Thriving Neighbourhoods Conference
Session: Sustainable Urban Transformations

From Urban Forest to Trans-Continental Eco-System Corridors©

This story starts with a magnificent 40-year-old gum tree in the back yard of a house in Canning Street, Carlton. It was located very close to the service laneway. When it was decided that the bluestones (cobble stones) needed to be re-set they were removed, about 250 mm of soil was then excavated, a concrete base was laid and the bluestones were put back. In this process much of the fibrous root system of the tree was removed and the concrete stopped infiltration of rainwater. Within a couple of years this great tree was dead. With its removal we lost a food source and a living habitat for our much loved rainbow lorikeets, the morning warbling of the local magpies, a perch for numerous other birds and the removal of countless smaller plant and animal organisms and microorganisms. It was a significant loss to the environmental quality of the neighbourhood and a loss to the urban forest.

A couple years later the City of Melbourne called for submissions in response to its Draft Urban Forest Strategy. It was an irresistible challenge. Far from watching the natural systems of the urban area degrade how could we establish a process that would systematically heal the ecosystem and create a healthy resilient environment of which we would all be proud to be a part?

If that is the background and the challenge let me declare where I start. Firstly, I am an inveterate designer and student of design. From engineering and then architecture I have been in the business of postulating solutions to problems. But this is more than just putting together physical arrangements in support of a set of desires. For me it has become about creating processes of interaction between people and the environment. It is an approach that sits between a problem domain and the support systems. On the one hand we need to know what is physically possible (the possible artefacts and arrangements) but this approach inevitably leads to an equivalent exploration of what is put forward as the problem.

I would also argue that everywhere and in every aspect of our aspirations is, or should be, the pervasive guiding principle of sustainability: in particular environmental sustainability on which all other aspects of sustainability rest. This is the context within which we should shape our constructed environment. It also helps us identify appropriate constraints to be applied to our interventions as they modify the wider natural systems of the biosphere.

This leads me logically to my second starting point. I see myself primarily as an applied ecologist – a human ecologist. Whatever we do in the physical world is an intervention in the ecosystem of which we are a part. It may seem unnecessary even to mention this but so often our interventions focus strongly on the physical objects and the services that they are expected to deliver to people that this critically important issue is overlooked. We can

succeed spectacularly on one front and fail miserably and disastrously on the other. Let us move towards healthier communities in healthier environments.

It is from this viewpoint that I turn to the idea of an urban forest. Inevitably we must start with some consideration of the present situation. Any urban forest is, by its very nature, an ongoing growing and developing system so where we start on this process is important. It sets the basis of what we can and should do.

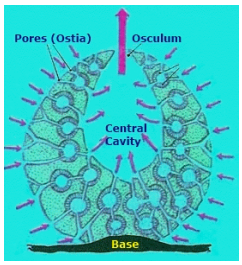
Ecologically, cities, and indeed much else in recent human development, have been very damaging to the pre-existing environmental systems. Firstly, through many different physical and chemical activities, they have depleted or destroyed the local biota and thus the indigenous biodiversity over substantial areas, and, they have drastically changed the various physical elements – soils and the supportive flows of water and nutrients. In many cases they seem to have destroyed it completely. The second major blow to the natural environment is that cities and human development have broken up the continuity of the natural system. From a seamless, continuously interactive ecosystem the emergence and development of the human enterprise has created a disjointed array of isolated subsystem. It may be likened to creating an archipelago: a collection of isolated island ecosystems. This is very significant because healthy ecosystems require the opportunity for the opportunistic migration of species and for the interflow of genetic material. Continuity and interaction are essential characteristics of a healthy system.

The defining message from this observation is that we are starting with a degraded and disjointed ecosystem. It is degraded in the sense that almost everywhere we look there has been a loss of species and thus a loss of biodiversity. Further the web of life – the continuity of the ecosystem - has been seriously broken up. On both counts the system has suffered a loss of resilience. Almost all of this is attributable to human activities and development.

This cannot, of course, be resolved by removing human interventions, or settlements or, indeed, humans themselves. The challenge is to formulate ways in which healthy human enterprise can live successfully within a healthy ecosystem. This cannot be achieved by reconstruction of the ecosystem that has gone. Our very existence has changed the parameters. The goal must be a new synthesis of humans within the environment.

The pattern of a sponge may serve as a metaphor. It has a continuous fabric that encloses a vast number of holes and passageways. Both have continuity.

Let us think about the structure of a sponge. A sponge consists of a continuous fibrous structure that forms a very large number of holes and passageways.



When humans started modifying the environment only isolated areas of the landscape were affected. The sustainability, the integrity of the system as a whole was not threatened by these minor intrusions. From there, however, over the millennia and especially over recent centuries there has been an accelerating progression of human development and intervention that has now resulted in a radical transformation. Such is the scale of this change that humans and the natural systems of the environment have swapped places. They still retain a sponge-like relationship. But, whereas humans started as occupants of small holes in sponge-like natural ecosystem structure these holes have gradually expanded and connected up so that they have taken on the geometry of the fabric of the sponge. The natural ecosystem is now consigned to the holes. It has become a set of left-over remnants of its former self.

Cast in this way, it seems that the natural systems are broken and broken in two ways. There has been a loss of species and local and global biodiversity that is thought to be gathering pace. And physically or geographically, it has been broken by being broken up. It has already lost that continuity that is such an important characteristic of a healthy resilient ecosystem.

Now, what do you do when something important for our very survival is broken? You fix it. Herein lies the guiding principle for the ongoing development and redevelopment of the ecosystem. That process can begin with what we may describe as the urban forest.

Whether we recognise it or not our urban areas contain plants including shrubs and trees that together constitute our urban forest. That is where we start. Of course the motivation for the creating the present situation was not to repair the local bio-systems; frequently it was precisely the opposite. Australia has a long tradition of replacing indigenous vegetation with European and North American species. The past has often been specifically about destruction of the local flora and with it much of the local fauna. We now have the opportunity, or more realistically the imperative, to turn that around. The challenge is to invent an urban ecosystem – including the urban forest – that, on the one hand, supports our human enterprise and, on the other, repairs the natural bio-systems with rich indigenous biodiversity and continuity. Translated into the language of architecture or planning or urban geography this means developing a system of interconnected bio-system corridors and nodes.

We can start with waterways, major road and railway corridors and linear utility reserves as the currently existing connecting systems of the urban fabric while the parks, existing nature reserves and flood-plains serve as the nodes. If that would provide a primary sponge-like structure it can be supplemented at a smaller scale by planting along lesser streets, cycle tracks and pedestrian ways.

But as we have seen much of this has already been planted and managed in such a way as to replace the local with the foreign. What is now needed is not, of course, a wholesale process of replanting across the whole of the urban landscape. That is neither possible nor desirable. What is required is a long-term commitment to focus much of our future maintenance, re-planting and development of the urban forest on systematic transformation to indigenous

and bio-diverse plants. And with these plants will come the indigenous fauna from the tiniest microbes to the birds and animals. We need the vision and we need to think in terms of bio-system regeneration. In the dynamic evolving situation in which we now operate we need to take every opportunity that arises to expedite the transformation process.

Lest this seems simple to the point of naivety we also have to recognise other expectations. The list of indigenous trees for the whole of Australia includes very few that are deciduous. Yet, we know that shade is important in the harsh Australian heat and that for much of the country winter sun is also highly desired. Deciduous shade trees therefor do a valuable job of protecting us and our buildings and motor vehicles from the excesses of summer solar radiation and giving us access to the warmth of the sun when we most want it.

There should be one major constraint on using non-indigenous plants. We should not tolerate the introduction or retention of plants, or indeed animals, that are toxic to the environment in the sense that they actively destroy the natural systems around them. Australia has a long history of getting this wrong - from the cat, dog, rabbit and cane toad to the blackberry bush, prickly pear and lantana - and the whole continent has suffered accordingly.

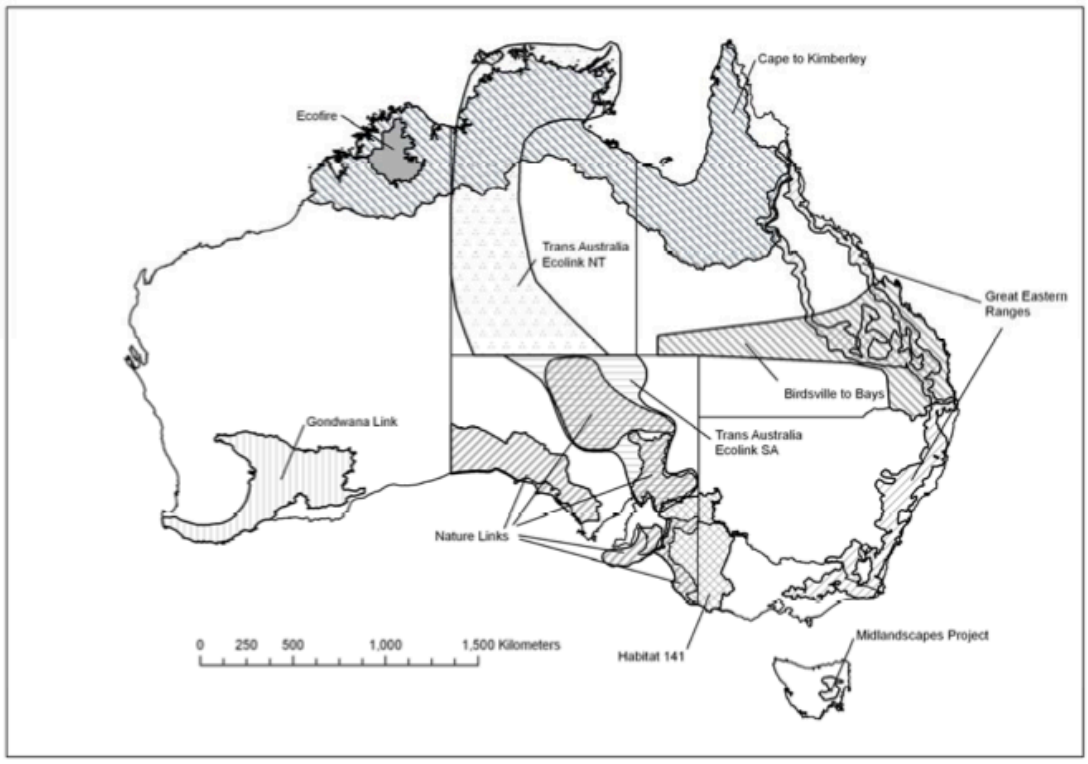
The clear message is that we should not be doctrinaire. We should not be trying to recreate an undisturbed natural environment as if humans were not there. Rather we should be seeking a future ecological system in which the human enterprise is an integral fully interactive part of a healthy system. Humans by their very presence have modified some of the major operating systems of the ecosystem within urban areas - and, for that matter, everywhere else. Typically there is very much more water in urban areas than the natural rainfall. Humans also import nutrition for themselves and their animals. They then produce wastes that are, or can be, available to support the local bio-system.

If this, then sets the scene there are several interesting implications. Could such a vision be achieved through some prescriptive directive: almost certainly not. Could it be achieved by some local community or municipality: almost certainly it could – indeed - almost certainly it has been. But how to translate local initiative into something more pervasive? And here the politics of the situation may become interesting and supportive. Any group pursuing a sustainable urban forest strategy based on nodes and corridors predominantly using indigenous flora will find that its own success is limited unless it can persuade neighbouring communities or municipalities to adopt the same overall vision. Together they would find advantage in co-ordinating and connecting their two systems of corridors and nodes. And, of course together they would have a more persuasive case and more to offer their neighbours than if operating alone. There is a synergy emerging in the system. [The experience of local governments in establishing their own cycle ways has had this effect. They become much more useful if the neighbours also have a similar interlinking system: and so on.]

A similar situation arises at the edge of the urban area. The adjoining peri-urban areas would look quite different from outer suburbia but they have the same set of opportunities and could adopt the same overall pattern of land

use and planting by connecting up remaining areas of indigenous planting while leaving other areas for agriculture, horticulture and semi-rural life-styles and recreation.

The same advantages of interconnection continue even as the scale increases. Eventually we can envisage major eco-corridors connecting up from rural areas to coastal areas and the oceans. Both the Trust for Nature (privately held land places under conservation covenants) and Bush Heritage (purchasing land and managing it for conservation) already pursue these ecosystem corridor objectives. Similarly State Governments and the Commonwealth Government are involved in the creation of ecosystem corridors



Major corridor initiatives in progress or planned in Australia: from Witten et al, CSIRO June 2011

All of this is fairly conventional ecosystem thinking. What may be useful is the idea that there could be one overall conceptual framework that operates from the smallest street in suburbia through urban and rural ecosystem networks to a transcontinental bio-system corridor connecting the Southern Ocean via Habitat 141 in Victoria and the Trans Australia Ecolink corridors in South Australia and the Northern Territory to the Timor and Arafura Seas. And this may only be a beginning.

This whole ecosystem scenario can be thought of as a single fractal system. It is a system that comprises self-similar systems at many scales. While the dimension may be dramatically different the pattern at the local, regional and continental scale remains the same. It is the pattern of the sponge that ties the whole thing together.

Within this conceptual framework we have a management strategy for a single tree in Carlton all the way through to repairing the ecosystem of the continent. So be it.

If the idea ties the ecosystem together geographically it may also serve to provide common ground for the whole nation politically. It offers the prospect of the urban and rural peoples of Australia finding themselves engaging actively in a single common endeavour – that what is happening in the Pilbara or Cape York is recognisably just another manifestation of what is happening in Central Melbourne or the middle suburbia of Brisbane or in some small country town almost anywhere. It brings my backyard and the outback together within a single framework. Surely, this would be 'a consummation devoutly to be wished'.

Allan Rodger
Chairman, Habitat Trust
13th November 2012

Notes

See: Copenhagen Institute of Interaction Design and the life of Bill Moggridge

Allan Rodger, A Submission to the Consultation Process
City of Melbourne Urban Forest Strategy: Making a Great City Greener, 2012 -1232
Consultation Draft – November 2011, February 2012

Stuart Whitten (CSIRO), David Freudenberger (Greening Australia), Carina Wyborn (ANU), Veronica Doerr (CSIRO), Erik Doerr (CSIRO), Art Langston (CSIRO) A compendium of existing and planned Australian wildlife corridor projects and initiatives, and case study analysis of operational experience. A report for the Australian Government Department of Sustainability, Environment, Water, Population and Communities, June 2011