Restoring the lost Lake Pedder?

By Dr K. Crowley

The tragic loss of one of the world's most outstanding natural icons, Tasmania's original Lake Pedder, remains unreconciled. Kate Crowley chronicles the public debate on the possibility of restoration.

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Other than in the minds of utopian dreamers, there seems no prospect that Lake Pedder, lost to hydroinundation in the early 1970s, will ever be restored. A Commonwealth inquiry recently concluded that this owes more to Tasmanian parochialism and to the practical issue of currently prohibitive cost estimates than it does to any lack of technical expertise (Commonwealth Government 1995). The restoration of Lake Pedder, if such a thing were even possible, would be certain to offend Tasmanian historical pride in its iconic dam-building practices, especially now that the hydroindustrial era is over. To many Tasmanians, the enlarged Lake Pedder is a source of pride, a defiant symbol of hydroindustrialization and the quality of life that it once generated, rather than a symbol of wilderness destroyed.

The Middle Gordon hydroelectric scheme that swamped the 10 km^2 glacial Lake Pedder created a vast impoundment of 242 km^2 and a storage capacity of 3 km^3 (HydroElectric Commission, unpublished submission to the *Commonwealth Inquiry into the Proposal to Drain and Restore Lake Pedder,* 1995). This 'fake' Lake Pedder dam is ironically now defended using terms such as 'unique', 'aesthetically magnificent' and 'flush' with native fauna'. It is acclaimed in utilitarian terms as an engineering feat of gigantism that remains internationally one of a kind and would be vandalized and lost forever if drained. Tasmania may be globally renowned for its natural environment and political greening, but there remains a simmering local resentment against conservation in Tasmania that is little appreciated by the rest of Australia (Hay 1994). It is not appreciated at all by the international community which sees Tasmania as an idyllic ecoparadise. There is no doubt that a pilgrimage to Lake Pedder restored would become an international ecotourist attraction.

It seems tragic in hindsight that talk of Lake Pedder's restoration began even as the flood waters were rising to engulf it. Whatever its prospects, the quest for restoration is significant for evoking the recognition of past ecological folly, the meaning of lost places, the hope for an improved future and the right to utopian dreaming (Crowley 1999). It has been argued that restoration would provide a *locus poenitentiae,* an opportunity to repent, if not taken by ourselves, then by our children 'who will undo what we have so foolishly done' (St John 1974). The dam was included within the 1982 Tasmanian Wilderness World Heritage Area by the World Heritage Bureau of UNESCO in recognition of its restoration potential (Kiernan 1995). In 1994, following the commissioning of several feasibility studies over the preceding years, a Pedder 2000 restoration campaign was launched in Hobart by David Bellamy, the David Suzuki Foundation and Dr Bob Brown (Pedder 2000 1994a).

Within 12 months, the Hobart-based Pedder 2000 had formed branches in Sydney, Melbourne, Canberra, Adelaide, Launceston and Burnie, and secured a Commonwealth inquiry into the restoration issue. It is primarily the environmental merits and technical feasibility of restoration raised by this inquiry's findings that are dealt with here. This article covers three key aspects of the restoration proposal: (i) the case for restoration argued by Pedder 2000; (ii) the further issues raised by the Commonwealth inquiry; and (iii) the possible processes and impacts of drainage. It is fair to conclude on the available evidence that there is a clear split between optimists and pessimists in terms of the environmental and technical feasibility of restoration. That said, it is also important to stress that the available evidence is not exhaustive enough to objectively reconcile these positions, neither of which has been clearly proven or disproven.

While this article does not deal with the 'why' of restoration (Pedder 2000 1999a), the International Union for the Conservation of Nature (IUCN) offers several compelling grounds. It argues that Lake Pedder's

loss was an environmental disaster that severely affected the integrity of the Tasmanian Wilderness World Heritage Area. The restoration of Lake Pedder would be a significant step towards improving this integrity. It would also signify the need to restore degraded wilderness where feasible, and offer a symbol to the world of a determination to do so. The predicted power demand from the Tasmanian grid is argued by restorationists and colleagues to have not eventuated (Blakers 1994a), and Lake Pedder restored could offer untold economic benefits to the Tasmanian community (Anderson 1994; International Union for the Conservation of Nature 1994; Tighe 1992; Pedder 2000 1994b; Pedder 2000 1999b). Nevertheless, it is clear that there will be no restoration without, first, political and popular will, and second, without further investigation of the environmental and technical issues identified below.

Environmental and technical issues

The Pedder 2000 case for restoration

The restoration of Lake Pedder faces many complex technical questions, many of which have been deemed unresolvable by the Commonwealth Government without further research (Commonwealth Government 1995). Rather than 'why should the lake be restored?', these ask: what was the lake originally; has any of it survived; to what state should it be restored; how best should it be restored; over what time scale; and how best can the lake's vast surrounds be rehabilitated? It seems inconceivable that Lake Pedder's former magnificence, its intoxicating beauty, its primeval enriching mystique, its haunting, bedazzling spirit (Read 1996) could ever be recovered. And yet the original quartzite beach, its dune system and characteristic megaripples are reportedly intact, with only fine sediment covering the original lake bed after 27 years (Tyler 1994).

At the time of inundation, the areas surrounding the glacial Lake Pedder were characteristic of the south-west Tasmanian uplands. The slopes supported rainforest and wet sclerophyll communities, while the valleys supported open sedgelands, scrub and button grass on acidic peat soils. While the predominant surrounds were button grass, there were rainforest-pocketed hills to the north, and heavy tree- and scrub-covered dunes at the lake's edge (Johnson 1972). In terms of botanical surveying, the preflooded vegetation community was largely undocumented; however, the inquiry heard that the pristine original ecosystems of their surrounds remain intact. This, restoration advocates argue, would encourage the migration of indigenous native seed into the newly exposed landscape to eventually achieve a recovered vegetation community. Proponents of restoration were fairly relaxed about how close this community would be to the original, and how long restoration would take.

The recovery of Lake Pedder would not only be one of the world's largest restoration exercises; it presents a vastly complex, contested, political and ideological challenge.

The success of initiating the restoration project rests greatly on proving recoverability. First, drainage, which is discussed below, must be feasible. Second, the landform complex that comprised Lake Pedder must be recoverable. And finally, revegetation must be viable. In terms of landform, Pedder 2000 argues that the nested complex that comprised Lake Pedder (glacial cirques, moraines and outwash, and pink sandy beach) would re-emerge virtually intact upon drainage. Furthermore, it argues that this complex remains globally unique, and in the past comprised the lake's best, most loved features, offering its most classic photographic images (Kiernan 1994; Gee 1995; Pedder 2000 1995). Revegetation is a more complex, less resolved issue. Pedder 2000 scientific studies have found that the submerged surrounds of the original lake are not massively compacted and not inclined to become a reeking mud flat upon drainage. They have also found that original reeds and rushes are recognizable on the old lake bed; that the dunes are secured by mats of peat; and that the basin's soils remain bound by root systems. However, these studies alone have not proven the viability of vegetation recoverability.

Despite these uncertainties, Pedder 2000 has proposed simply 'pulling the plug', releasing water from the fake Lake Pedder at both its Serpentine and Scotts Peak dams. This would expose the original Lake Pedder.

Tasmanian Government restoration estimates

Costs of restoration have been estimated at between one-half billion and well in excess of one billion dollars Australian. This includes

- **$450 to $670 million for energy lost;**
- **$10 to $15 million for environmental impact assessments;**
- **$80 to $105 million for the removal and/or modification of all existing infrastructure and the provision of temporary civil works associated with any rehabilitation and revegetation works;**
- **$50 to $60 million for a programme of soil stabilization and rehabilitation works covering the inundated area of the lake and its shorelines; and**
- **$375 to $500 million for revegetation, and possibly ten fold that if a more intensive programme of revegetation is required beyond the view-scape around the old lake.**

(Source: Tasmanian Government, 1995.)

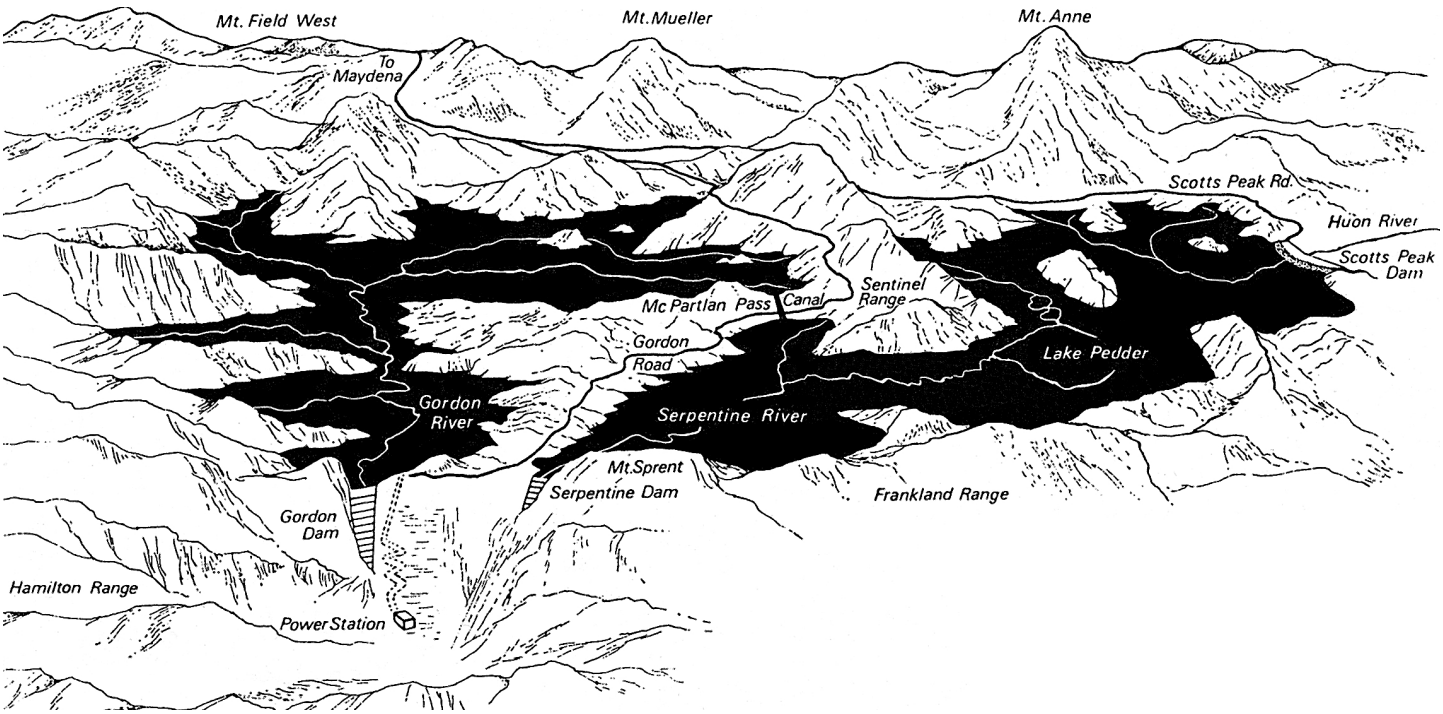

Figure 1. The Lake Pedder impoundment. Restoration would begin by opening the diversion tunnels at the Scotts Peak and Serpentine Dams. The Gordon Scheme would remain untouched. Reprinted with permission from Southwell 1983.

The adjacent Lake Gordon and Gordon Dam would remain untouched (Fig. 1; Pedder 2000 1994b; Commonwealth Government 1995). It claims that regeneration of vegetation would begin naturally over the following year, taking a decade or two, with weed infestation minimized both by the region's acidic soils and its remote location far from human settlement on the boundary of the south-west wilderness. Indeed, 'natural revegetation of the Lake Gordon margins following many years of low lake levels suggests that lowly plants such as mosses and liverworts will readily colonize the newly exposed bed of the Pedder impoundment' (Gee 1995).

Rapid drainage of the Serpentine Basin over the summer months was initially suggested by Pedder 2000 as the best means of protecting the inundated Lake Pedder's sand dunes from erosion, but only after prior studies to ensure the channels of the Huon and Gordon rivers can cope (Pedder 2000 1995). The issue of human intervention was not settled by Pedder 2000, with the need for forward planning based upon further studies being seen as the only way to determine whether revegetation could indeed be left to mother nature. On this issue there is a clear divide between human intervention and natural recovery. A scientific symposium heard both that rapid (i.e. supplemented) revegetation would help prevent soil break-up and erosion, but also that over 20 years or so of exposure, successional vegetation communities would most likely simply re-establish themselves (Pedder 2000 1995).

Commonwealth inquiry into draining and restoration

Within 14 months of launching Pedder 2000, a federal inquiry was handing down its findings on Lake Pedder's restoration prospects, an indication both of the national significance of the proposal and the political clout of its advocates. Drainage and the restoration of the geomorphological features of the original lake were found to be technically feasible, and likely to enhance the world heritage values of the Tasmanian Wilderness World Heritage Area. However, the most compelling reasons for restoration were found to be symbolic, with equally symbolic reasons found for retaining the dam. It was concluded that there were many more compelling, urgent environmental priorities to be achieved than Lake Pedder's recovery, and that the Commonwealth would thus not research nor consider the issue further (Commonwealth Government 1995).

The inquiry had heard from a range of authorities including the authors of the scientific reports commissioned in 1992 by Pedder 2000 on the project's feasibility. It noted that the restoration issue is more accurately one of restoring the original lake and rehabilitating the 24 000 ha of surrounding plains. While it is accepted that the original, distinctive features of Lake Pedder itself are recoverable, there remains great contention about how best to expose these features and about the criteria to be determined in re-establishing the surrounding vegetative cover. The lower criteria of rehabilitation, rather than higher criteria of restoration, would not require the surrounding plains to be returned to their original state, but to some other acceptable, stable state. But the prospects of both are recognized as needing further research (Commonwealth Government 1995).

Revegetation would be fraught with risks and challenges, even if only the lower criteria of rehabilitation were pursued. Issues of

concern include the state of revegetation that should be encouraged or actively established; the viability of the peat mat after exposure; the lower-order vegetation that may be needed to bind the peat and its impact; the assistance that may be needed to re-establish the button grass plains in the proportions that existed before flooding; the possibility of finding or resowing viable seed; the feasibility and the impact on the surrounding areas of a large-scale seed collection exercise; the need to minimize weed invasion; and the need to minimize erosion (Commonwealth Government 1995). Confidence has been expressed that the restoration skills required can be found in Tasmania between the skills of the HydroElectric Commission (HEC), the Forestry Commission, Greening Australia, the University's Department of Geography and Environmental Studies and the local councils (Oriel 1994).

In the end, the Commonwealth inquiry simply recognized that uncertainty remains as to vegetation rehabilitation methods, and indeed between the merits of rapidly assisted rehabilitation versus the seemingly more 'natural' gradual recolonization approach. This poses a significant cost issue, as the HEC submitted that an intensive programme of revegetation around the lake was required at a cost of between $375 million and $500 million and possibly ten-fold that (Commonwealth Government 1995). There is a similar prior question of rapid versus gradual drainage, as well as the issue of dam removal versus no dam removal. The drainage rate issue is one not clearly recorded by the inquiry. The inquiry heard both that gradual drainage of the surrounding plains has merit in terms of assisting vegetative rehabilitation, but also that rapid drainage may be more suited for recovery of the inundated landform. Clearly these opinions need to be weighed up in comparative terms before the merit of either can be clearly assessed.

Drainage issues, processes and impacts

Of particular interest at the inquiry was the evidence from restoration advocates that rapid inundation and submersion of the original Lake Pedder system had preserved its major geomorphological features by ensuring that little erosion damage was suffered. But it also heard the opposite from the HEC (which opposes restoration), namely that the dunes of both Lake Pedder and its tiny companion, Lake Maria, did indeed suffer considerably. Again there is obviously a case for further research to determine how Lake Pedder's submerged features would survive drainage, to determine, for instance, whether rapid or slow dewatering would best prevent dune slumping and wave damage, and indeed to determine whether these features need to survive intact, or should simply be assisted to re-establish themselves and then to recover naturally (Commonwealth Government 1995).

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Even more complex than the rate of drainage of the waters of the Lake Pedder Dam is the manner of drainage. This has not yet been the subject of feasibility studies by either proponents or opponents of drainage, although the HEC has simulated the draining process to calculate how long it would take to drain the impoundment by using current outlets. Three dams create the Lake Pedder impoundment: the Scotts Peak Dam, the Serpentine Dam and the small Edgar Dam. One option is to drain as much of the Lake Pedder impoundment as possible into Lake Gordon through the McPartlan Pass Canal, with the Edgar Dam riparian outlet and the Serpentine Dam outlets contributing. Pondage would occur behind the first two of these dams and would flood 47 km^2 of the upper Huon catchment and occasionally spill over into the Serpentine Valley (Commonwealth Government 1995).

While water from the Serpentine could be pumped into the Lake Gordon Dam, there is obviously an issue of whether any of the dams should be breached instead. Pedder 2000 recommends that they be left in situ (Pedder 2000 1999b). If only the Scotts Peak Dam were to be breached, there would still be up to 10 km of waters behind the Serpentine Dam that could occasionally reflood Lake Pedder, and would maintain a large mud flat. This partial draining was favoured by no one. All were equally concerned to retain the role that the Scotts Peak Dam plays in flood mitigation of the Huon River, whose valley now hosts a flourishing agricultural, and increasingly tourist-oriented, community, but equally is already suffering the effects of clear-fell forestry within its catchment. On balance, the inquiry appears to suggest modifying the Scotts Peak Dam, possibly via the construction of a spillway, and breaching the Serpentine (Commonwealth Government 1995).

The most drastic, and prohibitively expensive, breaching scenario would be the removal of each of the dams at a cost estimated by the HEC at $80–105 million. While rationale and method were not detailed in this costing, the HEC suggests that the dismantling would require new road access and track construction to facilitate disposal of the dam fabric, which would exceed 780 000 m^3, and which would need to be dumped in stable sites. 'The damsites, dumps and other associated scars which would remain after dam removal would require rehabilitation works such as recontouring or benching of the steep slopes, contour ripping of compacted areas, and covering with soil or peat' (HEC, unpubl. submission, 1995).

At the practical level, the HEC noted the environmental risks likely to be associated with drainage that should be the subject of an environmental impact assessment prior to restoration at $80–105 million. These included consideration of any likely effects on local fauna and remnant endemic species; the possibility that the erosion of the newly exposed dam bed would cause siltation and sedimentation; the downstream impacts of drainage and loss of drought proofing on irrigation-dependent communities; potential shoreline, dune and landform damage; the viability of highly interventionist revegetation methods as mentioned above; the need to minimize

fire, weed infestation, *Phytopthora* outbreaks; and the loss of high aesthetic values (HEC, unpubl. submission, 1995).

Conclusions

Although it may be utopian dreaming, there is clearly a sustained and, to some extent, scientifically informed push to drain the 'fake' Lake Pedder and to reclaim the original. While there is currently no political nor popular will to do so, this has not quelled the scientific nor professional debate about how best drainage and restoration could be achieved. Indeed, in the wake of the debate, a Key Centre for Ecological Restoration has been mooted for the University of Tasmania as a focal point for Australian restoration expertise (Oriel 1994). There is reasonable agreement that Lake Pedder's landform complex is recoverable; and there are technical, but not unresolvable, differences on the issue of drainage. But, as we have seen, there is a great divide on the issue of revegetation between proponents and opponents of restoration.

The Scientific Committee of Pedder 2000 intends to raise funds to examine unresolved restoration issues and has identified its research priorities as an investigation of revegetation methods; dewatering engineering and physical factors; draining implications; tourism, economic and employment impacts; environmental effects; power generation issues; legal issues and obligations; heritage values and impacts; and risk reduction strategies (Pedder 2000 1998). But it will be impossible to judge the prospects of restoration on these narrow grounds alone. The recovery of Lake Pedder would not only be one of the world's largest restoration exercises; it presents a vastly complex, contested, political and ideological challenge. There are issues of democratic principle, nature rights, political conservatism, technocratic dreaming and green revisioning at stake that are well beyond the scope of environmental and technical issues.

There would be, in conclusion, nothing typical in ecological restoration terms about the recovery of the lost Lake Pedder. In 1972, the world's first green political party, the United Tasmania Group, was founded in an effort to save it. The IUCN supports restoration, as do all manner of celebrities. Ecologist Tim Flannery sees Lake Pedder restored as the centrepiece of Tasmania's ecotourism industry. Film director Rob Sitch sees himself standing on Lake Pedder's restored beach one day. Author Richard Flanagan sees fighting for the lost Lake Pedder as fighting for a vision of what Tasmania could be. Thus far, most Tasmanians haven't seen it this way. They haven't revisioned their hydroindustrial past, even though they struggle with its debt burden today (Blakers 1994b). Pedder 2000 has recognized this, dropping their adversarialism and opting for education as a means of first removing the dam in the Tasmanian psyche (Gee 1999).

Acknowledgements

The author would like to thank the various reviewers of this article, anonymous and otherwise, for their insightful comments; and to L. Southwell for permission to reproduce his diagram of the Lake Pedder impoundment.

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