New directions ?

Assessing the achievements of the CRC for Freshwater Ecology will be the aim of the Fifth Year Review to be held this August. At the same time the CRCFE is busy putting together a proposal for a new Centre to continue its important work. Discussions are underway with prospective partners, and most of the major current partners who have indicated their wish to be part of the new proposal.

Director, Prof Peter Cullen

In planning for the new Centre, the CRCFE has been reviewing the present and emerging ecological issues that are barriers to sustainable land and water management. What follows is a preliminary overview of these issues, presented to stimulate discussion within the water management community. We welcome feedback and ideas. There is some work being undertaken by the CRCFE and other research organisations in most of the areas presented.

Environmental allocations – how much water is required and how should it be delivered to the environment. How to measure an ecological benefit. Includes floodplain and billabong wetting.

Wetlands – inventorying, rehabilitation, understanding key processes.

Cyanobacterial blooms – minimising, managing, toxin measurement and prediction. Involves nutrient management strategies, flow management and destratification.

Algal toxins – measurement, predicting formation, toxicity, safe levels in water for various uses.

Carp - impacts and possible control strategies.

Health assessment – monitoring protocols, appropriate guidelines for ecological protection, biological assessment of river health. Includes assessment of receiving waters to identify appropriate pollutant loads from urban and rural non-point and point sources. Needed for both monitoring programs and for State of Environment assessment. Implications of climate change.

Salinity – much catchment work is already underway, but the function of salt load/pulses against ecological damage is required so that investment decisions are more soundly based. Likelihood of increasing salinity in some major catchments.

Biodiversity and nature conservation – little research yet at a systematic level for riverine communities. Some recovery plans for individual fish species. Need to understand ecology of selected species, and identify appropriate conservation strategies and reserve systems for aquatic organisms.

Pesticides – Land and Water Resources Research and Development Corporation program concluding. More understanding is required on the ecological impacts of chemicals and mixtures of chemicals on communities and food chains. Concern with possible endocrine disrupting chemicals. Need to develop restoration strategies for contaminated waterways.

Riparian area management – role of riparian zone as a buffer and a source of nutrient and energy to aquatic ecosystem.

Ecology of lowland rivers – with regard to algal growth, fish populations, environmental flow requirements, indicators of health, need for connection with floodplain, impacts of point sources and non point sources in urban and rural areas. Interaction with estuarine areas. Role in nitrogen and phosphorus transformations. Community concerns with health and amenity of lowland rivers. Determination of acceptable point and non-point loads.

Nutrient management – measurement, sourcing, biological availability, microbial cycling, effectiveness of nutrient management, importance of large occasional pulses, sediment buffering.

Artificial wetlands – designing and managing wetland/pond systems for treating urban runoff, rural runoff, agricultural wastes, sewage and so on. Issues include groundwater connections, impacts of drying cycles, insect issues and harvesting of plant material.

Organic matter and carbon – industry concerns stem from after growth in pipe systems and desirability of minimising organic matter in storages. Wider ecological issues relate to floodplain-river interactions, role in microbial cycling of nutrients from sediment.

Restoration and rehabilitation of aquatic systems – is a major emerging issue in both urban and rural areas. Measuring impacts of landcare catchment activities. Focusing activities to benefit streams. Developing appropriate ecosystems in urban streams and drains. Removal of concrete lined drains to restore more natural drainage lines.

The CRCFE will obviously not have the resources or the capacity to work on all the issues presented above. We will need collaborators if we are to tackle some of the larger issues. The CRCFE Board will decide exactly which issues will be the focus of the Centre's activities. A number of factors will be involved in determining which issues the CRCFE will ultimately take on:

- Work already underway in the CRC and elsewhere
- Whether we have the intellectual capacity and the resources to tackle the problem effectively?
- Is there a good idea and clear hypothesis to be tested?
- What is the minimum investment to have a good chance of success?
- If the project succeeds, which partner organisations will use the results? What sort of difference will it make to the condition of our waterways and to the partner's operations in both capital and recurrent expenditures?

Peter Cullen