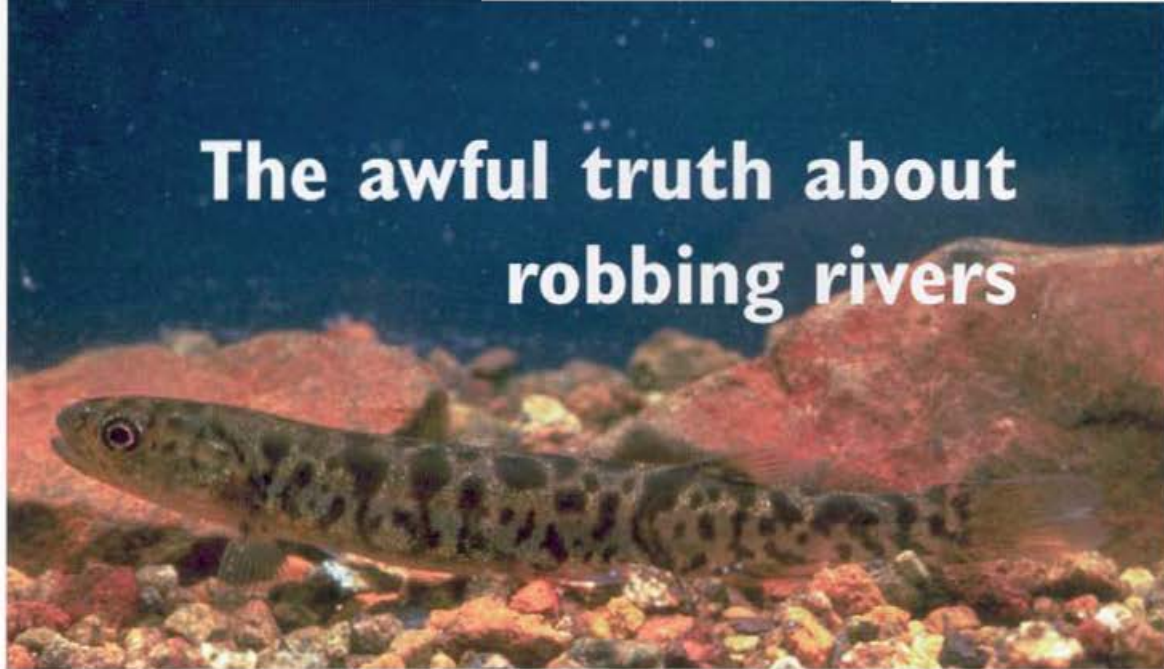
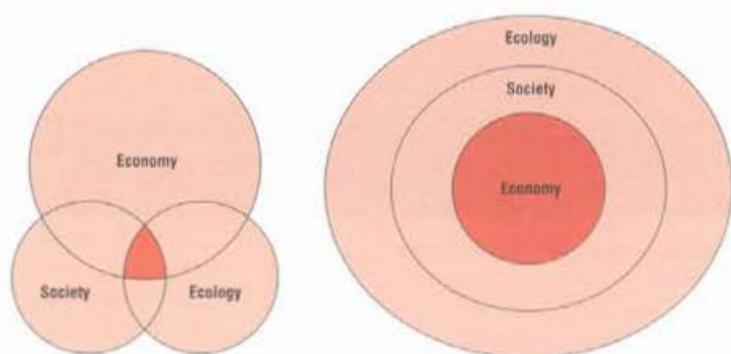


The Lake Pedder Golaxias, an endangered native freshwater fish. Many more aquatic species are endangered, in decline or extinct as a result of changes to Australia's inland waterways.

The awful truth about robbing rivers



Wayne Fubon



This is the predominant model of decision-making in Australia until the 1980s. It gives primacy to economic decisions and assumes that environmental problems can always be solved if the economy is sound. (Source: Aust SoE 1996, adapted from Ian Lowe 1994)

The decision-making model needed for an ecologically-sustainable future recognises that many important aspects of society do not involve economic activity. Similarly, human society is constrained by the natural ecology of the planet. The model requires integration of ecological thinking into social and economic planning.

Catchment and water management that recognises the extreme variability of Australia's rainfall and run-off is vital to improving the condition of our inland waters. The consequences of past failures to accept this variability are outlined in Chapter 7 of *Australia: State of the Environment 1996*.

In the Murray-Darling Basin, some 80% of the average annual water flow is diverted, the report says. In dry periods, this may be the total available water, leaving nothing to sustain the basin's natural systems. With rivers and wetlands starved of water, riverine environments have been disrupted and wetland destroyed and disturbed.

Most of the diverted water is used for irrigation, a practice leading to waterlogging and salinisation. About one third of Victoria's irrigation area has been salinised, and in some parts of the Murray-Darling Basin, the water table is rising by 0.5 metres a year as a result of irrigation and clearing for dryland agriculture.

In south-east Australia, the water table in some dryland catchments has risen by up to 30 metres since the 1880s. Dryland salinity will claim about one-quarter of the cleared land in south-west Western Australia in the next few decades and also is expected to spread through the eastern uplands of Victoria, New South Wales and Queensland.

The quality of surface waters is also affected by dryland agricultural practices. Run-off and erosion are raising levels of salt, sediments, pesticides and nutrients, (particularly phosphorus and nitrogen) in waterways. High levels of phosphorus, in conjunction with reduced stream flows, have resulted in extensive blooms of toxic blue-green algae, whose frequency may be increasing.

A result of these changes to Australia's inland waters is that many aquatic species are endangered, in decline or extinct. Native fish species have declined in abundance and diversity in most regions of Australia since European settlement, and some 32 species of frogs are reported to be in decline.

The plight of our inland waters highlights serious issues relating to Australia's environmental management: the problem of unwieldy government structures, administrative boundaries with no physical,

Council to promote environmental unity

NATIONAL guidelines relating to air pollutants and the tracing of hazardous waste are likely to be the first outcomes of a council set up in 1994 to develop uniform environment protection measures for Australia.

The National Environment Protection Council is a cooperative decision-making body representing all levels of Australian government. Its goals are to give all Australians the benefit of equivalent environmental protection, and to ensure that businesses are not disadvantaged by variations in major environment protection measures between Australian jurisdictions.

In *Australia: State of the Environment 1996*, the council is commended as a welcome step towards improving our national ability to manage the environment. Australia has so far shown little determination to take unified action on environmental issues, the report says.

At the council's first meeting at Perth in early 1996, four priority issues were addressed. These were ambient air quality, transport of hazardous wastes across state boundaries, contaminated site assessment, and the development of a National Pollutant Inventory. Draft guidelines and impact statements relating to the first two issues are due for public release early next year (1997).

geographic or ecological basis, and the need for long-term planning to incorporate an ecological perspective.

These issues arise repeatedly in *Australia: State of the Environment 1996*, emphasising the need for an integrated management approach to Australia's natural assets. The report confirms that Australians have been most effective in tackling environmental problems with a systematic approach that treats underlying causes, rather than symptoms.

Many of the pressures facing Australia's aquatic environments have evolved from planning decisions based on the short-term economic objectives of individuals, rather than long-term state or national interests, the report says. For example, irrigation and town water supplies have taken precedence over riverine ecosystems for the water in our inland rivers.

Traditional approaches to planning and management have proved ineffective in dealing with cumulative, off-site, and incremental environmental impacts such as habitat fragmentation, soil salinisation and nutrient run-off resulting from land clearance, the report says. But activities in our cities and farms affect what happens to our streams and rivers, estuaries and seas. It is estimated that about 80% of the contaminants in Australia's oceans and estuaries originate on land, the main sources being stormwater systems, sewage effluent discharges and run-off from agricultural areas.

A possible solution to these problems is to base environmental planning on biophysical regions.

B. J. van Aken, CSIRO Water Resources



Diversion of water from river systems, predominantly for irrigation, has caused waterlogging, salinisation, and the degradation of wetlands and riverine environments.

Bioregional planning is a framework that enables government, business and community interests to share responsibility for land-use planning. It is designed to overcome the major problems associated with fragmented decision-making. An example of this approach is catchment management, a system being implemented increasingly across the country. The Murray-Darling Basin Commission is a good example.

The report says greater knowledge and technical support is required to improve the success of catchment management. This includes scientific information on regional biodiversity, and methods of creating the infrastructure to include all interested parties, and to resolve conflicts between them.

Down and running out in the basin

PEOPLE living in about 60% of Australia rely on groundwater; yet this precious resource is poorly understood and often abused, according to *Australia: State of the Environment 1996*.

'Management of land and water must take full account of groundwater,' the report says. 'Groundwater is an integral part of the water cycle, and constitutes the largest terrestrial water store. The volume in just the upper one kilometre of the Earth's crust is 10 times that in all the world's rivers and lakes.'

Much of inland eastern Australia is supported by water from the Great Artesian Basin which lies underneath about one-fifth of the continent, typically at depths of more than 1 km. But this resource is depleted due to uncontrolled extraction from bores (see graph).

About 20% of bores in south-west Queensland have ceased to flow because of declining water pressure in the basin. Average flow rates have steadily declined from 600 million litres a day early this century to half that level today. A program of capping bores to conserve groundwater

is under way, but will take years to complete. The reliability of agricultural activities relying on this water source is therefore in doubt. They have relied on the harvesting of water that has taken hundreds of thousands of years to percolate through rock strata to inland Australia.

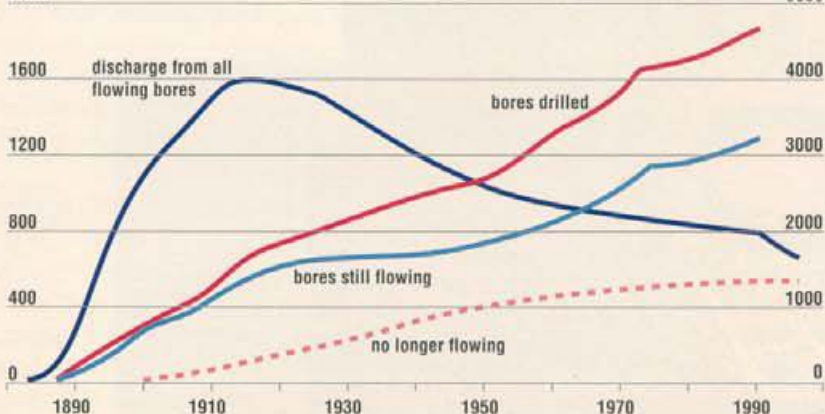
Another issue raised in the report is groundwater pollution. Because of the

timescales involved in replenishing groundwater, once pollution has occurred it is virtually impossible to remove. Basin recharge areas in New South Wales are also sites of major concern for groundwater contamination. The contaminants include total dissolved solids, metals, pesticides and nitrates; the sources are agriculture and mining.

Artesian bores in the Great Artesian Basin

Discharge (ML/day)
2000

Number of bores
5000



Source: Aust. SoE 1996, from QDPI