UTAS

School of Geography and Environmental Studies

3 March 2014

Committee Secretary
Senate Standing Committees on Environment and Communications
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Parliament House
Canberra ACT 2600

Submission to the Committee's inquiry into the natural world heritage values of the Tasmanian Wilderness World Heritage Area minor boundary extension and related matters.

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I question the quality of technical advice behind the decision to propose revocation of certain areas from the Tasmanian WHA. In particular, it would appear that an exclusively biocentric perspective has been adopted while overlooking the geodiversity and geoheritage values of areas contained within the areas involved and their relevance in terms of the World Heritage Operational Guidelines and Criteria. Geoheritage of World Heritage calibre warrants secure protection in formal protected areas because alternative protection measures are too insecure, and retention of World Heritage status is appropriate.

1. Inadequate recognition of World Heritage values

I will firstly illustrate some of my concerns by reference to the proposed revocation of the Navarre Plains (Figure 1), an area that is noteworthy for its glacial geomorphological phenomena, quite apart from any biological values that it may possess, and it's very considerable aesthetic values. However, my concerns are not confined to the Navarre Plains because what has occurred there is symptomatic of a wider failure to address geoheritage in the WHA.

Criterion (viii) under which properties may be inscribed on the World Heritage List recognises outstanding examples representing major stages of earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features. The geomorphological characteristics of the Tasmanian property are appropriately recognised under this criterion, including Tasmania's glaciated landscapes.

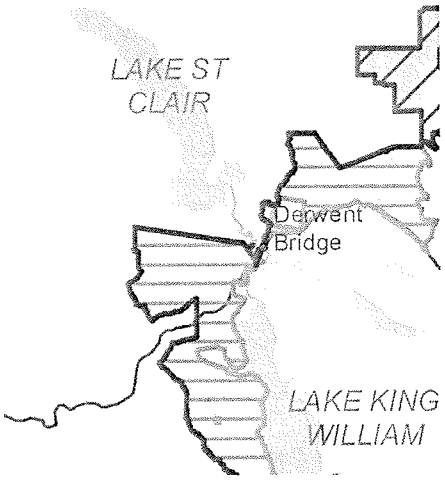

Figure 1. Location of the Navarre Plains

Let me first place the Tasmanian glacial record in global context:

1, The palaeoclimatic histories of northern & southern hemispheres differ (largely because northern hemisphere has more land and hence is more influenced by continentality). Hence, knowledge of the history of glaciation in the northern hemisphere does not provide sufficient insight into the events in the southern hemisphere, including Australia. Records are needed from both hemispheres to complement one another;

2. Terrestrial evidence of glaciation is much rarer in the southern hemisphere than in northern hemisphere because southern temperate latitudes are predominantly oceanic. There are few places where a terrestrial record can be obtained – SE Australia, New Zealand and the Patagonian Andes of South America. Glaciation of mainland Australia is confined to a few square kilometres only, the main evidence for this part of the globe comes from Tasmania;

3, Whether glaciation occurs is conditioned by the height of the host mountains, the taller the mountains the colder their upper reaches will be and the larger the glaciers that are likely to flow from them to leave a record of any cold phase in the adjacent lowland landscape. Both New Zealand and the Andes are tectonically very active and hence they are subject to very rapid mountain building processes and also rapid erosion processes. As a result, the record of glaciation in those places is complicated by the fact that the moraines left in the lowland landscape reflect not only regional temperature trends but also the height of the mountains at different times;

4. In marked contrast to New Zealand and the Andes, Tasmania is tectonically stable and has remained so for a very long time. Because the mountain landscape in Tasmania is relatively ancient the glacial record it provides allows insight into regional climatic trends through time without the complications of varying mountain height that confuse the New Zealand and Andean records. That makes the Tasmanian record globally outstanding;

5. The long term stability of the Tàsmanian mountains has also meant that very ancient glacial features have been preserved to a degree that has not occurred in the unstable mountains elsewhere in the southern temperate zone. (For example, Tasmania contains the only terrestrial evidence outside Antarctic for the initiation of glaciation in southern polar latitudes during the Oligocene);

Figure 2. End moraine ridges deposited by the piedmont glacier that flowed from Lake St Clair across the present-day Navarre Plains bear forest because they are better drained than the surrounding swampy outwash plains.

6. Furthermore, it is important to recognise that landforms are the product of three key things: the materials of which they are formed; the processes that act upon those materials; and time. Glacial landforms are not formed in similar rock types to Tasmania elsewhere in southern temperate latitudes and hence this too adds to their global significance, as does the time range of the Tasmanian record;

7. There are also many different types of glaciers. The Lake St Clair area is distinctive because it was the site of the only piedmont glacier to have developed in Australia. The morainic record left by that piedmont glacier is located on the Navarre Plains (Figure 2). Hence, the glacial landforms of the Navarre Plains represent a very distinctive and rare geo-species.

Therefore, the proposed revocation of the Navarre Plains from the WHA directly targets a site with very clearly demonstrable world heritage values from a geomorphological perspective. From the fact that revocation is proposed I can only presume that the officials or politicians responsible for proposing revocation of this area either haven't properly investigated the World Heritage values involved, haven't had sufficient expertise to recognise those values, or simply don't care. Revocation of this area is completely unacceptable.

2. Site disturbance and rehabilitation potential: a geomorphological perspective

The potential for damage to be caused to geoheritage is often misunderstood because the term "geo" tends to engender an impression that everything is made of solid rock and hence is unlikely to be vulnerable to any form of damage. However, much depends on the scale and composition of the landform involved. Table 1 illustrates some of this variation in vulnerability.

Because landforms are defined by their contours, then in objective terms any artificial change to those contours, at whatever scale, *by definition* constitutes damage to the geomorphology. If this occurs then evaluating the *significance* of that damage becomes the key issue (in terms of site value, the degree to which the value is compromised, and the potential for natural repair or assisted recovery) and it is only at this point that subjectivity legitimately enters the situation. As with biological species, some landform types are common and some are rare, some are robust and some are fragile.

Some landforms will be damaged by even moderate disturbance of the vegetation cover, others may be able to take one or two cycles of vegetation removal before being significantly damaged, and some large landforms formed of solid bedrock may be extremely robust unless subject to very high energy inputs such as are involved in open cut mining. There is also an important distinction to be made between landforms created by on-going geomorphological processes that may facilitate natural healing *versus* relict landforms produced by processes that are no longer active and hence where damage will be permanent (eg. landforms produced by cold climate processes earlier in the Quaternary, such as glaciation).

Some parties have argued that it is not appropriate to retain some areas in the WHA because they have already been subject to logging. To suggest that all value of these logged areas has been destroyed is inconsistent with the argument frequently mounted by logging interests that logging does no harm because everything will grow back. But my real concern here is that once again this seems to me to be an excessively biocentric perspective. I have seen no evidence to suggest that those espousing this viewpoint have given consideration to any perspective beyond the scenic value of forests and tall trees. What about the geoheritage upon which some of those forests grow? To fail to acknowledge and consider other natural values is in my view grossly neglectful and simply unprofessional. I urge the Committee to reject any such narrow minded, technically inadequate and unprofessional advice.

Table 1: Indicative vulnerability scale for geoconservation values, based on the intensities and patterns of disturbance entailed in particular land-use practices.

1. Values vulnerable to inadvertent damage simply by *diffuse, free ranging human pedestrian passage, even with care.*
   Examples: fragile surfaces that may be crushed underfoot such as calcified plant remains, or gypsum hairs in some karst caves that can be broken by human breath.

2. Values vulnerable to effects of more *focussed human pedestrian access even without deliberate disturbance.*
   Examples: risk of damage by entrenchment through the advent of pedestrian tracks, coastal dune disturbance; drainage changes associated with tracks leading to erosion by runoff; risk of damage as a result of changes caused by changes to fire regime; defacement of speleothems simply by touching their surface.

3. Values vulnerable to damage by scientific or hobby *collecting or sampling*, or by *deliberate vandalism or theft.*
   Examples: some fossil and mineral sites; karst caves.

4. Values vulnerable to damage by *remote processes.*
   Examples: hydrological or water quality changes associated with the clearing or disturbance of catchments; fracture/vibration due to blasting in adjacent areas (e.g. stalactites in caves); sites susceptible to damage if subsurface seepage water routes change due to creation of new fractures.

5. Values vulnerable to damage by *higher intensity shallow linear impacts*, depending upon their precise position.
   Examples: vehicular tracks, minor road construction; excavation of ditches or trenches.

6. Values vulnerable to higher intensity but *shallow generalised disturbance on site.*
   Examples: clearfelling of forests and replanting but without stump removal or major earthworks but possibly some light snig tracks; associated drainage changes.

7. Values vulnerable to *deliberate linear or generalised shallow excavation*
   Examples: minor building projects; simple road construction, shallow borrow pits.

8. Values vulnerable to major removal of geo-materials, or large scale excavation or construction.
   Examples: quarries; sites of large dam construction.

9. Values vulnerable only to very large scale contour change.
   Examples: mega-quarries

10. Special cases.
    Examples: erosion caused by sea level rise resulting from humanly-induced Greenhouse warming; sites where the *value* is rendered *inaccessible* through inundation beneath an artificial reservoir although the physical characteristics of the *site* may remain intact.

Notes:
- *each category of impact to which an individual site is vulnerable should be recorded for that site*
- *initial general indication of sensitivity is evident from the number of categories indicated*
- *individual category numbers provide a more detailed indication of the sorts of practices/disturbance patterns & intensities that may damage the values of a particular site*
- *this system is intended to provide an indication only and is not a substitute for the development of specific management strategies on a case by case basis.*

I would also draw the Committee's attention to events in the early 1990s when the quarrying of limestone near Exit Cave in the southern part of Tasmania's WHA was curtailed. Some millions of dollars of Commonwealth funds were subsequently expended undertaking rehabilitation works at the site in order to reduce the harm caused to the World Heritage values of Exit Cave (Figure 3), with good results. The damage that had been done to this site did not entail simply removing a veneer of trees from over the geoheritage, but instead the physical removal of a very large part of the hillside containing Exit Cave (Figures 3 and 4). Rehabilitation of areas that have simply been logged is a far less complicated matter. The Exit Cave matter has already set an obvious precedent concerning the practicality and worth of rehabilitating damaged sites in the WHA.

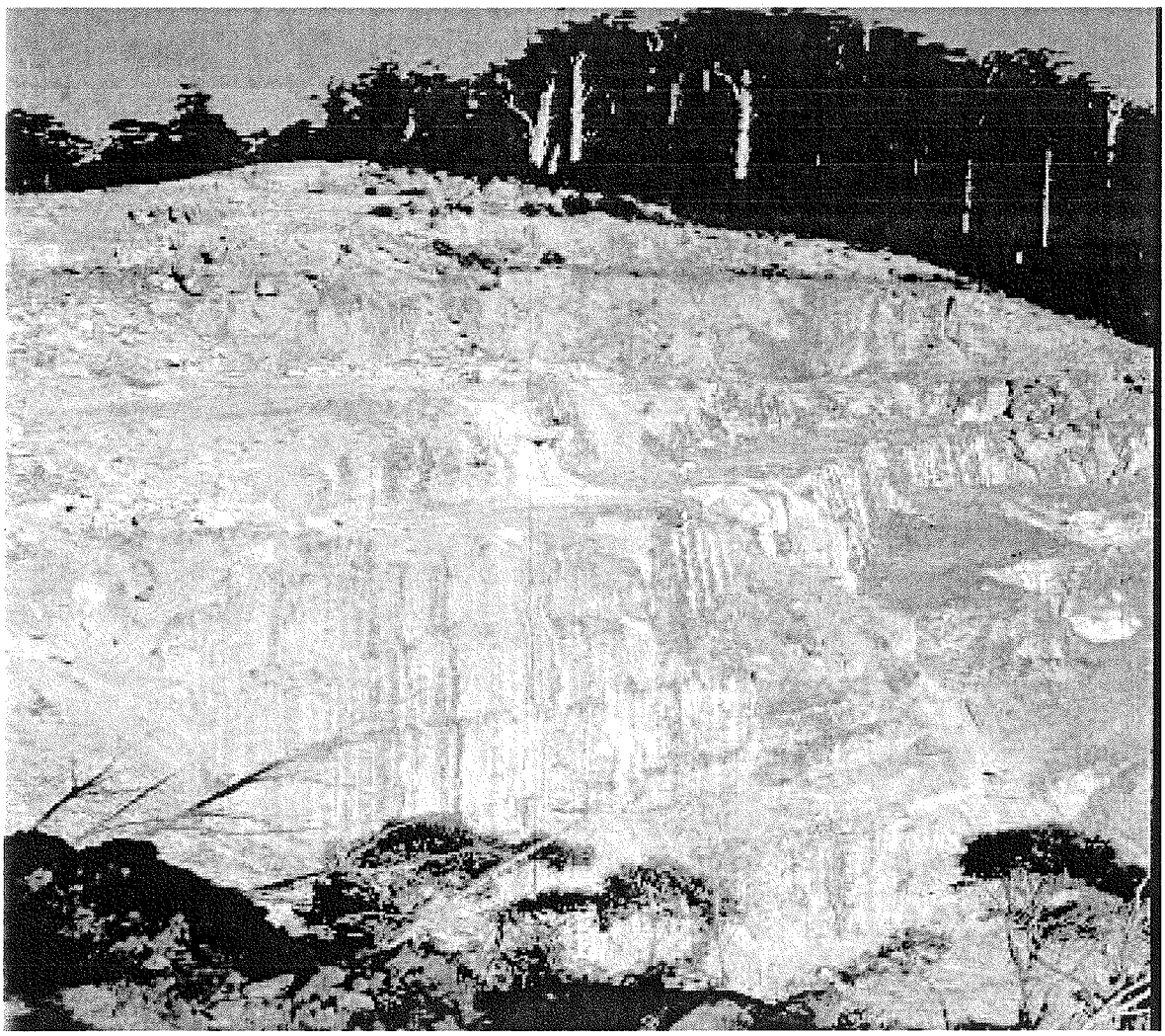

Figure 3. Exit Cave quarry, site of considerable Commonwealth expenditure on rehabilitation of WHA values despite much greater site damage than that caused by logging.

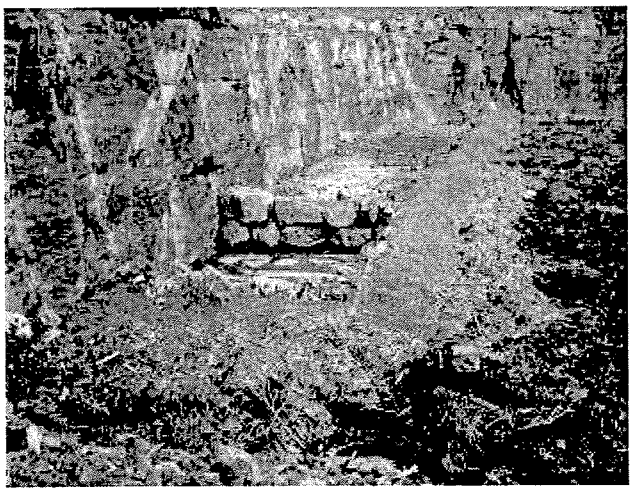

Figure 4. Rehabilitation works and progressive revegetation at the Exit Cave quarry. Although the hillside removed by quarrying cannot be replaced, the rehabilitation measures at the quarry have been highly beneficial to the World Heritage values of Exit Cave by reducing the influx of unnatural sediment and reducing adverse impacts on cave fauna.

2. Alternative modes of protection

It may be that those who are advocating revocation of parts of the Tasmanian WHA will argue that development might occur while still safeguarding key sites under other planning or legislative arrangements. I consider this unsatisfactory for locations of World Heritage significance, and doubly so given past failures in initiatives of this type.

a. Insecurity of informal reservation strategies

The Navarre Plains should have been included in the WHA long ago, but for political reasons they were not included. Earlier in my career I spent about 15 years employed in the Tasmanian forestry sector as Senior Geomorphologist with the old Forestry

Commission and later with the Forest Practices Board. In that capacity I was at one stage involved in discussions with the then District Forester with jurisdiction over the Navarre area. The situation was complicated by the need for a local timber source and the only alternative to Navarre Plains in the immediate area was said to be on an adjacent hill (above Bedlam Walls) where there was additional glacial material but less critical than that on the Navarre Plains.

The outcome of our deliberations was an agreement by the District Forester to log the Bedlam Walls ridge as a trade-off to allow protection of the Navarre Plains. But unfortunately when that District Forester moved on in his career, a stridently anti-conservation forester convinced his successor to remove protection from the Navarre Plains before any contrary viewpoint could be expressed. By that time the Bedlam Walls area had already been heavily logged (Figure 5). I regarded this at the time as a serious breach of faith a kind that does nothing to engender confidence in informal reservation or professionalism in forest area planning.

Informal reservation is fraught with the potential for such things to occur. Hence, I do not consider the geoheritage values of this area can adequately safeguarded other than by formal reservation, especially given that the calibre of the site is undoubtedly world heritage.

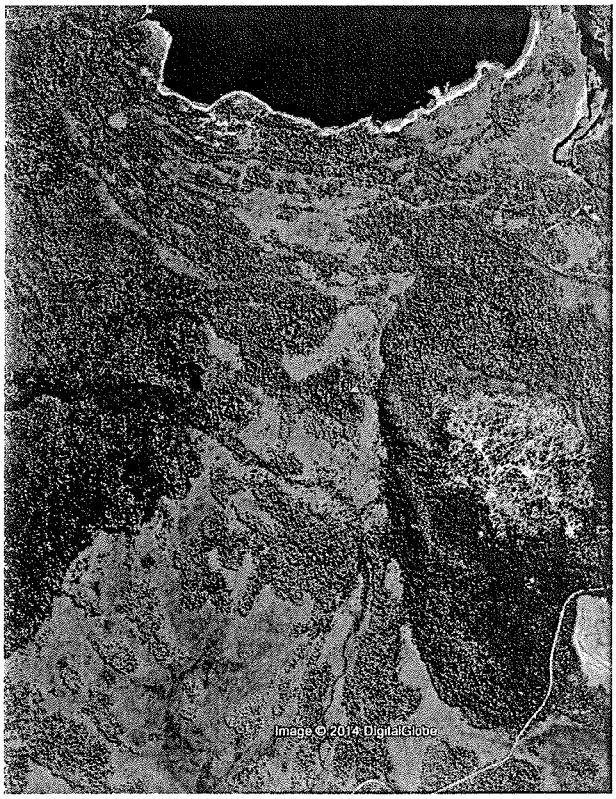

Figure 4. Logged area atop the glacially-over-ridden Bedlam Walls Ridge, adjacent to the Navarre Plains, is visible on the lower right hand sector of this image.

b. Inadequacy of Forest Practices Code for protecting World geoHeritage

Introduction of the Tasmanian Forest Practices system has undoubtedly led to major improvements in forest practices, and there have been some definite benefits for natural heritage conservation. However, my many years working with the Forest Practices Board also allowed me to see some serious failures of the system despite the best of intentions by some parties involved in it. Figures 5-7 illustrate a little of the impact of these on the karst geomorphology of the Florentine Valley.

Figure 5. Logging through sinkhole, Florentine Valley, Tasmania, 2002: This occurred despite the fact that the FPC (2000) and its companion "Operational Considerations in Sinkhole Management" both require that sinkholes be avoided in forest operations.

Figure 6. New road construction, Florentine Valley, Tasmania 2003, in breach of forest practices provisions:

- *"Roads will be located to avoid caves..." (FPC: 7)*
- *"New caves found during harvesting will be avoided & the CFPO advised as soon as possible (FPC: 37)*

Figure 7. Road constructed through sinkhole, Florentine Valley, Tasmania, 2002, in breach of forest practices provisions:

- *"Roads will be located to avoid.....sinkholes" (FPC:7)*
- *"Vegetation will be retained on the margins of sinkholes" (FPC: 14)*

Inadequate field supervision and auditing allowed these things to occur and no penalty was imposed, but of course no penalty would have undone the environmental damage caused by these lapses. That these breaches occurred leaves me with little confidence that Tasmania's forest practices legislation will provide sufficient safeguard for geoheritage sites if they are removed from the WHA. Notwithstanding the improved planning and management that has occurred since introduction of the Tasmanian forest practices system the potential for such lapses makes it inappropriate to rely upon it to protect geoheritage of World Heritage calibre. Formal reservation is required, and World Heritage listing is appropriate.

c. Fire management & geoheritage

It is also necessary that management of the areas proposed for revocation from the WHA is such as to ensure that adverse consequences of any unfortunate events that occur there do not spill over into the rest of the WHA. Fire management is an obvious case in point because serious damage can so easily be caused. The El Grande tree in the Florentine Valley provides some illustration of both the potential for damage to occur and the cavalier attitude of some managers of land near formal protected areas. The El Grande tree was 350 years old and 79 metres tall with a girth of about 20 metres. A few taller trees are known, but El Grande's total mass much greater (~439 m^3). It was believed to be Australia's largest tree and the largest known living thing in Australia. It was killed by a regeneration burn lit by Forestry Tasmania in April 2003. Forestry Tasmania dismissed their killing of El Grande as a disappointing "learning experience", it's General Manager of Forest Operations remarking only that "What we've learnt from this mistake is that single trees cannot be adequately protected in open harvested areas". Such an attitude from an neighbouring land manager is not reassuring.

A more relaxed approach towards fire management might be more acceptable if Tasmania possessed the area of natural vegetation that it once did, but so much has now been cleared that careful safeguarding of what remains is critical to retaining some botanical communities. But fire management also poses some significant issues for geoheritage protection. The massive Giblin River/Port Davey/Arthur Range fire a couple of years ago totally incinerated organic soils over a vast area, burning to bare bedrock and regolith and thus facilitating erosion of underlying mineral soils. Anthropogenic climate change may already be responsible for changing fire regimes that are resulting in increased soil and regolith erosion and resulting sediment transport along watercourses, implying damage to natural geoheritage, and the risk exists that this situation is likely to get significantly worse. Secure protection and management of areas around the borders of the WHA is essential to reduce the risk of fires damaging the core.

For example, the aeolian landforms in the area between Cockle Creek and South Cape Bay are particularly vulnerable in the event of severe wildfire. Proposed revocation of the area immediately upwind of them is of particular concern. Hence, quite apart from the importance of this area in scenic terms as a prominent part of the view-field for people walking the South Coast track there are also significant geoconservation reasons for disallowing logging there and retaining it in the WHA.

d. Revocations of national parks have already cost geoheritage dearly

Although logging interests frequently complain that timber is lost to conservation, the converse situation, when protected areas are revoked to allow access for logging, seldom receives any public attention. The most serious case from a geoheritage perspective was the revocation of the Florentine forests from Mt Field National Park in the 1950s. This erased protection from an area now known to contain some of the most significant caves and karst in Australia. Those who now suggest that only a small percentage of the upper Florentine forests are ear-marked for logging entirely ignore the fact that the vast majority of the valley has already been logged – and that now they are seeking even more from the precious little that remains. This remaining area includes some significant karst geoheritage, and also associated cultural heritage sites such as the Nanwoon Cave Aboriginal site.

Over 5, 500 ha of Tasmania's National Parks have been permanently revoked to allow logging. Although the smallest Australian state, Tasmania has revoked a greater area of its National Parks - in absolute terms (ie. in km^2), not just as percentage - than has any other Australian state. The area revoked from Tasmania's National Parks is possibly greater than the total area revoked in all other Australian states combined. Tasmanian revocations have been almost entirely to allow logging. These revocations have already cost Tasmanian geoheritage dearly, from the karst of the Florentine Valley to the glacial landforms in the revoked portions of the Hartz Mountains National Park. And this is without addressing additional situations where park status was not revoked but sites were destroyed anyway – such as the glacial landforms of the old Lake Pedder National Park drowned by dam construction and the waterfalls inundated in the Cradle Mountain Lake St Clair National Park as part of the Pieman River power development. Tasmania's World Heritage geodiversity and geoheritage are of World Heritage deserve much better.

Conclusion

The inadequate attention paid to geoheritage outlined in this submission extends far wider than the few examples I have chosen to illustrate. I have seen no evidence of geoheritage having been considered in any of the areas earmarked for revocation before that decision was taken by those promoting this step. In part this is symptomatic of an excessively biocentric perspective that is inconsistent with the World Heritage Operational Guidelines and selection criteria. I therefore urge the Committee not to support removal of these areas from the WHA given the complete inadequacy of the technical advice that lies behind the proposal.

In its final report issued in June 1995 the House of Representatives Standing Committee on Environment, Recreation and the Arts, Inquiry into the Proposal to Drain and Restore Lake Pedder, observed that "It is unfortunate that the beautiful, geologically unique lake was

ever flooded .... In future a much greater weight must be given to the preservation of ....geological diversity...". It would appear that as yet there has still been a very inadequate response to this conclusion, and that we are facing the risk of the same mistake being made yet again with respect to the Tasmanian World Heritage Area, and of a similarly lax attitude potentially adversely affecting other sites of natural heritage importance, including World Heritage Areas, elsewhere in Australia. Hence, I also urge the Committee to do its utmost to ensure that a far more professional approach is adopted henceforth to the assessment of impacts of proposed activities on world heritage values in Australia generally.

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