

TASMANIAN WILDERNESS: WORLD HERITAGE IN DANGER

A REPORT TO THE JOINT IUCN/WHC/ICOMOS MISSION, MARCH 2008.



Huon Valley Environment Centre Inc

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Executive Summary

Tasmania's western wilderness is one of only three great temperate wilderness zones on Earth (Periodic Report 2002. p.3). As a globally significant "benchmark", where features and processes of outstanding universal value are allowed to exist and evolve in a wilderness setting, its importance cannot be overstated.



The threatened North Weld forests. Snowy Ranges TWWHA in background.

However, large roadless natural areas containing the tallest flowering plants on earth, living fossils from the ancient Gondwana super-continent, some of the southern-most dated evidence for human occupation during the last ice age, spectacular and intricate geological formations, wild rivers and unique endemic species, have been excluded from the World Heritage property.

This extraordinary situation is an unfortunate legacy of past policy failures and political compromises. Such failures have bequeathed a number of management problems. Time is running out to rectify these issues.

Urgent action is required to ensure that the actual boundaries of the western Tasmanian wilderness are incorporated within an enhanced protected zone.

Once the protected area boundary has been consolidated along ecological and scientific lines, land use conflicts can be ameliorated.

The Huon Valley Environment Centre has consistently raised concerns to the IUCN, WHC and World Heritage Committee after monitoring and reporting upon risks associated with escaped burns and the degradation of pristine forested landscapes along the TWWHA boundary (see previous reports "Tasmanian Wilderness: World Heritage in Danger", "Crisis Report" and "Response to state party report WHC-06/30.COM/7B").



Old growth eucalypt cable logging, Arve Valley

Industrial activity along the boundary is causing tangible and demonstrable damage to the values of the TWWHA by degrading the vital wilderness quality which is a key element of the area's global significance.

The IUCN, the World Heritage Committee, the World Heritage Bureau, Tasmania's Parks and Wildlife Department, the Australian Heritage Commission and leading scientists have all argued that pristine landscapes adjacent to the TWWHA would make a valuable addition to the property and that encroaching industrial activity poses a threat to the values and integrity of the WHA. Yet the situation continues to deteriorate.

There is now an urgent need for decisive action on these issues. As the Operational Guidelines state: "the advice of the World Heritage Committee can often be decisive if it can be given before the property becomes threatened." (World Heritage Centre, 2005)

Drawing upon on-the-ground research, this report summarises key points of concern and details current logging plans. It specifically addresses the terms of reference for the current joint IUCN/ICOMOS mission by:

- Analysing and documenting key threats to the Outstanding Universal Values and Integrity of the TWWHA arising from logging activities including fire escape and road construction: and
- Outlining the heritage values of threatened forest ecosystems, which have been excluded from the TWWHA boundary to the east and north of the property.

Introduction

Current land use is posing a manifest threat to the values and integrity of the TWWHA and degrading contiguous landscapes with documented World Heritage values.

Along the eastern and northern boundary, industrial activity is penetrating ancient forested landscapes and roadless natural areas. In the southern area, covering the Huon district, this encroachment is of particular concern. The 2004 'State of the TWWHA' report notes that "Forestry activities [have] expanded into the southeastern border region of the TWWHA." (Tas. Parks and Wildlife Service, 2004 p. 29)

Large scale, commercial logging, road construction as well as mineral exploration and mining will damage and compromise key inter-related elements of the themes and values for which the Tasmanian Wilderness was endowed with World Heritage status.



Cable clearfell WR012C, Weld Valley

Reduction in wilderness quality and the degradation of viewfields from within the TWWHA pose a threat to the intrinsic values of the property.

Human encroachment on boundaries and the associated potential for incursion of fires, weeds, disease, poaching and illegal activity place the property in danger. Mineral exploration leases and industrial wood processing developments signal the possibility for heightened impacts along sensitive boundary areas.

The Tasmanian Parks and Wildlife Service, in its recent review of the TWWHA Management Plan, notes the incongruity between current adjacent land use and the values of the WH property: "Certain forestry activities conducted outside the WHA can have impacts inside the WHA (e.g. fire, impacts on river systems etc)," (Department of Tourism, Arts and the Environment. 2007 .p. 72)

However, The Australian Government, Tasmanian Government and local land managers have shown an unwillingness to implement adaptive management strategies to rule out these impacts. Current forestry management involves logging, road construction and burning directly adjacent to the TWWHA in a number of areas, and incursion into key natural buffer areas around the property.

The HVEC welcomes the recommendation of the World Heritage Committee to distance logging from the TWWHA boundary and to consider extending the area to cover valuable features and sites outside the current property. However, we note with concern that the state Party has demonstrated its determination to justify and facilitate increased access to areas along the boundary for logging and industrial activity, rather than to meet its requirements under the World Heritage Convention.

With major planned wood processing developments (such as the Gunns pulpmill in the North of the state and a proposed wood fired power station at Southwood, in the Huon Valley) as well as mineral exploration leases, time is running out to resolve these issues.

Current Landuse

The TWWHA was delineated with a sub-optimal boundary that excludes key interrelated features and ecosystems that would enhance the property and improve management (IUCN 1989, Tasmanian Parks and Wildlife Service 1990, World Heritage Committee 1990, 1994).

In particular, key river valleys containing outstanding examples of tall forest, wild rivers, karst and rainforest were excluded due to pressures from resource extractive industry. The TWWHA has largely relied on the naturalness of these adjacent unprotected forest areas to maintain integrity to date (Tasmanian Government, PWS. 1999. p. 92).

However, along large parts of the TWWHA boundary, there are no formal buffers established to maintain an appropriate interface between conservation and industrial activity. Industrial activity is now proceeding into these areas. This compromised and convoluted boundary has led to a situation where large-scale industrial forestry is occurring in pristine areas that are contiguous with (and surrounded by) the WHA and demonstrate many out-

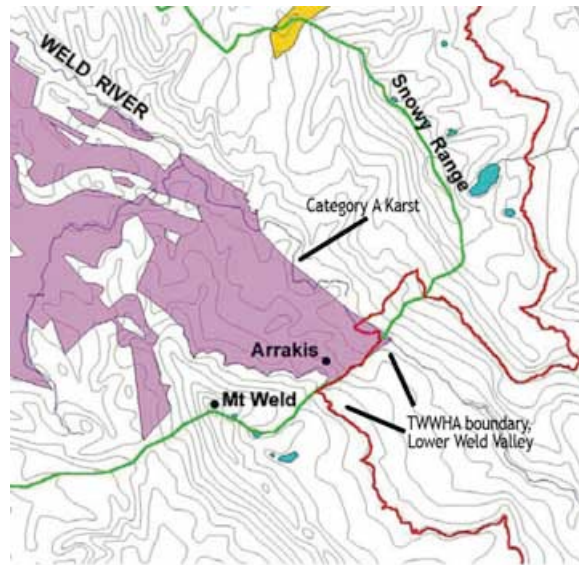


Industrial forestry, Picton Valley. Hartz Mountains TWWHA in background.

anding values which compliment landscapes protected within the WHA.

The current management of areas of heritage values currently outside the property is clearly inappropriate.

The State Party claims that 'buffers' have been incorporated *within* the TWWHA boundary to protect the OUV of the property. However, in many cases, features and sites of recognised World Heritage significance within the property directly abut State Forest zoned for logging. A case in point is the major Upper Weld Valley Karst area. This feature has been recognised as of OUV in its own right. However, there is clearly no 'buffer' incorporated *within* the boundary to protect this feature. The karst area and a major cave (Arrakis) directly adjoin and overlap state forest zoned for logging. Only buffers *outside* the current property can remedy this situation.



Weld Valley karst and the TWWHA boundary

The State Party Report suggests that the World Conservation Union IUCN, and other World Heritage bodies, have endorsed the current TWWHA boundary, determined following the September 1989 extension, and condoned industrial activities occurring in adjacent areas.

While extensions to the World Heritage property were supported by the IUCN, the inadequate and arbitrary nature of the boundary and the problem of logging in adjacent natural areas were noted in IUCN Technical Evaluations of the nomination, by the World Heritage Committee (December 1989) and in subsequent resolutions of the IUCN General Assembly (1990 and 1994).

The May 1989 Technical Evaluation noted that the TWWHA boundary 'does not follow natural features as is evident from its complex convoluted design' (IUCN, 1989). Despite subsequent boundary adjustments in the September 1989 nomination, this is still a valid criticism in many areas including the Lower Weld, the Middle Huon, the Styx valley, the Upper Florentine, Wylds Craig, the Counsel/Upper Derwent areas, Mt Wedge and the Navarre Plains.

In the October 1989 Technical Evaluation, it was noted that 'extractive forestry operations will occur outside the eastern boundary with clear-cutting, road-

building activity, the possibility of fire escape and reduction in visual quality and wilderness values.'

In entering the September 1989 nominated area on the World Heritage list, the World Heritage Committee noted that 'there were some small enclaves of publicly owned land with world heritage values currently excluded from the nomination and expressed the hope that these could be added on in the future' (World Heritage Bureau, December 1989). Most of these 'enclaves' remain unprotected and open to industrial forestry and mining activities.

These concerns were shared by the Tasmanian Department of Parks, Wildlife and Heritage (now Parks and Wildlife Service) which noted that the boundary was not adequate to ensure integrity due to its unnatural configuration and industrial logging activities occurring in adjacent wilderness areas, and that a more appropriate boundary would include extensions in a number of key areas identified by NGOs (Department of Parks, Wildlife and Heritage, 1990).

In 1990 and 1994 the General Assembly of the IUCN passed resolutions noting that wilderness areas identified by NGOs and in previous reports would add further old growth forest, contribute to integrity and simplify management of the TWWHA. It called for protection of all national estate areas contiguous with the current Western Tasmanian Heritage Site (IUCN, 1990).

Between 1993 and 1995, the issue of logging in wilderness areas adjacent to the TWWHA was raised in briefings to the Federal Environment Minister by the Commonwealth Department of the Environment, Sports and Territories, (Commonwealth Department of Environment, Sport and Territories, 1993) as well as in two reports prepared by leading Tasmanian scientists for the Federal Government (Kirkpatrick, J. 1994 and Blake, van Putten and Kirkpatrick, 1995). All identified logging in pristine forest adjacent to the TWWHA as a threat to World Heritage values and integrity and argued for enhanced reservation.

The World Conservation Union IUCN, World Heritage Committee, the Tasmanian Parks and Wildlife Service and leading scientists have all expressed concerns regarding the inappropriate configuration of the TWWHA boundary and threats to integrity, visual and wilderness qualities from industrial logging occurring in adjacent wilderness areas.

Policies and processes enacted subsequent to the declaration of the WHA, with the object of determining future land-use classification, employed flawed process and failed to identify and conserve many areas which warranted protection (Kirkpatrick, J. "Nature Conservation and the Regional Forest Agreement Process"). Processes and Criteria used to assess natural areas during the development of the Regional Forest Agreement (RFA) were fundamentally flawed. Leading Australian scientists have condemned the Tasmania RFA for failing to ensure an adequate reserve system. (ACF, TWS 2004. Attachment A)

In 1997, the IUCN noted that the allocation of public forest land for production and protection under the RFA had been made at a political level which did not meet IUCN aspirations on boundary improvements (SOC Report, 2007).

The 2005 "Tasmanian Community Forest Agreement" (TCFA) was also a missed opportunity to resolve land use conflict that was overriden by political imperatives and failed to employ scientific principles. Key areas such as the Lower Weld Valley were granted no additional protection, despite policy promises by the previous Coalition Government (The Howard Government 2004 Election Policy, A Sustainable Future for Tasmania). To compound the failure, \$20 million was provided to logging agencies to construct new roads into some of the last remaining natural roadless areas adjacent to the TWWHA.

Fifty six million dollars of taxpayer's funds was granted to the Tasmanian logging industry, ostensibly to assist with restructuring in the wake of the TCFA. The National Audit office has recently questioned the appropriateness of at least \$13 million of these grants. Grants were approved without sufficient documentation and transparency, sometimes without assessment by the federal bureaucracy, and without sufficient follow-up to ensure money was used for the intended purpose (The Mercury, February 29, 2008). Hence, the TCFA has aggravated the ongoing land-use conflict, rather than resolving it.

The State Party claims that State legislation, including the Forest Practices Code (FPC), protects the natural values of adjoining state forest areas. In reality, the FPC provides no protection for old growth forest values and has failed, in numerous instances, to ensure the protection of outstanding natural and cultural values (see NGO response to previous State Party report). The FPC has overseen the destruction of many of thousands of hectares of pristine old growth eucalypt and rainforest, largely for woodchips, in recent decades.



Southwood industrial site, Huon River



Old growth logging, Styx Valley.

This ecological impact is compounded by serious management deficiencies. RFA Forestry activities are exempt from the Federal Environmental Protection and Biodiversity Conservation (EPBC) act, as well as from standard State threatened species legislation.

Environmental legislation and Forest Practices prescriptions have not ameliorated impacts such as the "accidental" logging of pristine old growth forest in parts of a major formal reserve adjacent to the Hartz National Park (part of the TWWHA), in the Arve Valley which occurred in 2007 (Forestry Tasmania, 6 June, 2007) Seven hectares of old growth tall eucalypt forest contained within the formal Arve Loop Reserve were clearfelled, during cable logging operations. There is nothing to stop such 'accidental' breaches occurring in coupes along the TWWHA boundary, resulting in damage to the property.

The State Party claims that the delimitation of "Speciality Timber Management Units" (STMUs) in some areas along the boundary will safeguard the TWWHA. STMUs still involve extensive forest clearance, road construction and damage to wilderness and other natural values. State Foresters have expressed to Huon Valley Environment Centre members that they are not aware of a clear definition of what STMUs actually are (Personal communication with FPO Terrance Ware 27 July, 2007). There appears to be considerable ambivalence as to what actually constitutes an STMU.

Commitments regarding management of STMU have been diluted. Prior to the TCFA, 'clearfelling and burning' were 'specifically excluded from STMUs'. In 2004, STMUs were 'to be managed through partial harvest or selective systems'. The TCFA now only commits to 'management of selected areas of STMUs on State forest, for selective harvest of special species timber,' (Timber Workers For Forests, 2005).

State Party claims that no burning will be undertaken in STMUs are contradicted by on-the-ground activities. Coupes contained within areas designated as STMU in maps provided to the current mission by the State Party have and will be subject to burning (see photo of coupe WR017B).



Burnt "Specialty Timber Management Unit" logging coupe WR017B, Lower Weld Valley.

Huon Valley Environment Centre volunteers have raised this apparent contradiction with Forestry Tasmania staff, who have confirmed that only STMU's containing pure rainforest will not be subject to burning. STMU's containing Eucalypts will continue to be burnt. This includes the vast majority of STMU's along the South Eastern portion of the boundary, which include mixed old growth eucalypt and rainforest.

The State Party also appears to be seeking to deliberately mislead the current mission regarding the length and planning of 'North Weld Road'. The State Party report Attachment A states that "North Weld Road" is a 'small (1.4km) extension of an existing road' that has been "completed" in 2007, and will be no closer to the TWWHA than existing roads. Forestry Tasmania logging and roading schedules clearly show that "North Weld Road Stage 2" (1.5km) will be constructed this year, to the Weld River where a bridge will be constructed to access the North Weld area and coupe BB016E (Forestry Tasmania. 2007).

These documented plans are at odds with maps and information provided to the mission. Media statements by Forestry Tasmania have confirmed these plans. (The Mercury, January 6 2008). It is alarming that State Forest managers appear to be seeking to mislead the mission as to their plans for roading and logging in these critical areas adjacent to the TWWHA.

Encroachment of logging roads is also opening sensitive natural areas up to further industrial activity. Mining interests have already indicated that access via Forestry roads improves prospects for mineral exploration and mining.

1.0 Threats to the TWWHA

1.1 Fire escape

The single greatest threat to the outstanding alpine and rainforest vegetation communities protected within the TWWHA is fire (Balmer J. et al. 2004. p. 26).

Alpine and rainforest communities, and the World Heritage Values they support, have specifically evolved in the absence of fire over many centuries. In the 200 years since European settlement, Tasmania has lost large swathes of the alpine and rainforest communities which had evolved and persisted for millenia (*ibid*).



Fire sensitive alpine vegetation, Hartz Mountains.

The TWWHA was instituted partly to protect some of the remaining key areas of alpine and rainforest vegetation from human-induced fire damage. The TWWHA Management Plan (1999) states that fire management planning should ensure that: "fire is prevented from occurring in rainforest, alpine and sub-alpine vegetation and other fire-sensitive plant or animal communities" and that "wet forests are protected from fires so as to maintain the maximum area of forests as old growth."

Such protection can only be assured if fire is excluded from these sensitive areas. However, parts of the TWWHA containing fire-sensitive vegetation and covered by "fuel-stove only" prescriptions - barring camp fires

directly abut areas of state forest subject to logging and high-intensity burning. The practice of high-intensity and other burning in areas subject to logging in close proximity to the TWWHA poses a severe threat to these remaining vegetation communities, and the suite of species which rely upon them.

The Commonwealth Department of the Environment (1993), Professor Jamie Kirkpatrick (1994) and Blake *et al* (1995) have identified the practice of forestry burns as a threat to the integrity of the WHA, particularly where the WHA occurs downwind and/or up-slope from forestry operations.

After logging occurs, incendiaries are dropped via helicopter on logged areas. Very hot fire is generated, causing scorching of soil, hot winds and smoke plumes during high-intensity burning (used to regenerate eucalypt forest). Lower intensity fires are used in some selective logging coupes. Both types of fire are often left to smoulder for weeks after ignition.



Burnt logging coupe, left to smoulder, Little Denison Valley.

Such fires can and do escape the boundaries of their specific coupes. When coupes are situated close or adjacent to the TWWHA boundary, the threat to World Heritage values is exacerbated.

Since the 1989 extension of the TWWHA there have been numerous documented examples of deliberate or accidental fires started in logging coupes escaping and damaging adjacent forests, in addition to the Wedge Inlet fire which escaped into the TWWHA, burning some 157 hectares. Some of these fires have directly threatened or damaged the values and integrity of the TWWHA.

Location and date of fire	Area Burnt (ha)	Cause
Weld Valley (March 2004)	46	Escaped Regeneration burn- came to within 200 meters of WHA
Picton Valley (Jan 2003)	100 (+)	Spark from logging machinery- came to within 300 meters of the WHA
Saddleback (Jan 2003)	610	Spark from logging machinery
Huon Area (March 1998)	270	Escaped prescribed burn
Hopetoun (March 1998)	11	Escaped prescribed burn
Upper Styx (March 1998)	?	Escaped regeneration burn
Styx (March 1998)	1500	Escaped regeneration burn
Saddleback (March)	4741	Escaped regeneration

1998)		burn
Rebecca (Tarkine) (March 1995)	5000	Spark from chain-saw
Gordon (Feb 1989)	2160	Escaped regeneration burn- entered area nominated for WH
Lune River (Feb 1989)	1061	Escaped regeneration burn- entered area nominated for WHA
Clear Hill (Feb 1989)	2187	Escaped regeneration burn
Kermandie (Feb 1989)	148	Escaped regeneration burn
Esperance Coupe EP57/61	318	Escaped Regeneration burn
Hopetoun (Feb 1989)	173	Escaped regeneration burn

The frequency and extent of fires originating from logging and forest management activities is cause for concern, especially in areas adjacent to the TWWHA. As logging operations proceed closer to the TWWHA boundary in some areas—in steep, remote country with thick vegetation—the threat associated with burns escaping prescribed boundaries is exacerbated. In some cases, just metres of forest separate logging areas and burning activities from the TWWHA.

The State Party report acknowledges that 'there is a risk that fire may spread from State forest into the TWWHA,' and that 'fire is the major external threat that could affect substantial parts of the TWWHA,' yet it claims that this major risk is neutralised by modifying coupe boundaries and by 'the preparedness' of crews to fight escaped fires. However the regular occurrence of planned burns escaping and dama-



Burnt old growth forest, Picton Valley.

ging large areas of forest throughout the state demonstrates that boundary configuration and fire-fighting preparedness are inadequate and reactive tactics.



Escaped high intensity burn, coupe WR015B, Lower Weld Valley. Burnt to within 200m of the TWWHA.

Even when burns are contained within coupe boundaries, impacts from hot winds, soil damage and smoke can impact upon sensitive microclimates within and adjacent to the TWWHA (Threatened Species Section, 2006).

Burning can also increase threats associated with pathogens for example Myrtle wilt.

Key elements of the alpine and rainforest vegetation communities protected within the TWWHA are particularly sensitive to fire. One third of King Billy Pine populations have been eliminated by fire in just one period of 100 years. Large populations of other conifers, such as Pencil Pine, and deciduous beech have also been lost from the TWWHA by fire (Balmer J. *et al.* 2004. p. 32). Fire can also destroy areas of peat bog (Sharples, C. 2003. p. 110). Tracts of very sensitive alpine and rainforest vegetation occur in highland areas of the TWWHA in close proximity to areas where burning is taking place and where known fire-escapes have occurred.

Due to the scale and frequency of logging and burning operations, there is a high probability that further incidences of fire escapes will occur, with significant impacts.

1.1.2 Natural Wildfire

Wildfires caused by natural occurrence (such as lightning) have been a part of the evolution of the Western Tasmanian landscape over millions of years. Wildfires can cause damage to parts of the TWWHA. They are also essential to maintain some vegetation communities and biodiversity.

However, the increased frequency of human-induced fires in areas which have not been subject to wildfire for (in some cases) centuries, represents a

pronounced threat to the values of the property. Some rainforest and alpine areas in close proximity to State Forest production areas have survived for many centuries without fire. The maintenance of their outstanding values required total fire exclusion.

The management of recent natural wildfire outbreaks demonstrate the risk posed to the TWWHA from increasing the frequency of burns along the boundary outside the range of natural occurrence, in a context of changing climate, as well as the acute difficulty of responding to fires in inaccessible or remote terrain. The reality of steep and inaccessible terrain makes it virtually impossible to fight or manage fire outbreaks in many parts of the TWWHA.

The TWWHA Management Plan notes that the logistics of transporting fire fighting crews into remote locations limit the ability of the Service to suppress fires (Tasmanian Government, Parks and Wildlife Service, 1999. p107). Such difficulties mean that the protection of fire-sensitive communities throughout much of the WHA is "largely dependent upon chance." (*ibid*)

1.1.3 Climate and vegetation change - increased fire risk

The hotter, dryer weather induced by a changing climate will exacerbate the risk of fire escape and uncontrolled burns within the TWWHA. An increase in the number of days of high fire danger, dryer vegetation and aggravated fire conditions will make the task of reacting to fire events more difficult (Senator Ian Campbell, 2006). The drying out of forest and alpine environments during times of high heat and drought will make these ecosystems much more sensitive to fire escape.

The conversion of old growth eucalypt and rainforest communities along the TWWHA boundary to regrowth eucalypt, managed on shorter rotations, will also heighten fire risk, as younger, more flammable trees and understory replace the cool, moist microclimate maintained in older forests.

Logged areas and burnt coupe edges also open up adjacent forest, stretching into the TWWHA, to light and drying, further increasing the fire risk.

There is escalating risk and unpredictability as logging proceeds closer to the boundary; fire frequency, flammability and drying increase, and the climate continues to grow hotter and dryer.

1.2 Disease & Pest Incursion

The world-unique flora and fauna protected within the TWWHA face major threats from a number of aggressive diseases and pathogens. Logging, road construction and industrial activity adjacent to the boundary of the property is

aggravating serious threats to key species for which the Tasmanian Wilderness was endowed with WH status.

A number of unique, iconic species, such as the Tasmanian Devil, Platypus and frog species are currently suffering serious population declines and other impacts as a result of pernicious diseases.

While the TWWHA constitutes a "safe haven" for these species at present- due to its wilderness character and isolation- the incursion of industrial activity into unprotected natural buffer zones around the property represents a dire threat to the values of the WHA. Intensifying industrial activity along the TWWHA is likely to heighten the risk of disease transference into the area and aggravate pressures on threatened populations, as a result of habitat disturbance.

1.2.1. Tasmanian Devil

The Tasmanian Devil (*Sarcophilus harrisi*) is a unique endangered species endemic to Tasmania. It is the World's largest carnivorous marsupial and is a living relic of the ancient Gondwana supercontinent. The Tasmanian Devil is currently subject to a severe and unprecedented disease outbreak, The Tasmanian Devil Facial Tumour Disease (DFTD), which has led to a 90% population decline in some areas and 40% loss of the species across Tasmania (Tasmanian Government. Department of Primary Industries and Water. Tasmanian Devil Newsletter 2007).



Healthy Tasmanian Devil



Devil afflicted with Facial Tumours

The factors causing this unusual infectious cancer are uncertain, however human alterations and inputs into the environment have not been ruled out as a contributing factor. Recent research has confirmed unusually high levels of toxic, flame retardent chemicals (hexabromobiphenyl ether and

decabromobiphenyl ether) in Tasmanian Devils (Hansford, Dave. 2008). The disease is spread through contact between individual animals and specifically through the biting and fighting behaviour of the Devil (<http://www.tassiedevil.com.au/disease.html>- Mcallum, Hamish. et al. 2007).

At present, the TWWHA is a vital "safe haven" for this unique species. Some infected individuals have been found at the edges of the property, and a small number within the area. However the disease "front" has been roughly established just east of the current TWWHA boundary. The South West appears to be effectively free of the disease (see figure). Large, intact areas of unaltered natural ecosystems have, to date, been most resistant to the spread of the disease. It is believed that the disease is spreading in a westerly direction across Tasmania (State Party Report p. 16).



Current known extent of DFTD in Tasmania

If the DFTD continues to spread westward, the TWWHA will be faced with proven immanent danger of a serious decline in the population of an endangered species for which the property was legally established to protect, as a result of disease and man-made factors.

The increased incursion of logging roads, forest clearance and human access into unprotected natural buffer zones around the property places vital disease-free populations within the TWWHA at much greater risk.

Devils are known to utilise roads and clearings during their extensive foraging and scavenging activities. Individuals regularly travel around 50km in one night in search of food (McCallum, H. Jones, M. 2006). Juvenile Devils also travel and disperse from their original home range to establish new dens. Carcasses and "road kill" on access roads can also encourage devils to use roads.

The spread of logging roads, forest clearance and human activity into previously dense and thickly forested areas around the TWWHA will provide easier access to these areas for disease-affected devils along the disease-front and encourage more contact between animals and greater over-lap of home ranges. These factors will almost certainly contribute to greater transference of the DFTD to populations within the TWWHA.

Increased industrial activity in these adjacent areas, up to the boundary of the TWWHA could help to spread the disease and aggravate pressures on at-risk populations.

As human encroachment on natural areas around the boundary increases, it is only prudent to expect that the risk of disease transference will rise. Disturbance of habitat, vegetation removal and human encroachment along the fringes of the TWWHA are likely to impact upon the health and viability of populations of the species within and adjacent to the TWWHA. The precautionary principle demands that alteration of habitats and the encroachment of human activity into these areas should be limited.

1.2.2. Phytophthora

The plant pathogen *Phytophthora cinnamomi* affects native vegetation and especially buttongrass moorlands, leading to damage and alteration of natural plant compositions and habitat (Balmer, J. et al. 2004. p.45). The pathogen is known to spread via human activity including machinery movement. Soil and mud attached to heavy machinery and vehicles has been demonstrated to spread the plant pathogen phytophthora into undisturbed forest communities in Australia and America (Jules, 2002; Wills, 1993 cited in Pauza, M. and Driessen, M. 2008).

Washdown requirements are in place for logging operators transporting machinery and timber to and from logging coupes. Contractors are required to ensure that harvesting equipment is free of dirt, mud and other contaminants before being transported to logging coupes. However these prescriptions are regularly ignored and not enforced. In February 2007, the Wilderness Society reported a breach of the FPC and FPP in the Upper Florentine valley. Three machines were brought into pristine forest without being washed down. This is a regular occurrence, even in coupes next to the TWWHA (The Wilderness Society (Tasmania) Inc. Media Release, 2007).

Increased logging, machinery movement and human access along the fringes of remote and sensitive parts of the TWWHA could exacerbate the spread of this pathogen, damaging natural values in the area.

1.2.3. Frog Species

Species of endemic frogs which are amongst the World Heritage values of the TWWHA include the Tasmanian tree frog (*Litoria burrowsae*) Tasmanian froglet (*Crinia tasmaniensis*), brown froglet (*Crinia signifera*) and



Tasmanian Tree Frog

brown tree frog (*Litoria ewingii*). The highly virulent chytrid fungus is posing a severe threat to populations of Tasmanian frogs. The spread of the disease has been specifically linked to the construction of roads and human activity in previously undisturbed areas (Matthew Pauza, M. and Driessen, M. 2008).

Whilst a recent survey of the the fungus has found the TWWHA is relatively unaffected to-date, the disease has been found in the Central Highlands (Obendorf, D. 2005) and particularly in areas around the fringes of the property.

The disease was present in 52% of survey sites on the fringes the property. The disease was detected at 69% of State Forest survey sites, including State Forest areas covered in this report (Pauza, Mathew and Driessen, Michael 2008).

For all survey sites within and around the TWWHA, the presence of the disease was strongly associated with the presence of gravel roads. Areas of forested vegetation with gravel roads, in particular, showed a strong presence of the disease (Pauza, Mathew and Driessen, Michael 2008).

Anthropogenic processes, particularly gravel road construction and maintenance, are believed to be primary factors in the transmission of this damaging disease. (*ibid*)

The incursion of roads and logging into previously undisturbed natural areas in very close proximity - or directly adjacent - to the the TWWHA is likely to severely increase the risk of disease transference into the TWWHA. Transference of the disease would severely impact upon populations of endemic frogs which are a recognised World Heritage Value of the property.

1.2.4. Platypus

The Tasmanian platypus (*Ornithorhynchus anatinus*), one of only two known monotremes, is also currently threatened by a fungal disease (termed Mucormycosis). The disease causes ulcers and sores. The mode of transmission and impact of the disease is poorly understood.

1.2.5. Weeds and Pests

The TWWHA is characterised by largely unaltered and natural plant and animal communities. These communities embrace many species identified as features of OUV. Expanded road networks, clearance of natural vegetation, increased human activity, soil disturbance and "open slather" recreational use along the fringes of the TWWHA exposes the property, and its complex of naturally occurring species, to increased incursion by introduced pests, weeds and animals. Incursion can directly impact upon flora and fauna species of OUV as well as damaging the natural context in which they occur.

The incursion of introduced animals (in particular dogs and cats) into pristine natural environments around and within the TWWHA poses serious threats to the values of the property. The impacts caused by introduced cats, rabbits and rats on Macquaries Island (part of the TWWHA), provide a dramatic example of these threats (Tasmanian Government. 2007). Cats and dogs have caused demonstratable damage to other parts of the TWWHA including The Walls Of Jerusalem.

Escaped or deliberately released cats and dogs prey on native wildlife and spread disease in natural areas. Roads and vegetation clearance around the fringes of the TWWHA open the property up to incursion by these pest animals and to deliberate or accidental "dumping" of introduced species by humans.

Recent anecdotal reports from the Weld Valley include sightings of feral cats in rainforest areas on the newly constructed North Weld Road.

With a network of roads now providing virtual access to various remote parts of the TWWHA, the risk of pest animals entering and impacting upon the property is heightened. Forestry Tasmania's policy of allowing and actively encouraging recreational users to bring dogs and pets into sensitive areas around the TWWHA is irresponsible (<http://www.forestrytas.com.au/topics/2008/01/visit-the-weld>).

1.3. Unregulated access, poaching and illegal activity

Road construction, and vegetation clearance around the fringes of the TWWHA exposes large parts of the boundary to unregulated human access and mechanised access which facilitates illegal activity and poaching that can impact on World Heritage values.

The large, convoluted nature of the TWWHA boundary makes it hard to monitor and regulate all areas. In the past, large natural buffer zones in adjacent areas outside the property largely safeguarded WH values inside the boundary from deliberate or accidental human damage. However, multiple new roads and vegetation clearance occurring to within metres of the WHA boundary has created numerous unmanaged access points into remote and sensitive parts of the property.

These entrance points can be utilised to gain closer access to parts of the property not managed or regulated for recreation or human visitation. The 'State of the TWWHA' report notes that "unauthorised track cutting and/or marking causes direct impacts on vegetation and is also likely to be associated with unplanned increases in access to relatively pristine and remote areas, which in turn can give rise to a range of impacts," (Parks and Wildlife Service, 2004).

More concerning is the use of such access to facilitate illegal activity and/or poaching which can severely impact upon WH values.

A case in point is the vandalism and poaching occurring in the unusual and spectacular "crystal caves" in the TWWHA in the Lower Weld Valley. Crystals have been removed from the caves by poachers and rock collectors (Schapples, 2003 p. 69). While dense forest and steep terrain has, to date, provided some protection from unregulated access into the area, planned roading activities in the adjoining state forest would considerably improve access and facilitate further damage.

Poaching of Huon Pine, King Billy Pine and other plant species of World Heritage value is noted as the main ongoing illegal activity affecting the TWWHA (Parks and Wildlife Service, 2004). Organised poaching of Huon Pine is known to occur in the Southern Forests, mainly the Picton and Huon Valleys. Poachers rely on Forestry roads to access stands of these tree species. Extended networks of roading in areas alongside the TWWHA are likely to further facilitate access to stands of Huon Pine and make monitoring and enforcement more complicated.



Huon Pine, State Forest adjacent to TWWHA- Picton Valley.

1.4. Loss of wilderness

The undisturbed and unaltered nature of the TWWHA and the prevalence of large, uninterrupted natural vistas are key contributions to the area's World Heritage status. The TWWHA also relies on the remoteness and naturalness of its natural and cultural assets to maintain its integrity (Tasmanian Government, Parks and Wildlife Service, 1999. p. 92). The wilderness context of the property enhances the significance and security of the Outstanding Universal Values identified in the property.

However, in many areas, the boundary of the WHA does not protect wilderness even within the WHA. As industrial activity proceeds closer to the boundary, the wilderness quality of the property and the important wilderness context of its values, are inevitably downgraded. Logging and roading is also downgrading important wilderness quality in adjacent areas.

This gradual, but pernicious, loss of wilderness quality represents a degradation of the core values of the property as "the wilderness quality of much of the TWWHA is one of the over-arching themes for which the region was nominated for World Heritage listing (DASETT 1989, p. 27 cited in Schaples 2003. p.82).

A wilderness quality map prepared for the Tasmanian RFA shows areas of high wilderness quality extending beyond the current TWWHA boundary into unprotected state forest in various areas (TPLUC 1996). These roadless wilderness areas have contributed to the integrity and wilderness value of the TWWHA. Wilderness quality within the property is secured when adjacent roadless areas of high wilderness quality are retained. However, areas along the boundary which have been subject to logging evidence reduced wilderness quality. This loss of wilderness quality also extends into the adjacent TWWHA (see map in section 2.1.7.).



Roading into pristine tall eucalypt forest adjacent to the TWWHA, Lower Weld Valley



Logging road into wilderness forests, Esperance/Peak Rivulet area.

Planned roading and logging operations will see a significant reduction in wilderness quality in a number of key areas. For example, wilderness quality in parts of the Weld Valley within the TWWHA is rated as "high" (Wilderness Quotient (WQ) 12+), based on the 1996 mapping. High wilderness quality (WQ 14+) also extends into adjacent state forest, particularly in the North Western corner of state forest.

However, roading and logging has lead to a demonstratable loss of wilderness quality in the south-eastern portion of state forest in the Weld and a corresponding loss in adjacent parts of the TWWHA. A similar downgrading would be likely to occur if planned forestry operations in the North Weld proceed as planned.

The loss of wilderness quality in the TWWHA is exemplified and compounded by the damage to aesthetic values.

Natural, unaltered viewfields from mountain ranges and major vantage points within the TWWHA are an important World Heritage Value of the property. The TWWHA Management Plan (1999) states that: "it is important that the complete range of viewfields from distant vistas to foregrounds is carefully managed. Views out of the WHA , as well as within it, need to be considered..."



Pristine forests, Weld Valley- before logging.



Pristine forests, Weld Valley- after logging BB021C.

Current and planned logging and roading activities in adjacent areas will substantially degrade viewfields from the WHA, exacerbating the existing damage caused by logging activities to date.

Specifically, logging coupes and roading in the following areas will degrade viewfields in the TWWHA:

- Middle Huon Valley: logging and roading will impact upon viewfields from surrounding ranges.
- Lower Weld Valley: encroachment towards the WHA particularly in the North Western extent of State Forest will reduce wilderness quality and impact on viewfields from adjacent ranges.

- Snowy Ranges: logging will degrade viewfields from a popular visitor area in the TWWHA
- Upper Florentine: Logging will damage viewfields from ranges such as the Thumbs and Needles.
- Counsel/Upper Derwent: Roding and logging intrusions will damage wilderness values inside the WHA. Coupes could substantially degrade the viewfield of Mt Hobhuse and Darkes Peak.
- Esperence/Hastings/Lune River: Logging and roading will degrade viewfields from WH mountains such as Adamson's Peak and Southern mountain ranges.
- Catamaran: Logging will degrade viewfields from southern mountain ranges.
- Picton Valley and Hartz Mountain slopes: logging will degrade viewfields from Hartz Mountains.

2.0. Values of Adjacent Areas

As the IUCN and World Heritage Committee has consistently noted, there are "enclaves" of land consisting of natural roadless areas outside the current TWWHA which, if included in the property, would add to overall value and improve management (World Heritage Committee, 1989). Many of these areas contain features, sites, processes and ecosystems which represent key elements of the Outstanding Universal Values protected within the TWWHA.



These "enclaves" constitute important parts of Tasmania's wilderness which have been excluded, and remain excluded, from the World Heritage Area due to pressure from resource-extractive industries.

Many of these areas retain high wilderness quality and contribute materially to maintaining the wilderness quality of the adjacent TWWHA.

Many of these areas also have documented World Heritage values. Specific natural areas and their World Heritage values have been identified and documented by NGO's (The Wilderness Society), the IUCN (Technical Evaluations- 1989), the Tasmanian Parks and Wildlife Service (1990) and Australian scientists (Blake, Van Putten and Kirkpatrick, 1995).

These remaining, high-value adjacent areas represent opportunities to significantly improve the integrity of values and management for the TWWHA.

By incorporating more of the key interrelated elements of identified World Heritage values and consolidating the boundary along ecological parameters, an extended protected area in the Southern Forests would add to the integrity of the values and management of the TWWHA.

Threatened forests of World Heritage value immediately adjacent to the Tasmanian Wilderness World Heritage Area include:

- parts of the Great Western Tiers and Upper Mersey;
- the Navarre forests near Lake St Clair;

- the Derwent / Counsel River areas south of Lake St Clair;
- the forests of the lower Florentine and Blue Creek at the foot of Wylde's Craig;
- the Upper Florentine Valley;
- Mt Wedge;
- Forests adjacent to the Mt Field National Park;
- The Styx valley;
- The slopes of the Snowy Range;
- The Weld Valley;
- The Middle Huon;
- The Picton Valley;
- The Lune / Hastings / Esperance area.

2.1. Natural Values

2.1.2 Tall Eucalypt Forest

Tasmania boasts the world's tallest flowering plants and the largest hardwood trees on Earth. In intact old growth forests, mighty specimens of *Eucalyptus regnans* (Swamp Gum), *Eucalyptus obliqua* (Stringybark) and *Eucalyptus delegatensis* (Gum topped Stringybark) can tower over 80 metres in height and reach over 280 cubic metres in volume.

These tall forests have been deemed of Outstanding Universal Value and World Heritage value under Natural criteria (iii) and (ii). They represent the most outstanding development of the distinctly Australian eucalypt ecosystem.

However, large tracts, containing some of the best examples of these forests, lie outside the current TWWHA boundary and face destruction by industrial logging operations. "Most tall forests with immensely tall trees (> 75 m in height) occur outside the TWWHA boundaries with only four tall forest areas known within the TWWHA and one other area in a National Park" (Balmer, J. et al. 2004).



Tall eucalypt forests (green) and the TWWHA boundary.

There are documented and infamous examples of the failure of Forestry Tasmania's "Giant Tree policy" and the Forest Practices Code to protect the trees concerned, including:

- El Grande—Australia's most massive known tree—killed by a forestry burn within a few kilometres of the TWWHA in 2003;
- Giant Blue Gums discovered by a giant tree enthusiast at the edge of a clearfelled area on the slopes of the Snowy Range, a few kilometres from the TWWHA. The adjacent logging operation may have destroyed trees equal or taller in height and posed damage to the retained blue gums;
- Gandalf's Staff in the Styx Valley - remained threatened by logging for two years after it was first brought to the attention of Forestry Tasmania.
- El Maestre: a giant *E. regnans* in the Arve Valley, burnt and damaged by an escaped logging burn.



Giant Blue Gums, Snowy Range



El Maestre, Arve Valley

The current WHA excludes key interlarded parts of the outstanding tall eucalypt forest ecosystem. In some cases, illogical contour boundaries have specifically excluded lowland areas containing the most outstanding examples of tall eucalypt forest. Excising valley forests has also severed the important connectivity and transition between lowland eucalypt forests, rainforests and alpine vegetation on higher slopes.

This is a serious failing in integrity. Extending the protected area in the Southern Forests would improve the integrity of tall forest values.

These tall forests are also host to a range of threatened species, karst formations and other features of World Heritage significance. They also demonstrate the striking interaction between relict gondwanic rainforest species and more recently evolved tall eucalyptus forest.

Adjacent areas demonstrating the tall forests value include:

- Weld Valley Forests

Large, pristine tract of wilderness old growth tall eucalypt forest on steep slopes beneath World Heritage Area in vicinity of Mt Weld and Snowy Range. Pristine lowland tall eucalypt alongside wild Weld river overlaying karst formations. Exceptional natural beauty of tall forests interacting with well developed rainforest and aesthetic features such as waterfalls.

- Upper Florentine Forests

Possible best expression of the Eucalypt sub-theme. Exceptional diversity. Characterised by three dominant overstorey species: *Eucalyptus regnans*, *Eucalyptus delegatensis* and *Eucalyptus obliqua*. Important habitat for in-situ conservation of *E. delegatensis* tall eucalypt forest ecosystem (RFA World Heritage Expert Panel, 1997).

- Styx Valley Forests

A diverse mosaic of old growth and regrowth tall eucalypt forest and temperate rainforest over maximum local altitudinal range and in a substantially intact condition. The Styx valley represents easily the greatest concentration of officially recognised 'giant' tall eucalypt trees in the World.



Giant Eucalypts, North Weld area.



Old growth tall eucalypts, Esperance area

- Upper Derwent and Counsel River Forests: Represents the development of tall eucalypt forest near its altitudinal limit in Tasmania and its direct connectivity with tall eucalypt forests at lower elevations.

- Esperance/Hastings/Lune River Forests: Southern extremity of undisturbed tall old growth obliqua forests.

- Picton Valley Forests
Intact stands of Tall old growth eucalyptus forests beneath Hartz Mountains, Mount Riveaux and Mount Picton.



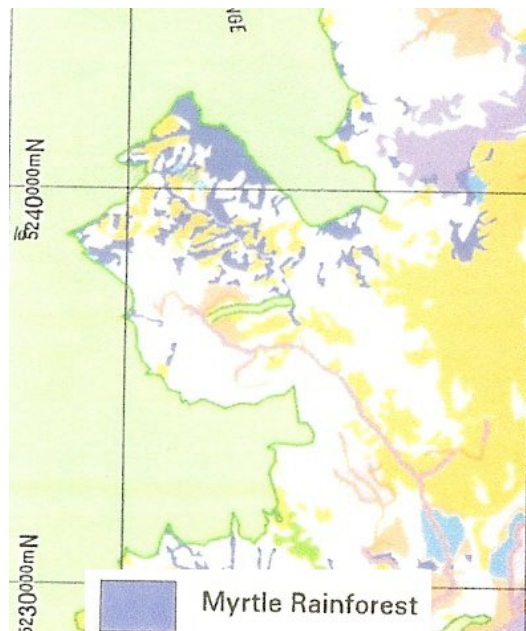
Threatened tall eucalypt forests, Picton Valley.

- Middle Huon Valley Forests
Large stand of tall eucalyptus alongside Huon river and overlaying major karst formations - *Eucalyptus obliqua* forest with a range of age classes.
- Snowy Range Slopes
Old growth tall eucalyptus interecting with gondwanic rainforest and alpine conifer species of World Heritage significance (ie King Billy Pine).

2.1.3. Temperate Rainforest and Relict Gondwanan Biota

Tasmania is home to an array of endemic flora and fauna demonstrating links with ancient Gondwanan biota. These lifeforms constitute outstanding examples representing a major stage of the Earth's evolutionary history.

Various species - and rainforest communities in particular - represent unique "living fossils" of scientific importance and exceptional natural beauty. Temperate rainforests are host to a range of species of Gondwanan origin. Fauna species of Gondwanan origin also flourish in areas of undisturbed tall eucalypt, heath and moorland as well as riverine ecosystems.



Temperate rainforest, Lower Weld Valley

The current TWWHA boundary does not ensure the integrity of this important World Heritage theme. Some of the best examples of well developed temperate rainforest and other habitat for biota with Gondwanan links are currently excluded from the property. These areas are currently subject to penetration and degradation by forestry, mineral exploration and other threatening activities.

Key areas of well-developed/high quality rainforest have been excluded from the property. Pure myrtle rainforests on the steep, south-western slopes of the Snowy Range in the Weld Valley, have been excluded by an anomolous boundary. Higher altitude mixed forest on the eastern slopes of the Snowy Range - containing endemic long-living conifers of gondwanan origin - faces ongoing destruction. King Billy Pines have been logged and burnt in this area in recent years (see photo under Denison map in Attachment Document).

The valleys of the Huon and Picton contain remnant stands of the exceptional Huon Pine (one of the world's longest living tree species), but are also subject to encroaching industrial activity.

Other adjacent areas containing significant stands of intact temperate rainforest and relict Gondwanan biota include:

- Mt Wedge forests;
- Navarre Plains area;
- Upper Florentine forests;
- StyxValley forests;
- Peak Rivulet/Esperence forests



Open rainforest, Lower Weld Valley

Many of these areas also demonstrate the ongoing interaction and co-evolution of Gondwanic species and Tall eucalyptus ecosystems.

Whilst outside the scope of this present report, some of the largest and most well developed stands of pure temperate rainforest occur outside the TWWHA to the west and North of the property. As a review of the floristic values of the TWWHA explains: "The largest stands, and arguably therefore the most

superlative examples, of [myrtle rainforest] are currently outside the TWWHA boundary on Mt Murchison, Mt Dundas and the Tyndall Range. However, these stands are not in secure reserves and are subject to mineral exploration." (Balmer J. et al. 2004. p. 17)

Important habitat for unique and sensitive fauna species demonstrating Gondwanan links also occurs adjacent to, but outside, the current boundary. This habitat is subject to degradation by logging and other industrial activity, as well as impacts from the incursion of diseases and pathogens.

Forests outside the current boundary are important habitat for the following species:

- Little Denison Burrowing Crayfish (*Engaeus spinastacoides* or *Ambrastacoides*)- newly discovered, rare local species found only in a limited number of catchments in the Little Denison and Weld Valley.

- Monotremes including Platypus (*Ornithorhynchus anatinus*) and Echidna (*Tachyglossus aculeatus*) - wild rivers flowing through unprotected forest including Weld, Styx, Derwent, Florentine, Huon and Picton are especially significant habitat for the Platypus which is now threatened by a fungal disease.



Platypus

- Threatened marsupials with Gondwanic affinity: Tasmanian Devil, Spotted Tailed Quoll. Unprotected forests including Weld, Florentine, Huon are important natural buffer zones for slowing the westward spread of the Tasmanian Devil Facial Tumour Disease in the TWWHA.



Spotted-Tailed Quoll

- Indigenous Frog species with Gondwanan origin. Highland areas such as the Navarre Plains are important habitat for the Tasmanian tree frog (*Litoria burrowsae*), now threatened by the amphibian chytrid fungus. Pristine ponds creeks and streams in unprotected forest provide habitat for Tasmanian Froglet (*Crinia tasmaniensis*), Brown Froglet (*Crinia signifera*) and Brown Tree Frog (*Litoria ewingii*).

- Tasmanian Cave Spider (*Hickmania troglodytes*), found in karst areas in unprotected forests in the Weld, Huon, Florentine and other areas.
- Invertebrates, including moth species. Research has demonstrated significant decline in abundance and diversity of moth species after logging in old growth forest in the Weld Valley (Green, G. Gray, A. McQuillan, Dr. P. 2004.).

Many of the Tasmanian relic gondwana fauna species face serious threats as a result of diseases and pathogens (Tasmanian Devil, Platypus, frog species), habitat loss (Swift Parrot, Spotted Tailed Quoll), land clearing activities and forestry (freshwater crayfish species).

Adjacent areas containing habitat for these key species should be preserved to help ensure the perpetuity and integrity of the relict gondwanan biota.

2.1.4. Geology and Geomorphology

Geological, geomorphological and karst features within the Tasmanian Wilderness have been deemed of World Heritage value according to natural criterion (i), (ii) and (iii). They are also integral to the presence and maintenance of cultural values. Individual sites have been recognised as of World Heritage value in their own right, but more commonly, assemblages of interrelated features and processes, have been recognised as themes of Outstanding Universal Value (OUV).

In many cases, key interrelated elements of these assemblages are excluded from the TWWHA, despite their obvious connection with features and/or processes protected within the property. Adjacent areas contain geological features and processes which compliment and connect with features protected inside the property and would contribute to the theme of OUV.

Failure to include outlying but connected sites and features represents a failure to ensure integrity. Interrelated features, which would enhance the total value, have been excluded. There is thus a deficiency in the integrity of the TWWHA with respect to geological values.

A 2003 review of the Geoconservation values of the TWWHA prepared for the Tasmanian Government has identified a number of geological sites and features which "contain important exemplars and/or extensions of features contributing strongly to World Heritage geoconservation themes in the existing TWWHA." (Schapples, C. 2003).

The report notes that "the TWWHA boundaries do not encompass several major aspects of Tasmanian karst diversity which if included would potentially enhance the value of the Diverse Karst Landform and Process Systems World

Heritage theme." Adapted management and possible inclusion within extended TWWHA boundaries have been suggested for these sites.

A number of the sites identified by Schapples (2003) are in State Forest adjacent to the TWWHA and subject to or in close proximity to logging activities.

Features of Geoconservation significance occurring in unprotected areas to the east and north of the TWWHA include:

- Riveaux/Mt Picton Karst
An extensive, well developed karst system in State Forest in the Middle Huon Valley, including several large caves, in undisturbed old growth forest. A Forestry road has been constructed over the karst area, requiring rehabilitation.



Cave opening, Riveaux Caves

The 2003 report also notes that *"the Mt Picton Riveaux dolomite / limestone karst region has potential for an unusual scale and diversity of karst phenomena in an undisturbed geomorphic process environment, making the World Heritage values of the area very significant under all Karst themes and sub-themes (Section 3.2.2),"* and *"the undisturbed nature, significant extent and contents of the Riveaux karst and catchment, and its proximity to the recommended Blake's Opening TWWHA extension (Section 3.3) means that the karst contributes significantly to karst World Heritage themes of the adjacent TWWHA."*

There is the possibility of a *"direct subterranean hydrological link between the Riveaux limestone and Blake's Opening dolomite karsts, such that disturbances in one of these karsts could be transmitted directly to the other by subterranean karstic hydrological connections."*

- Junee River karst System
One of Tasmania's largest and most important Ordovician limestone karst systems, the Junee Karst system (Eberhard 1994) which includes Australia's deepest cave (Niggly Cave 375 metres depth), is situated

partly in State forest and partly in the Mt Field National Park, immediately adjacent but outside the TWWHA.

- Eddy Creek Karst (Weld Valley)

An unusual marbelised karst system extends from the Weld River up the Eddy Creek valley almost adjacent to the TWWHA beneath the south-eastern flanks of the Snowy Range. The karst occurs in roadless natural State Forest area contiguous with the TWWHA, but zoned for wood production. While exploration of the area to date has been limited, initial research suggests that the area is of high geoconservation significance.

Sharples maps Precambrian dolomite extending from the Weld River up the Eddy Creek valley to within a short distance of the TWWHA boundary.



Cave opening, Eddy Creek Karst



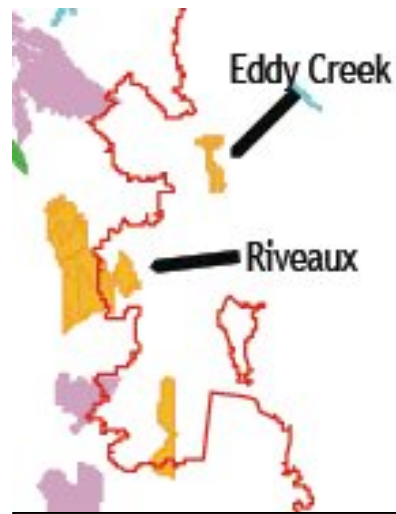
Outcrop, Eddy Creek area

Several cave entrances, dry valleys, areas of dolines and other karst landform features were discovered and documented during recent field trips to the area. (Cracknell, Matt. February 2007).

Cracknell (2007) reports that: *"Marble karst features are very rare in Tasmania. The Eddy Creek karst may be one of a kind; the author has not as yet come across any other references to karst bedrock of this type in Tasmania. The dolomite in the Eddy Creek area may have been metamorphosed to marble during and after Jurassic intrusive activity. This karst area could potentially host hydrothermal silica deposits similar to the ones found in small caves situated in the Mt. Weld and Hastings karst areas"* (Sharples, 1994).

The Alluvial deposits on the valley floor may be of glacio-fluvial origin (Kiernan, 1987 in Sharples, 1994) and there is potential for glacio-karst interactions (Sharples, 1994).

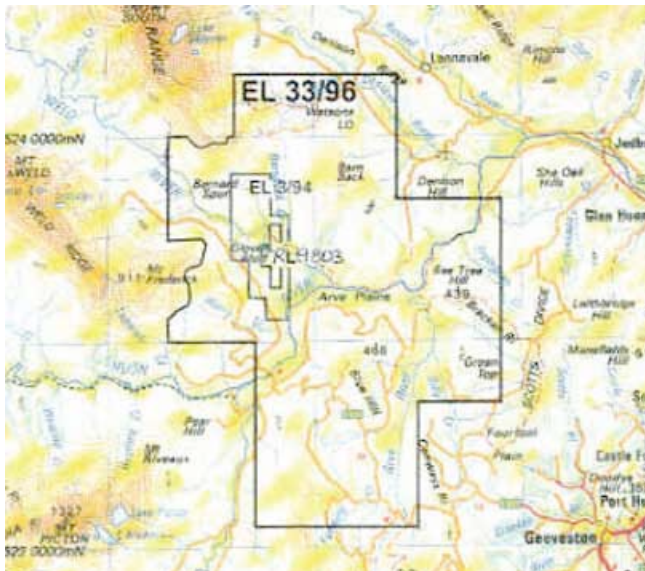
Cracknell notes that *"further investigations and reconnaissance are needed to determine the extent of metamorphosed carbonate bedrock in the Eddy Creek area and its associated karst drainage. This will ensure the future conservation and protection of the unique, unusual and relatively unknown Eddy Creek karst."*



Location of Eddy Creek and Riveaux Karts and TWWHA

The Eddy Creek Karst complex constitutes an unusual and possibly unique geomorphological feature in a largely unaltered setting in close proximity to the TWWHA. It this represents a significant omission from the TWWHA in terms of geoconservation.

Unfortunately, the entire extent of the Eddy Creek Karst is currently encompassed by a Mineral Exploration Lease, which has been recently extended by the Tasmanian Government (Department of Economic Development, 2007). Mineral exploration activities and mining will irreperably damage the values of this sensitive area.



Mineral Exploration lease covering Eddy Creek Karst

Eddy Creek/Glover's Bluff also includes a strike ridge, through which the entire Weld River flows. It is a visually striking geological feature, rare so far east, which comprises button grass moorland embedded in rainforest and tall eucalyptus (Tasmanian Natural Values Atlas).

Weld Vally precambrian dolomite (known or likely to be intensively karstified) also extends beyond the current TWWHA into the western extent of unprotected State Forest in the Lower Weld (Schapples 2003).

Schapples (2003) notes that forestry impacts may damage karst systems in a variety of ways. Mechanical disturbance and impacts on water catchments of karst systems can damage these sensitive environments.



Glover's Bluff, Strike Ridge

Features of geoconservation significance in unprotected areas adjacent to the TWWHA have already been subject to disturbance and degradation as a result of industrial logging activities. In 1998-99, for example, Forestry Tasmania built a logging road just metres from the entrance of a streamsink swallet in the Middle Huon (Riveaux Karst) area which was part of a complex of sensitive karst formations. Soil disturbance has led to silt and mud run-off into the karst and remedial work is inadequate (McKinnon Janine, 2002). Future planned logging activities could directly damage karst and will degrade the integrity and wilderness setting of these important features.

Geomorphological formations and karst features are also important for the maintenance of other World Heritage values, such as cultural heritage and threatened species.

2.1.5. Habitat for Threatened and Unique Fauna and Flora

Unprotected natural areas adjacent to the TWWHA contain key remaining habitat for threatened, rare and unusual species of plants and animals. Habitats of World Heritage value, housing threatened, rare and unique fauna and flora stretch beyond the boundaries of the current TWWHA in many areas.

Unfortunately, key areas of habitat outside the property are immediately threatened by large scale commercial logging and other industrial activity. These activities will degrade the habitat value of remaining natural roadless areas and impact upon populations of threatened, rare and unique species.

Research demonstrates that logging undisturbed tall old growth forests leads to a significant decline in biodiversity. Specifically, dramatic reductions in the diversity of macrofungi have been recorded between mature wet eucalypt forest (248 species) and young regeneration forest (131 species) in the Huon Valley (Gates G.M, Ratkowsky D.A and Grove S.J, 2005). Similarly, reductions in the diversity of Moth species (Green, G. Gray, A. McQuillan, Dr. P. 2004) and plant

species (Hickey, J. 1994) have been demonstrated. Logging activities degrade the habitat value of natural forest areas by reducing biodiversity, as well as directly impacting upon species of conservation significance.

In 2006 the Australian Federal Court ruled that forestry operations occurring in state forest in the Wielangta area had been carried out otherwise than in accordance with the RFA. The Court found that these operations will have a significant impact on threatened species including the Wedge-tailed Eagle, Broad Tooth Stag Beetle and Swift Parrot (Federal Court of Australia. 2006). The Wielangta trial has exposed major deficiencies in the workings of Australia's endangered species laws as they apply in native forests subject to logging operations. Threatened species management in Tasmania has been poorly coordinated.

Specific species of conservation significance that utilise natural areas adjacent to the TWWHA include:

- The Tasmanian Wedge Tailed Eagle: Australia's largest Raptor. Listed as endangered on State and Federal Registers. Relies on old growth and natural forested areas adjacent to and within the TWWHA for nesting habitat. Wedge-tailed eagles nest only in old-growth trees in native forest, well away from disturbance. About 80% of eagle nests occur on private land or State forest with few being protected in formal reserves (Bryant and Jackson 1999). Logging results in loss of nesting and hunting habitat.



Tasmanian Wedge-Tailed Eagle

- Tasmanian Devil: World Largest Carnivorous Marsupial. Listed as endangered. Widespread but faces dramatic impacts from Facial Tumour Disease. The current disease front has been identified just west of the current TWWHA boundary. Logging and road construction eliminates den sites and may contribute to spread of the Tumour Disease.
- Spotted Tailed Quoll: endangered forest-dwelling marsupial species, most abundant in higher rainfall areas containing rainforest, wet forest and blackwood swamp forest. Logging eliminates den sites and diversity of prey.

- Grey Goshawk: endangered pure white bird of prey, distinct from mainland grey goshawk by its pure white feathers. The grey goshawk hunts and nests in all types of wet forests, including rainforest, mixed forest and blackwood swamps. There are less than 110 breeding pairs in Tasmania.
- Swift Parrot: endangered small migratory parrot. Swift Parrots nest in tree hollows, usually on upper slopes and ridges in dry eucalypt forest within 10 km of the coast. Reliant on flowering Blue Gum and Black Gum forest
- Little Denison Crayfish: newly discovered species of freshwater burrowing crayfish. Gondwanic affinities. Recently nominated for threatened species listing. Completely reliant on two forested catchments adjacent to the TWWHA in the Weld and Little Denison Valley.
- Invertebrates: including Caddisfly species (Order Trichoptera), Mt Mangana Stag Beetle (*Lissotes menalcas*), Cave species (spiders, beetles, crickets)

Many unique and threatened species protected within the TWWHA utilise large ranges, including forests outside the current boundary.

2.1.6. Aesthetic Values

Unprotected natural areas alongside the TWWHA boundary contain landscapes and features of exceptional natural beauty. Spectacular tall forests, wild rivers, hidden waterfalls, rainforests, geological formations, visually striking transitions from forest to moorlands and sweeping natural vistas of undisturbed forest remain unprotected outside the TWWHA.

These aesthetic features are of outstanding value in their own right, and also contribute to vital natural viewfields from key vantage points within the TWWHA. The wilderness quality, naturalness and presentation of the TWWHA would be greatly enh-



Un-named waterfall, Lower Weld Valley

anced by excluding damaging industrial activity from these areas. Continuing logging activities will degrade the integrity of outstanding natural scenic landscapes from within the TWWHA.

Key areas where landscapes and features of aesthetic value remain threatened by industrial activity include:



View over the threatened Weld Valley

- The Weld Valley: Vistas of pristine tall eucalypt and rainforest on steep slopes beneath the current TWWHA, rainforest and tall eucalypt-fringed wild river, rainforest clad streams and dramatic waterfalls, buttongrass moorlands and strike-ridge emerging from

- pristine forest (Glover's Bluff). Unprotected forest part of viewfield from Snowy Ranges and Mt Weld. Subject to degradation from logging and mining.
- Navarre Plains: Uninterrupted vistas of natural treeless landscape at gateway to major visitor node of TWWHA (Lake St Clair).
 - Upper Florentine Valley: Outstanding scenic natural landscape extending from treeless alpine regions of the Sawback Range and Mount Field to tall eucalypt forest and rainforest on the broad valley floor. Aesthetically outstanding and very accessible examples of tall eucalypt forest with rainforest understorey. Contributes to the integrity of the outstanding scenic landscape of the adjacent parts of the TWWHA. (e.g. The Saw Back Range, Tiger Range, The Needles, Mount Mueller). Subject to degradation from planned logging and roading.
 - Styx Valley: An area of superlative aesthetic significance derived from the intimate association of very large eucalypt trees (e. regnans) in dense rainforest setting.
 - Middle Huon Valley: Spectacular tall eucalypt forest and rainforest fringing a largely wild river. Visually outstanding cave formations in

unprotected karst. Visible from the Huon Track, a popular entry point to the TWWHA.

- Denison Forests: Tall eucalyptus forests including King Billy Pines fringing eastern slopes of Snowy Range. Important part of natural vista from Lake Skinner Track and popular walking areas in TWWHA.
- Picton Valley: Natural viewfields significantly damaged by past logging, but natural forest areas fringe slopes of Mt Picton, Mt Riveaux and Hartz Mountains. Clearly visible from major TWWHA visitor areas in Hartz Mountains.
- Esperence/Hastings/Lune River: Intact areas of rich Tall eucalypt forest part of viewfield from Adamson's Peak and southern mountain ranges.

Adjacent forest areas include viewfields from famous walking trails such as the South Coast Track, Huon Track, Adamson's Track, Lake Skinner Track and from peaks such as Mt Rufus, Mt Picton, Hartz Mountains, Mt Field West and the Snowy Range; and from tourist roads such as the Lyell Highway and Gordon River Road. Logging is degrading these viewfields

2.1.7. Wilderness

Many natural roadless areas adjacent to the TWWHA demonstrate high wilderness quality, despite the ongoing infiltration of logging and industrial activity. Wilderness mapping shows that the current TWWHA boundary does not encompass the full range of the Western Tasmanian wilderness area.

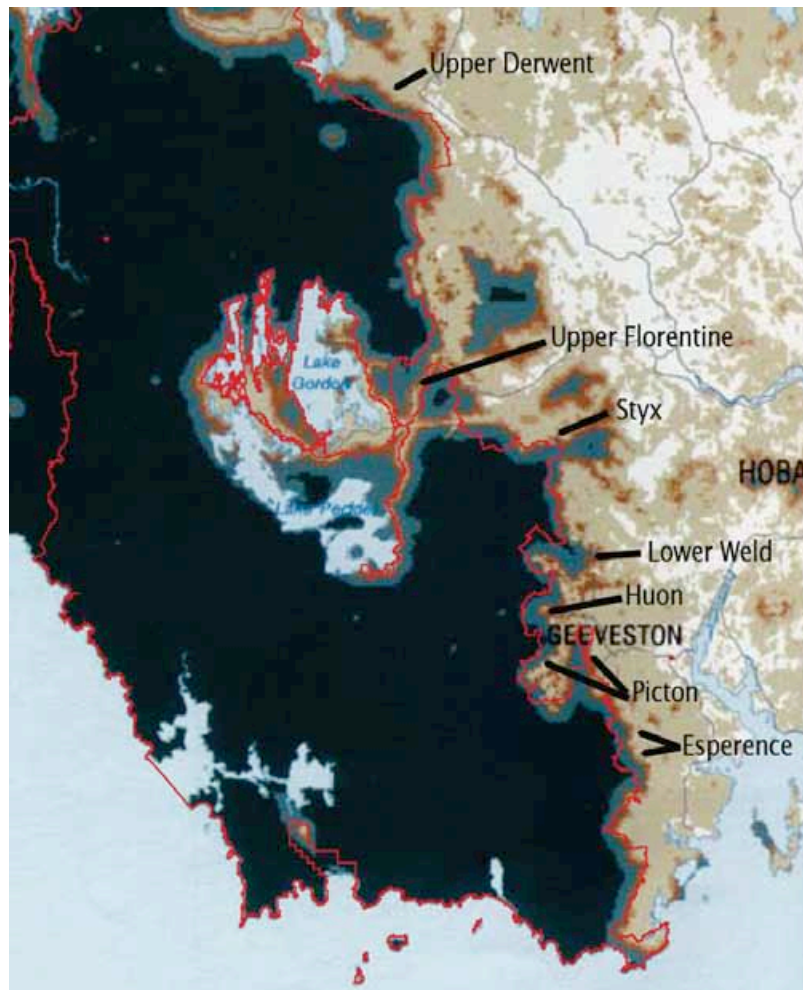
Wilderness quality ratings measure and quantify visual and actual naturalness. In many cases, wilderness areas have been free of effective human disturbance for centuries. Wilderness provides for the unfettered existence and evolution of natural landscapes and ecosystems which predate human occupation.

Areas showing high wilderness quality from the RFA (1996) map include:

- Upper Derwent: High wilderness quality extends beyond TWWHA into state forest. Area recently opened for logging.
- Upper Florentine: High wilderness quality extends beyond the TWWHA despite the existence of a major road through the area (Gordon River Road)
- Upper Styx : High Wilderness Quality extends beyond the TWWHA around Mt Mueller and Mt Styx.

- Snowy Range slopes: High wilderness quality extends beyond the TWWHA around the headwaters of the Russel River.
- Weld Valley: Extensive area of high wilderness quality extends beyond the TWWHA especially in the North Weld, Barnback area and upper reaches of South Weld.
- Middle Huon and Picton: Areas of high wilderness quality remain beneath Mt Fredrick, Mt Picton, Mt Riveaux and Hartz Mountains. Some roadless areas with high wilderness quality recently opened for logging.
- Esperence: Areas of high wilderness quality remain in obvious boundary "indents" in the Peak Rivulet and Hartz Mountains area.

Wilderness quality in the majority of these areas has been downgraded or is presently under threat from recent roading and logging activities.



Wilderness Quality map (1996) showing High Quality Wilderness outside the TWWHA, along the Eastern boundary.

2.2. Cultural Values

Southern Tasmania constitutes a cultural landscape demonstrating outstanding evidence of early human occupation in challenging environments over tens of thousands of years. This evidence includes archeological sites in caves and rock shelters, rock art, unusual stone tools and quarry sites, ancient rock art and indigenous land use patterns.

Some of this evidence has been protected within the TWWHA, however, key parts of the cultural landscape, including features, sites and objects of cultural and archeological significance have been excluded from the property. Key components of this incredibly significant cultural landscape remain unprotected and under immediate threat from industrial activity.

The legacy of Indigenous Tasmanian occupation in the Southern Forests represents some of the southern-most dated evidence for human occupation during the last ice age. Forested river valleys, cave and karst systems, mountain moorlands and button grass plains constitute interrelated components of an ancient cultural landscape, adapted over tens of thousands of years of indigenous occupation.

The Middle Huon area includes outstanding evidence of early human occupation of the Southern forests - including rock art - in complex and secluded karst systems within State Forest. The Riveaux caves are worthy of World Heritage status in their own right.

Specific sites, such as Riveaux, represent threads in a much larger tapestry of heritage values which encompasses the Southern Forests. Numerous caves and cultural heritage sites, such as Bone Cave in the Upper Weld, within the TWWHA were linked to features outside the property.

Recent field research in the Lower Weld Valley has revealed several sites and features of potential Indigenous cultural significance. A grinding stone, stone tools and other features have been identified and are currently being assessed by cultural heritage officers from the Tasmanian Aboriginal Land and Sea Council (TALSC)



Potential Indigenous stone artefact, Lower Weld Valley.

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