at Fremantle when the inner harbour was built has also had hydrologic effects: greatly increased flushing has in fact mitigated the problems of nutrient overload and increased productivity of marine organisms, as the lower estuary is now effectively a marine inlet.

The example of the Venetian lagoon is worth looking at briefly, to show an estuarine system that was managed successfully for a thousand years, but has run into serious trouble in the last fifty. The Venetians fled from the mainland during the barbarian invasions of the Dark Ages, and began to settle the islands of the lagoon in the 11th Century. The lagoon was their defence and means of communication, so they began to take steps to arrest the natural processes of sedimentation. 'Una laguna profonda e una laguna sicura'. In the course of the centuries they diverted all the major rivers to the north and south of the lagoon, and thus maintained a stable system. This was a massive engineering intervention, and contrary to nature, but it nevertheless showed understanding of natural processes, and it worked. In our own day, however, the whole system has collapsed. The Lido channel has been deepened to 11 metres, the Malamocco channel, which runs to the industrial Porto Marghera has been deepened to 13 metres; most of the tidal marshes have been filled for industrial land and the airport, so that their capacity to filter and break down tidal energy through an intricate web of distributaries has been lost. Now the tide rushes in and rushes out with great erosive power. Venice is not sinking, but eroding.

The point of the example is that slogans such as 'Design with Nature' are not very helpful. Nature can be manipulated successfully, but it cannot be ignored. Because the art and science of managing the river will depend on our success in managing change, I have drawn up a very simple matrix, below:

Change Matrix

Past and Present	Good (for the river)	Natural	Bad	Future
Inevitable				Highly probable= predictable
Avoidable at cost				Possible= can be anticipated
Easily avoidable				Unforeseeable therefore cannot be planned for

You can fill in the boxes yourselves, but to illustrate, I would suggest that a bridge at the Narrows was inevitable, given population growth and the geography of the river, but that the Narrows Interchange was avoidable at a cost, a cost that the community might have been prepared to pay, if it had been adequately consulted. The Kwinana Freeway has inevitable given the Narrows Bridge; its riverside location was avoidable, but only at a cost that the community would not have been prepared to pay (i.e. the destruction of many houses in South Perth). Many locational decisions are easily avoidable: a particular facility, be it a restaurant, playing field, Old Peoples Home, or whatever, may be highly desirable in itself, but we should always ask whether or not a riverside location follows from its special character, and if not, whether there may be alternative sites.

As for the future, we can certainly anticipate increasing pressures on the river, which probably means more careful partitioning of uses that are not fully compatible. The only way we can plan for unforeseeable change, however, is to be cautious, and to maintain as much of the foreshore as open space as we possibly can. I would like a long term program to increase the open space, for example, along the southern foreshore along the Great Eastern Highway, and indeed anywhere an opportunity arises, thus building up a 'Land Bank' that can be drawn on in the future. The estuarine reaches have already become a 'ring of gold', the preserve of the wealthy, and this makes foreshore access and generous reserves increasingly important.

The second part of my paper is to review the concept of 'Arcadian' design and to consider its relevance for today and tomorrow. The first point I would make is that it is deeply ingrained in the local consciousness, so much so that its cultural origins may not be easily recognised. It is derived essentially from the rural bias of the English ruling classes. This is not the place to develop that theme, but it is worth noting the way in which it colours the accounts of Georgiana Molloy, John Lort Stokes, Mary Ann Friend, and Captain Stirling himself. It is very evident in the report of Charles Fraser, the Government Botanist with Stirling.

'From Pelican Point to the entrance of the Moreau the country is diversified with hills of gentle elevation and with narrow valleys, magnificently clothed with trees of the richest green. Here the genus Banksia appears in all its grandeur, consisting of three species, of which B. grandis is the most conspicuous. The principal timber is Eucalyptus. The shrubs consist of a species of Dryandra, two species of Hakea, one of Grevillea, and a pendulous species of Viminaria of considerable height, richly clothed with yellow and crimson flowers, associating itself in the most graceful manner with the weeping Leptospermum formerly alluded to. Xanthorrhoea hastilis is abundant, as is Zamia spiralis, while Anthocercis littorea is seen to attain a height of 10 feet. The shores are covered with rushes of great height and thickness...

The view from Pelican Point is exceedingly grand. The contrast between the dark blue of the distant mountains and the vivid green of the surrounding forests is such as must in a peculiar manner strike the attention of a person long accustomed to the monotonous brown of the vegetation of Port Jackson. It is, indeed, materially different from anything I have yet seen in New South Wales.

From Point Heathcote to the islands the country seems to improve, as far as I could judge from the immense quantity of herbage it produced...

At Point Fraser the bank may be said to terminate, and the channel appears to be that of a beautiful inland river. From the entrance to this spot it may more properly be called an estuary. The flats, or levels, at this spot are very fertile...

One mile up the river from the last point is a small creek of fresh water, issuing from an extensive lagoon clothed with arborescent species of Metrosideros of great beauty. The banks are covered with the most interesting plants, amongst which I observed two species of Calutris, a species of Acacia with a scolopendrous stem, and several Papilionaceous plants. The Angophoras on the flats are gigantic. These flats are formed of tolerable loam, of great depth, and capable of producing fair crops.'

Reprinted in Seddon (1972)

The significant point is that an appreciation of the landscape became translated into an economic evaluation: both Stirling and Fraser concluded that if the trees were so green and the landscape so fine, then the Swan River must be fertile and productive.

Thus begins an Arcadian phantasmogoria which has coloured the experience of Perth to the present day, and the view from Mt Eliza in Kings Park has played a key role in generating it. Stirling was not alone in admiring the view; the French, under Francois Péron in 1801, perhaps the first Europeans to climb Mt Eliza, had a difficult and unpleasant trip up river, sticking in the mud flats near the Herrisson Islands (as had the Dutch before them and Stirling after). On their first night, they reached the Narrows, made camp at the foot of Mt Eliza, climbed the cliffs behind them, and:

'.....were charmed with a beautiful prospect. On one side we discovered the upper course of the river, which went up towards a range of flat mountains in the distance, and on the other we could follow its course down to the seashore. The banks of the river appeared almost everywhere covered with beautiful forests, which extended a considerable way into the interior of the country.'

Peron did not conclude from the beauty of the scenery that this was the place for a colonial settlement and its capital city, as did Stirling. The Dutch were even more dismissive than Peron - they saw a sandy waste. A landscape view is again recorded by John Lort Stokes, a Commander in the Royal Navy, explorer and navigator. Lort Stokes arrived at Swan River in the Beagle in 1837.

'.....That arid appearance which first meets the settler on his arrival, and to which allusion has already been made, cannot but prove disheartening to him: particularly if, as is generally the case, his own sanguine expectations of a second Paradise have been heightened by the interested descriptions of land jobbers and emigration agents. However, when he ascends the river towards the capital, this feeling of despondency will gradually wear away; its various windings bring, to his eager and anxious eye, many a bright patch of parklike woodland; while the river, expanding as he proceeds, till the beautiful estuary of Melville water opens out before him, becomes really a magnificent feature in the landscape; and the boats, passing and repassing upon its smooth and glassy bosom, give the animation of industry, and suggest all the cheerful anticipations of ultimate success to the resolute adventurer. From about the centre of this lake-like piece of water, the eye first rests upon the capital of Western Australia, a large straggling village, partly concealed by the abrupt termination of a woody ridge, and standing upon a picturesque slope on the right bank of the river,

thirteen miles from its mouth. The distant range of the Darling mountains supplies a splendid background to the picture, and the refreshing sea breeze which curls the surface of Melville Water every afternoon, adds to the health, no less than the comfort, of the inhabitants.'

My own appreciation of landscape is also founded in this cultural tradition but it is clear that an essentially rural concept of landscape cannot be maintained throughout the river foreshores of a large metropolis, and much more urbane solutions will be needed in some areas, although I hope that this can still be carried through by respecting the primary values of the natural landscape, especially the natural colour range, which includes the yellow ochres of limestone and sand, the black-greens of the Swan River Cypress, the greys and grey-green of so much of the natural vegetation.

I have chosen to illustrate this by taking a city that it is very different from Perth, but the very differences dramatise the concept (Lisbon on the Tagus would be a much more appropriate analogue for Perth, but I do not have relevant illustrations). Consider, therefore, Zurich in Switzerland, built over the centuries on both sides of the Limmat River and around the shores of Lake Zurich. It is a grey city, built of grey stone under grey skies, and the trees have that soft mid-green of the mesophylls that looks so out of place under our strong light and sun-bleached vegetation. The city was first a port, and it is built up hard against the river, but the stone-flagged quays are pedestrian precinct, and this promenade has been extended over the last decade along the lake and also around the ditch (the Schankengruben) that was once the moat below the city walls. Land is scarce in Switzerland, so all of this is on a small scale, tightly organised, and very urban. But the waters of the lake and river are clear as crystal, the pedestrian spaces are tranquil, despite the nearby traffic, and the composition, though far from naturalistic or Arcadian, nevertheless is in harmony with the natural elements through its restraint, simplicity, use of worn stone and the trees of the region. As the intensity of foreshore use increases, parts of metropolitan Perth will have to consider hard-edge urban design - and I hope that it does so boldly, with that emphasis on quality that characterises Zurich, where things are made to last. We need landscapes around the river, whether natural, Arcadian, or urban. The present tendency is to move from the natural to an uneasy compromise, to make gardens. We need landscapes, not gardens, which tend to be wrong in scale, demanding in maintenance, and often essentially suburban in character. We should above all take care not to suburbanise the river more than we have already done. We should indeed set out to reverse the trend.

Some relatively robust natural landscapes can remain natural, like the cliffs at Peppermint Grove, and this could serve as a model for regeneration in similar areas. Some natural vegetation on highly erodible sandy soils has degenerated dramatically under the heavy use of the last decade. Some of the river can remain as Arcadian - naturalistic rather than natural, Nature groomed and tidied up a little. But I have three last points to make about this kind of landscape.

1. The first is that such landscapes will require community input for their effective maintenance. We need the equivalent of Neighbourhood Watch applied to the river, not as an occasional ad hoc 'clean-up', but as a regular commitment, with, perhaps, honorary wardens (Foreshore Watch). Councils and the Trust cannot do it all for us, and councils inevitably are driven towards engineering solutions - concrete, bitumen, large areas of lawn - because they can be maintained mechanically, whereas more natural systems are intricate, and need much more detailed care, even in picking up litter by hand where it is trapped by reeds or paperbarks.
2. The second is that our cultural preference for groomed landscapes probably needs further adjustment to the realities of the Australian environment, in which leaf litter, persistent dead branches and signs of insect attack are the rule. I would recommend to you all very strongly a new book by Robert Powell, published by the Department of Conservation and Land Management, called 'Leaf and Branch: Trees and Tall Shrubs of Perth'. In my view, this book makes a most valuable contribution

to the aesthetic appreciation of the local environment. Even though some of it is contrary to my own cultural conditioning, it has deepened my understanding by relating form to function. I am convinced that any aesthetic that is not based on such ecological insight is superficial. This is the area in which my own landscape responses have changed as I have learnt from people like Robert Powell. Should 'Nature' be groomed at all? I would now say that it should be tidied up only when there are strong functional reasons for doing so, such as reducing fire hazard. But we should not cut off dead branches, or look with distaste at a flooded gum whose leaves are riddled with leaf-miners. Remember that the insect fauna supports the birds, and see it as part of a productive system. There are both functional and aesthetic reasons for replanting the local flora wherever possible. Endemic species are adapted to low fertility and summer drought, and therefore we not only saving precious water, but avoid adding nutrients, which only add to the nutrient overload of the Swan. Robert Powell notes that many of the eucalyptus brought in from eastern Australia, and most exotics, are single stemmed. This makes them very prone to wind damage in this windy city (there is a massive clean up at the University of Western Australia after every major wind storm for this reason, and it is an expensive operation). However, the indigenous trees and shrubs are nearly all multi-stemmed and often the foliage comes right to the ground, which makes them wind resistant and it also protects the soil around them. Moreover these trees and shrubs with low-angle limbs from the base can lean out from the bank over the water, one of the beauties of the upper reaches; trees such as *Eucalyptus maculata* cannot do this. There is still much to learn for people with my cultural conditioning towards groomed landscapes. I believe that Robert Powell, Luke Penn and Mike Moritz - whose study of water sensitive design I strongly commend to you - will help to move us towards such an appropriate and relevant aesthetic.

3. To reinforce the above I would conclude that even if we allow that mounting urban pressures and greater intensity of use will lead to more 'hard-edge' along parts of the foreshore, the Zurich example shows that this can still be naturalistic in its use of materials. What we should always avoid is the arbitrary imposition of rigid geometries purely out of tidy-mindedness. Let me illustrate with a quotation from one of my own books, 'Sense of Place'.

'Thomas Burnet, an Anglican theologian of the seventeenth century, once argued that the irregularities of the coastlines of the world were evidence of degeneracy: God could not have made it so.'

'If the Sea had been drawn around the Earth in regular figures and borders, it might have been a great Beauty to our Globe,...but finding...all the marks of disorder and disproportion in it, we may as reasonably conclude, that it did not belong to the first order of things, but was something succedaneous, when the degeneracy of mankind, and the judgments of God had destroyed the first World.'

David Daiches offers the following comment on the Burnetian view:

Burnet! You wring my heart full sore.

I had not realized before

How crooked, twisted, bent and curled

Is this our poor distorted world.

I look below and at my feet

I see misshapen grasses meet.

Above me in the endless sky,

*The malformed clouds float sadly by...
While sky and meadow, field and tree
Are just as ugly as the sea.
Enough! I shut my burdened eyes
And do my best to visualise
A world where all is neatly framed
And Burnet need not feel ashamed ...
Such ordered creatures play their part
In boosting their Creator's art.
How trim the patterned ocean's strand
In perfect square of yellow sand!
I note the rocks that bound the seas-
Triangular (isosceles)
Neat fishes as they swim adduce
The square on the hypotenuse.
A nymph approaches - creature fair
How straight and even is her hair!
Her eyes two perfect circles are;
Her bosom is rectangular.
Am I delighted? I am not!
- Burnet, you talk the damnedest rot.*

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A Vision for the River

Speaker: Mr M Hipkins

Background

Max Hipkins is a qualified Town Planner and Architect who has extensive experience in Australia and overseas. He is currently employed by Whelans Planning Consultancy. Mr Hipkins is also a member of the Swan River Trust.

Introduction

"Would you tell me, please which way
I ought to go from here?"

"That depends a good deal on where
you want to get to," said the Cat.

"I don't much care where," said Alice.

"Then it doesn't matter which way you go,"
said the Cat.

'Alice's Adventures in Wonderland'

(Lewis Carroll)

My talk today is about the importance of having a vision for the river, so that we know where we are going.

No one follows a road map to nowhere but an organisation implementing a plan or management strategy without a vision is effectively doing the same thing.

A vision is a mental and verbal picture of a desired future state. This picture gives meaning and purpose to the organisation in the surrounding chaos and pulls it into the future. A vision is as much about stirring people's hearts as challenging their minds. This vision will guide strategic planning, will make decision making more focused, purposeful and meaningful, and less arbitrary and capricious. An organisation's vision is its most potent tool for managing change and is particularly important in an uncertain or changing environment such as we face in W.A. today.

Perceptions of the river have changed markedly over the last 160 or so years.

At the time of European settlement the river was biologically highly productive and much valued by the Aboriginal people for the variety of its food supply - mammals, birds, fish, reptiles, amphibians, crustaceans and molluscs. There are numerous historical references to this prolific wildlife flocks of birds so thick they darkened the sky, even two reports of dugong (Riggert 1978).

For the new settlers the river was the lifeline and focus of all activity. The various means necessary for physical, economic and social survival clustered around the river. Most

people lived nearby and almost all business was conducted literally within a stone's throw of the waterfront.

Degradation

However, no thought was given to the capacity of the resource to accommodate the demands made upon it and the river was rapidly degraded, by shooting and trapping wildlife, dredging the river for transport, diverting freshwater inputs for water supply, adding stormwater drains, filling wetlands with municipal refuse, dredged spoil and factory wastes' and locating industries along the river where the waterway could act as sewer to remove wastes.

Although it was still possible to live off the river during the Depression, and many did, the low point was reached during the 1930s when all of the city's sewage was going into the river, there were no controls on industry and Depression employment schemes involving land reclamation and river wall construction were at their peak.

The river was considered as a limitless resource, to be used and abused at will.

Although degradation commenced with first European settlement, it is only in the last 50 - 60 years that we have begun to significantly change the nature of public access and connection to the riverfront.

Initially, through roads paralleled the river some distance away. These roads are now known as Stirling, Canning and Great Eastern Highways, Guildford Road and Thomas Street. Access to the water was at right angles, such as at Mends Street, South Perth and Broadway, Nedlands.

Since the 1920s and 30s, commencing with the construction of Riverside Drive and Mounts Bay Road and subsequently the Kwinana Freeway, major roads have been built along the water's edge which have proved to be significant barriers to river access. Other "tidying up" has also occurred with filling, construction of river walls and the creation of parks and gardens, sometimes with golf courses where access can only be gained on payment of a fee. Through these approaches 'waterfront character' can be and has been drastically altered and community access to the river restricted.

Management - A Beginning

The first public protests occurred as early as 1908 in relation to a proposed "river beautification" programme, which involved the introduction of artificial islands, and by the 1930s there was increasing concern about conflicts between industrial and recreation use. In 1943 the Director of Works, with the Commodore of the Royal Perth Yacht Club and four other persons, formed the Swan River Reference Committee - an advisory body to co-ordinate works on the river and to deal with such problems as water purity and cleanliness of foreshores.

The Committee was gradually expanded to 15 members and in 1955 released a report which defined pollution and suggested methods of control. It was the first of its kind in Australia. The Swan River Conservation Act 1958, established a Board with powers to licence industrial discharge to the river.

Point Sources - Under Control

In the years that followed, the Swan River Conservation Board and successor agencies' the Swan River Management Authority and Swan River Trust, have been extremely successful in phasing out industrial discharges from point sources.

The number of discharge permits issued has declined progressively over the last 30 years: 27 in 1969, 21 in 1978 and 18 in 1990, 8 of which do not have to regularly report to the Swan River Trust. The treatment of wastes is now such that point sources are no longer considered a problem (Bond 1969; Riggert 1978; Swan River Trust Annual Reports).

Filling - Ongoing Problem

It has taken considerably more effort to bring filling of the river and adjoining wetlands under control.

There was a public outcry in the early 1960s over reclamation of Mounts Bay for the Narrows Bridge interchange and the South Perth foreshore for the Kwinana Freeway. This resulted in an amendment to the Act in 1966, which required parliamentary approval for filling any area in excess of 2 acres (0.8 ha). However Parliament had previously approved, in 1963, a regional planning scheme which located new freeways along both the Swan and Canning Rivers and this scheme continued to be implemented. Also, municipal refuse continued to be dumped along the river.

In 1977, a major report 'The Swan and Canning Rivers Activity Study' drew attention to these issues and called for much greater protection for what still remained of the river's wildlife as the top priority (Forbes and Fitzhardings 1977). The tips were phased out in the early 1980s but it took until 1988 for the proposed freeway upriver on the Swan to be deleted from the regional plan and it was only in 1989 that a Canning River Regional Park and aquatic wildlife reserves on the Swan River were proclaimed.

Filling of the flood plain for urban development is still permitted to continue although the Swan River Trust is at present grappling with policies that may curtail this practice. An increasing number of development applications for land subdivision, rezonings from rural to urban and increases in residential density, particularly in and adjoining the flood plain in the upper reaches of the rivers, is one of the most pressing problems currently facing the Trust.

I am not quite sure why this is proving to be the case. It is an established principle of town planning law that there is no compensation for zoning and that planning authorities are fully within their rights to refuse applications to rezone. Yet it is constantly argued that development should not be held up. Most discussion that does take place with rezoning applications revolves around how much of a foreshore reserve can be obtained, considering what is reasonable for the owner to provide, rather than what is the impact of the development on the river landscape and whether the land should be rezoned in the first place.

In these cases of rezoning, where the Trust is only providing advice and another agency is making the final decision, the Trust can afford to take the moral high ground, provide leadership and demonstrate that it is possible to have not just black and white solutions, represented by public foreshore and abutting urban development. Many shades of grey are possible, varying from permanent rural buffer zones between the urban areas and river to maintaining existing character, through a range of low density activities sympathetic to the river environment.

As a planning consultant frequently employed by developers, I would be the first to agree that the approval process for the overwhelming majority of development applications should be streamlined. However there are some instances where the process should be slowed down, to allow more rigorous examination of proposals and along the river is one such area. Unlike the Town Planning legislation, the Swan River Trust Act does not specify a time limit within which the Trust shall make a decision, quite rightly in my opinion, and to not hold up development should never be used as the reason for making a quick decision.

Even where a zoning commitment has already been made, a lot can be done relative to where and how development is located on the land, in accordance with traditional town planning law. Street set backs for buildings from even the most minor cul-de-sac are accepted without question, largely on aesthetic grounds, yet for some unexplained reason there is a reluctance to apply a similar set back from the river because of conflict associated with property rights.

More consideration should be given to the river and community good rather than to the rights of the individual landowners. The landowner has his rights safeguarded against bureaucratic excess by appeal mechanisms. The river and the community usually have no second chance. Allowing building within the flood plain represents an irreversible commitment of estuarine resources, the diminution of which results in a partial loss of one of the most significant life support systems of the planet, something we cannot afford at any price.

And the loss is so unnecessary. The problems of encroachment are not particularly hard to solve; the mechanisms are already available and no budgetary allocations are required. All that is needed is the political will.

Other Current Concerns

However there are other issues which are much more difficult to tackle, including heavy metals and pesticide contamination which have started to show up in fish and nutrient build-up which could soon reach the point where assimilative capacities are exceeded and extensive blooms occur, as in the Peel Inlet.

The three main sources of nutrients are:

- agricultural runoff;
- seepage from septic tanks; and
- household fertilisers.

All three are very difficult to tackle.

Perth has about one-third of its built-up area unsewered, which is the highest of any capital city in the Australia. Around \$5 million is currently being spent per annum in a sewerage backlog programme. However, it has been estimated that the cost of connecting all unsewered areas would be between \$400 and \$800 million - a daunting sum of money, particularly in the current economic climate.

To reduce the use of agricultural fertiliser, research is needed to identify alternative cropping patterns requiring less fertiliser. There is some evidence to suggest that use of fertiliser is responsive to manipulation of the price mechanism but politically this is a sensitive issue. Above all a sense of responsibility needs to be instilled into both manufacturers and consumers to ensure that these products are used wisely.

To decrease household fertiliser use, a similar public education campaign is necessary to demonstrate the effects of over use and to show what can be achieved with indigenous plants that do not need fertiliser.

And this is where the vision comes in.

The Importance of a Vision

The Swan River Trust has operated since March 1989 and for the first time in Western Australia the agency responsible for river management has control over development on the water and public lands that adjoin it. This provides a new challenge for there is now the ability to determine future events.

In the past, short run problems with clear targets have been effectively addressed. Now the problems are more complex and long term strategies are necessary. The Trust, in fact, already has an approved management strategy in place, which lists hundreds of recommendations for action. However there are no priorities indicated and the many calls for detailed management plans do not consider the desired outcome.

To exercise proper control it is essential to develop a vision of what the river should be like in the future. Governments think in terms of 3 or 4 years, town planners longer, perhaps up to 20 years' but for unique resources the horizon must be much longer, 50 to 100 years or more.

I was at a conference in Melbourne last week where the City Planner from Ottawa in Canada described a 200 year plan for his city. The urban area was anticipated to expand something like five times the present size and the element chosen to structure the city was a linear park system based on watercourses. Parks were planned to increase in area more than tenfold. An ambitious purchasing programme is currently underway to protect these lands that will be needed in 200 years' time.

Even if our present economic constraints here in Perth prevent such a grand vision at this time, a lot can be done to preserve the status quo and protect the river from encroaching development.

It is only in the context of a vision that the implications of incremental actions can be understood, priorities established and forward plans developed. There is no room for compromise. It is the vision that provides the frame of reference within which current issues are addressed.

I have a vision for the river and it is not, as it was in yesteryears, the centre of ALL of Perth's life. Demands on the resource are such that activities which are enjoyed by relatively small numbers of people and/or don't directly use the water, such as golf courses and football ovals, must make way for water dependant land uses such as wildlife and aquatic recreation areas that cannot readily occur elsewhere and that give greater benefit to the wider community.

The river will always be the focus of the metropolitan area and at Perth city and elsewhere, at periodic intervals along its length, we should accept an urban character for the waterfront where people have access to enjoy the river. However we should never forget natural processes and the river's flood plain should contain only minimal development to allow flooding to take place without the likelihood of significant damage. Generally, the river should be a green space, a quiet place, a migration route for wildlife between the escarpment and the ocean, where wildlife flourishes in contrast and relief to the built-up area where noise and hard surfaces predominate; a resource that permeates adjoining areas and breathes life into lands further back, without a sharp transition between the built and natural environment, or public and private ownership.

This vision would result in wide non-urban corridors adjoining rivers in the upper reaches and excludes major roads along river foreshores. It requires that private property adjoining the river is well landscaped, preferably with indigenous vegetation. Not so many years ago it was mandatory for all residential development to provide at least 50 per cent of each lot as landscaped open space. The requirement has been relaxed somewhat recently but I believe it is appropriate to return to the higher standard, at least adjoining the river.

The vision also requires that the natural contours that decide the edge character of the river be maintained wherever possible, suggesting controls to set buildings and retaining walls back from the property boundary closest to the river and to only allow minimal earthworks for buildings.

The vision includes tree preservation orders on both public and private property to protect existing vegetation.

Such controls are necessary to prevent repetition of the recent destruction that has taken place on the Majestic site and elsewhere. Imagine the impact if such alteration of the landscape was commonplace, which it could well be over the next 50 - 100 years.

In the vision that I have painted there is no room for the selfish adjoining landowner who, in his attempt to maximise his return or own advantage, overbuilds his block with stark retaining walls to increase the usable area of land without consideration of the view from the river of his ugly and insensitive development. He needs to be told that land steeply sloping down to the river is not suitable for building a tennis court, even if he does have an engineer to do the design. Adjoining owners do not have the right to use and abuse their property in such a way that they alter the character of the river landscape and spoil the enjoyment of the community.

Some people will subscribe to this vision; others will agree with only parts of it. The actual vision is not as important as the process of getting there - the critical thing is that key stakeholders, particularly the public, are involved.

In Melbourne last week I heard that in Brisbane and in Adelaide, considerable effort is being put into surveying the populations to find out what people like and dislike about their city. What is the character of Brisbane? What makes Adelaide different? What buildings do people like and what do they regard as monstrosities? What do they want to keep and what do they want to change? I believe we need to ask a lot more questions about our river - how it should be used, what sort of trees people like, what they think of buildings in or over the water, what is the preferred mix of "natural" to "built" foreshore.

Public participation in the planning process, particularly in formulating the vision, will be time consuming and possibly frustrating but a shared vision will make implementation much easier in the long run.

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The Public and Foreshore Protection

Speaker: Mrs S de la Hunty

Background

Shirley de la Hunty has a long standing interest in the Swan River. She is the Chairperson of the Foreshore and Waterways Protection Council and a Councillor for the City of Melville.

I feel a little uncomfortable in this program, with so many important professional presenters but I think it is very worthwhile for me to come and listen to the others. Thank you George Seddon for coming back to W.A. I have all your books, and it is a joy to hear you speak again. While you were speaking, you mentioned that filling along the foreshores has occurred in the past. Unfortunately in-filling is still happening today along the river foreshores and this is one of my concerns.

In one of the pictures you presented, you showed a beautiful tree with geese in it. I was right at the back of the room at the time, and you made the comment that "man is here". Man has been here for a very long time, and one of the things I have had to get used to in our commonly held conception that man has newly arrived on the Swan River landscape. In my association with the Swan River, it appears obvious to me that Man has been here for a very long time.

In my position as President of the Foreshores and Waterways Protection Council, I am probably able to represent some of the public attitudes towards development adjacent to the river, as tens of thousands of Perth Citizens have approved of the motivation that formulated the Council. At the moment I don't think I'm going to be allowed to stop being President as I can't find anybody to take on the position. It is a very big job, however I am proud of the support we have had.

It is indeed the public interest that drove us to form the Council. At the time of its formation, there seemed to be a desperate need to stop or slow down the development of wetlands along the river system and the coast. The initial formation of the Council resulted from a meeting attended by various people including Dulcie Hodgson, who is the President of the Kings Park and Swan River Society. We held this meeting out of sheer affront at the proposal to put Mr Goldberg's development on the old Swan Brewery site. This development was announced just before Christmas in 1984 and the Council was officially formed as a response to it in 1985.

At first the Council thought that the State Government had purchased the old Swan Brewery site for recreation. Unfortunately however, this rumour was soon dispelled, and debate as to the long term use of the site has been a long drawn out saga. Public concern opposing development of the site has been immense and has been expressed at six major public rallies. The Council has also had enormous written support, including 30,000 signatures representing all sorts of organisations unrelated to our group.

I believe that it is really quite a shocking indictment of our society that the debate over use of the site has gone on for so long, given the extent of public opposition to it.

Our Council also became concerned, and disgusted, about the exclusive nature of private commercial developments taking place under a range of guises and "fast track" entitlements along the river foreshores throughout the metropolitan area. These developments conflict with the growing uneasiness of the public generally, and local residents who have formed many groups opposing the development proposals. I would like to think that groups such as ours have inspired and helped the seventy or so support groups which have sprung up all around the foreshores, largely composed of local residents, to fight their proud battles. It is a most interesting and exciting aspect of the public attitude, action and communication. A

lot of people now know that in an area, they can unite to create some sort of opposition, where they win some and lose battles. Members of our Council have at times met and talked with members of these local groups to tell them what has happened in the past, and give them a few directions in relation to which way to go. In doing this, I feel we have served our purpose in helping to protect the foreshores.

We have also I suspect, had influence on the formation of the Swan River Trust because I think we touched on a number of going concerns to the public. In this way I think our Council helped to form a unified management body for protection of the river, for which we are extremely grateful. A lot of the attitudes which George Seddon and Max Hipkins have already stated are the sorts of attitudes and concerns that I think are generally felt in the community, and it clearly would be inappropriate and unnecessary for me to comment on those further. Our Council has policies on wetlands, the river, and coasts, and these stand very much in rhyme with what I understand the general public feels towards development.

My work with the Council is interesting, and at times exhausting. I was late today because I do not have the time to just go and research things. I propose to retire from my position as President at the end of the year, and then I might have the time to read a little bit and put a few thoughts together. For people like me, who are volunteers, it is sometimes exhausting and certainly a financial challenge to be involved in this work, however we often achieve a sense of whether its worthwhile going on or not. There is the "burn-out" syndrome which of course we all go through at times. Nevertheless, we are happy to note the change that has occurred through the support of issues which will be discussed here today.

There has always been a growing community awareness that the environmental health of the river is related to its recreational appeal. Our Council has had some bitter struggles in the past over specific proposals, which on occasions has led to some members becoming totally turned off and exhausted. Some of these contentious issues include the Mosman Park Tea Rooms, the proposed redevelopment of the Swan Brewery site and the proposed subdivision of Buckland Hill. When Max in his talk, referred to certain types of foreshore, there's a lot that I see and worry about, for example, the Mosman Park foreshore. This was originally public land which has now been turned into private land and has created a big scar on the Mosman Park foreshore. There still are many mistakes being made in today's world and in today's environment. When we have such great support in opposing these types of development proposals, one wonders how they can still happen.

As I have mentioned, there has been great public involvement and concern in relation to proposed developments along the river foreshores. When I feel intimidated or have been attacked in Parliament I think it is very easy to feel that perhaps you are stupid to put yourself in that sort of position. However, it is the public support for our Council's roles and attitudes that keeps me going, as long as it doesn't get too tough! The attitude which the general public now has is heartening.

One reads almost weekly in the local press an article by somebody in which they reminisce about their youth spent on or nearby the river. There are so many of our citizens who knew the river in the way George portrayed it in his talk.

I agree with George and with Max that change is almost inevitable. I realised this fact a few years ago. Nevertheless, our Council would like to make sure that when a change does take place, it is a wise, well planned and a far sighted change. We have already seen foreshore parks been trodden virtually underfoot with the expansion of Perth and on occasions with the Planning and the Housing Departments. I think that these events are almost inevitable with urban expansion. However, for this reason it is even more vital that we preserve our foreshore areas, to retain public access to the river.

I was in Adelaide last week, as I know some others of you were, where I attended a conference organised by the Royal Australian Institute of Parks and Recreation, entitled "Managing Conflict in Parks and Recreation." I am a member of the Melville City Council and I thought this conference would be useful in learning to resolve conflicts situations. I also thought that some of the examples discussed could possibly be applied to similar issues here in Western Australia. I am not sure that I learned anything new at the conference, however I did hear how conflict can be developed and looked at in about twelve different

ways. One speaker concluded with the statement that "Well, conflict is inevitable". I said "Well, I suppose that's so."

One very interesting address, which unfortunately was not included in the proceedings of the conference, was given by Ted Dexter, entitled "The River Torrens Park". This involved discussion concerning how the land was brought into public ownership and the landscape transformed. The speaker gave a most interesting reflection on how the public was involved in this process. Another interesting aspect discussed was flood mitigation. Floods are responsible for immense damage to foreshores along the river downstream. They have initiated a "public watching" scheme, whereby members of the public are involved in policing and maintaining flood mitigation. This initiative is, I suspect, a classic example of public participation and the recovery of what was assumed to be a lost cause. Wildlife has returned to the foreshores, and gentle banks have replaced the steep banks which prevented safe public access to the river. They also have established a linear park and an "obhan railway." I think that the Western Australian Government should give serious thought to establishing an "obhan railway" in the north of W.A. This would be an environmentally sensitive way to transport people.

Another inspiring and interesting address was given by Nigel Caswell on behalf of John Senior, from Victoria, entitled "Fragmented Management of an Urban Creek". Here they have transformed a dirty drain into a beautiful creek drain, one hundred kilometres long. Work on the river involved thirteen local councils, and numerous privately owned agricultural properties. Much of the rubbish and landfill clean-up and subsequent rescue of the Merri Creek was driven by public concern and participation.

To achieve a co-ordinated planning approach for the river, the various management groups, including environmental groups, the Environmental Protection Authority and the Swan River Trust, need to work together to meet the objective of natural conservation control. Until this objective is met, the various people and organisations involved in preserving the foreshore, such as our Council, will have to battle on.

Sometimes one despairs, as anger and short sighted decision making is no way to resolve important planning decisions which involve the long term planning for the river. Our Council believes that public participation in the form of submissions on specific proposals has fallen into disrepute. The submission process appears to be sincere, however the Council believes it is often patently and publicly misused, when often the decision to proceed with the proposal has been made prior to the submission period commencing.

I was pleased to hear this morning the Environmental Protection Authority announce that the numbers of people involved in volunteer groups and supporting conservation groups rose last year from 8000 to 14000. This is a very encouraging sign of the growing sense of concern and awareness amongst W.A. people.

I hope that some of the millions of dollars owed by the Western Australian Government which appears to have gone astray in recent months is found and spend on buying back river foreshore, thereby returning it to public ownership.

Our Council believes that developments such as commercial restaurants and sporting and associated service facilities should not be allowed on foreshore reserves. I would like to think that this generation of ours might have the wisdom to preserve some areas for the future, to maintain the diversity of uses, and not encourage exclusive and intrusive use of the foreshores.

Thank you very much for the opportunity to hear the other speakers and for the invitation to speak on behalf of the Council on what we are all trying to preserve - the best of the aesthetic and recreational aspects of the Swan and Canning river system.

Fringing Vegetation, Components in the Riverine Landscape

Speaker: Mr. L Penn

Background

Luke Penn is a professional officer at the School of Biological and Environmental Sciences, Murdoch University. He is interested in all aspects of riverine ecology, especially in relation to environmental management. His Honours studies were on the fringing vegetation of the Swan and Canning Rivers, and he subsequently studied the ecology of the Canning River wetlands in detail. His present work involves a series of investigations into the biologies of freshwater fish of south-western Australia and he has authored or co-authored bulletins, reports and scientific papers on fringing vegetation in south-western Australia. He is currently in the last stages of his Ph D studies.

Introduction

Much of the natural landscape of the Swan and Canning Rivers consists of the peripheral vegetation remaining along the foreshore and flood plains of these rivers. This vegetation does not comprise one plant community contributing a single landscape form, but rather it consists of a number of plant communities, each contributing a very different landscape component to different regions of the rivers. Detailed descriptions of this vegetation have been given by Penn (1983) and Brock and Penn (1984). For this document only the major plant communities, known as complexes or communities (Penn 1981, 1983), together with their dominant and therefore characteristic species, will be used to describe the different landscape components of the Swan and Canning Rivers.

The fringing forest landscape

In estuarine areas fringing forest is mostly low (<15 m), dense and often of uniform appearance. In the freshwater sections of the rivers the forest is taller, sometimes reaching over 30 m, and is more open and variable in appearance.

The estuarine forest

In highly saline sections of the Swan estuary (below Guildford on the Swan and below the Kent St. Weir on the Canning) the Casuarina-Melaleuca Complex, dominated by the small trees *Casuarina obesa* (swamp she oak) and *Melaleuca raphiophylla* (swamp paperbark) are to be found, either fringing saltmarshes or estuarine waters. When salinity is reduced by natural freshwater flushing, the Melaleuca-Juncus Complex thrives. Here *Casuarina obesa* is absent and the understorey is dominated by rush, *Juncus kraussii* (shore rush). In peripheral zones receiving large volumes of water via creeks or more commonly man made drainage systems, *Juncus kraussii* is replaced by a variety of other native plants, and recently by numerous weeds, associated with freshwater conditions. This gives rise to the Melaleuca (Swamp) Complex.

The upstream freshwater forests and woodlands

In more freshwater upstream sections of the river estuaries and further upstream along the rivers themselves, the fringing forest of the the rivers forms, with *Melaleuca raphiophylla* the Eucalyptus-Melaleuca (Riverbank) Complex. Although it is abundant on the adjacent flood plains, clearing and livestock damage have removed all the native understorey species in most areas. A small representative stand of this floodplain vegetation remains today on the Canning River near Ferndale (Brock and Penn 1984). However, in most areas it

remains only as a grassy woodland of *Eucalyptus rudis* and is mainly used for parkland or for the grazing of livestock. It is the large relic eucalypts of these woodlands which form the dominant landscape component of the upper Swan River.

Saltmarsh

Where a flood plain becomes inundated regularly by saline water causing the deposition of salt by evaporation, saltmarshes develop. Typical saltmarsh vegetation is low and flat, consisting of either decumbent shrubs of no more than 0.50 m in height or shrubs or rushes mostly less than 2 m in height. The vegetation is often dark in colour and highly uniform in appearance.

There are three complexes and three communities comprising saltmarsh vegetation.

In the most saline zones of saltmarshes, the vegetation is characterised by succulent plants known as samphires. The Halosarcia Complex is dominated by the shrub-form samphires *Halosarcia halocnemoides* and *H. indica bidens* and the Sarcocornia Complex by the decumbent shrub *Sarcocornia quinqueflora* (samphire). Rarely found along the estuary is the *Sarcocornia blackiana* Community. Where tidal inundation is more frequent, causing lower salinities, the *Juncus kraussii* Complex occurs, forming quite extensive rush stands.

Recently, the two introduced species, *Typha orientalis* (bulrush) and *Bolboschoenus caldwellii* (clubrush), have invaded saltmarshes. They exploit reduced salinities over the winter to summer period brought about by stormwater runoff, while remaining dormant over the high salinity period of late summer and autumn. *Typha orientalis* is less tolerant of high salinity than *B. caldwellii* enabling them to co-exist separately on the same saltmarsh. Such is the success of these two species that they characterise their own communities, totally displacing the native species.

Fringing vegetation

The tall sedge *Schoenoplectus validus* and the bulrush *Typha orientalis* both form fringing communities along the upstream sections of the estuary. In more saline areas their occurrence is often associated with stormwater outlets. *Schoenoplectus validus* forms a single species community, mostly occurring as a narrow band one to three metres wide, about one to two metres from the river bank, and is virtually absent along the Canning River.

Conservation

Issues relevant to the conservation of the various plant communities of the peripheral vegetation of the Swan and Canning Rivers have been discussed elsewhere (Penn 1983, 1987; Brock and Penn 1984). It is necessary here only to mention that while examples of all the plant communities of the estuarine and riverine peripheral vegetation remain today the representation of some of them is perilously small (Penn 1983, 1987). Therefore, landscape projects, utilising the local native species, would be very useful in increasing the representation of some of the more threatened communities.

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River Erosion Processes and Their Effects on the Landscape

Speaker: Mr W R Till

Background

Bill Till officially joined the Swan River Trust/Waterways Commission in August as the Director Engineering, after relieving in the position on a part time contract basis from the Department of Marine and Harbours since February 1990.

He has over fifteen years experience in Maritime Engineering in the Harbours and Rivers Branch of the old Public Works Department and subsequently the Department of Marine and Harbours. Prior to this he accumulated five years experience in water supply, sewerage, irrigation and drainage in the P W D.

Introduction

River erosion is a naturally occurring event. It is part of a river's sediment transport regime. The landscape I believe is a human perception of the beauty or otherwise of a particular vista or view.

If we accepted nature's handiwork in the transportation of rainfall run off and the consequent sediment transport to the sea, there would not be a need for this talk, possibly even this conference.

It is the desire to build structures and control our environment that leads us to our interest in river erosion processes and our need to understand them and where desirable control them.

Our need to protect the banks of rivers and other watercourses against erosion dates back to very early civilisation. The response to this need has been the development down the years of many methods of protection, using naturally occurring materials, which exist today alongside modern materials and engineering systems.

Traditional methods of protection have developed as an ART rather than a SCIENCE. After discussing erosion processes, I will discuss bank protection.

When we choose to control the erosion processes by undertaking bank protection we must understand that it then forms a part of the natural environment and the landscape of that area or, if things go wrong, the work will dramatically affect the existing environment and consequently the landscape.

Channel and river morphology

Nature and origin of bank material

From both a geotechnical and geological viewpoint, it is convenient to classify river banks as follows:

1. **Cohesive** banks in which there is a significant amount of clay. Some peats can also be grouped under this heading.
2. **Non-cohesive** banks which have little or no cohesion, i.e. those with a small amount of clay, and generally comprising sand or gravel.

3. **Composite** banks which have a layered structure, e.g. a cohesive soil overlying a non-cohesive soil.

Composite banks (see Figure 1) are most commonly found in rivers transporting bed material. The lower section of the bank consists of sediment which is compatible with the bed material and represents an earlier bar deposit. The upper bank consists of sediment which is not in any quantity on the bed of the channel and results from the deposition of fine sediment on the bar surface during flood recession. Vegetation helps to stabilise the material and encourage further deposition by increasing the local hydraulic roughness.

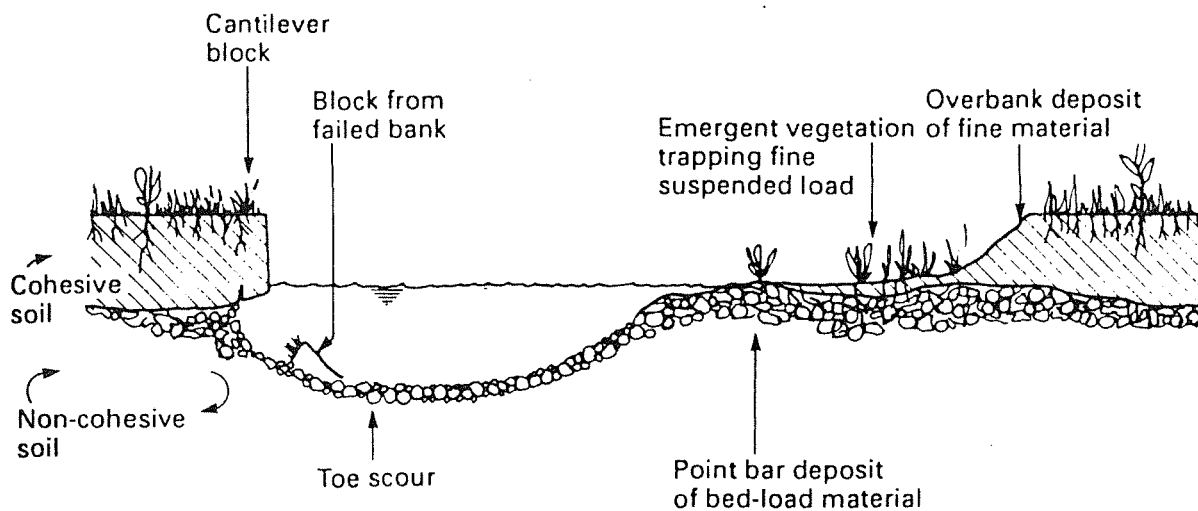


Figure 1 Cross-section on meander bend in river with composite bank (Hemphill and Bramley 1989).

In the Swan/Canning system we have river channels upstream of the Causeway and Mount Henry Bridge and an estuary environment downstream. In the estuary areas the tidal regime is dominant whereas in the river channels stream flow becomes dominant during the winter months.

Processes governing channel morphology

Stable channels

Unprotected channels in alluvial materials adjust their overall shape and dimensions through erosion and deposition. Eventually they achieve a quasi-steady state or regime condition in which, over a period of years, the average dimensions of the channel do not change significantly. Regime theory has traditionally been used to determine channel width, depth and slope.

Bank erosion processes play a significant role in the development of stable channels. Not only do such processes directly control the adjustment of channel width, in association with bar deposition, but they also have a major influence on meander development.

Changes in width also affect the discharge capacity of the channel, bed load transport processes and bed scour and fill.

Unstable channels

Instability occurs during the natural adjustment of a river towards a regime state. Human influence modifying discharge, sediment load or channel morphology can be a major factor triggering erosion and deposition. How rapidly the river responds to these changes depends on the degree of change and the natural stability of the river (Hey 1986b as cited by Hemphill and Bramley, 1989). Mathematical modelling procedures, based on continuity, flow resistance and sediment transport equations, have been to predict scour and fill activity in fixed-width channels, which enables channel response to engineering works to be forecast (US Army Corps of Engineers 1977 as cited by Hemphill and Bramley 1989). No process-based equations are yet available to predict width and plan form adjustment.

Bank erosion in unstable alluvial channels can be particularly rapid. Differential erosion and deposition leads to rapid changes in the plan geometry of the river and concomitant changes in channel slope. Increased meandering reduces channel slope, whilst channel straightening through cut-offs increases the local gradient. Any such systematic change in bed elevation as a result of erosion or deposition can also promote rapid bank erosion. Incision can destabilise a bank, while aggradation, often through the development of central bars and islands, promotes rapid widening and the development of a braided channel.

Processes affecting surface erosion of banks

Entrainment of surface material depends on the erosive forces exceeding the resistive forces. The erosion of surface material in turn is often responsible for destabilising a section of bank and promoting mass failure. The main processes responsible for surface erosion are illustrated in Figure 2.

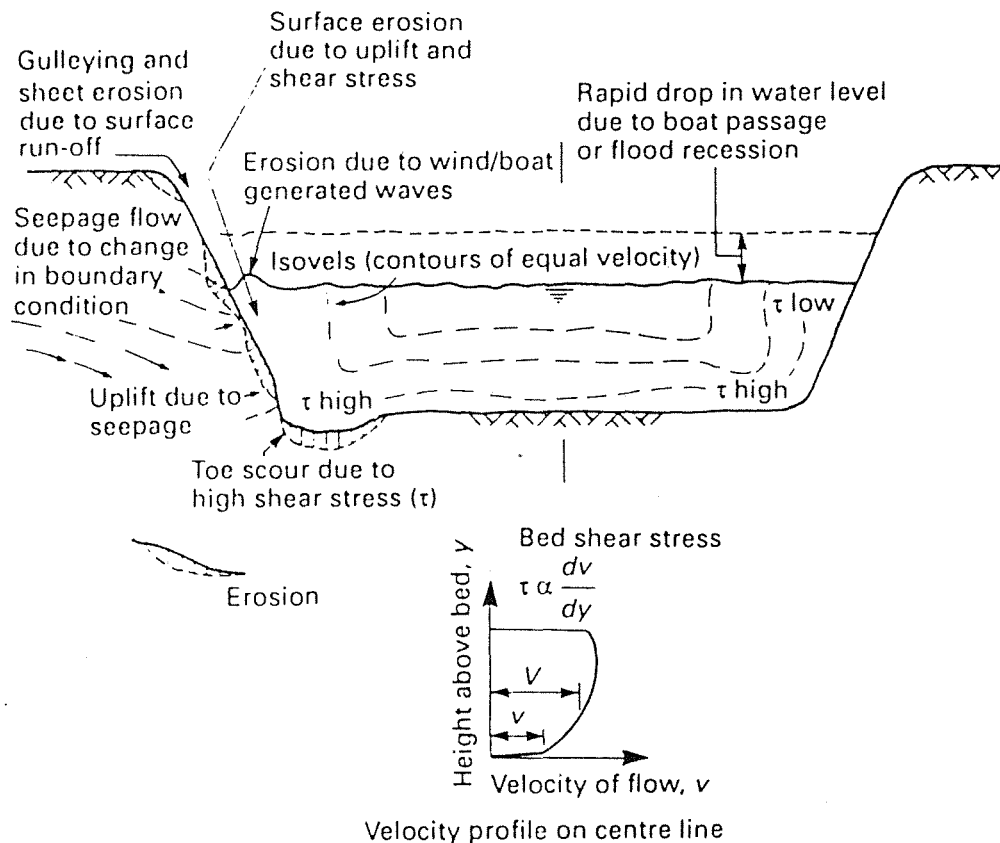


Figure 2 Channel cross-section illustrating surface erosion process (Hemphill and Bramley 1989)

Erosion by current flow

Straight channels

In an infinitely wide straight channel exhibiting two-dimensional uniform uni-directional flow, the boundary shear stress (τ), which is related to the drag force, is given by:

$$\tau = \gamma d S$$

where γ is the specific weight of water, d the flow depth and S is the water surface slope (= bed slope). The water surface slope is generally fixed by topographical controls and hence does not vary with discharge. Boundary shear stress therefore varies with flow depth and is a maximum at peak discharge.

In a straight channel of finite width, the mean boundary shear stress is equal to $\gamma R S$, where R is the hydraulic radius. The velocity distribution in the channel is affected by the banks, which cause a three-dimensional flow pattern. A typical velocity distribution is illustrated in Figure 2. The effects of the secondary flow pattern and cross-sectional shape are to produce a complex variation of boundary shear stress. Figure 3 shows the observed distribution of velocity and shear stress in a trapezoidal channel. Peak values of boundary shear stress are observed in the zones of three-dimensional flow near the banks where the velocity gradient is locally high.

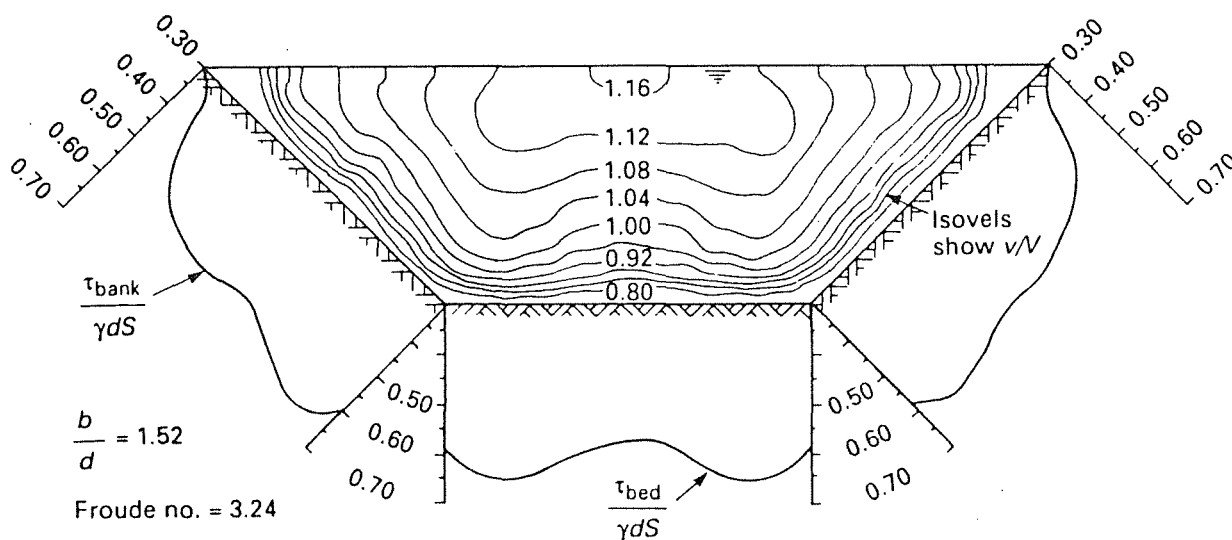


Figure 3 Distribution of velocity and boundary shear stress in a trapezoidal channel (Yuen, 1988 as cited by Hemphill and Bramley 1989)

Differences in the roughness of the channel bed and banks have further secondary effects on boundary shear stress distribution. The effect of the channel sides being rougher or smoother than the bed is respectively to increase or decrease the shear force on the sides. As

yet it is not possible to predict the shear distribution theoretically, and the engineer is often left to make informed assumptions on the peak shear stress.

Irregular channels

In rivers, flow is three-dimensional due to local variations in cross-section (such as those caused by pools and riffles) and changes in plan shape. The presence of secondary flows within the channel distorts the primary velocity and boundary shear stress distributions. In these circumstances the equation gives only an approximate average shear stress, and the actual shear stress varies depending on the local velocity gradients near the boundary.

In a river, shear stresses and bed load transport vary significantly between pools, riffles, and straight and meandering sections in response to changes in velocity distribution and secondary flow patterns (Figure 4).

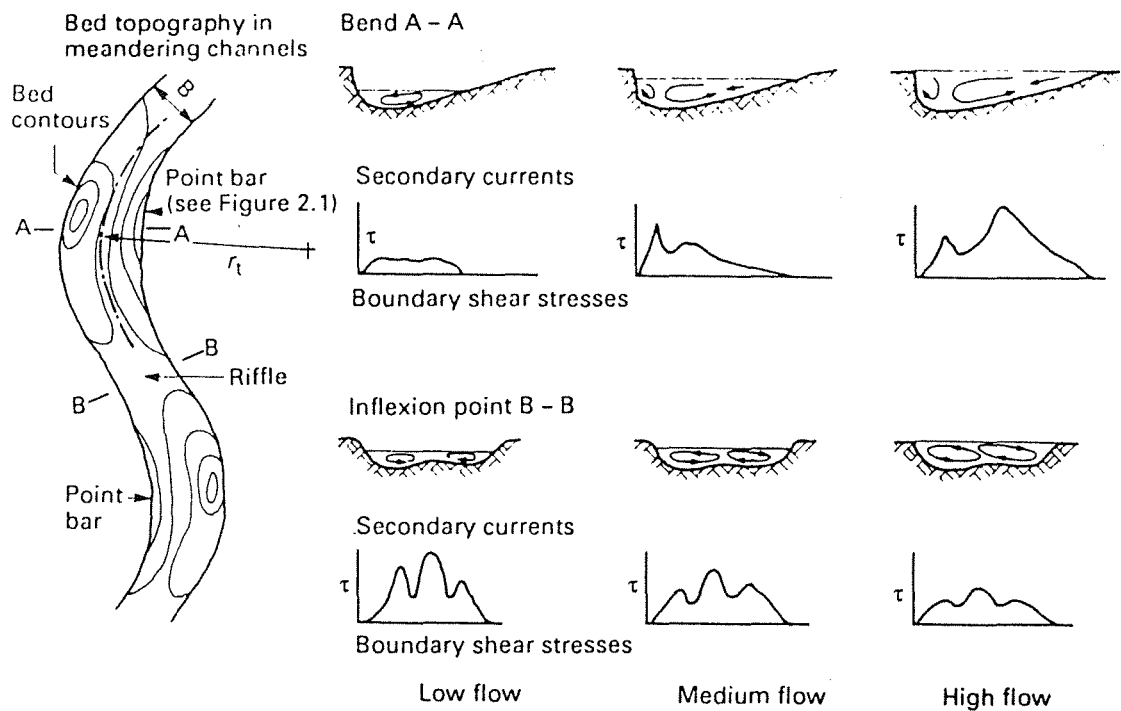


Figure 4 Secondary flows and boundary shear stress in meandering channels (Hey 1986 as cited by Hemphill and Bramley 1989)

In a meandering channel, down-welling (i.e. flow towards the bed) associated with the secondary circulation causes a peak in the boundary shear stress distribution. Similarly, locally low values occur where secondary circulation produces up-welling (Bathurst et al. 1979 as cited by Hemphill and Bramley 1989). As a result, scouring occurs on the outer bank in meander bends during flood flows, since shear stress adjacent to the bank increases in the direction of the flow. Conversely, deposition occurs on the point bar, in spite of the fact that shear stresses and sediment transport are high, because there is a downstream decrease in shear stress.

With regard to bank shear stress, maximum values are observed at the base of the outer bank in the meander bend (Lane 1955 as cited by Hemphill and Bramley 1989). At low flows, peak values occur at the meander apex, but as discharge increases peak values move

downstream towards the inflection point. The location and rate of bank erosion depend on the frequency of flows, their associated shear stresses, and the critical shear stresses for entrainment of the bank material.

Bankfull discharge is often regarded as the dominant or channel-forming discharge for design purposes, as it is responsible for transporting the largest volume of sediment in the long term. In meander bends, maximum values of shear stress occur at this discharge. During overbank flows, shear stresses are unlikely to increase significantly due to flow separation between main channel and overbank flows.

Effects of local features

Any local feature in a channel which impinges on the flow will affect the flow pattern locally. The effects may be:

1. To modify the velocity distribution in the principal flow direction, e.g. constriction by a culvert.
2. To introduce a strong three-dimensional flow field, e.g. deflection of flow by a bridge pier.
3. To introduce a higher degree of turbulence in the flow, e.g. flow downstream of a weir following a drop in water level.
4. To modify the velocity gradient locally, e.g. flow along a length of relatively smoothly lined bank.

Downstream of the local feature the flow will readjust by turbulent mixing to a more general flow pattern related only to the geometry of the watercourse. Within the area of influence of the local feature, the affected flow pattern may cause scour to occur.

There is, as yet, no comprehensive analytical method of determining the flow pattern produced by local features. Mathematical models are not, as yet, used in civil engineering hydraulics to simulate strongly three-dimensional flow, but can be used to investigate the turbulent mixing processes downstream of a constriction, or at a change in boundary roughness.

Various empirical methods exist for estimating scour depths caused by local features. The engineering design approach is generally to minimise the effects of scour by careful hydraulic design.

Erosion by wave action

Wind-generated waves

Wind blowing over water generates surface waves which can be described in terms of:

1. wave height, H - vertical distance between trough and successive crest.
2. wave period, T - time between successive upward crossings of the mean water level.
3. wave length, L - horizontal distance between adjacent upward crossings of the mean water level.

Waves having values of H , L and T which do not vary with time are termed regular waves. In sufficiently deep water, the wave length depends only upon the period and is given by:

$$L_0 = \frac{gT^2}{2\pi}$$

The maximum wave height at a particular point can be calculated from wind direction and strength records and from the fetch length.

Boat Wakes

It is generally acknowledged that boat wakes are a contributing factor in the erosion of river banks. However, there is considerable divergence of opinion as to the contribution to the rate of erosion that this factor effects at any particular site. And, as we have seen already, the contributing factors are many. The effect of boat wakes can vary considerably from site to site.

The Swan River Trust has just received a report it commissioned from the UWA Centre for Water Research which investigated the boat wake energy on the banks and compared this to normal wave energy.

In the Point Resolution/Chidley Point area it reported that annual boat wake energy was estimated to be less than 10% of annual wave energy, with ferry traffic contributing about half of this.

In the upper reaches of the river, boat wake energy was estimated to vary from 3% to 48% of annual wave energy depending on location.

It must be emphasised that these figures relate only to wave energy and do **not** take into effect the other factors affecting any particular location.

Summation

A river/estuarine system is an extremely complicated three-dimensional environment. Any change to one condition can have a consequential effect on a number of the other conditions until an equilibrium is again achieved.

The complexity can be illustrated by the fact that in this age of space travel and high technology and after over 100 years of research, it has NOT been possible yet to theoretically or mathematically express accurately flow and sediment transport in river channels. Current theory and formulae only give us an indication of what will probably occur.

Because we still have so much to understand about river flows and sedimentation, my suggestion is that we make changes to the river flood plain only where it is absolutely necessary and that we observe carefully the messages the existing river regime is sending us. When we wish to reduce the rate of bank erosion, we should also follow nature's examples as much as possible by the use of vegetation and sediment deposition. Where erosive forces are high, we should plan, where possible, to allow for the erosion which will occur.

I believe these types of solutions will generally provide the most acceptable landscape for the community.

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Perth Gardeners Kill Swans

Speaker: Mr D Deeley

Background

David Deeley is a Senior Environmental Officer responsible for Estuarine and Catchment Monitoring and Management. He co-ordinates the Working Party to strengthen the Trust's role in Integrated Catchment Management.

He joined the Waterways Commission in February 1990, before that he worked for the Environmental Protection Authority and Department of Agriculture.

I would first like to thank Charlie Nicholson, Mike Mouritz and Bruce Hamilton for the inspiration they gave me in preparing some of the things included in this talk.

The title's a bit tongue in cheek. If you have a look in the Collins dictionary at the definition of a garden, it has three definitions and, the third is 'a fertile and delightful spot or region'. So, I'm, looking at the entire Swan Catchment as a garden that the Swans have disappeared from.

We should talk about the entire Swan- Avon catchment, but that's probably a bit too big. Farmers are beginning to look after their part of the garden through Landcare District Committees. So I will only talk about the coastal plain catchment here.

I thought it was important to focus on the catchment today. I am going to talk about the hydrology of the Swan Coastal Plain, the soils and the estuary itself, I'm going to briefly touch on history and development with the impact of fertiliser and what we have done to the flushing of the Swan River by blasting the Fremantle bar. I am then going to talk briefly about the two types of pollutant loadings, toxic pollutants and bio-stimulants or nutrients. I will then touch on management options, that is ways we can increase catchment water yield and reduce catchment nutrient yield.

The soils of the Swan Coastal Plain are particularly unique. The Chemistry Centre have developed a 'phosphate retention index' (PRI) which gives you an indication of the ability of the soils to retain or bind phosphorus. Clay loams have a good ability to retain phosphorous, with PRIs ranging from 40 to 1000. If you look at the sands over clay duplex soils, they have a PRI of between 10 and 50. Bassendean sands are essentially siliceous glass beads. Farmers refer to this sand fondly as silver loams or 'gutless grey sands', which is pretty much what they are. They have almost no ability to retain nutrients, particularly phosphorous. The Spearwood sands are slightly better at retaining phosphorous, they have a phosphate retention index of between 2 to 10.

There are very few places in the world that have soils with such a limited ability to retain nutrients. You can see on our coastal plain the very large amount of Bassendean and the Sand over clay soils, which have an extremely low ability to retain phosphates.

I will now go on to talk about the water quality of the Swan and Canning estuary. Originally it was a large, fresh to brackish lake, i.e. largely fresh in winter becoming more saline in the summers. It had very limited ocean exchange.

Originally there was little coastal plain drainage into the Swan River. Urbanisation and rural clearing have seen the removal of most of the coastal plain vegetation, and there has consequently been a reduction in evapotranspiration, so that water balance has changed. To cope with that and to also drain the wet areas we have had to construct an extensive network of drains on the coastal plain. This slide shows you the network of drains that have been constructed, most of which discharge into the Swan River. There are also other local authority drains which are not shown on the map.

The consequence of those drains is that there has been a major increase in the catchment water and nutrient yield. There is a much larger amount of water draining into the river and hence nutrients being delivered to the Swan now than was the case previously.

This drainage water, polluted by sewage and rubbish tip runoff, becomes what is referred to as diffuse source pollution.

The next consideration is estuary flushing. While the nutrient load to the river has increased, the effect of blasting the Fremantle bar was to massively improve the tidal exchange. So while we are putting more pollution into the river we've made the river more able to tolerate this with a massive increase in ocean exchange. The lower reaches of the river are now largely marine throughout the year. In the upper reaches the Swan River receives fresh water from tributaries and winter rainfall. During summer as fresh water flow decreases, a salt water layer moves up the river. Mixing between the lighter fresh water layer and the denser salt water is limited. As a consequence, oxygen diffusion is reduced, and deoxygenation can occur. Under conditions of deoxygenation nutrients are released from the sediments into the water column.

The next point I would like to discuss is pollution loading to the system. There are two types of pollution loading. Firstly there are the toxins, including heavy metals and pesticides. I do not intend to discuss these further at this point, as I believe they are largely manageable with pollution control measures, of which monitoring and licensing are essential elements.

I am going to concentrate today on the diffuse source bio-stimulants. Phosphorus loading is primarily composed of particulate phosphates, which are dissolved into inorganic phosphates. One particularly important point to note here is that in Swan Coastal Plain drainage, dissolved inorganic phosphorous makes up to 70% of the phosphorous input total, something that is unique to Western Australian coastal plain drainage. Elsewhere in the world and in the eastern states of Australia, up to 70% of the phosphorous is in particulate form, and is being pushed around the landscape absorbed onto soil particles. This has particular relevance when structures are designed to reduce phosphate concentration in water. For example, in the eastern states, if a settling pond is constructed to slow the water down, particulates will drop out and remove a large proportion of the nutrients. In Western Australia if you slow the water down, it doesn't do a great deal as most of the phosphates are dissolved in the water column and it will just keep moving once it starts to come out the other end of the basin.

Phosphates and nitrates are essentially plant fertilisers. When we put them into an aquatic system, they behave in the same way as for a terrestrial system, i.e. there is an increase in primary production. You then in turn increase secondary production. Traditionally, the oligotrophic estuaries on the Swan Coastal Plain had low levels of production. Since European settlement of the Swan Coastal Plain, this production has increased. For example, you get better fish catches, which is not necessarily a bad thing. When the level of primary and secondary production becomes too high, a system becomes eutrophic.

I am not suggesting that there will be *Nodularia* blooms in the Swan River as bad as in the Peel Harvey estuary because the ocean exchange is far too good. However, the Swan could tend towards this state in the upper regions where it is more fragile.

What major options do we have available for management of diffuse source pollution? One of the keys is to reduce catchment water runoff. In Western Australia, water pushes nutrients round the landscape. It is important to develop water sensitive design, i.e. we must look at what water runoff is doing in terms of pushing nutrients around the landscape. We have to start thinking about what role trees can play in reducing catchment water yields.

This slide shows some examples of the philosophy which we should be starting to develop, hydrozones, for example. This slide is typical of the sort of European and tropical greenery we aspire to in Perth, although it may not be particularly appropriate with our sandy soils and hot dry summers.

This slide is typical of what we have on our foreshores, i.e. lawns right down to the water edge.

The site of this next slide worries me greatly. It illustrates irrigated land built directly over a very large night soil and rubbish dump on the bank of the Swan River. I bet that 50% to 90% of the irrigation water applied to that site is going straight through the soil and pushing nutrients around the landscape. We have to be more efficient when we design these things. Water sensitive design is needed.

This slide shows the concept of natural water harvesting, which can be done at various levels. This is an example of an infiltration basin up in the Pilbara, this is one in Cottesloe. There should be more of them.

For irrigation design, micro systems are traditionally more efficient. You are able to better control the amount of water needed for a water efficient garden when you use trickle systems.

Putting in recharge basins, as I have shown here, and establishing bio-filters contribute to drain management. There has been some excellent work commenced by the Water Authority. David Wills and Geoff Mauger in particular have been looking into the role of bio-filters and recharge basins in improving drain water quality.

We have to start selecting plant species that are less soft and more hardy, i.e. hardy turf for the golden summers approach. Gold is as attractive as green when compared to the grey of Europe. Do we need those lush greeneries the whole year round?

We need to form the habit of applying minimal amounts of fertiliser. We should base the amount of fertiliser that we apply to soils on what the plants actually need, not what fertiliser companies recommend. We also need to analyse plant tissue and determine whether or not we even need to apply nutrients. Slow release fertilisers and organic fertilisers also have a role to play.

People want to have green lawns. If they amend these gutless grey sands and incorporate some fine clay material into them they are able to have these lawns. The clay material allows the soil to retain more water and more nutrients. So you can then have green lawn if that's what you want. But you need to amend the soil first.

Summary

I have spoken about the geomorphology of the catchment. I've touched on the history of development, and what we have done. We've basically increased the pollutant loading to the system, however, we have also made it more able to accept that pollution loading. I've touched on the different types of pollutant loadings and the role of bio-stimulants. I've also outlined some management options which are available to us: reducing catchment water yield, water sensitive design and reducing the catchment nutrient yield. I believe the key to this is urban integrated catchment management. The community and the local government must take the lead role in driving this concept. State and Federal government bodies can support the process. But I think most importantly, let's get to it and enjoy the process.

Landscape Design and the River

Speaker: Mr J Oldham AM

Background

In January 1990, John Oldham was awarded Membership of the Order of Australia for Service to Landscape Architecture, acknowledging his contribution to the profession. John's original training was in architecture, which he completed in 1930. After World War II he was involved in reconstruction as a Research Officer on Housing and Town Planning, then in 1950 transferred to the Snowy Mountains Hydro-electricity Authority at Cooma where he was in charge of the Architecture, Planning and Landscape Section.

In 1954 he decided to specialise in Landscape Architecture and in 1955 was invited to join the State Housing Commission as a full-time Landscape Architect. He subsequently transferred to the design branch of the Architectural Division of the Public Works Department. With the P W D he prepared landscape schemes for schools, hospitals, court houses and police stations throughout Western Australia and at the same time built up a private practice with his wife, Ray.

His work includes the design of the Narrows interchange and the development of the foreshore parks along the Swan River into a unified landscape concept.

His book, 'Gardens in Time' co-authored with Ray Oldham, was published in 1980.

In 1984 John was awarded the Australian Institute of Landscape Architect's Award in Landscape Architecture in recognition of his contribution to the profession and to the Institute.

I have known and loved the Swan River since my childhood. I grew up in Peppermint Grove about 100 yards from Freshwater Bay, and by the age of 12 knew every inch of the foreshores from Blackwall Reach and Point Walter, around Freshwater Bay and Mosman Bay to Dalkeith.

My brother Gilgie and I explored the river in an old, clinker-built dingy. We swam, fished, crabbed and prawned along the sandy beaches, and sunbaked and picnicked on the shady lawns that fringed them.

When we felt adventurous we explored the bushland near Devil's Elbow, but that area was unsuitable for active play, because we had to be careful where we put our bare feet to avoid jagged rocks or prickly plants.

The natural bushland was thickest in the steep, inaccessible areas: but Dalkeith, even though it had no houses then, was more like parkland than bush. I think some areas have always been like that.

Captain Stirling in 1826 wrote:

'As our party advanced along the banks, its open forestlike character afforded no impediment to our march.'

George Fletcher Moore wrote in 1831:

'The foreshores of the Swan River consisted of plains that resembled well-ordered parks.'

In my youth the foreshores of the estuary consisted of two major landscape types: sandy beaches with a grassy verge shaded by informal trees; and rugged, relatively steep rocky bushland areas which contrasted with, and happily complemented, the parklike verges. The growth of Perth and its riverside suburbs has considerably changed the landscape surrounding the Swan River estuary. No longer pristine, it has a different, more civilised character.

This new landscape has been formed by the way we have used - and sometimes abused - our river, its foreshores and hinterland. But it is the river as it is now, that must be the object of our plans and landscape design. The river, with its foreshores and hinterland, is still a place of infinite variety and beauty.

The coastal plain through which it flows is generally flat and without prominent landmarks. When there are changes of level, the higher land becomes much more prominent and dramatic. For instance Mount Eliza, no more than 300 feet high, seems to tower above Perth Water. The almost perpendicular rocks of Blackwall Reach, and the cliffs around Rocky Bay, are an impressive contrast to the sandy spit of Point Walter, which is partly under water. Further up river opposite the low peninsula at Maylands, the not-very-high eminence at Rivervale is more impressive by contrast with the low, marshy islands around the Causeway.

In the flat stretches of river bank there is also variety. The white sandy beaches fringing some areas seem to beckon swimmers and small children to wade and explore. The reeds and rushes of wetlands are the home of myriads of waterbirds which add their music to that of the wind and the water. Local authorities, who once liked to 'clean up' low-lying swamps and wetlands, are beginning to realise these also have a distinctive beauty, and play an important role in the environmental cycle - especially important for the continued well being of fish, birds and insects.

Then there are the beautiful indigenous trees. Paperbarks, which once lined much of the banks, their white arms stretching in benison over the calm reflections. The tall gum trees of the upper reaches, and the flood plains around Guildford, which invite children to play and picnic in the cool shade in summer, as they throw beautiful dappled shadows on the greens ward.

The Metropolitan Region Planning Authority stated our present problem very well in 1968 in 'A Plan for the Swan and Canning Rivers,':

'Perth and its people want the River as it is - a glorious stretch of water to look at, to lounge around, to fish and swim in, to sail, motor, row and ski upon,....'

What kind of landscape design is required to accommodate the desires of Perth and its people?

I have time today for only a few thoughts:

We want an informal landscape treatment - no formal enclosure of the banks - no straight terraces or geometrical lines like the high, steep stone walls erected around the turn of the century - which have cut the people off from the river for nearly 100 years.

We have already adopted largely the appropriate foreshore treatment for some areas especially those having considerable use. This is sandy beaches fringed with grassed areas and informally growing trees. Freshwater Bay, Mosman Bay, Matilda Bay, Point Walter, Point Resolution and further up, Garratt Road, Bayswater, and several other pleasant places are all instances of this.

It was on this basis that I developed my landscape scheme for the Narrows Interchange. Watering and mowing are required for this sort of landscape treatment where people will

want to use it for passive recreation - old people, small children, mothers with babies and toddlers - and this maintenance is well justified by the way these grassed areas are much used and enjoyed.

We accept lawns gladly for organised sport such as golf, football, cricket, hockey, tennis and so on, and the watering, mowing and other maintenance they require. We should also accept this kind of maintenance for areas where we want to walk, sit, swim, crab, prawn or fish, go picnicking, and where our small children wish to play.

There is another landscaping reason to welcome this necessary watering for grassed areas: this is because it greatly increases the range of beautiful trees and shrubs that become available for our designs for people.

Deciduous trees such as plane trees can then be used. These are especially valuable in Western Australia because they give us welcome dense shade in our scorching summer months and yet let all the sunshine through in the winter, when it is welcomed. None of our trees in Western Australia are deciduous.

We can also introduce trees and shrubs into our foreshore plantings which link them happily with our residential areas and semi-public open spaces - such as the campus of the University at Crawley.

There are other places of our foreshores where a more rugged character is important, where there will be less intensive use by people. The steep bushland near Devil's Elbow on Freshwater Bay; the perpendicular cliffs at Rocky Bay in North Fremantle; and the northern shore from Rocky Bay to Chidley Point are instances of this rugged natural character. Here the indigenous flora should be carefully conserved and restored. Intensive use should not be permitted in our plans because these natural reaches are an effective and welcome contrast to the generally flat foreshores and banks and so are a very important part of our heritage. They should be preserved at all costs.

One concluding thought: An exaggerated emphasis on indigenous and native flora can be faulty and incorrect in landscape design and is quite irrational.

Most Western Australian people had their origins in other countries. The truly indigenous Western Australians are the Aborigines. The people who are so devoted to native plants are mostly newcomers - like me.

But I have never heard any of them say that we are out of place here and should leave the country to its indigenous people...though perhaps the Aborigines would be happy if we did!

All suitable plants should be welcome in our landscape plans for the river and its environs.

My formula (if I needed one) would be something like this:

If an indigenous plant is suitable for my design purpose, I would give it preference.

My next preference would be for a native plant of Western Australia (but not of this locality) and then next, of Australia.

But if an exotic plant is clearly desirable to fit my design and the purpose of the design, I would not hesitate to choose it.

There are a number of introduced trees and shrubs that greatly enhance the landscape of Perth and the river. Some have been used for so long, and have so many associations with our history and our people, that they have become part of our traditional landscape. Two that immediately spring to mind, are the Norfolk Island Pine and the plane tree.

Both of these trees play a vital role in giving Perth and the Swan River their present beauty and distinctive character.

Retention of Foreshore Diversity

Speaker: Mr G Rundle

Background

Graeme Rundle is President of the W A National Parks and Reserves Association.

Graeme says that in his teens he virtually lived in the Swan River during his leisure time, particularly in the Maylands Guildford area.

WANPARA itself made a substantial submission on the Draft Swan River Management Strategy and lobbied on aspects of the Swan River Trust Bill. The Association also extracted a commitment from the Minister for Waterways that proposals to vary the Management Strategy would be publicised and involve a public consultation process.

I think we should remember, that coming up this decade, will be the 300th anniversary of the European discovery of the Swan River. I hope the Swan River Trust bears that in mind, because it would be a good opportunity to review the Swan River Management Strategy implementation progress. The Swan River Management Strategy, I think, is a brilliant document, its one of a couple of remarkable documents which have come out lately. Another one ... is of course George Seddon's 'Sense of Place'.

In my talk I thought that I would concentrate on the river above the Causeway, as the speakers so far this morning have tended to look at the river below the Causeway first. But we need to look at some things which have happened in the area below the Causeway first.

After European settlement, the river became a transport artery for the settlers. It was also recognised that some of the best land for growing crops occurred along the river edges. So land grants began to be made, initially along the river banks.

It became desirable to live close to the river, and the people who were able to own land along the foreshore areas were lucky. We should not always knock private ownership of the foreshore, as there are situations where it can be a benefit to the management of the foreshore. People who go on the ferry trip tomorrow should keep that in mind. I draw your attention in particular to the area around Bassendean. I think that we have probably been able to hang onto some interesting areas of foreshore there because of private ownership.

Since the first settlement, one of the major changes to the landscape of the river has been in the Avon Valley. Another is the removal of the bar at the river mouth, which has contributed to a substantial net gain river flow and improved flushing, which became necessary because of the sort of settlement we have. There are a number of other major landscape impacts also, including infill to provide land backed berths, in the Fremantle Inner Harbour area. It took five years from the official start of the Inner Harbour to when the first royal mail steamer came in, to complete that project. In Victorian times engineering projects were moved fairly fast. There was also the artificial modification of the coast adjacent to the north and south in Fremantle, and of course the impact of the removal of four of the 'Seven Sisters' at Mosman Park. There has also been a significant amount of landfill occurring around the river foreshore in the last 20 years. In a report prepared by the Public Health Department in 1970, it was stated that something like 250 ha of river foreshore has been reclaimed in the last 20 years, and the process is still on-going. In the lower Swan River estuary, foreshores around Attadale and South Perth areas have been most affected, in particular with the construction of the Kwinana Freeway.

It's interesting to appreciate in detail just how much of the Perth City foreshores has been reclaimed. Major engineering work was also undertaken around the delta islands, as part of the Swan River Improvement Scheme.

Islands which were originally found in the vicinity of Herrisson Island also formed a considerable barrier to river navigation, and were the first landing place of the French explorers in 1801. These islands also presented a serious navigation impediment during early settlement days, during which time the river provided a vital means of transport. To alleviate this problem, the Burswood Cut was constructed but it did not prove to be particularly successful. A 'closeable cut' was then constructed there.

I spent most of my childhood in the 1950s in Bayswater, within one or two kilometres of the river. At that time, much of the river foreshore vegetation, which I was thrilled with, was composed of sheoaks and reeds, often with water extending inland behind the sheoaks. These areas provided vital refuges for various sorts of waterbirds, and created an interesting environment which the local kids explored.

The point that I would like to make here is that much of the planning and development of the river foreshore is undertaken by adults, not thinking of kids who enjoy and play in the foreshore areas. The river provides a great adventure playground, at least it certainly did was when I was a child, in particular in the Maylands-Belmont area.

During the river trip, please take note of the character of the river near Tranby House. The foreshore areas, particularly on the Belmont side and further up stream towards the Garrett Road Bridge, are still in good condition in terms of vegetation cover, and still have a very natural appearance. There were a lot of shallow banks around there when I was a kid, and we used to swim out to them and explore. I remember being surprised at how much wildlife there was.

The foreshore area here is also quite interesting, and one of the things my Association would like to see is the retention of the vegetated foreshore areas in this part of the river, instead of creating open grassed foreshore areas that are common parts of the river.

Another aspect of development which my Association feels a lot of thought should be given to is access to the river, in particular, cycle ways and pedestrian paths. We were very pleased to note that attention was given to this aspect of river management at a very early stage in the 'Environmental Guidelines for Dual Use Paths'. One of the important features of these Environmental Guidelines is that they draw attention to the need for a dual use path to be constructed along the foreshore in an environmentally sensitive way.

While the general view is that there should be dual use path all the way around the river, a lot of care needs to be taken on the placement of those, and the fact that the path does not necessarily have to be constructed right next to and in close proximity to the river.

Now we can get back more into my territory near the Bayswater Tip site. This area was originally a large flood plain, which has now mostly been filled in by the Bayswater Shire Council as a sanitary landfill site. This area was originally used as a grazing area, and when I was a child I remember seeing rickety remnants of post and rail fences, abandoned carts, and pools of water with waders in them. It was a tremendously interesting landscape, which is now a filled in rubbish tip. It would be a challenge for a landscape architect to turn it back into an interesting landscape.

The W.A. National Parks and Rivers Association also feels that the construction of the Ascot Racecourse so close to the river was ill conceived as well. This area was originally a very tranquil place, which required an effort to get there. Once there, people were rewarded because it was quiet and undisturbed. It now attracts people to that part of the foreshore, and it is no longer tranquil. I'm not saying areas like this should be locked up, but there is a difference between maintaining diversity and attracting people to those areas.

In the next section of the river upstream of the racecourse, there are a number of properties which actually back down to the river, which are still in pretty good condition. Some of them have their own private jetties, which is a marvellous engineering feat. From a landscape point of view, this area is very interesting, and is rather different from any other part of the river. This all goes towards maintaining diversity.

During the ferry trip tomorrow, I think people should also take particular notice of the wildlife refuge areas where public access should not be encouraged, for example System Six Area M51. In these areas access should be restricted, so that wildlife living there can have sanctuary without fear of disturbance.

Finally, in the upper reaches of the Swan River, most of the foreshore area is in private ownership, with a very rural character. This rural aspect of the river is the one with which I am most familiar, and I think it is important that we do not lose too much of this original character.

A Local Government Perspective

Speaker: Mr G Masters

Background

Gil Masters is Manager of Parks and Gardens at the City of South Perth. Previously he was employed by the City of Wanneroo. On changing his place of work to a well established area one thing which became evident was the concern of residents to retain the character and amenity of their suburb.

Local authorities have a prominent role in the provision of commercial and recreational facilities along the Swan and Canning Rivers. In providing these facilities it should be a requirement that the well being of the rivers is assured and that a mechanism is put into place which will ensure this happening. The past management of the rivers, although well intended, was fragmented. However, since the incorporation of the Swan River Trust Act 1988 and its amendments, there now exists the opportunity for adequate planning and management to ensure that future development is in harmony with the waterways.

In 1986 the City of South Perth embarked on an ambitious project to prepare and produce a management plan for the foreshore area of Salter Point. Following its adoption by Council, a management plan for the wetlands of Waterford was undertaken. Council in conjunction with the Swan River Trust is preparing a management plan for the foreshore adjoining Perth Water encompassing the regional recreation area of Sir James Mitchell Park, a controversial area in itself.

For the first two management plans, Council employed an environmental officer to carry out the study. The work involved field studies, liaison with various organisations and specialists including the community, which resulted in the adoption of the final management plan.

Each management plan was formatted in the following manner:

1. Preparation of a draft management plan
2. Assessment of public submissions
3. Revision of the draft plan
4. Adoption of the management plan

Both plans consist of two parts:

1. Compilation of resource information data as a basis for management and which included:
 - a. Location and ownership
 - b. Any existing recommendations - eg. System Six
 - c. Climate
 - d. Geomorphology/soils
 - e. Flora - field studies
 - f. Fauna - field studies
 - g. History - local
 - h. Human involvement - eg. landfill site, farming area

- i. Past/present management
 - j. Existing legislation - covering the reserve area, local by-laws
 - k. Values - conservation etc.
2. Management, issues and strategies with each part divided into sections, individually dealing with an aspect of management and identifying the aims and objectives and including:
- a. Vegetation -revegetation
 - b. Insect control
 - c. Fire management
 - d. Public use - current and future;
 - e. Monitoring - present and future
 - f. Community involvement
 - g. Education - use of pathways, signage etc.
 - h. Review period - effects on implementation
 - i. Implementation

This all sounds very easy. Just collect the data, liaise with specialists, speak to the residents and public, prepare a draft plan for public comment, modify if necessary, prepare the final plan and submit to Council for adoption. This was not the case. The scientific data collection and associated work provided the basis for recommendations, however it is in the community area that conflicts arise either during the draft process or during implementation. In simplest terms small issues can become major stumbling blocks if not addressed at the initial draft stage. The conflicts can include:

1. Resident "ownership" of a recreation space particularly along foreshore areas. There can be a number of reasons for the reactions, however identification of such issues early in the planning process will help alleviate problems later on.
2. Regional recreation space and its impact on a community can become an emotive issue particularly when upgrading an area to provide a facility for the region.
3. General apathy of the community during the initial planning. It is only after the event that some constructive views are offered.
4. Movement of local population, i.e. new residents previously not exposed to the management plan (even real estate agents).
5. Misinterpretation of management strategies. Even after consultation and acceptance, and implementation has commenced, dialogue continues as to whether what was expected to happen is actually being implemented.
6. The individual loss of amenity. The major issues can obscure some of the local and individual requirements, and may contribute to the loss of an amenity which might have easily been protected in the strategy. It may be that a resident will perceive and agree with a management strategy until upon implementation it is found to affect them directly, e.g. loss of views, restricted access to the area, or loss of use of the local boat launching facility.

Funding restrictions are a problem common to all local authorities, where priorities are changed or reordered on a yearly basis affecting continuation of the implementation, particularly if staging of the work is required.

However, all these issues have to be addressed and, for any plan to be successful, it must be clearly demonstrated that they have been identified in the management plan.

It is evident that the community should be consulted at all stages, including implementation. Working in isolation will only alienate the local community.

When preparing a management plan the following points should be considered:

- . The community is consulted at all phases of the plan.
- . The draft management plan is open for public comment.
- . Aims and objectives are clear, easily read and identifiable so that people can relate them to their individual needs. This stops any confusion at a later stage.
- . The local community should be involved wherever possible in the implementation stages, e.g. planting of trees, especially where views may be restricted.

Landscape and the Community

Speaker: Mr D Kaesehagen

Background

David Kaesehagen is a member of the North Fremantle Community Association. The Association has been involved with redevelopment of the North Fremantle area particularly in relation to the protection of the river environment.

Introduction

The role of community groups in environmental stewardship is being increasingly recognised by all levels of government today. So much so that positions are being created within various government departments which have the specific role of directing the efforts of community groups for the conservation of Australia's biota. This is a feature of our society that hopefully will increase in the future.

My talk today will not centre on the general but rather on the specific. I will preface it with examples of what community groups are doing and can do. In particular I will illustrate what one community group achieved in conserving and initiating the repair of a landscape on the Swan River.

Current Directions

In preparing this talk I did a quick survey of the local authorities which fringe the Swan and Canning Rivers to find out how many community groups were involved with the landscape in terms of maintaining remnant flora, erosion maintenance and any other activity. About 80% of the Councils had community groups involved at various levels. Some of the ways in which community groups are being involved include:

- + tree planting;
- + weed control;
- + general maintenance e.g. litter clean-up, trail clearing etc.;
- + development work e.g. helping in the preparation of management plans;
- + seed collection; and
- + lobbying.

The main areas were in tree planting and weed control. It was generally felt that the major benefits to local authorities was firstly an economic one and secondly, and most importantly, the creation of community ownership of the landscape. This led directly to community building and this I believe is also one of the biggest benefits. It's a great feeling to be working on repairing the landscape with people that live down the road, three streets away or at the other end of town. People find out about each other, settle differences, get a greater understanding of the environment and get a sense of positive satisfaction from feeling they can help to create a better world in which to live.

The community group that I am involved with is the North Fremantle Community Association which was formed at the end of 1985. This Association is a strong well coordinated group with a proactive direction. Its cohesiveness and strength come from a number of factors which I believe include its relative isolation from the community, i.e. it has natural boundaries of the sea and river, and open space separates it from its nearest neighbour, Mosman Park. An unprecedented level of major projects, particularly government projects, have left the local community feeling under siege. These include

proposals such as the Anchorage development, relocation of Water Police, redevelopment of the State Engineering Works site, redevelopment, and the proposed subdivision of Buckland Hill.

Rocky Bay - an example

In 1985 the Community Association was formed over local concerns about a proposal which involved mining the cliffs at Rocky Bay and creating a marina. It was later discovered that this proposal was for the area adjoining Rocky Bay in Mosman Park. The proposal never saw the light of day though, as relevant government authorities put a lid in it.

This proposal made the local community realise that the cliffs are a very valuable part of North Fremantle, particularly as they contained the only indigenous vegetation in the locality. Increasingly it became apparent there was considerable depth to the area, particularly in terms of both Aboriginal and European history. We gradually built up a picture of what the original landscape looked like through the discovery of the 'Seven Sister' formation, the realisation the precipitous cliffs had been quarried away to make way for State owned industries, the many photographs which captured the fine stands of native vegetation that clothed the cliffs, the anecdotes of how Rocky Bay was one of the most beautiful bays on the Swan River. The Association became increasingly aware of the dereliction which had occurred in the Bay, and the urgent need to redress the problems.

As a consequence of the historical and environmental concerns felt by the community, an application was made to both Greening Australia and the Heritage Trail Secretary for funding to establish a heritage trail and revegetate the cliffs of Rocky Bay. These applications were made in conjunction with 'Apace Aid' in North Fremantle. We were successful in both our applications and received total funding of \$11,000. We also wrote to local industry and secured additional funds. In total about \$12,000 was made available to grow and plant 10,000 endemic plants, write and design a heritage trail brochure, develop the trail brochure, develop the trail, design the signage, and co-ordinate the overall project.

Between October 1987 and May 1988 we established a tunnel house at Apace, collected seed, propagated about 7,000 plants. We also researched material for the heritage trail brochure and began construction of the trail. Over the summer months the area was cleaned up with assistance from the Fremantle Council. In April and May weeding programmes were implemented, which essentially involved removing the fennel and castor oil bushes which proliferated in certain places. During May, June and July the planting programme was implemented and during the following month the trail was completed. This included fencing, track construction and placement of signs. By September we had completed the draft brochure and planting programme. In December the Rocky Bay Heritage Trail was opened by the local member of Parliament, Bill Hassell.

Many people and organisations were involved in the project. One of the people involved took a tally of the people, organisations, tasks undertaken and hours worked on the project. In summary a total of 228 people worked on Rocky Bay for 695.5 hours. This total excluded the time spent in producing the heritage trail brochure.

So how did we manage to secure such a high level of community involvement? One of the main reasons was because one of the people involved in the project, Kim McHarg, was also doing a media course at the time, and incorporated the Rocky Bay project into his course. The media was used on every possible occasion and we developed good skills in writing our own press releases and setting up stories which we knew would capture the imagination of any reporter and would therefore attract good press. For example, we arranged for some people skilled in abseiling to volunteer their skills for a media stunt. This involved them abseiling off the cliffs with backpacks filled with trees. They descended to certain predetermined points and planted the trees from their packs. This achieved full front page coverage on one of the local papers. A total of 22 articles were printed in four different newspapers. The *West Australian* printed three articles with photographs, and additional cover was given in local newspapers. We never managed to capture the visual media, however we were featured on radio programmes four times.

The project was an enormous success and owes a lot to the dedication of many people, particularly at Apace Aid. However it didn't stop there. At the same time that this project was being undertaken, the North Fremantle Community Association was also involved in a broader more contentious issue, i.e. Buckland Hill. Both the North Fremantle Community Association and the Mosman Park Ratepayers' Association were responsible for forming the Buckland Hill Action Group. These Associations recognised the potential of the Buckland Hill landscape as a regional park, particularly one which had the potential to link the river to the ocean. The Buckland Hill Action Group attracted both local interest and general community interest from people throughout the metropolitan area, who joined in the campaign. In the end the land was sold with one third retained as public open space. At the same time the Anchorage development, the State Engineering Works site, the former CSBP site, and quite a few other areas in North Fremantle were being considered for redevelopment. It was as a result of these proposals that the community recognised an urgent need for sub-regional planning, particularly in relation to local Council and State Government interaction. To cut a long story short, in 1989 a committee was established to deal with just this type of planning. This committee is called the 'Leighton Peninsula Planning Study Group', and includes representatives from the City of Fremantle, Town of Mosman Park, Department of Planning and Urban Development and the community.

River to Ocean - A Regional Park

The first major issue the Leighton Peninsula Study Group dealt with was the establishment of a regional park, which ran from the river to the ocean, linking the existing foreshore reserves. This proposal was expanded and refined by the group. The finalised proposal went through the various channels of government and was put to State Cabinet by the Minister for Planning for 'in principle' approval, which was granted. As a result of this work, a regional park will be established which will link the river to the ocean via Buckland Hill, capturing the five remaining 'Seven Sisters' and extend from the Stirling Bridge in Fremantle to Chidley Point in Mosman Park on the river foreshore side and from south Cottesloe running down to Port Beach on the ocean side

This park will allow for integration of a wonderful piece of the landscape, and we believe that the community will undoubtedly be willing to become involved in the implementation of the final management recommendations.

Finally I would like to say that there is great scope for the community involvement in many aspects of managing the Swan River landscape. It is important that they (the community), where possible, be encouraged to become involved in its development and overall management. The Swan and Canning Rivers should be seen as a Metropolitan Park which gives us our unique sense of place and provided unlimited enjoyment to current and future generations of West Australians.

Workshop Summary

Thirteen workshop groups based their discussions on the following three questions:

- What are the issues relating to the Swan River landscape?
- What are the solutions to these issues?
- Where do we go from here?

Issues and solutions have been tabulated below.

Issues

Commercial Facilities and Uses

Inappropriate commercial developments on the foreshore

Lack of cafes, coffee shops and tea houses around the river which are open to all of the public

Lack of understanding and consideration of the aquatic resource of the river for economic gain such as mollusc farming

Community Involvement

Lack of community atmosphere in the river environment

Not enough use is made of the public to help in management e.g. participation, control, unimpeded access, environ-hood watch, foreshore watch.

Community is not aware of how they can have input into management

Community should have their say on how this regional resource is managed

Conservation and Preservation of the European and Aboriginal Cultural Environment

Historic landmarks are being lost

People do not understand or recognise the significance of the river to the Aboriginal community

Difference in values held by Europeans and Aboriginals

Destruction of building heritage such as Nedlands Baths and jetties

Significant Aboriginal heritage areas are not identified or recognised

Conservation and preservation of the natural environment

Few remaining natural areas around the river, particularly vegetation units on the waters' edge

Wildlife population is decreasing

Exotic weeds and non indigenous plants are spreading

Foreshores degrading

Some buildings reduce the amenity of the foreshore

Insufficient revegetation occurring

Remnant plant communities along the foreshores of the whole river system need protecting

Retention of natural landscape elements e.g. limestone cliffs, beaches, vegetation

Loss of natural vegetation especially in terms of destruction of wildlife habitats

Development on the foreshore is not in sympathy with the natural flora and landforms

Do not understand the role of tributaries in river processes

Contribution of grassed areas to nutrients in the water

Development pressure on wetlands e.g. Swan Lake and Maylands brick pits

Loss of rural landscape along the river

Lack of protection for wildlife breeding areas

The importance of visual amenity of the river is not recognised

Disturbance by noise from boats

Flora and fauna populations need to be of a size to be sustainable

Development has resulted in degradation of the landscape

Unique character of the river and its foreshores is not recognised or identified

Whole catchment Avon/Swan/Canning is not considered when managing the estuary

Damage to vegetation and banks from exotic plants and machinery

Inadequate planning of vegetation planting around the river such as:

- use of the right species

- proper site design

- community involvement

- after care

Trees and other vegetation in the viewscape of the river requires protection

What is the 'spirit' of each area so that development plans can reflect this

No priority for management of particular ecosystems and areas

Need to know what values people appreciate in order to protect them

Examine the river foreshore in terms of areas that are suitable for conservation

No clear definition of what 'conservation areas' are and what may be permitted in these areas e.g. retention and enhancement of remnant land systems, institution of measures for wildlife protection and the limitation of public access and facilities, in those parts designated 'conservation areas'

Education

Education of the public is essential to ensure that the river is used properly and people know how to look after it

Lack of public knowledge on suitable species for planting, stormwater runoff, fertiliser and water application, ecological importance of wetlands

Lack of awareness by Local Authorities of environmental issues

No education of public on the value of the river

Lack of appreciation of river resource

Difficulty of effective community education and shared values 'stewardship'

Learning to value and appreciate the positive and negative aspects of a healthy diverse natural ecosystem (mosquitoes, algal smells)

Limited public understanding of riverine/estuarine processes

Limited education of children about the river

Erosion

Misuse of power boats and subsequent boat wash

Undermining of trees

Boatwash on the lower river and estuary

Inappropriate public access causes erosion

Natural erosion processes in the estuary

Damage to bank by river boat traffic

Foreshore walling reduces the amenity of the natural environment

Boat erosion is degrading foreshores

Characterless walls stop access to the water

Flood Plain

Loss of flood plain

Flood plain is not recognised as an important part of the landscape and flora and fauna habitats

Identification and prioritisation of foreshore with respect to the 1 in 100 year flood

Disregard of the importance of flood plains by people building houses

Flood plains are not protected from development

Foreshore Developments (and control)

Loss of public open space for the development of car parks and toilet blocks

Fragmentation of development control

Sufficient development control is not being exercised through Town Planning Schemes

Public access to the foreshore

Limits or control required on such developments

Unsympathetic redevelopment of sites is occurring e.g. Anchorage

Council individuality needs to be retained

Visual amenity of the development

Not all developments complement the environment and the following needs to be considered:

- building form
- height limits

- building materials
- landscape requirements
- foreshore access

Standardisation of regulations in relation to developments on the foreshore

Loss of access due to retaining walls along the foreshore

Development of the foreshore at White Beach (Dalkeith)

Land use conflict on and abutting the river

Lack of information on land use activities and development potential

Commercial development needs more regulation

Developments are too neat and structured i.e. grass and manicured river banks

Developments are not environmentally designed

Water-environmentally sensitive design and management is not occurring at planning stage

No development guidelines and controls are available for people to use as a benchmark

No resolution of landowner'/community rights

No consideration to the maintenance of visual continuity and compatibility of individual developments

Lack of interest on foreshores near freeways.

Too much unsympathetic and inappropriate development adjacent to river

No communication and debate over developments affecting the river landscape

Population growth will make the river even more valuable so there is a need to make sure that commercial development is strictly controlled

Concern about planned city foreshore developments including Barrack Square, restaurant at the Causeway

The Minister for the Environment should not have the last word

Some boating industry is appropriate on the foreshore

Foreshore Ownership and Access

Loss of public access to the foreshore

Alienation of foreshore from the public by roads and other developments

Inadequate sign posting

Vandalism encouraged by inappropriate access

Uncontrolled access in conservation areas

Case for some foreshore areas to be kept in private ownership as Councils are unable to maintain them

Public ownership is required to ensure public access to the river and foreshore

Individuals have exclusive rights to the foreshore

Maximum public access needed

Acquisition of foreshore reserves along the length of the river
Rationalisation of reserves along the river
Responsibility of owners with high water mark titles
Loss of public access to the river due to hard walling the river edge
Conservation areas are not in public ownership
Vehicle access
Lack of statutory funding to purchase land reserved for Parks and Recreation
Compensation should be paid for loss of development potential where Parks and Recreation reservation includes private property
Requires continuity without infringing on individual rights
Alienation of land
Improved pedestrian access required
Ease of public access to the foreshore should vary with the environment

Landscape Design

Views to and from the river are not protected or considered
Scenic quality is not being maintain or enhanced
Landscape design does not have a strong ecological base
Landscape design of edges is not imaginative
No range of landscape units appropriate to specific locations
Architecture is not interesting or appropriately positioned
Landscape plan must extend well back beyond foreshore, and have historical continuity, points of interest and look good from the water

Legislation

Legislation is not consistent
Power of the Swan River Trust not clear

Management and Implementation

Funding for development and maintenance of foreshore reserves is insufficient.
Local government requires greater assistance with funding
Decisions or plans that are developed are often not implemented
Interaction between managing landowners, agencies and the Swan River Trust
Degree of autonomy of local government authorities
Who should manage the area?
No forward planning on foreshore use
Too many government agencies involved in management of the river
Lack of information to public from Government and Government to other Authorities
Limited communication between Government agencies and between Government and the community

Future management control of foreshores and the water body

No inclusion of maintenance programmes and costings in landscape plans and co-ordination of maintenance programmes between Councils

Population Growth

Impact on river environment due to increasing population

More pressure on the river will result from population growth including

- Recreation use

- Pollution

- Fishery depletion

- Increased densities close to river resulting in visual impacts

- Need for public facilities Eg carparks and toilets

- Need to plan transport

- Need to preserve natural habitat

Recreation (public facilities and use)

- Inappropriate recreational activities in riverside locations

- Need activity nodes for public use

- Need special areas for special purposes

- Need compatible recreation activities to enable community enjoyment of the river

- Recognition of all recreation needs along the river

- Retention of traditional uses of particular areas

- Fishing opportunities (both recreational and professional)

- Lack of informal and recreational and adventure facilities for children

- Lack of information on demand for public facilities

- Under utilisation

- Impact of boating on erosion, congestion, litter, noise and pollution spills

- Insufficient sullage pump out facilities

- Need to identify users and usage where appropriate

- Good views for people using the river

- Provision of both active and passive recreation

- Active recreation should not compromise natural environment

- Use of the river for things that rely on the river as a resource, as a matter of priority

- Planning for the creation and maintenance of diverse areas along the river

- Intrusion of power boats too far upstream

- Not enough resources put into management of navigation or foreshore areas

- Waters should be usable for people. People should be a priority over conservation

- Need to give priority to quiet river-related uses on waters and shores (compatible recreational activities)

Jet skis adversely affect other people, e.g. noise, health and are not restricted in the areas they can use

No clear definition of passive/active recreation area

Need to consider all the ramifications, fertiliser on playing fields and carpark for example, are not suitable for the foreshore

Over use and degradation of facilities

Transportation

Opportunity to use the river for transport

Under utilisation

What are the possibilities?

Vision/philosophy

No clear philosophy, lifestyle or image of what people want from the river

Swan River Trust management area is not compatible with landscape elements

Different priorities between LGA's and community groups

Need long-term plan with a focus on environmental need

Rate of change needs to be controlled

It is not recognised that change is essential and an inevitable component and it should be monitored and responded to if necessary

Water quality and pollution

Pollution from sources like Bayswater Main Drain

Maintenance and improvement

Need to know what nutrients are going in and control them

Need to know what is coming from urban environment

Contaminated industrial sites, soils and groundwater

Litter

Chemical spills

Petrol and diesel spills

Pesticides and fertilisers

Past landfill site and future development opportunities, retention of pollutant and removal of old sanitary fill sites

Effluent disposal and drainage into the river

Septic tanks

Boat sullage

Private gardens

Integrated catchment planning

Physical and well being of the community. People need to feel that the river is clean

Affects on quality of vegetation and habitats

There is a need for better understanding and management of the drainage entering the river system

Implications of increased population growth on water quality

Land uses and recreation must take the protection of water quality into account (e.g. lawn on foreshore, use of anti-fouling paints, disposal of effluent from boats)

Lowering of water quality

Awareness of pollution both visual and physical and the importance of its control

Solutions

Community Involvement

Establish a programme of community involvement and education in:

- 1 Management and restoration of natural areas (e.g. similar to North Fremantle and Melville's Greening Australia programmes)
- 2 Management practices in the catchment area (e.g. fertiliser, tree planting, stormwater, effluent)

Revitalise the river as a communication and activity corridor

Public participation and policing

Consult and inform local communities

Train facilitators to

- inform the community
- local press
- school speakers

Participate by example - provide resources to community groups

Provide feedback

LGA's are the key to local involvement

Facilitation via local community groups

Emphasise success and advantages of community involvement (e.g North Fremantle) such as cohesion, decreased crime, increased well-being etc

Community involvement and input into planning, design and management

Establish means of community input, both now and on an ongoing basis

Consult local people when planning for the character and development in particular areas, and use their local knowledge and interest

Prepare a broad plan, defining zones with particular characters, with more detailed plans for each area, through a consultative process

Produce publications, displays etc to inform the community about what the plans aspire toward

Use local government planning schemes to implement the plans, through a process of formal adoption by Councils

Conservation and Preservation of the European and Aboriginal Cultural Environment

Identify Aboriginal and European heritage sites along the river

Aboriginal consultation and participation

Understand natural, cultural and historical processes involved and apply to planning and design

Conservation and preservation of the natural environment

System Six areas should be in public ownership

Community, LGA and State Government agencies to have joint projects to revegetate the river

Identify all elements of the landscape (both valuable and threatened)

Assess all elements in terms of conservation value

Prioritise assessment

Educate the community about the need to conserve these elements

Use legislation to protect these areas and develop management plans for valuable areas

Determine the roles and responsibilities of managers

Provide skilled staff in terms of technical expertise and hands on work for rehabilitation and protection of valuable areas

Involve the community in conserving valuable areas

Develop mechanisms for this involvement

Address the loss of natural vegetation especially in terms of the destruction of wildlife habitats

Minimise grassed areas along the foreshore

Develop tree planting programmes

Develop a landscape and land use plan for the river to retain existing landforms and vegetation

Collection and storage of local seed. Protection of the gene pool

Increase trial regeneration strategies

Utilisation of similar studies and work. No need to reinvent the wheel

Promote catalogue research. Collect and record local knowledge

Government and industry to increase funding for research

Implementation of the Swan River Management Strategy

More education

Greater policing

Physical barriers around conservation areas

Staged controlled access for areas with different conservation values

Revegetate with endemic species

Improved landscaping of grassed areas - break up more with different features

Protection of unique landscape values

- Identify unique aspects of Swan natural landscape

- Assemble data base of information
- Analyse data base in terms of both function and aesthetics

Contrast suburban, transposed landscape with the natural landscape i.e. positive and negative aspects

LGA competition to improve awareness of uniqueness e.g. photography competition to photograph the 10 best and 10 worst aspects of the foreshore landscape

Establish criteria for preservation

Fund research for better understanding of natural processes

Revegetation projects

Education and community involvement

Funding for maintenance of reserves

Develop management plans

Decide what you want with the river

Survey, measure and estimate what's involved in conserving vegetation and wildlife, including the cost. Identify the components most under threat.

Form a committee under the SRT with the public involved to oversee conservation

Look at the river in terms of local regions

Prioritise conservation goals on the basis of public amenity, biological diversity, etc as well as cost

Maximise viable biological diversity

Education

Incorporate environmental education into the curriculum of primary and secondary schools

Should cover all aspects of river functioning and protection

Should focus on education of primary school education

Include environment awareness as an educational subject/topic

Community group involvement

Industry to be encouraged to support awareness programmes

Promotion through government

Support local groups, workshops and work programmes

Focus to be given to environmental sites of specific importance

Develop walk trails with community groups invited to act as guides

Tools -video/film/workshops/newsletter/reports

Audience - LGA's landowners, developers, planners, school, children, designers, Ministers, community, bureaucrats

Topics - Environmental promotion with logical ecological principles, positive and negative aspects of natural and transposed landscape intuitive perceptions

Direct educational efforts to schools/public seminars

Disseminate information through the media/displays

Education programme to show benefits of landscape plan

Erosion

Identify natural erosion processes of the river

Develop levels of boating activity in terms of speed etc taking into account erosion

Promote awareness of river erosion

Introduce permits and licence levels for boating activities and redirect funds into erosion control and rehabilitation

Develop erosion control measures in sympathy with the natural environment

Recognise natural erosion process of the river and the role of tributaries in the river processes

Control of erosion should be by foreshore reserves or where necessary appropriate walling

Flood plain

Environmental Protection Policy for the flood plain

Foreshore developments (and control)

Mechanism to control or limit foreshore developments

Review existing mechanisms, note gaps in existing policy

Control through LGA

State legislation e.g. MRS, Trust, EPA

Similar system to SPC Coastal Policy regarding height

Wholistic planning mechanism to address ecological, vegetation and landscaping issues rather than in an ad hoc manner

Uniform guidelines for Council to implement but care to be taken to ensure Council's do not lose their individuality

Incorporate guidelines on protection of the natural and cultural landscape into town planning schemes

Develop consistency in town planning schemes affecting or abutting the Swan River Trust Management Area and develop model provisions for this consistency

Develop a statutory process which will allow the incorporation of these guidelines into town planning schemes

Prohibit retaining walls along the foreshore

Tighten control on development including the standardisation of regulations

Develop location specific criteria for developments along the foreshores as part of a regional plan

Develop standard guidelines for each development node (e.g. setback, drainage)

Ensure development is in sympathy with natural flora and landforms

Continue with one control body

Local committees with advisory powers to local authorities e.g. flood plain and foreshore committees

Similar local committees structures so that network can be established to ensure similar aims and continuity

Overall control body must advise committees of applications which affect them

Foreshore ownership and access

In upstream areas an increased Parks and Recreation Reservation is required in order to permit purchase of property

Key government owned sites should not be sold off

All conditions of development to ensure public access along the foreshore

Develop a system of grading desired level of public access (such as A, B, C class CALM Reserves)

Rights of appeal for minor amendments or no minor amendments

Set up a landbank. This would involve retention of all that is there at the moment, and the provision of an intensive land acquisition programme

Landscape design

Trust to develop guidelines and these to be incorporated into Local Government Town Planning Schemes

Develop a masterplan for the river foreshore. This must be evolutionary and show foresight to take into account the needs of future generations. It is important to identify detail and to design precincts

Legislation

Empower the SRT (real teeth) to control use of the river

Management and implementation

Fund sharing arrangement between LGA and State government

Determination of percentage share between agencies

Trust policy on sharing arrangements

Some commercial development of some areas should be considered to assist funding

Long term planning is required to ensure implementation of plans and policies

A single decision making authority to manage the river

Establish community working groups

Unification of administrative control covering river planning

Integrated catchment planning

Land capability assessment

Adequate data collection and manipulation

Obtain financial and human resources

- reallocation, lobbying, education

-Federal, State and industrial sponsorship

- fund raising

Set up mechanics which makes best use of research. Research is necessary to provide information for managers who in turn must pass it on to the public. Reports must be

read, therefore it is important that they are user friendly. There is also a need for more communication between different organisations. This should involve the use of up to date communications technology

Population growth (forward planning)

Identification of conservation areas

Access constraints for sensitive areas

Identify suitable development nodes with development envelope

Identification and promotion of alternative water recreation areas

Decentralisation of the work force

Allow for effects of population growth on river in planning, including transport needs

Flexibility to allow for future changes in demography

Decentralise using water resource of other areas e.g. Rockingham

Recreation (public facilities and use)

Identify where particular activities are appropriate, particularly in upstream areas

Ensure that all activities are environmentally safe before they are promoted to the public

Identify suitable recreation nodes

Phase out recreational uses which are detrimental to the landscape

Carry out recreation surveys to determine recreation needs of the community

Support passive use of the foreshore and river (restrict powerboats)

Understanding of children's needs by adult decision makers

Involve children in resolution of needs

Sites in appropriate locations to minimise conflict

Awareness of public liability

Improve definition of recreation areas

Provide appropriate linkages e.g. bike paths, improved river transport

'Honey pot areas'

Define specific recreational uses and intensities for each area - allocate according to landscape attributes

Regulate through legislation

Acquisition of land for reserves to allow for future needs

Need to zone appropriately

Education

Identify nodes where human activities are established and /or appropriate and based on this establish guidelines for development in the management plans

Identify suitable activities for each area, but make them flexible and allow for change over time

Adopt a system of incentives or pay offs to developers and landowners rather than a punitive approach

Recreation Definitions

- | | |
|---------|---|
| Passive | a) areas that are small in scale for contemplative and retreat activities. These areas are for low physical output |
| | b) Energy input based definition, for example windsurfing is a passive activity as little or no infrastructure is required. |
| Active | a) Energy intensive activities, as they influence open space. Motorised recreational pursuits and the casino fit into this definition as much resource material has been put into the venue |

In areas that are designated suitable for passive activities, it is important to ensure the provision of reclusive settings which have minimal open space opportunities

Active areas require the retention of existing open grassed areas where this is appropriate. However the relocation of some of the existing facilities - such as tennis courts and sporting ovals - which do not require foreshore settings should be considered

Vision/philosophy

Establish objectives and values

A linear park from Fremantle to the sources of the Avon and salt rivers (at least as far as Yenyenning Lakes) and Canning River to Canning Dam

Water quality and pollution

Nutrient input management plan

Recognise that water quality is an urban design issue to be addressed in planning within the urban catchment of the river

Monitor input from the urban environment such as roadways etc.

Compulsory rehabilitation of contaminated sites

Use legislation to control pollution

Promote awareness of alternatives to the use of pollutants

Develop minimum standard for pollutants and fines for those who exceed these levels

Conduct monitoring programmes

Introduce government incentives e.g. tax breaks for research and development into new pollution control methods

Consider the effects of nutrients on the river environment

Develop a greater control over drainage around the river

Develop standard guidelines for drainage from development

Improved technological process. Recycle waste products (i.e. waste water)

Better management of rural activities

More education

Greater policing

Legislate against existing polluters but provide compensation

Recycle effluents and domestic wastes

Objective is no pollution but need to control at acceptable levels

Support pollution controls with laws rather than discretionary powers. Penalties should be appropriate and indexed

Where do we go from here?

Nine of the thirteen groups developed strategies of how to prepare and develop a landscape plan for the river environment. These are listed below:

Group 1

The Trust should consult and prepare a broad concept plan within a relatively short time and make it available for public comment. The plan should be prepared on a LGA district planning committee basis.

The Trust should provide a central co-ordinating role.

Define conservation areas:-

- where
- species
- priority for protection

Have the river placed on the National Heritage Listing

Develop a comprehensive education programme including:-

- sign posting
- school programme
- low key interpretation programmes

Implement System Six

Acquire more open space around the river and find alternative sites for playing fields and other unnecessary activities

Control weeds and other pests

Group 2

Landscape structure plans should be developed which have broad guidelines on how the landscape should be enhanced.

- Trust should have an officer who sells the landscape plan to the various LGA's and government agencies. This should be at a practical level to show LGA's how it will fit in with their programmes and philosophy.
- An officer needs to be available to change the plan for individual LGA's without losing the philosophy or concept of the landscape plan.
- Government agencies and Councils to endorse the plan and incorporate into their Town Planning Scheme or as a planning control area.

Group 3

Establish a committee to oversee development of the plan

Ensure this committee has representation from local and State government and the community

Use the Swan River Trust as the driving force behind the committee

Set objectives and develop policies for the Swan River landscape

Develop a broad scale general plan for the river with recommendations for area specific smaller plans

Carry out a fact finding study prior to developing the plan to identify all elements of the landscape

Establish a task force to develop the plan - with a multidisciplinary composition including landscape designers, ecologists, planners, recreation professionals, park managers on a community level, the community.

Group 5

Consider landscape character zones - not LGA boundaries.

Professionally prepared draft (broad overview) available for public revision. Should provide options.

Thorough literature review.

Identify study deficiencies.

High profile public participation.

Good marketing on completion.

Sunset clause for review.

Group 8

Establish broad concept, then break into regions for detailed planning within this broader context.

Ensure community/local government consultation and establish structures for this.

Need very broad community involvement in the design process.

Need a central body to formulate/develop the plan.

Plan to be implemented by a central body (not necessarily above body).

Group 9

State government must commit the finances to the process and fund a government body to achieve the plans.

Have discussions with local people.

Gain the commitment from all relevant parties to abide by the plans adopted.

Consult with public interest groups, the community generally and technical people, based on a broadly stated vision and landscape description.

Define regional zones along the River.

Model CALM's process with management plans - informal consultation, publication, then asking for a response, but include meetings and surveys through some simple process.

Put all this into a time and cost frame, then COMMIT TO IT.

Group 10

Institute a four pronged strategy for Swan and Canning Landscape Preservation.

Planning

1. Steering Committee (to develop guidelines):
 - Local Government

- State Government.
 - Community.
2. Divide up River into Sectors (involving 1 or more LGA(s)).
 3. Establish Sector Committees to develop component plans in consultation with LGA(s) and community groups.
 4. Steering Committee compiles overall plan.
 5. Public Comment.
 6. Final plan for adoption by
 1. SRT
 2. LGA(s)

Legislation

1. Develop tree preservation, historic and scenic landform protection legislation.
2. Use/develop legislation to resume land necessary to complete M.R.S. (reserves).

Management

Proceed to manage all the issues raised provided that their management does not depend upon new legislation (these should be covered in Legislation, above).

Public Awareness

There needs to be a comprehensive programme involving public brochures, talks, advertisements etc aimed at elevating LGA, Govt and community awareness on the value of the Swan landscape and the need to preserve it through concerted action.

Group 11

1. Undertake a resource survey - "what do we have now?"
Identify and analyse what we've got to get an overview of river attributes, physical environment, ecosystems, historical sites, aesthetic/visual values, current uses.
2. Produce a broad-scale map showing existing values and uses.
3. Produce a 'use plan' - proposals.
4. Referral of proposals for discussion, e.g. to local government. Look at local issues in a 'whole river' context.
5. Release for public review and feedback, including forums, use of media. This is essential to reflect people's views.
6. Reach agreement on broad principles to produce a long-term plan for the river.
7. Release guidelines to provide a 'theme' to follow - should include:
 - development
 - reserves
 - revegetation
 - access
 - recreation
 - materials to be used
 - visual guidelines.

8. Release to the public and get Cabinet support.
9. Review periodically to reflect changing priorities.

Action

Commission study by consultants steered by Steering Committee to undertake resource survey and map existing values and uses.

Swan River Trust to develop proposals with help from Steering Committee and consultants.

Review and release guidelines.

On-going public information and education is vital throughout the process.

Group 12

1. Set up a Steering Committee to report to the public. This committee will direct, monitor and coordinate the management of the river and the foreshore. This committee will be made up of members of all relevant groups. The committee must include landscape consultants, biologists, conservationists, developers and community members. Regional groups - Eg Nedlands group - must be set up to report to the Steering Committee. It is envisaged that regional groups hold a public meeting once per year, and leaders report feedback from regional groups to Steering Committee.

This committee is to be managed by the Waterways Commission. It is the responsibility of the Committee to make sure that the Masterplan is correctly implemented.

The Masterplan is a set of instructions to achieve a goal = the **'VISION'**.

Group 13

Swan River Trust to prepare a position paper based on the findings of this workshop/seminar

Circulate paper to government departments, local authorities, conservation groups and all participants

Use media coverage and community newspapers

Workshop Participants

Andrew B	Engineer, Department of Marine and Harbours
Armstrong K	Green Plan Co-ordinator, City of Wanneroo
Atwell D	Parks and Gardens Manager
Baxter L	Department of Planning and Urban Development
Bettink J	Engineer, Town of Bassendean
Blackwell M	Landscape Consultant
Boon E	Salesman
Brown J	Councillor, City of Gosnells
Burrows S	Shire of Swan Planner
Byrne C	Landscape Architect
Caddy D	Planning Consultant
Carne I	Field Management, Department of Planning and Urban Development
Carter B	
Chesterman T	Landscape Planner
Cole D	
Conway K	Town of Bassendean
Cook R	Teacher
Curry B	Regional Parks, Department of Planning and Urban Development
Davis S	Landscape Architect
Day H	Accountant
Devenish S	Town Planner, Town of Bassendean
Dillon M	Mosman Park Ratepayers Association
Duncanson U	Community Representative
George P	Water Authority Engineer
Godwin R	Manager Parks and Reserves, City of Stirling
Griffin S	Teacher
Hamary G	Consultant
Handcock I	Mayor East Fremantle Town Council
Hemsley L	Foreshore and Waterways Protection Council
Humphrey V	Swan River Trust
Hunter I	Manager Parks and Reserves, City of Fremantle
Hunty de la S	Speaker

Hutchison S	Community representative
James B	Landscape Consultant
Kaesehagen D	Landscape Consultant
Lee P	Consultant
Legasti de C	Department of Planning and Urban Development
Lilbume P	Landscape Consultant
Lloyd I	National Council of Women
Lumsden J	Administrative Secretary
MacKinnon G	Shire of Swan
Masters G	Speaker
Miller G	City of Gosnells
Mitchell H	Consultant
Moir G	Community representative
Mol de R	Building Surveyor, Town of Bassendean
Morrell D	Community representative
Morris A	Planning Assistant, Local Government
Morris P	Mayor, City of Gosnells
Nellestyn van D	
Nicholson c	Community representative
Norman F	Community representative
Notely J	Landscape Architect
Oldham J	Speaker
Otness O	Community representative
Parker J	Community representative
Penn L	Speaker
Peters B	
Pieroni M	Graphic Artist
Powe A	Landscape Architect, City of Perth
Provis G	Manager Parks and Gardens
Reid G	APACE Co-ordinator
Rowlands J	Department of Planning and Urban Development
Rundall G	Speaker
Searles C	Parks and Gardens Technical Officer
Seddon G	Speaker
Serio G	Architect
Shellin T	Horticulturalist

Smith D	Landscape Planner
Stephens P	City of Belmont
Stralow M	East Fremantle Town Council
Street M	Environmental Officer, City of Melville
Thompson T	Landscape Architect
Trent K	Councillor
Veale I	Town of Bassendean Flood Plain Committee
Ward J	Hames Sharley Consultants
Ward M	Department of Planning and Urban Development
Williams G	Department of Planning and Urban Development
Woods D	Engineer, Water Authority
Young G	Administration Officer

Workshop Facilitators

Group 1	Chalmers C
Group 2	Thurlow B
Group 3	Seal C
Group 4	Hutchison R
Group 5	Davis G
Group 6	Till B
Group 7	Deeley D
Group 8	Chester E
Group 9	Robinson M
Group 10	Parker I
Group 11	Majer K
Group 12	Browne-Cooper K
Group 13	Rowdon J

