

Gordon River erosion

The Gordon River, with its famed reflections of rainforest-cloaked banks, has been a popular tourism destination for more than a century. With the opening of the Murchison Highway in 1963, the publicity given to the region during the Franklin River Blockade and the introduction of high-speed cruise vessels, the number of tourists enjoying the beauty of the Gordon River has increased dramatically. Today, cruises on the Gordon River are the second most popular visitor destination within the Tasmanian Wilderness World Heritage Area, with over 100 000 visitors each year.

However, the operation of cruise boats has contributed significantly to the erosion of the banks of the Gordon River. The very values of the area which attract the tourist and have contributed to the area's listing as a World Heritage Area have come under threat.

The river and the problem

The Gordon River is remarkable in many respects. Despite the relatively small size of its catchment, it has one of the highest discharge rates of

any river in Australia. It is the major influence on the hydrology of Macquarie Harbour — indeed the brackish nature of the waters of the harbour are the result of the outflow of the river.

The levee bank landform systems that line the river between Lake Fidler and Sir John Falls are unique in the southern hemisphere. They support at least 11 different forest and scrub communities, some which are unknown from other river systems. Prior to the introduction of speed restrictions, these banks were being eroded at the rate of up to one metre per year. In some sections, the river bank had retreated by 10 metres.

The endemic Huon pine, a majestic species recognised for its significance to the World Heritage values of the area, grows along the river. This remarkable tree is noted for its evolutionary antiquity, rarity and longevity. Individuals can reach ages in excess of 2500 years. Erosion threatens these botanical values.

Lake Fidler and Sulphide Pool reveal a very rare phe-

nomenon of global significance. Thought to be the shallowest meromictic lakes in the world, they are graphic examples of a unique condition of saline micro-stratification (meromixis). Within these lakes, chemical and biological processes of great interest to the scientific community occur. The unique high saline environment of the lakes supports a number of significant species, including photosynthetic bacteria that can live in the absence of oxygen. Erosion threatened to breach the levee banks and the meromictic lakes that lie behind them.

The erosion of the Gordon River banks was first noted in 1979. Subsequent examinations found that by 1986 continuous stretches of the river bank up to several hundred metres long had collapsed into the river, taking with them Huon pines and myrtles up to 20 m in height. Further investigations revealed that bank erosion was being caused by the wash of newly introduced high-speed tourist launches. In 1993, radiocarbon dating of bank sediments indicated

that, prior to the onset of river traffic, the banks of the lower Gordon were either stable or in a process of active deposition of sediments.

The solution

In an attempt to limit the problem, a six knot speed limit was imposed from Pine Landing to the south-east end of Horseshoe Bend. This limit was later increased to nine knots and extended upstream of Limekiln Reach. In 1989 all cruise boats were restricted to the area below the upstream end of Horseshoe Bend, with a nine knot speed limit applying from the mouth of the river. This was reduced in 1994 to a uniform six knots for all commercial vessels.

Reductions in speed can have a dramatic effect on the erosive power of a boat's wake. For example, a decrease in speed from nine knots to six knots can result in a 60% reduction in the erosive power of the vessel's wake.

A series of monitoring systems, developed by Parks and Wildlife Service experts (in consultation with hydrologists and geomorphologists from the Universities of Wollongong and Tasmania and the Australian Maritime College) were put in place to assess the role of speed restrictions in limiting river bank erosion. Monitoring stations have been set up at

48 different sites and are inspected every six months. A further 43 quadrants are monitored to assess revegetation. In addition, a further 36 bank profile transects have been established.

Results indicate that the restrictions have had a positive impact. Erosion rates have slowed dramatically, from one metre per year in the mid-80's to a current annual rate of 1-2 centimetres. The final stage in the rehabilitation of the banks, however, will be the return of the natural vegetation. This will be a very slow process as rainforest species, such as myrtle, can take hundreds of years to reach their former stature.

Further reading

Dixon, G. (ed) (1991). *Gordon River Ecological Survey*. Occasional Paper no. 30, Department of Parks, Wildlife and Heritage.

Parks and Wildlife Service (1994). *Lower Gordon River Recreation Zone Plan*.

