Foreword

On behalf of the Tasmania Parks and Wildlife Service, I am pleased to present the Gordon River Tour Operator’s Information Kit — the first of its type to be produced by the Department.

The increasing environmental awareness of visitors to Tasmania, as well as the strong growth of the ecotourism industry, ensures that the kit will serve as a useful resource for those involved in providing visitors with information about the values of the Macquarie Harbour region.

Both the Parks and Wildlife Service and those involved in the tourism industry have an important role to play in ensuring that the many values of this region are presented to local, interstate and international tourists. Through effective interpretation, we can bring both an understanding and appreciation of these values to visitors, while encouraging them to share in the protection of the area.

This information kit should prove a valuable resource for tour operators who are as yet unfamiliar with the natural and cultural values of the region, as well as providing an accessible reference for those with a long experience of conducting tours.

Peter Williams
General Manager
Tasmania Parks and Wildlife Service
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Preface

The Gordon River Tour Operator’s Information Kit has been produced to bring together information on a diverse range of topics relevant to the Macquarie Harbour region. The kit has been designed to assist tour operators working not only on the lower Gordon River, but also at the many points of interest around the shores of Macquarie Harbour, the King River, Ocean Beach and the Strahan district.

With the continuing expansion of the tourism industry, and particularly the ecotourism sector, the provision of accurate, up to date information has become an increasingly important part of the role of tour operators and all those involved in the tourism industry. The presentation of such information through interpretive techniques serves many functions, ranging from increasing the understanding and awareness of visitors through to enhancing the quality of the service provided.

The lower Gordon River acts as the western gateway to the Tasmanian Wilderness World Heritage Area. As such, it offers visitors the opportunity to discover the many values that make the region one of the most significant World Heritage Sites in the world. The region is rich in natural wonders and cultural heritage. This kit brings together a wealth of information in an easily accessible form. It is hoped that the kit will provide a valuable resource for all those involved in the tourism industry in the region.

The following people have contributed their knowledge and experience to the production of this information kit: Jayne Balmer; Jason Bradbury; Raymond Brereton; Peter Brown; Sally Bryant; Jenni Burdon; Alan Coates; Richard Davey; Mike Driessen; Andrew Dishington; Forestry Tasmania; Denise Fowler; Robbie Gaffney Peter Grant; Troy Grining; Paul Helleman; Inland Fisheries Commission; Geoff Lennox; Paul Malone; Hamish Maxwell-Stewart; Angie McGowan; Alan Morrison; Brett Noble; Mike Pemberton; Steve Smith; Tom Mumbray; Tim O’Loughlin; Irynej Skira; Tasmanian Aboriginal Land Council; Hans Wapstra; Jennie Whinam. Written by Steve Johnson, Interpretation Section, Parks and Wildlife Service. Plant drawings courtesy Richard Hale and Sue Backhouse; other illustrations courtesy of Tom Mumbray, Jane Burrell and the Tasmanian Museum and Art Gallery.

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## Timeline for the Macquarie Harbour region

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>? to present day</td>
<td>Aboriginal sites indicate human occupation in Tasmania for at least 35,000 years. Aboriginal people were present during the last ice age, making them the most southerly dwelling people in the world.</td>
</tr>
<tr>
<td>24 November 1642</td>
<td>Abel Tasman becomes the first European to sight Tasmania, noting the peaks Heemskirk and Zeehan to the north of Macquarie Harbour. These peaks were named over 150 years later by Flinders after Tasman’s ships.</td>
</tr>
<tr>
<td>28 December 1815</td>
<td>Captain James Kelly enters Macquarie Harbour and becomes the first European to sight this magnificent stretch of water.</td>
</tr>
<tr>
<td>3 January 1822</td>
<td>The brig, Sophia, under the command of Captain James Kelly, arrives at Sarah Island with the first complement of convicts. Lt. John Cuthbertson becomes the first Commandant of Sarah Island.</td>
</tr>
<tr>
<td>4 March 1822</td>
<td>First attempted escape by John Green and Joseph Saunders. Neither were ever heard of again.</td>
</tr>
<tr>
<td>10 March 1822</td>
<td>The second escape attempt takes place. All six men were believed to have perished.</td>
</tr>
<tr>
<td>20 September 1822</td>
<td>The infamous cannibal convict Alexander Pearce escapes with a party of eight prisoners. It is alleged that Pearce participated in cannibalism. Pearce became the first escapee to have crossed the interior to the settled eastern districts.</td>
</tr>
<tr>
<td>24 April 1823</td>
<td>Lt. Cuthbertson drowns while attempting to rescue a schooner that had slipped its moorings.</td>
</tr>
<tr>
<td>7 June 1824</td>
<td>Matthew Brady escapes, beginning a life as a bushranger that was to last nearly two years.</td>
</tr>
<tr>
<td>19 July 1824</td>
<td>The cannibal convict Alexander Pearce is executed in Hobart Town.</td>
</tr>
<tr>
<td>24 April 1823</td>
<td>Lt. Cuthbertson drowns while attempting to rescue a schooner that had slipped its moorings.</td>
</tr>
<tr>
<td>16 February 1825</td>
<td>Three convicts are hung on Sarah Island for murder. The Commandant’s intention that the execution would deter further murders was thwarted by the men as they joked and shouted words of encouragement to their fellow prisoners from the scaffold.</td>
</tr>
<tr>
<td>21 April 1825</td>
<td>Lt. James Bulter becomes the third Commandant of Sarah Island.</td>
</tr>
<tr>
<td>12 July 1829</td>
<td>Captain James Briggs becomes the fourth Commandant of Sarah Island.</td>
</tr>
<tr>
<td>4 May 1826</td>
<td>Matthew Brady, the famous bushranger who escaped from Sarah Island, is hung.</td>
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</tbody>
</table>
11 March 1831
Major Perry Baylee becomes the final Commandant of Sarah Island.

28 November 1833
Sarah Island ceases to operate as a penal settlement

13 January 1834
Convicts left behind to complete the final ship seize the brig, Frederick, and sail her to South America.

28 April 1842
Sir John and Lady Franklin and Party visit Sarah Island for a tour of inspection of the deserted settlement, noting the greatly dilapidated condition of many of the buildings.

April 1846
Sarah Island re-opens as a probation station to be operated by convict pass-holders.

April 1847
Convict pass-holders removed from Sarah Island. The second period of operation as a penal settlement failed to result in the anticipated profits. None of the convict pass-holders were paid the wages promised them.

13 May 1896
First commercial cruises take place on the Gordon River.

13 August 1907
The Kawaturi is swept onto the North Spit while attempting to enter Macquarie Harbour in a heavy gale. Two adults and four children are drowned.

13 January 1925
The last train steams out of Kelly Basin Station, marking the end of an era for the Basin township of Pillinger.

9 February 1926
Sarah Island and Grummet Island are gazetted as a Scenic Reserve, the first formal recognition of their importance to Australia's cultural heritage.

19 November 1932
The Lyell Highway is officially opened.

3 May 1939
Gordon River Scenic Reserve proclaimed.

29 June 1963
Mt Lyell workers make the last journey on the Abt railway between Queenstown and Strahan.

16 October 1979
The HEC tables a report on the Gordon River Power Development.

13 May 1981
The Franklin — Gordon Wild Rivers National Park is proclaimed

14 December 1982
World Heritage Commission accepts and lists the Western Tasmanian Wilderness National Parks as a World Heritage Area. Conservationists begin their blockade of the Gordon River, an act of mass civil disobedience which results in a total of 1272 arrests over a period of nearly three months. International media attention is focused on the campaign.

January 1983
Tasmanian Wilderness Society director, Bob Brown is arrested at Sir John Falls and internationally renowned botanist David Bellamy is arrested at Warners Landing.

1 July 1983
High Court rules that under the World Heritage Properties Conservation Act 1983, the construction of the dam must cease.

12 December 1989
Additions made to the World Heritage Area, which included most of the previously unreserved lower Gordon catchment.

9 October 1992
A mass stranding of 76 pilot whales is discovered at Ocean Beach.

22 November 1992
Strahan Visitor Centre officially opens.

2000
First stage of new Abt railway to link Queenstown and Strahan is completed.
Aboriginal people of Macquarie Harbour

Tasmanian Aboriginal people have occupied Tasmania for at least 36,000 years. At the height of the last Ice Age, they crossed the plains of Bass Strait exposed by the lower sea levels to become the most southerly humans on Earth. With the end of the Ice Age and the accompanying increase in sea levels some 10,000 years ago, the Tasmanian Aborigines became separated from their mainland counterparts, resulting in a period of isolation longer than that experienced by any other human society.

Archaeological records
The Macquarie Harbour region and the rivers that flow into it are rich with Aboriginal sites. Investigations at Kuti Kina Cave, one of the richest archaeological sites in Australia, have unveiled an occupation spanning from 20,000–15,000 years ago. Along the coast south of Macquarie Harbour, numerous sites can be found, including middens composed of discarded shells and scatters of stone artefacts. An interesting item which is frequently associated with Ice Age sites is Darwin Glass, a hard, black silicate glass formed by a meteorite impact at the site of the Darwin Crater. As the distribution of Darwin Glass reveals, this much prized cutting material was carried considerable distances from its source.

All these archaeological sites are unique and non-renewable depositories of Tasmania's Aboriginal cultural heritage and are of great significance to the present day Aboriginal community. They are testimony to a people who have one of the longest and richest histories of any existing people in the world today. The sites have contributed to the internationally recognised cultural value of the Tasmanian Wilderness World Heritage Area.

Some sites, such as coastal middens, have accumulated over thousands of years and can reveal enormous amounts of information relating to how diet, tool technologies and other aspects of the Aboriginal lifestyle have changed through time. If a site is disturbed, such information is lost forever. For these reasons, it is important that these unique features of the cultural landscape remain intact. To ensure this, all Aboriginal sites are protected under the Aboriginal Relicts Act 1975.

Aboriginal society
Much of what is known of Aboriginal society and culture is based on the historical accounts of early explorers, such as James Kelly and George Augustus Robinson, and the passing down of oral traditions to today’s Aboriginal community.

Aboriginal society was organised around the hearth group, which comprised several related individuals who shared a common cooking fire. These were structured into bands which travelled and hunted within a given home territory, occasionally negotiating entry onto the territory of other bands. Bands within the same region were structured into tribes, united by language, customs and inter-marriage. The Macquarie Harbour region is the traditional territory of the South-west, or Toogee tribe, composed of the Lowreenne and
Mimegin bands. The area was also visited by the Peternidic (Pieman River) band of the North-west tribe and the Ninene people (Port Davey) of the South-west tribe.

The tribes moved seasonally, following the coast as far north as Cape Grim. An early European visitor to the area described how the Aborigines crossed the mouth of the harbour ‘on floats, in the form of a boat, made of bundles of the paper-like bark of the Swamp Tea-Tree, lashed side by side, by means of tough grass.’

The major food resources of the South-west people comprised shellfish, crayfish, seals, penguins and mutton-birds and their eggs. On the coastal plains, Bennetts wallabies were hunted, as were wombats and birds.

The tool kit of the Tasmanian Aborigines comprised implements of stone, wood and bone. Cutting and scraping tools were made from pieces of stone by striking flakes off a larger stone, while larger, waterworn stones were used as grinders and pounders. Other unworked stones were used with great effect to maim birds and small mammals. Barbless spears were made from the tea-tree (*Melaleuca sp.*) and heated over a fire to straighten the shaft. Plant fibres were used for a variety of purposes, ranging from the manufacture of ropes for climbing trees in quest of possums, to binding together rafts and weaving baskets.

Aboriginal huts built from tea-tree branches and bark, often covered in feathers and lined with grass, provided their inhabitants with warm and comfortable protection from the strong winds and rain that lash the west coast. Huts were of durable construction, having an average lifespan comparable to that of a weatherboard house. The circular depressions over which these huts were built can still be found along the coast.

### Early European contact

The first record of European contact with the tribes of the Macquarie Harbour region comes from the journals of the first European to visit the area, James Kelly. The following account reveals his misgivings about contact with the local people:

> ‘The Whole face of the Coast Was on Fire and Lucky it Was for us it Was on fire, for the Smoke was so thick We could not See a Hundred yards a Head of the Boat. On pulling into the Narrows at the Small Entrance Island We Heard a Large Number of Natives Shouting and Making a Great Noise as if they Were Hunting Kangaroos.

> It was Lucky the Smoke was So thick for Had the Natives Seen the Boat passing through the Narrow Entrance it is possible they would have Killed Every person on Board by Volleys of Stones and Spears in their usual way’.

There are few accounts of the interactions between the convicts of Macquarie Harbour and the indigenous people. Accounts by escaping convicts provide information that negates the idea that the South-west tribe did not venture inland. Goodwin and Connelly, during their escape from Macquarie Harbour, noted ‘two parties of natives...consisting of about 10 persons in each, mostly women and children’ on the banks of the upper Gordon River, while several surveyors recorded evidence of Aboriginal occupation of the inland regions.

The Aboriginal people of the Macquarie Harbour region were among the last to maintain an active resistance against the loss of their lands in the face of the European invasion; yet, following the ‘conciliation’ campaigns of George Augustus Robinson, few remained within the Macquarie Harbour region.

### Further reading


Today’s Aboriginal community retains a sense of injustice to the invasion of its land. Such sentiments have been exacerbated by successive proclamations by historians and scholars that the Tasmanian Aboriginal people were exterminated during the bleak decades of the 19th century. Such misinformation has filtered down into school history books and, even today, remains the conviction of many members of the Tasmanian public. Consequently, the Tasmanian Aboriginal community has had to overcome public misconceptions as to its very existence, let alone address pressing issues such as inequities in health, housing and education and the pursuit of land rights.

When Europeans invaded in the early 19th century, Tasmania was occupied by a population of 4000–7000 Aboriginal people. In the years that followed, forceful eviction and attempted genocide greatly reduced the Aboriginal population to an exiled community, divorced from their home lands, on pathetic ‘settlements’ on a series of Bass Strait islands.

Black and white conflict
The conflict which was to result in near extermination of a whole group of people was based upon cultural arrogance and a failure to understand the Aboriginal world-view. Europeans, who brought with them delusions of superiority and western notions of land ownership, failed to recognise that Aboriginal culture is essentially different. Further, the Government never acted on the notion that the Aboriginal people had rights to their own land, nor was compensation to Aboriginals forced from their traditional hunting grounds ever

Governor Arthur’s proclamation of equal justice for Europeans and Aborigines. No Europeans were ever executed for killing an Aborigine.
(reproduced courtesy of the Tasmanian Museum and Art Gallery)
seriously considered.

These irreconcilable differences led to increased outbreaks of violence by settlers and others becoming increasingly common throughout the 1820s. In turn, Aboriginal people responded with attacks upon settlers, and throughout Tasmania the conflict escalated to a state of war. Pitted against the sheer numbers of European settlers arriving, the Aboriginal resistance had little hope of succeeding. In addition, the introduction of new diseases such as influenza, added to the already terrible burden on the Aborigines.

Martial law was declared in 1828 and for the three years that it was in place the Aboriginal population of the settled districts was reduced from about 200 to less than 50, while 89 white settlers were killed. In 1830 an operation involving 2000 men and enormous expense was established in an attempt to round up the Aboriginal people. The so called ‘Black Line’ managed to collect one boy and an old man.

Robinson, the ‘Conciliator’
In March 1829 Governor Arthur ordered the removal of the Aboriginal people from Tasmania and their relocation to Flinders Island. George Augustus Robinson, who had previously been appointed to oversee the Aboriginal community on Bruny Island, approached the Governor with the suggestion that he lead an expedition to ‘conciliate’ the Aborigines and bring them to the government settlement. For the next six years Robinson was to travel widely throughout the island in the company of a group of Aboriginal people, including the well-known Trucanini and her husband, Woorrady.

Robinson made two journeys to the west coast in 1830 and again in 1833, using the penal settlement of Sarah Island as his base. On his second expedition to the Macquarie Harbour region to round up the remaining Aborigines, Robinson’s previously amicable approach to the indigenous people had diminished. After failing to encourage them to come with him peacefully, he captured the last of the Aboriginal people by threat of force:

‘I ordered the two white men and my sons to uncover their fuses, and to file off on each side. The friendly natives did the same with their spears so that the strangers was in our centre. The wild aborigines now gave up all further thought of going away’.

Robinson brought 28 of the Peternidic and Ninene people to Sarah Island between April and August 1833, where they were initially kept on the exposed Grummet Island. Fourteen Aboriginal people died during their stay at the penal settlement.

They were later moved to the lower floor of the penitentiary on Sarah Island, where the prisoners above them ‘took every occasion to annoy and would not think it a crime to murder them.’ The convicts harassed the Aborigines, ‘pouring down water through the boards, urinating upon them and hammering on the floor.’ They were again moved to the cramped prison hospital, where a further five died within 24 hours. On Commandant Baylee’s insistence, the surviving Aborigines were moved to the harbour entrance where they awaited transportation to the Bass Strait islands.

On 3 February 1835, Robinson reported, somewhat inaccurately, to the Colonial Secretary that ‘the entire aboriginal population are now removed.’ In little over 30 years of European settlement nearly the entire population of a people who had lived in Tasmania for over 36 0000 years had been either killed or evicted from their land.

Many were sent to Flinders Island, where a pitiful settlement was established at Wybalena (Blackman’s place). Here the deaths continued unabated. It is from these survivors of one of the bleakest chapters in Australia’s history that the present day Tasmanian Aboriginal community is largely descended.

Further reading
European explorers of the Macquarie Harbour region

The Dutch explorer Abel Janszoon Tasman was the first European to sight the west coast of Tasmania, just north of the entrance to Macquarie Harbour. It was to be another 173 years until this wild and mountainous region was further explored. The initial exploration by sea of Macquarie Harbour was motivated by the desire to seek new resources for the fledgling colony. The search for suitable land for agriculture provided the impetus for the first attempts to cross the mountainous regions of the west, but it was to be a long time before an overland link was established between the settled east and the west.

James Kelly
The first European to ‘discover’ Macquarie Harbour was Captain James Kelly. A first generation Australian, Kelly was born in Parramatta in 1791, a mere three years after the First Fleet had arrived in New South Wales. It is believed that he was conceived aboard the transport Queen, as it carried its cargo of convicts to the new colony — among them his mother, Katherine Devereaux. Kelly gained his experience as a seaman during his voyages into the southern oceans in search of the fur seals that provided oil and fur for the new colony. On one such journey Kelly found himself stranded on Macquarie Island for 18 weeks after his ship ran aground.

The voyage that was to lead to Kelly’s discovery of Macquarie Harbour was commissioned by Thomas William Birch, a merchant whose primary motive for financing the trip was to locate a source of Huon pine timber. According to Kelly’s journal, Birch accompanied him in the schooner Henrietta Packet to Port Davey, a discovery that they named in honour of the then Governor of Van Diemen’s Land.

Kelly then continued to sail up the west coast in the ship’s whaleboat, Elizabeth, accompanied by four oarsmen. Their boat was only one third the length of today’s Gordon River Cruise boats. They arrived at the narrow entrance of Macquarie Harbour on 28 December 1815, and named the new discovery in honour of the Governor of New South Wales, Lachlan Macquarie.

There is some confusion as to whether Birch was with Kelly at Macquarie Harbour. Birch’s account claims that he was, while Kelly’s journal, written some time after the event, makes no mention of Birch accompanying him.

On the 30 December Kelly continued further up the harbour, where he came upon the mouth of a large river, which he named the Gordon, after ‘Mr Gordon of Pittwater, who had kindly lent the boat for this particular trip of discovery’. Kelly noted the Huon pines that grew along the rivers’ banks, an observation that was to be influential in the decision to establish the Sarah Island penal settlement seven years later.

Early exploration
Exploration was perhaps the last thing on the minds of the officers and convicts as they struggled to establish a penal settlement on Sarah Island in 1822. The forays that did take place were largely to find areas suitable for growing the crops needed to fend off the constant threat of starvation, or to locate natural resources, such as Huon pine, for use in...
the Sarah Island shipyards. Early reconnaissance of the Gordon River was undertaken by Commandant Butler, who pushed up the river as far as the first impassable rapids, some 31 kilometres from the mouth. For one member of the party, Thomas Lempriere, there were ‘few if any rivers in the Colony which afford such grand and imposing scenery.’

The rugged terrain of the west coast afforded a formidable challenge to early land explorers. Among the first Europeans to venture far inland was the explorer James Hobbs. In February 1824, he climbed the D’Aguilar Range at the southern end of the Harbour. From the summit he lamented, ‘nothing appeared but one mountain towering over another’. Hobbs was not impressed with the farming potential of the Macquarie Harbour region.

**Goodwin and Connolly**
Two unwitting explorers of the wild river country to the east of Macquarie Harbour were the convicts James Goodwin and Thomas Connolly. In March 1828, the two prisoners absconded from a pining party on the lower Gordon River, and travelled up the lower Franklin, upper Denison and upper Gordon rivers. In the three weeks that it took the pair to successfully traverse to the settled east, they had become the first Europeans to encounter many of the major features of the rugged wilderness that so effectively isolated the Macquarie Harbour penal settlement. Goodwin’s own account of their route suggests that they crossed the Prince of Wales Range and entered the Vale of Rasselas near the southern shoulder of the Denison Range and on to Wylds Craig — wilderness areas that today attract only the hardiest of bushwalkers. Goodwin was pardoned in 1829 and later became an indispensable member of a party involved in the exploration of the interior.

**Opening the west**
The road which had been envisaged between the settled east and the west had its origins in the track cut by James Calder from Lake St Clair to the lower Gordon to facilitate the journey of Sir John and Lady Franklin in 1842. Although the purpose of the track was not primarily for exploration of the area, Calder did become the first European to sight many of the major features of the upper Franklin region, such as Deception Range and the Jane River. The track, which had taken Calder 32 weeks to cut, was to later become the first of the mineral access routes into western Tasmania. It was the mineral boom that was to lead to the establishment of a network of roads and railways in the Macquarie Harbour region and the establishment of towns that were to briefly flourish around the shores of the harbour.

**Further reading**


Maps of the time showed the unexplored interior of the south-west as ‘Transylvania’. (Courtesy of the Tasmanian Museum and Art Gallery)
Daily life at Macquarie Harbour penal settlement

The population of the Macquarie harbour penal settlement, although fluctuating, comprised some 100 military and a dozen or so civil officers, some of whom were accompanied by their wives and children. The remainder were convicts, most of whom were re-offenders. Between 1827 and 1830 the average number of people residing on the island was about 420, although after this date the numbers steadily declined. The largest number of residents was noted in 1828 as 531.

Accommodation
In the main penitentiary on Sarah Island convicts slept in hammocks, with 12-30 to a dormitory. Prisoners of good character who had gained positions as overseers, tradesmen or gardeners lived in smaller huts, with 2-8 men to a room. Labourers at the farm on nearby Philip Island were accommodated in huts under the supervision of a convict constable. Convicts engaged in pining along the lower reaches of the Gordon River often stayed overnight in work camps.

The most incorrigible of the convicts were housed on the tiny, spray-swept Grummet Island. On this 'island of despair' up to 60 prisoners were housed in a dormitory. They were frequently obliged to sleep in clothes that had become soaked after wading ashore from the work-party boat.

Work
The convicts worked in a variety of occupations, including administrative duties, carpentry, tanning, shoemaking, tailoring, masonry, sawing and shipbuilding. Lumbering gangs and charcoal burners operated up the Gordon River, while the pilot's station at the entrance to the harbour employed eight convicts as boat's crew. The most severe labour, often reserved for newly-arrived men and those working in chains, was hauling and piling the logs which had been rafted up from the Gordon River.

Working hours were:
• 6.30 am – 9 am
• 10 am – 1 pm
• 2 pm – 6 pm

These times varied throughout the eleven years that the island operated as a penal settlement. Under Commander Butler, the hours were reduced to a 7 am start and 5 pm finish during the six months of shorter daylight. Sundays were a rest day, and work ended at midday on Saturdays to allow prisoners to engage in domestic duties such as washing.

Food and supplies
Despite attempts to gain some degree of self-sufficiency, the
colony was frequently short of food supplies. On occasions, the convicts’ rations were considerably reduced due to delays and spoilage of supplies from Hobart. A report of 1828 describes '2 040 pounds of colonial salt beef...very bad and putrid...unfit for use...to be destroyed.'

The rations of the convicts varied throughout the history of the settlement. An 1827 report reveals the daily rations for each convict as:

- 1 lb 4 oz wheatmeal
- 1 lb fresh meat or salt beef or
- 10 oz salt pork
- 11 1/2 oz salt

These were issued in bulk to work gangs once a week. It was the prisoner’s responsibility to prepare his own food and ensure that the rations lasted the week.

This diet was supplemented with vegetables when these were available; however an overall deficiency of vegetables resulted in scurvy becoming one of the more prevalent diseases of the settlement. The pilot, based at the entrance to the Harbour, grew potatoes which he sold to the penal settlement. Soldiers often trapped wallabies and other native animals to supplement their own rations.

The regulations
The following is an extract of the regulations issued on 6 July 1824:

'At daylight every morning (Sundays excepted) a Boat proceeds to the small Island to bring off the bad Characters who are kept there. The Bell then rings for Muster 1/2 an hour before Sunrise, when every Prisoner attends in the presence of the Superintendent. They are then divided into Gangs and marched to the Pier, where they are rigidly searched to prevent Provisions, Knives, Fish Hooks, etc., etc., from being taken away.

A quarter of an hour before Sunrise, they are embarked in Boats and proceed to the Main, where they labour at the Farm, felling, rolling, and brickmaking, and do not return till Sunset.

At One P.M. on Saturday, Prisoners are exempted from Labour in order that they may mend their Clothes.

At 8 P.M. every Evening, Prisoners are mustered in the Penitentiary in the presence of the Superintendent, who locks them up in their several Rooms, leaving 1 or 2 Constables in each.

On Sundays, the Church Service is read by the Assistant Colonial Surgeon, in the presence of the Commandant and all the Prisoners.'

Not all the regulations were enacted to the letter. As Reverend Schofield, chaplain of the penal settlement describes in a letter of 1829:

'the Commandant has absented himself (from church) ever since I preached the missionary sermon. "Not many win, not many noble are called."'

Tobacco and alcohol
Despite a total ban on tobacco, there was a thriving black market trade largely organised by the military. A letter intercepted from one of the prisoners to his father thanking him for the two pounds of tobacco he sent, implicated the wife of the shipwright in the smuggling operation. In the latter years of the settlement, regulations became increasingly relaxed. Indeed, the convict James Porter (who later seized the Frederick) was once given 25 lashes for 'neglect of duty in not taking care of some tobacco offered into his charge!'

Alcohol was forbidden, although rum was occasionally issued to prisoners suffering from rheumatism. To mark the King’s birthday, prisoners were issued an allowance of rum so that they may drink to the King’s health. Such relaxing of the regulations led Commandant Butler to complain in 1826 that ‘a system of partial intoxication…was prevalent among the prisoners’. In 1830 the Colonial Secretary wrote to Commandant Briggs:

'I have the honour to acquaint you that it has been reported to the Lt. Governor that certain convicts have expressed a desire to be sent to Macquarie Harbour, stating that when there they would receive sugar, tea and rum daily...'

Further reading

Punishment at Macquarie Harbour penal settlement

The Sarah Island penal settlement was proposed by Lt. Governor Sorell as a ‘place of banishment and security for the worst description of convicts’ and as such developed the reputation as one of the severest of the penal settlements established during the history of transportation. In a letter to Commandant Wright in 1824, Governor Arthur wrote:

‘Unceasing labour, total deprivation of Spirits, Tobacco and Comforts of any kind, the sameness of occupation, the dreariness of situation must, if anything will, reform the vicious characters who are sent to you.’

In the early years of the settlement, such ‘dreariness of situation’ was supplemented by particularly harsh punishments. The commandant held the power of a magistrate and was able to hear charges and decide the appropriate punishment. Generally this took the form of either lashings with the cat-o-nine tails or solitary confinement, although other forms of punishment, such as chains, reduced rations and loss of privileges were also used. The first commandant, Lt. Cuthbertson, described as a ‘sadistic bully of peculiar qualities’, prescribed lashings freely in an effort to stop the ‘frenzy of escapes’ and excess brutality that dominated the first years of the settlement.

However, with the arrival of Master Shipwright, David Hoy, in 1828 and the transition from a ‘place of banishment’ to an organised industrial centre, there was a dramatic drop in the number of lashings. It is likely that the influence of other factors, such as improved diet and living conditions, the availability of contraband, the setting up of religious instruction by Reverend William Scholfield and the establishment of a school, had a bearing on the decline in punishment after 1828.

‘The Macquarie cat’
The Macquarie Harbour cat-o-nine tails was reputed to be heavier and larger than that of the army or navy. It had seven knots in each tail and a double twisted whipcord rather than the usual single cord. Particularly during the early years of the penal settlement, the formidable ‘Macquarie Cat’ was used with relentless frequency. In the first seven years of the settlement an average of 6560 lashes per year were inflicted on 175 men. However, in the last five years of the settlement, this had dropped dramatically to an average of 850 lashes per year inflicted on 25 men.

The permissible maximum of 100 lashes was the common sentence for those who attempted escape, yet it is clear from the endless escape bids that the cat-o-nine tails did little to deter the convicts in their quest for liberty. The great majority of floggings, however, involved far fewer strokes of the cat-o-nine tails. Twenty-five strokes were common for such offences as ‘neglect of duty’, a number which also decreased during the latter years of the settlement.

While records are not complete, it is possible that the convict Scrummy Williams held the dubious record for the most number of lashings given to a prisoner, with a total of 500. After one of his numerous
floggings, Williams was pronounced unfit to receive the remaining 25 of his 100 lash sentence and was taken to hospital. However, due to his deprecatory remarks while in hospital he was taken out to receive the remainder of his sentence. Lempriere, the Commissariat Officer, claimed to ‘have heard of a man receiving a hundred lashes, and for an insolent word, perhaps extortion by the smarting of his back, being tried on the spot, and his punishment repeated.’

One convict describes the aftermath of a flogging:

‘unless it were at the meal Hours or at Night he was immediately sent to work, his back like Bullocks Liver and most likely his shoes full of Blood, and not permitted to go to the Hospital until next morning when his back would be washed by the Doctor’s Mate and a little Hog’s Lard spread on with a piece of Tow, and so off to work…and it often happened that the same man would be flogged the following day for Neglect of Work.’

It is doubtful that such harsh punishment did anything to reform the convicts. Indeed, the settlement’s surgeon stated that he ‘never knew a convict benefited by flagellation’. In his estimation, they turned out as ‘more desperate characters than before’. It is probable that the harshness only encouraged escape attempts and other acts of desperation, such as the murder of fellow prisoners in an attempt to gain a brief reprieve from the despair of the settlement.

**Solitary confinement**

Flogging was partly replaced by the increasing use of solitary confinement. Convicts served a maximum of 14 days in cells housed within the gaol on a diet of water and bread. On occasions each cell held as many as three men serving their ‘solitary confinement’ together! Prior to the confinement cells being built on Sarah Island, convicts served their solitary confinement on spray-soaked Grummet Island, often being obliged to sleep in their wet clothes. For some, solitary confinement was welcomed as a relief from back-breaking labour.

**Other punishments**

Other forms of punishment included the reduction of a prisoners’ rations through stopping their allowance of meat. Conversely, well-behaved convicts were often rewarded with a range of little extras, including the occasional tot of rum. Irons were also used as a form of punishment. Prisoners were forced to work in a chain gang, usually on Sarah Island itself, although many men worked in chains hauling logs while chest deep in the icy waters of the lower Gordon River.

Convicts who committed serious crimes, such as assault or murder, were tried in Hobart. On one occasion, three convicts found guilty of murder were hung on the Island. In mockery of Commandant Wright’s intent to use the execution as a deterrent to other convicts, two of the condemned men laughed and joked from the scaffold with their fellow prisoners, displaying ‘appalling indifference to their fate.’ The other man, like the vast majority of those that faced the gallows, died truly penitent.

For some men, the threat of execution did little to deter their crimes, for the gallows offered a tempting way out of the desperate lives they suffered at Macquarie Harbour. For those that were fortunate enough to be a witness to a serious crime such as murder, a temporary reprieve from Macquarie Harbour was obtained while they travelled to Hobart Town to act as a witness in the trial. As Commandant Butler lamented:

‘I am quite at a loss to know how to act...The prisoners are forming every scheme they can devise to get up to Hobart Town as Witness or otherwise, and all their statements are now at variance as to the Person who made this last attempt at murder.’

**Further reading**


Escapes from Macquarie Harbour penal settlement

Although many men did attempt to escape from Sarah Island, few were successful. The first attempted escape occurred on 4 March 1822, two months after the settlement was established. The two men were never heard of again. Six days later another escape party of six convicts met the same fate. Such was the price that many paid for attempting to escape from Sarah Island, but for some their bid for freedom resulted in remarkable adventures and often long periods of liberty.

The great majority of escapes occurred in the early years of the settlement, with 156 recorded between 1822 and 1828. Of these, over half died in the attempt. Despite much greater opportunities to do so, far fewer attempted escape in the last five years of the settlement.

The quest for the east

Although the majority of escapees headed north up the coast, a few did undertake the treacherous journey across the wild, unknown mountain ranges of the west coast in an attempt to reach the settled regions of the east. Two convicts who successfully took this route were James Goodwin and Thomas Connell, who slipped away from a pining party in a canoe they had secretly carved from Huon pine. The two men headed up the Gordon and Franklin rivers until forced to abandon their craft eight kilometres up the Franklin at an impassable waterfall. For four weeks the pair travelled by foot across the wild mountain regions of western Tasmania, entering areas that no white man had seen before. Goodwin was later captured near the settlement of Ouse. Connell, who had earlier parted company with Goodwin, was never seen again. After his capture, Goodwin was granted a pardon and employed in the service of the Surveyor General in recognition of his unique, first-hand knowledge of the western wilderness.

The cannibal Pearce

On the 20 September 1822 an escape attempt by a party of eight prisoners resulted in Alexander Pearce becoming the first to reach the settled districts of the east. Pearce was captured after a brief period of liberty and upon his return to Macquarie Harbour he confessed to the cannibalism of other members of the escape party in order to ward off starvation. As the grisly tale unfolded, Pearce related how the men had granted one of their next meals the opportunity to say prayers before eating him. Eventually, only Pearce and one other man, Bob Greenhill, remained alive. Greenhill had earlier said, perhaps jokingly, that he was so hungry he could eat a man! When Greenhill was finally overcome by tiredness and fell asleep, Pearce killed him and set out alone, taking with him a portion of Greenhill’s thigh and arm.

There was insufficient evidence to try Pearce for murder. On his second escape, only a few weeks after he was returned to Macquarie Harbour, Pearce again killed his companion for food, despite having sufficient bread and salt meat with him at the time of his capture. Pearce was found guilty of murder and executed at Hobart Town on 19 July 1824.

Matthew Brady

One of the best known prisoners to escape from Sarah Island was the flamboyant Matthew Brady. In June 1824 Brady and fourteen companions seized a boat and sailed to the Derwent estuary before taking to the
bush. For nearly two years Brady led one of the most notorious of Tasmania’s bushranger gangs. For some settlers he was a folk hero, a chivalrous man who rarely used violence and took every opportunity to protect the reputation of women.

The Government moved to bring Brady and his gang to justice by offering a 25 guinea reward. Brady responded by posting a notice offering 20 gallons of rum for the capture of Lt. Governor Arthur. Brady eventually met his fate after being captured by a group of settlers led by John Batman, who later founded Melbourne. He was hanged before a crowd of well-wishers and weeping women on 4 May 1826.

**The Frederick escape**

Perhaps the most remarkable escape attempt occurred after the official closure of the penal settlement. Twelve convicts, under the supervision of several soldiers and Master Shipwright David Hoy, remained behind to complete the fitting out of the brig, *Frederick*. Despite the fact that specific orders concerning the completion of vessels in the yards had mysteriously been mislaid, the men dutifully carried out their tasks with ‘great propriety, executing Mr. Hoys’ orders with promptitude and alacrity’.

After the launch of the *Frederick* in January 1834, ten of the convicts seized the ship. They landed their overseers on the beach, leaving with them half of their supplies. The convicts then sailed the *Frederick* south of New Zealand and onto the distant coast of South America. Six weeks later they abandoned the *Frederick* off the coast of Chile and rowed the ship’s whaleboat the remaining 80 km to shore.

Passing themselves off as wrecked sailors, the men were welcomed into the community and several soon assumed positions as shipwrights and respected members of the community. Several married local women, while six of the men made a further escape to America and Jamaica.

Ultimately, the long arm of British law caught up with the four remaining men, bringing them back to face the Hobart gallows in 1837. At their trial, two of the escapees, William Shires and James Porter argued that they were guilty only of stealing a ‘floating bundle of wood and other materials’. As the *Frederick* had never been registered, there was some doubt in the Chief Justice’s mind as to what legally constituted a ship. Further, the ship had been seized in enclosed waters and not on the high sea — a requisite for charges of Piracy. It was these legal technicalities which saved the men from the gallows. Nonetheless, the men were transported to Norfolk Island for life. The story of the *Frederick* has been dramatised by Richard Davey in his play, *The Ship that Never Was*.

**The final escape**

For many men the burdens of Sarah Island were intolerable. Particularly during the early phase of the settlement, some deliberately committed murder in order to be sent to the gallows and escape once and for all from the tortured lives they led. One hapless prisoner by the name of Trenham confessed that his motive for stabbing another prisoner was to get out of this world. He reasoned:

‘I would be sent to Hobart Town and tried for my life; if found guilty, the parson would attend me, and I would be sure of going to heaven.’

Unfortunately for Trenham, the man he stabbed recovered and Trenham was tried, flogged and forced to continue living in the world he so desperately wished to escape. Yet for others, their desires were realised and after being found guilty of murder they were hung in Hobart Town. For them it was the final escape.

**Further reading**


Lampriere, Thomas J. (1839). *The Penal Settlement of Van Diemens Land*. 
Industry at Macquarie Harbour penal settlement

The Sarah Island penal settlement, like all penal establishments of its day, was expected to recover much of its cost through industry. To this end, convicts were engaged in a variety of occupations. Although the settlement never quite achieved this aim, it did produce an enormous number of saleable items for the newly-founded colony. Such productivity occurred despite Governor Arthur’s directive that convicts be engaged in unremitting labour ‘even if it only consists of opening Cavities and filling them up again.’

Pining
The discovery of Huon pine along the foreshores of Macquarie Harbour and the lower Gordon River played a large role in the decision to establish a penal settlement in the region. Huon pine, being particularly resistant to wood rot, proved to be an outstanding timber for shipbuilding. It was used at the Sarah Island shipyards and also formed the largest item for export. In 1827 alone some 2869 logs were collected. A number of other trees were used by the settlement for shipbuilding, including blackwood, myrtle and celery-top pine, the latter being particularly useful for masts and spars.

Pining was considered the most disagreeable and dangerous of the jobs that convicts performed. Felled logs, often weighing up to 12 tonnes had to be levered and manipulated by handspikes and rolled into the river. Convicts, even those in chains, worked waist deep in the cold waters of the Gordon River arranging the logs into rafts which were then floated to the settlement.

Shipbuilding
Shipbuilding was a major industry on Sarah Island. Under the command of Captain Butler, considerable progress was made in establishing dockyards and recruiting convicts, as suggested in his letter to the Colonial Secretary:

‘We are much in need of good sawyers and a few boat builders. If there are any idlers of either description about Hobart town or in the lumber yard, I could turn them to good account here for a few months.’

In one of the earliest examples of land reclamation in Australia, large logs were laid out from the shore and held in place with rocks to provide a platform upon which the dockyards were constructed. The extensive remains of the dockyards can still be seen today along the shores of the island.

The first of two official Master Shipwrights appointed to the settlement, Thomas Cole, received considerable criticism about the quality of the ships built under his charge:

‘The curve of the vessel is very incorrect, the counter and stern considerably too low. Very unsafe when laden. Sails very indifferently and will not work but in smooth waters.’

The arrival of David Hoy as Master Shipwright in 1827 ushered in the greatest period of productivity. Indeed, in its day Sarah Island was the largest shipbuilding yard in Australia. During the life of the settlement a total of 113 vessels were constructed, 80 of them in the period 1828-1832. The largest of the vessels built at Macquarie Harbour was
bigger than some of the vessels used to transport convicts from the British Isles! They included a 250 tonne barque, six brigs, at least seven schooners and over 70 smaller boats and launches.

Newly arrived convicts were recruited and trained as shipwrights, boat builders, blacksmiths or sawyers or labourers depending on their inclinations and abilities, and the lengths of their sentences. Up to 35 convicts were employed as shipwrights, supported by other craftsmen and clerical workers. One such convict, Newton Gray, who was transported for life for highway robbery, displayed considerable ‘exertion, intelligence and zeal’ in his labours as shipwright, earning a conditional pardon in 1829. Another convict, James Reeves, apparently was so dedicated to his work that he declined an offer to return to Hobart Town in order to complete two new boats!

**Farming**

Farms were established at Macquarie Harbour in an attempt to gain a degree of self-sufficiency — an aim that was never quite achieved. Prisoners grew a variety of vegetables, including peas, cauliflowers, cabbages, beans, onions, carrots, turnips, celery and lettuce. Some crops were grown on Sarah Island, where most of the top soil was brought in from the mainland and enriched with a mixture of compost, wood ashes and locally produced lime to overcome the poor quality and high acidity of the soil. Another farm was established on nearby Phillip Island which produced nearly 40 tons of potatoes annually, while at Farm Cove growing potatoes and raising pigs were the main activities.

**Other industries**

Coalminers worked the deposits found along the shore of Macquarie Harbour at a point now known as Coal Head. However, due to a lack of expertise and the poor quality of the coal, the mine was later abandoned.

Brickmakers worked around the southern shores of the harbour, producing the thousands of bricks that were used in the construction of some of the buildings on Sarah Island. Four to six men were engaged in limeburning on the Gordon River near the Champ (Marble) Cliffs and charcoal burners operated at the mouth of the river.

Shoemakers produced large and profitable numbers of shoes which were used for prisoners throughout the colony. A tannery was established on Sarah Island which tanned wallaby skins using the bark of celery-top pine and wattle. However, the leather was reputed to have become ‘a disagreeable colour, which stained the stockings’. This pink dye was often used by convicts to colour their own clothes.

Carpenters engaged in the manufacture of a wide range of items, often in prodigious quantities, as revealed in a letter written by the storekeeper in 1831:

‘There being...upwards of 500 water buckets and 850 wooden bowls instore, it would be advisable to discontinue the manufacture of these articles for the present.’

In some cases the finished product, when it arrived at Hobart Town, was found to be of ‘very rough workmanship...most shameful articles and totally useless’!

Clearly, in an establishment whose purpose was reformation through ‘unceasing labour, total deprivation of spirits, tobacco and comforts of every kind, the sameness of occupation and the dreariness of situation’, not all convicts were inspired to adopt a dedicated approach to their work.

**Further reading**


Women of Macquarie Harbour penal settlement

Little information is available on the women who lived at the Macquarie Harbour penal settlement. What information that does exist shows that the female population was composed of a handful of convicts, the wives of the military and civil officers, and perhaps surprisingly, the wives of a small number of convicts. The Reverend Scholfield recorded 14 women and 27 children in August 1828, the highest number known to reside on Sarah Island. In the last year of the settlement, several Aboriginal women were brought to the island by George Augustus Robinson during his ‘conciliation’ campaigns.

Women convicts were gradually moved to Hobart. A report of 1828 reveals only one female prisoner remained at the settlement, while a further 13 women, wives of the military and civilian officers lived with their husbands.

Abuse of women
Aboard the first transport to Macquarie Harbour was a group of eight women convicts. These women were the first to occupy the penitentiary built on Grummet Island. A report of June 1822 makes obscure references to the ‘unsoldierlike behaviour’ of three soldiers that visited the women. The three men were court martialed.

Lempriere, the Commissariat Officer, in his 1839 narrative of the penal settlement, writes:

>'The grossest immorality could not fail to reign in a place where there were no means of keeping the sexes apart...Numerous were the cases of immorality, but we will pass them over with the silent disgust they merit'.

Lempriere goes on to propose his own vision of a women’s penal settlement:

>'It should be situated on an island to prevent the possibility of escape. The officers superior and subordinate should be married men. The women could be employed in spinning and carding wool, making shirts and clothing for the convicts generally...even a little hoeing and digging would do them no harm'.

Work of the women convicts
Little information is available which might reveal the lives that these women led, other than the assignment of some convict women as servants to civil officers and their families. Women in these positions lived in outbuildings attached to the quarters in which they worked. One of the tasks assigned to the female convicts was the production of lime. Shells obtained from the entrance of the harbour were burned to produce the lime that was so desperately needed to fertilise the poor soils of the settlement.

Disobedience and resistance
One of the female convicts, Jane Davis, was sent to Macquarie Harbour with her husband, William. Both were guilty of receiving stolen sheep,
although it appears that Jane was the more guilty partner. Jane, who was born in Tasmania, was sentenced for 14 years. Punishment records show that Jane was punished at Macquarie Harbour for ‘disobedience of orders and sending an improper message to Mr Barnes, the Assistant Surgeon’. Her punishment was to ‘wash 40 prisoners’ shirts weekly’. Both Jane and her husband were later sent to Maria Island.

Mary Ann Furze was transported for seven years. On arrival in Van Diemens Land she was assigned to a position of domestic servant. She absconded from this position for several months, an act which led to her being sent to Macquarie Harbour for the rest of her sentence. Like many convicts, Mary found herself in solitary confinement more than once for ‘disobedience of orders’ and ‘neglect of duty’. On one occasion she was given seven days solitary confinement for ‘Neglect of duty, using threatening language to the Dispenser of medicine and destroying the fresh water kept for hospital use’.

Sarah Simmonds was sent to Sarah Island and assigned as a servant to the last doctor of the settlement. After an affair with the Commandant’s clerk, and being caught visiting his quarters, she was deemed ‘unsuitable’ for the settlement and returned to Hobart.

The wives of the officers and military
While several soldiers and civil officers were accompanied to Sarah Island by their wives and children, there is no record of the officers being accompanied by their wives. The largest family of a civil officer was that of Thomas Cole, who lived with his wife on the island. Mrs Cole later found herself embroiled in a scandal over the smuggling of tobacco for one of the prisoners.

The Pilot, James Lucas, lived with a woman known as Margaret Keefe and four children at the entrance to Macquarie Harbour. Initially the couple lived together unmarried and were consequently shunned by the Commandant. When they were married, the Commandant did not attend the wedding.

Lempriere was also accompanied by his wife, Charlotte and two children. Together with Reverend Scholfield they set up a school for the prisoners. The Reverend Scholfield was similarly accompanied by his wife, Martha, who remained on the Island for the duration of her husband’s stay. Martha suffered a miscarriage shortly after arriving. The couple were to have no children.

It is likely that the arrival of these families and the role they played in introducing both education and religious services played a role in the transition of the Macquarie Harbour penal settlement from a place of despair to an organised and efficient industrial complex.

The wives of prisoners
A small number of well-behaved prisoners were allowed to have their wives with them on Sarah Island, where they lived in small huts. There appears to have been no more than two such women on the island at any one time. Not all the appeals of convicts to have their wives with them met with success, as the following response by Governor Arthur to one such petition demonstrates:

‘Two worse characters there cannot be, and I will not approve of the Woman’s being transported to the same place as her husband’.

Further reading
Huon pine has played a central role in the history of the Macquarie Harbour region. Indeed, it was a search for sources of the highly-prized timber that prompted the voyage that led to the settler’s discovery of the harbour. In 1819, during a reconnaissance of the suitability of Macquarie Harbour as a penal settlement, Thomas Florence and James Kelly brought back a load of pine that fetched £200 for the Government.

**Convict piners**

Exploitation of Huon pine (or Macquarie pine, as it was also known) was one of the major factors which led to the decision to establish a penal settlement at Macquarie Harbour. During the life of the settlement, convicts cut pine from the lower Gordon River and along the shores of the harbour, much of it being exported or used in the settlement’s own shipyards. Just prior to the closure of the penal colony, the Commandant, Captain J. Briggs, commented:

‘there is no doubt still a great quantity of Huon pine uncut, but the difficulty of access to the swamps in which it only grows, and the number of persons it requires after cutting it down, in transporting it to the water, and from the price it has hitherto brought in the Hobart Town market. I fear no individuals could undertake to export it with any chance of remuneration to themselves.’

Despite Briggs’ report, pining was to continue for another 150 years.

During the second phase of the Sarah Island penal settlement, from 1846-7, convict pass holders cut pine from the timber reserves around the Harbour. However, they were unable to make wages for themselves nor meet the weekly Government quota, resulting in a loss of £2591.11s to the State. One person who did profit from this collapse was George Watson, who received £829.13.4 compensation for the loss of his shipping contract. Watson later pressed the Government, unsuccessfully, for exclusive rights to cut timber both at Macquarie Harbour and Port Davey.

**A century and a half of pining**

Following the closure of the settlement in 1847, pining operations continued on a small scale. From the 1850s to 1880s, Captains Lloyd and Heather and their families lived on Sarah Island, managing pining operations. However, a moratorium was placed on the cutting of Huon pine and blackwood from 1882-7 due to concerns that the colony was depleting its reserves of these timbers. In 1887, investigations by the Conservator of Forests led to the recommendation that pining continue under stringent regulations.

In about 1887 the Doherty brothers and their families — the founding fathers of Macquarie Harbour’s pining dynasty — established a camp at Picanniny Point and became the first to extract pine from the King River. With the mining boom of the turn of the century and the establishment of railheads and substantial townships at Kelly Basin and Teeookana, the demand for timber grew. Sawmills were opened in Strahan. Piners
worked the Gordon River, pushing further upstream as they exhausted the timber resources of the lower reaches.

In 1911, surveyor Hartwell Conder had a wooden tramway built which traversed seven kilometres of rugged terrain, crossing 29 bridges, to a cliff top high above the King River. Logs were cut from the rich timber reserves here, sent down a chute to the river and floated to the mouth of the King. A boom gate across the mouth collected the logs which were then pulled ashore to be processed at Condor’s Sawmill at Picaninny Point.

In about 1913, the Grining brothers constructed a pining tramway from near Coal Head to the upper reaches of the Braddon River. The timber reserves at the mouth of the Braddon River were worked by Victor Neilsen, while James Crossan, and later his son, Ted, cut timber from the Fysh and Bird rivers and Pine Creek. Smith and Edgerton worked the upper reaches of Pine Cove Creek from the late 1920s, using horses and, less successfully, tractors, to haul the logs eight kilometres over the rugged terrain.

Piners gained an intimate knowledge of the area. Pioneers such as Barnes Abel and Charlie Doherty pushed upstream to name the spectacular Deception Gorge (now known as the Great Ravine) and the First Splits on the Gordon River, as well as the stands of Huon pine on the upper reaches of the Denison River (now known as the Truchanas Huon Pine Reserve).

Pining boomed in the mid 1920s, buoyed by economic prosperity and expansion. However, the depression years brought hardship for the pining community. The largest of the sawmilling operations at Strahan went broke. The depletion of timber resulted in the need to utilise poorer-grade timber. Huon pine oil was extracted from sawdust and sold to German pharmaceutical companies from 1930 until the outbreak of the WWII. The war itself also resulted in many piners leaving the area.

Post-war technology — crawler tractors, trucks, chainsaws — allowed the Gordon and distant shores to be worked. On occasions, helicopters were used to fly piners into remote areas. By 1960 only two sawmills that adopted the new and more efficient technology available operated in Strahan — as is the case today.

In the early 1980s, a major shift in community attitudes led to the protection of many stands of Huon pine within the Tasmanian Wilderness World Heritage Area. Today, the Teepookana Plateau, under the management of Forestry Tasmania, provides the bulk of the wood used in Strahan’s two existing mills.

**Further reading**


The history of the Teepookana township and the railway line that once joined it to the outside world is tied to the mineral boom of the turn of the century. The discovery of rich deposits of copper at Mt Lyell led to the establishment of the Mt Lyell Mining Company in 1892. Yet transport of ore from the Mt Lyell mines posed a major problem. Between the mines and the nearest potential port lay an expanse of rugged and steep terrain cloaked in thick rainforest. In the minds of many, such terrain seemed impossible to traverse.

The Abt railway
The German-patented Abt railway system was selected as the best alternative to overcome the difficult terrain of the King River Valley. A central cog on the engine engaged the teeth of a third rail known as the ‘rack’ which was positioned midway between the two outside rails. This allowed locomotives to haul loads over sections two and a half times steeper than was possible for conventional lines.

In 1894, work commenced on the ambitious project. Four hundred men, many from Victoria, laboured under the harsh conditions. Morale was often low among the workers. In the mid-winter of 1885 a stop-work meeting forced the contractors to offer reduced work hours and slightly improved wages (six shillings and sixpence for an eight hour day). The line was completed as far as Teepookana by 1896.

The Abt railway was hailed as one of the greatest engineering feats of its day. Many cuttings, up to 20 m deep, were laboriously hewn by pick and shovel. The line was 34 km long and had 48 wooden trestle bridges, the longest being the Quarter Mile Bridge. (Its remains can be seen one hours walk from Teepookana.) This bridge was nearly 250 m long and a steel girder soon replaced the original timber span. Trains crossed the bridge at a walking pace as any speed above this caused the bridge to sway dangerously.

Teepookana
From the time that work commenced on the track, until 1899 when the track was extended to Regatta Point, Teepookana was a hive of activity. During the last years of the nineteenth century it was the fourth busiest port in Tasmania. At its peak, Teepookana was home to about 200 people. Most residents were railway workers.

Situated at the highest navigable point of the river, the township acted as a port facility for the Mt Lyell Mining and Railway Company. Two steamers, the Pioneer and Eagle, and over a dozen barges, or ‘lighters’, plied the King River, carrying coal, passengers, goods and mail for shipment by rail to the copper mines, and copper for shipment from the Strahan port facilities. Today, the ruins of two Huon pine lighters can be seen at the Fishermens Wharf.

Buildings comprised a two storey Royal Hotel, bakery, butcher, a police barracks, school, Mt Lyell workshops, stores and goods sheds. Today the remains of the once busy wharf can be seen along the bank below the Iron Bridge, while the six ton steam crane that once hauled copper onto barges now stands outside the Regatta Point Railway Station.
The end of an era
Although the rail system of the west coast was vital to the social and economic growth of the region as a whole, the fortunes of railway towns often waned. In 1899, the Abt railway was extended a further 11 kilometres to Regatta Point. The following year, the Tasmanian Government extended its railway the three kilometres around the bay from Strahan to Regatta Point. With Strahan acting as the port for the Mt Lyell Mining and Railway Company, facilities were translocated from Teepookana to Regatta Point. With the town’s major function now rendered obsolete, the population of Teepookana rapidly declined.

Teepookana, however, did not die completely. The town struggled on until 1963, when the line was closed after 69 years of operation. Shortly after, much of the track was ripped up and sold. By 1972, the main span of the Quarter Mile Bridge had been washed away in floods. For Teepookana, and the townships of Dubbil Barril, Rinadeena and Lynchford along the line, the end of an era had come.

A new beginning
In the year 2000, the first stage of a new 35 kilometre railway connection between Queenstown and Strahan began operation. Although not a direct reconstruction of the historic Abt line, the finished project will essentially follow the original route. The journey gives visitors a unique opportunity to discover the region’s history and stunning scenery.

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Pining at Teepookana Plateau
Among the first to work the timber reserves of the King River were the Doherty brothers, who arrived around 1887. Some piners used draught horses to drag logs from the Teepookana Plateau to the King River. In 1911 Hartwell Conder established a seven kilometre long wooden tramway, complete with 29 bridges, to transport logs to the top of a near vertical chute upstream from Teepookana. The logs were rafted down the King River to be collected at its mouth for Conder’s sawmill at Picaninny Point.

Huon pine continues to play a role in the economy today. The 20 000 hectare Teepookana State Forest is managed by Forestry Tasmania under a multiple use system. Huon pine which has previously been cut or destroyed by fire is salvaged, providing a backup for other salvage operations from HEC impoundments. A rehabilitation program for those areas previously disturbed by logging is carried out — although the seedlings will take five centuries to mature!

Further reading


Rae, L. (1988). The Abt Railway on Tasmania’s West Coast. Lou Rae, Sandy Bay.
Kelly Basin had been the site of a convict timber station as early as 1824, and for much of the rest of the century was used intermittently as a pining area. During the brief life of Sarah Island as a probation station between 1846-7, at least one party of convict pass holders operated in the Kelly Basin region.

At the turn of the century, however, Kelly Basin became the site of the bustling township of Pillinger. Yet in the space of just a few years, Pillinger blossomed and faded into virtual obscurity. Today, the ruins of the township lie beneath the towering blackwood trees — the first stages in the reclamation of the land by rainforest.

**A town born of rivalry**

In the final years of last century west coast mining was dominated by two companies headed by direct and dynamic Irishmen: James Crotty and Bowes Kelly. Before merging in 1903, a ‘war’ between the two companies resulted in rival mines, railways and ports. Kelly’s Mt Lyell Mining and Railway Co Ltd officially opened its railway and smelters in March 1897, linking its smelters and its port with the Abt railway which ran from Queenstown to the port of Teepookana and, later, Strahan. Crotty’s North Mt Lyell Copper Company opened its railway late in 1897. It followed an easy grade, linking the towns of Linda, Gormanston, Crotty, Darwin and the Kelly Basin port township of Pillinger.

**Pillinger**

In 1898, the Government surveyed the town of Macquarie (later to be known as Pillinger, after the Minister for Lands and Works, Alfred Pillinger), on the western shore of the Basin. The town was subdivided into 108 lots — each except one were 56 square metres in size. These were sold through an auction held in Strahan in 1898, with lots selling for an average price of £46. At the time, these prices were the highest paid for any town allotments on the west coast.

Two separate towns sprang up on opposite shores of the Basin. The two were connected by a ferry service, as no road linked the east and west. Railyards, sheds and a railway station were situated on the western side of the Basin. The main settlement, known as West Pillinger, was clustered around the railway station. A police station, post office and school were located in the centre of town. Two wharves, each 122 metres (400 feet) in length were located on the western shore. A dam was constructed on the Nora River, some six kilometres from the Basin, which provided water for the town.

The North Mt Lyell Company’s works were situated on the eastern side of the Basin. Workmans’ huts, a dining hall, band and billiard hall, Company run store and some Company officers’ residences were situated in this area. The longest of the three wharves — 244 metre (800 feet) — built in the Basin was located on the eastern shore.

A brickmaking plant and a sawmill provided materials for the building of smelters at Crotty. Until these smelters had been completed, an ore-crushing plant was established at Kelly Basin to allow limited
processing of copper ore prior to shipping.

In the brief period between 1898 and 1903, Pillinger thrived. Its population peaked at about 600 in 1902. At this time there were 80 dwellings, 25 businesses, three hotels, a Catholic church, coffee palace and shipping agent’s office. The licensee of the Shamrock Hotel, Mr Percy Waxman, built a hall which provided a venue for various events such as church services, balls and performances by the Blind Musicians Company.

A library was well patronised, athletics meetings were held and a slipway was built by the Kelly Basin Aquatic Club. In 1901, the Pillinger Cricket Club was formed. A State School was built, with enrolments numbering 65 at the start of the 1902 school year.

A large number of Strahan piners and their families — Doherty, Abel, Timbs, Grining, Fisher and Jones — made Pillinger their home, spurred on by the large contracts being let for railway sleepers, mining timbers and sawmill timber. Pillinger also offered the opportunity to live in relative comfort closer to their place of work, even if only for a brief period. After the demise of the town in 1903, the pining families settled in Strahan.

The decline of Pillinger

The failure of the smelters at Crotty played a significant role in the demise of Pillinger. As early as October 1901, rumours were circulating that the Crotty smelters were unable to raise sufficient heat to carry out the process of smelting copper. Despite the considerable expense of their construction, the smelters were opened and closed several times — once after the chimney toppled over when struck by lightning. These setbacks, in conjunction with poor management practices, led to the increasing realisation that a merger with the rival Mt Lyell Mining and Railway Co Ltd was inevitable.

With the amalgamation of the two mining companies in 1903, the decision was made to use Strahan as the port for the new combined company, making the port facilities at Kelly Basin virtually redundant. Many residents left the ailing township. Between 1903 and 1920, the number of voters enrolled on the electoral roll plummeted from 188 to 22.

Trains continued to operate until 1925, mainly transporting firewood and mining timber to the mines. The following year, the track was removed from the stretch of line between Kelly Basin and Darwin. Following the cessation of rail services, only one shop and one hotel stayed open. Only two families remained. The last of these — the Crossans — left in 1943.

Pillinger today

Today, interpretive panels at the site of East Pillinger provide a fascinating insight into the town’s history. A 3-4 hour return walk to Kelly Basin from the Bird River Bridge follows the old rail formation. Remnants at the site include the old brick kilns, boilers and a rail carriage.

Further reading


The Franklin River conservation issue

One of the most recent episodes in the diverse history of the Macquarie Harbour region unfolded during the summer of 1982-3, when the village of Strahan became the focus of the largest conservation battle ever fought in Australia: the battle to save the Franklin River. The issue dominated Tasmanian politics throughout the late 70s and early 80s and caused great rifts between those who supported the construction of the dam and those who sought the preservation of the wilderness values of the region.

**The issue**

In 1979 the Hydro-Electric Commission (HEC) released a proposal to construct a 180 megawatt power scheme which would result in the inundation of 37 km of the middle reaches of the Gordon River and 33 km of the Franklin River valley. The scheme would add to the huge power output already provided by the State’s 23 hydro-electric power stations and generate a significant number of jobs for the west coast — an area with one of the highest unemployment rates in Tasmania. There was some concern, however, among economists and academics that an increase in power output would not necessarily strengthen the economy, nor decrease levels of unemployment.

Regardless of economic rationales, the focus of the conservationists was the protection of the Franklin River, one of Australia’s last truly wild rivers, and the integrity of one of the world’s last great temperate wilderness areas.

**The ‘greenies’**

A co-ordinated campaign by the Tasmanian Wilderness Society (TWS) and other conservation groups mobilised support from a wide cross section of the community during a long campaign to bring the plight of the Franklin River to the notice of all Tasmanians and indeed, much of the world. A series of public meetings and street marches, culminating in the largest street march seen in Tasmania, brought the issue to the forefront of Tasmanian politics.

Those who supported the dam responded with a campaign of their own. With the support of pro-dam politicians, they argued passionately for the economic benefits that the construction of the dam would bring.

**The politicians**

In order to stem the growing wave of concern over the construction of the dam, the Labor Government of Premier Doug Lowe sought a compromise, passing legislation that paved the way for the construction of a dam on the Gordon-above-Olga, an alternative that did little to appease either pro or anti-dam groups.

In 1981 a referendum was held in an attempt to resolve the issue, giving the Tasmanian people the opportunity to express their support for the construction of either the Gordon-below-Franklin or the Gordon-above-Olga scheme. The option of no dams, however, was withdrawn. This resulted in a staggering 44% of the electorate casting an informal vote by writing ‘No Dams’ across their ballot ticket.

In 1982, the Government nominated the
Cradle Mountain — Lake St Clair National Park, Franklin — Lower Gordon Wild Rivers National Park and the Southwest National Park for World Heritage listing. The listing was accepted at the December UNESCO meeting on World Heritage. The Western Tasmanian Wilderness National Parks World Heritage Area had satisfied all the criteria for listing as a natural property and three of the six cultural criteria. In doing so, the listing had satisfied more criteria than any other World Heritage Area on Earth. Yet the World Heritage Committee expressed that it was ‘seriously concerned at the likely effect of dam construction in the area on those natural and cultural characteristics which make the property of outstanding universal value’.

Prior to the listing, however, a State election was held at which the Labor Government was defeated. The new Liberal Premier, Robin Gray, was a staunch proponent of the dam who considered the Franklin River, ‘nothing but a brown ditch, leech-ridden and unattractive to the majority of people’. On the 16 June 1982 the newly-elected Gray Government revoked parts of the Wild Rivers National Park, paving the way for the development of the Gordon-below-Franklin power scheme.

The Franklin River blockade
The campaign to save the Franklin River, now clearly lost on political grounds, shifted emphasis, with the organisation of what was to be one of the largest acts of mass civil disobedience seen in Australia. The Franklin River Blockade, organised by the TWS under the leadership of Bob Brown, commenced on the 14 December 1982, the day the Western Tasmanian Wilderness National Parks World Heritage Area was listed.

A total of 2613 people registered at the TWS headquarters in Strahan to participate in the campaign of non-violent civil disobedience. Protestors chained themselves to gates at the HEC compound in Strahan and formed blockades in rubber duckies at Warners Landing. As boat load after boat load were arrested, new waves of protestors came to take their place. The campaign continued throughout the summer of 1982-3 and resulted in the arrest of 1272 persons. Bob Brown was imprisoned for three weeks, and many people, including internationally renowned botanist, David Bellamy, were remanded in custody.

Federal intervention
During the height of the campaign, the Tasmanian Government rejected $500 million offered by Prime Minister Malcolm Fraser to construct an alternative power scheme outside the boundaries of the World Heritage Area. Further offers by the newly-elected Labor Government under Bob Hawke were similarly turned down. Then, on 31 March 1983, the Hawke Government, which had recently been elected into office on an anti-dam platform, passed regulations forbidding HEC works within the World Heritage Area. Despite this, the HEC continued with the construction of works while the Tasmanian Government’s challenge to the validity of the legislation was heard in the High Court. It was the decision of the High Court on the 1 July 1983 which, after a four to three majority ruling, prevented the damming of the Franklin River.

The Federal Government subsequently provided the Tasmanian Government with $276 million in compensation, the bulk of which was used to subsidise the cost of the King and Anthony HEC power schemes. Grants were also provided to assist in the management of the Tasmanian Wilderness World Heritage Area.

The listing of the Tasmanian Wilderness as a World Heritage Area was an essential component in the landmark decision to halt the construction of the dam, but listing also gave recognition to the natural and cultural values which make the area of outstanding universal significance.

Further reading
Geo-heritage of the Macquarie Harbour region

An ancient beauty
The rocks that underlie the rugged beauty of the Tasmanian Wilderness World Heritage Area (WHA), including the Macquarie Harbour and Gordon River region, are ancient. The oldest rocks date back a thousand million years and range in physical nature from the very hard quartzites and dolerites through to highly soluble limestones and readily eroded sandstones and gravels. The complexity of the geology contributes to the WHA values of the region. Sandstones, siltstones and conglomerates, dating back to the Ordovician period (505–433 million years ago), contain a variety of ancient marine fossils. These reveal a legacy from a distant past when what we now call Tasmania was beneath a shallow sea.

During the Cambrian period (505–570 million years ago) a line of volcanoes, known as the Mt Read Volcanic Belt, began erupting in an inundated region to the west of where Macquarie Harbour now lies. It was under these conditions that the ore bodies extracted from the west coast ranges were initially formed.

During the Jurassic, some 170 million years ago, tectonic activity associated with the fragmentation of the ‘supercontinent’ Gondwana and subsequent faulting laid the foundations of the dolerite mountains typical of much of the WHA. In the Macquarie Harbour region, faulting occurred during the Tertiary period (65–2 million years ago), resulting in the formation of the Macquarie Harbour graben. This downfaulted block is the most spectacular example in the State and reaches a depth of 600 m. Much of it is now filled by Tertiary sediments.

The Ice Age
In many respects today’s landscape is a legacy of the Ice Age. Broad, U-shaped valleys, such as the Surprise Valley along the Lyell Highway, and highland tarns and cirques all owe their characteristic appearance to the action of glaciers. Like massive rasps across the landscape, glaciers have resulted in the dislodgment of vast amounts of gravel debris from the headwaters of the Franklin and Gordon rivers. Much of this sediment was subsequently washed downstream.

Tasmania has undergone at least three major glaciations throughout the Pleistocene (2 million–10 000 years ago). During the last Ice Age, from 100 000–10 000 years ago, global sea levels were about 100 metres lower than present. Macquarie Harbour as we know it today would not have existed. Instead, the Gordon and King rivers would have flowed to a coastline some distance seaward of the present day coast. With the end of the Ice Age, sea levels rose, stabilising to their present level around 6000 years ago. This resulted in the flooding of the Gordon and King River valleys.

The Gordon River
The Gordon River rises from Lake Richmond on the flanks of the King William Range and passes through some of the most rugged country in Tasmania. The river often cuts deeply against the grain of the prevailing direction of the mountain ranges, forming spectacular gorges. With the third largest discharge of any river in Australia, the river exerts an enormous influence on the hydrology of Macquarie Harbour, resulting in the brackish nature and...
tannin-stained colour of its waters.

Along the lower reaches of the river, in-filling with fine sediments has resulted in the formation of levee banks and mud flats and may have forced the river to adopt its present meandering course. The levee banks that line the river between Sir John Falls and Lake Fidler are unique in the southern hemisphere and are of great interest in that they appear to be of very similar composition throughout their length. Such uniformity suggests that they were formed rapidly under a constant regime of deposition of unvarying source material.

**Meromictic lakes**
Lake Fidler and Sulphide Pool are rare examples of meromictic lakes, lakes which are stratified into narrow layers of fresh and saline water. They are probably the only meromictic lakes in the world formed by the cutting off of inner bend river channels by levee development. They are of outstanding significance on a global scale. The saline water within them is derived from the movement of salt water up the Gordon River. This permeates through the banks of the river, thereby entering the lakes and, being denser, forms the lower layer of their waters. The meromictic lakes are extremely fragile. The construction of the Gordon dam has had an adverse impact on the lakes. Due to the alteration of the natural discharge of the river, the movement of salt water up the lower Gordon river has been altered, resulting in changes to the amount of saline water entering the lakes.

**Limestone caves and cliffs**
The caves in the Gordon River region are based on Gordon Limestone, a carbonate sediment up to 2000 m in thickness and considered to be one of the best developed in the world. The weathering of this limestone through chemical processes has led to a profusion of caves, many of which are globally significant archaeological sites. Kuti Kina Cave, on the Franklin River is one such site that has revealed one of the richest depositories of archaeological remains in Australia. The Champ Cliffs (Marble Cliffs) on the lower Gordon River are also derived from the Gordon limestone.

**Why is the water brown?**
The famous reflections found on the Gordon River are made possible by the dark colour of the water. This dark colouring is a typical feature of watercourses throughout the south-west and is caused by the presence of tannin in the water. The tannin is leached out of the peat substrate upon which certain vegetation communities (such as buttongrass, tea-tree scrub and rainforest) grow. Peat is composed of organic material derived from these vegetation communities and forms in areas where there is high rainfall and low evaporation. When the tannin-stained water tumbles over rapids and waterfalls a froth forms, often giving the appearance of a stream polluted by detergents. This is not the case, and the presence of tannins has no effect on the purity of the water. Indeed, Tasmania is very fortunate in the abundance of clean freshwater streams that flow throughout the State.

The appearance of the tannin-stained water has led some people to believe that the water is poisoned, as this early account suggests:

> ‘The torrents which pour down the mountains mingle with the decayed vegetable matter, and impregnated with its acids discoulour the water of the harbour: and the fish that approach the coast often rise on the waves and float poisoned to the shores.’
> (John West 1852)

**Henty Dunes**
The extensive dune field 12 km north of Strahan is one of the highlights of the Macquarie Harbour region. The highest dune is over 40 m and commands a good view across an undulating sea of sand. The dunes are a dynamic system, constantly changing their appearance and marching inland at over one metre per year. The longitudinal movement of sand along the Ocean Beach coastline provides the building material for the dunes, while the predominantly south-westerly airstream moves the sand inland. In some places the advancing dunes have uncovered the remains of old trees that once grew along the coast.
Gordon River erosion

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

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

The river and the problem
The Gordon River is remarkable in many respects. Despite the relatively small size of its catchment, it has one of the highest discharge rates of any river in Australia. It is the major influence on the hydrology of Macquarie Harbour — indeed the brackish nature of the waters of the harbour are the result of the outflow of the river.

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

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

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

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

In 1993, radiocarbon dating of bank sediments indicated
that, prior to the onset of river traffic, the banks of the lower Gordon were either stable or in a process of active deposition of sediments.

**The solution**

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

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

A series of monitoring systems, developed by Parks and Wildlife Service experts (in consultation with hydrologists and geomorphologists from the Universities of Wollongong and Tasmania and the Australian Maritime College) were put in place to assess the role of speed restrictions in limiting river bank erosion. Monitoring stations have been set up at 48 different sites and are inspected every six months. A further 43 quadrants are monitored to assess revegetation. In addition, a further 36 bank profile transects have been established.

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

**Further reading**


Cool temperate rainforest of the lower Gordon River

A special rainforest
The word rainforest evokes images of a profuse diversity of plants, often draped in vines and lianas and possessing buttressed roots. While such an image is true of the tropical rainforests of northern Australia, the cool temperate rainforest communities of Tasmania are very different. Tasmania is the Australian stronghold of cool temperate rainforest, a type of rainforest characterised by an open and verdant, cathedral-like quality: a silent, cool, dark and damp place where both the trunks of trees and the forest floor are festooned with a luxuriant carpet of mosses and lichens. In autumn and early winter in particular, the rainforest floor is dappled with an array of brightly coloured fungi.

An ancient flora
Tasmania’s rainforests contain some of the most ancient of Australia’s flora, with species which date back over 60 million years — long before the arrival of the eucalypts and acacias which today dominate the Australian flora. The rainforest species evolved on the ancient continent of Gondwana, a landmass which once incorporated the present day continents of South America, Antarctica and New Zealand. It is not surprising, therefore, that many of the rainforest species of Tasmania have their closest relatives in these continents. Even in the frozen continent of Antarctica, pollen evidence reveals a landmass once much warmer than present and covered in a close relative of the myrtle (Nothofagus cunninghamii), the species which dominates Tasmania’s rainforests today.

The rainforest species
The diversity of species in cool temperate rainforests is considerably lower than that of the tropical rainforests of northern Queensland. (There is, however, a rich diversity of lower plants, such as mosses, lichens and liverworts). Many of the species are endemic (i.e. restricted to the State). The dominant species of the cool temperate rainforest is myrtle (or myrtle-beech, as it is more accurately known), which can attain heights of up to 50 m and ages in excess of 500 years. The myrtle, despite its perhaps inappropriate common name, is more closely related to the beech trees of the northern hemisphere rather than the myrtles of the northern hemisphere. Sassafras (Atherosperma moschatum), is commonly found in association with myrtle. Sassafras is a commercial timber used for quality furniture. The distinctive black stain often seen in its heartwood is caused by a bacterial infection. The endemic leatherwood (Eucryphia lucida) bears a profusion of beautiful flowers in late summer and early autumn. Its nectar forms the basis of a substantial honey industry. Along the banks of the Gordon River, the...
A bizarre plant that occurs among the rainforest species is the pandani (*Richea pandanifolia*). This endemic plant, which resembles the pandanus palm of tropical regions, is not a palm at all, but rather the largest member of the heath family. The long, sharp-edged leaves are retained on the trunk to provide insulation. Small pools of water which form at the base of the leaves provide a habitat for a diverse range of invertebrates.

There is a considerable diversity of rainforest understory species, including native plum (*Cenarrhenes nitida*), native laurel (*Anopterus glandulosus*), mountain pepper (*Tasmannia lanceolata*), white waratah (*Agastachys odorata*) and the rare whitey wood (*Acradenia frankliniae*). The Macquarie vine (*Muehlenbeckia gunnii*) is a perennial creeping vine common in the region. Its succulent, purple fruit was often eaten by the convicts of Sarah Island.

Many of these species are found along the banks of the lower Gordon River and at the Heritage Landing boardwalk. An easily accessible and interpreted rainforest walk can also be found along the track to Hogarth Falls, while a short boardwalk at Sir John Falls gives visitors who fly into the Gordon River an opportunity to see a rainforest dominated by myrtle, Huon pine and leatherwood.

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**Myrtle wilt and Phytophthora**

Myrtle wilt is a disease caused by a fungal infection which can kill our majestic myrtles. Disturbance such as roading has the potential to trigger local epidemics of the disease. Phytophthora root rot, although a greater threat in drier vegetation communities, can result in the death of at least 39 known susceptible rainforest species. Caused by an introduced fungal pathogen (*Phytophthora cinnamomi*), this serious disease can be spread in soil by earth-moving machinery, four-wheel drives and even on walkers’ boots and tent pegs.

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**Further reading**

Native conifers of the Macquarie Harbour region

Tasmania is fortunate in possessing a very large number of plant species that occur nowhere else in the world. Our rainforest and alpine communities are unique assemblages of plants of great botanical significance. One such group of plants, the native conifers, is particularly important in the Macquarie Harbour region, not only for its botanical values, but also for the role that pines have played in the area's history.

**Huon pine**

The Huon Pine (*Lagarostrobos franklinii*) derives its common name from the stands which once occurred along the Huon River, itself named after Captain Huon Kermandec, commander of the French ship, *L’Esperance*. The species is restricted to western and southern Tasmania, where it is largely confined to riverine habitats. It belongs to a family of ancient native conifers dating back 135 million years.

Estimates of the area of living Huon pine vary, but are in the order of 10 500 ha. In addition there are about 800 ha of standing, fire-killed pine. The current area of remaining pine is the remnant of a much wider original range that has been reduced by fire, inundation, logging and mining. Today, the remaining stands are well protected within reserves, the majority being within the World Heritage Area.

Although extremely slow growing, the tree may attain heights of over 40 m. Growth rates average a mere 1 mm per year, but can vary from 0.3 mm to 2 mm, depending on conditions. Huon pine can reproduce both vegetatively (from fallen individuals) and by seed. Seed dispersal is largely limited to the area downstream from riverine stands.

The Huon pine can reach prodigious ages, often in excess of 2000 years, making it among the longest-lived organisms on Earth. Only the bristle-cone pine of North America exceeds it in age. International headlines were made with the discovery of a stand of Huon pines on Mt Read that was widely quoted as being in excess of 10 000 years of age. All the individuals in this population are genetically identical, and are all males. The stand arose from one or a small number of individuals, and has maintained itself by vegetative reproduction. It is important to remember that no individual tree in the Mt Read stand is 10 000 years old — rather, the stand itself has been in existence for that long.

Huon pine occurs at Heritage Landing, including an individual more than 2000 years old. This tree, which survived the ravages of lightning strikes and escaped the piner’s axe, finally fell completely in July 2000. However, the amazing life cycle of the species continues...
growth springs from the fallen tree. Please refrain from touching the trees along the boardwalk as the removal of their protective covering of moss and bark may hasten their decline.

**The history of pining**
The timber of the Huon pine has long been prized for boat building and furniture. The timber is easily crafted, attractive and floats on water (a feature which facilitates its ease of transport). The Huon pine’s well-known durability is due to the essential oil, methyl eugenol, which gives the wood both its distinctive odour and its high resistance to rot and attack by marine organisms.

The exploitation of the Huon pine was a major incentive behind the original exploration of Macquarie Harbour, and the subsequent establishment of the penal settlement on Sarah Island. After the closure of the penal settlement, the species continued to play a significant role in the history of the region as piners engaged in the extraction of timber from the remote regions of the Gordon River. Today, two small sawmills continue to operate in Strahan and, at Teepookana Plateau, Forestry Tasmania engages in the salvage of Huon pine timber.

**Celery-top pine**
The celery-top pine (*Phyllocladus asplenifolius*) is so named because of the resemblance of its ‘leaves’ to those of celery. In fact, these are not true leaves, but rather cladodes (flattened stems); although very young seedlings have needle-like leaves. The tree grows to 30 m in height and may attain a maximum age of 800 years. It is one of the first of the rainforest trees to return after fire as birds help to spread its seed.

The timber of celery-top pine was utilised in the ship building yards of Sarah Island for the construction of spars and masts. Today this slow-growing tree is exploited as a by-product of clearfelling in old-growth forests and is commonly used for external cladding and poles in the building industry.

**King Billy pine**
The King Billy pine (*Athrotaxis selaginoides*) is thought to derive its common name from the Tasmanian Aborigine William Lanney, who was referred to as ‘King Billy’. It reaches a height of 40 m and may reach ages in excess of 1200 years. The species is restricted to regions above 600 m where it grows in rainforest.

A close relative of the King Billy pine, the pencil pine (*Athrotaxis cupressoides*), is generally restricted to sub-alpine areas above 800 m. Like its relative, it can reach ages greater than 1200 years.

**At the mercy of fire**
Like other trees of the cool temperate rainforests, Tasmania’s native conifers are highly susceptible to fire. In certain areas of the State, extensive stands of dead ‘stags’ give testimony to the ravages of previous fires. Some species will never recover due to their very slow growth and poor seed dispersal abilities. Indeed, one-third of the State’s King Billy pines have been eliminated by fire.

**Phytophthora root rot**
Phytophthora root rot can result in the death of many species of native plant, including our native pines. Caused by an introduced fungal pathogen (*Phytophthora cinnamomi*), this serious disease can be spread in soil by earth-moving machinery, four-wheel drives and even on walkers’ boots and tent pegs. It is a good policy to clean all camping equipment that comes in contact with soil, such as boots, tent pegs and trowels, before undertaking a walk into another area.
Plant list for the lower Gordon River

The following list gives the more common species to be found along the lower Gordon River. Often the common name is little known. Species are therefore listed by their scientific names. Species that are endemic (i.e. found only in Tasmania) are indicated by an asterix.

- **Blackwood** \(\text{Acacia melanoxylon}\)
- **Prickly Moses** \(\text{Acacia verticillata}\)
- **Buzzy/Biddy-widdy** \(\text{Acaena novae-zelandiae}\)
- **Whitey wood** \(\text{Acradenia franklinii}^*\)
- **Horizontal** \(\text{Anodopetalum biglandulosum}^*\)
- **Native laurel** \(\text{Anopterus glandulosus}^*\)
- **Heart berry** \(\text{Aristotelia peduncularis}^*\)
- **Sassafras** \(\text{Atherosperma moschatum}\)
- **Mountain blue berry** \(\text{Billardiera longiflora}\)
- **Fishbone water-fern** \(\text{Blechnum nudum}\)
- **Hard water-fern** \(\text{Blechnum wattsii}\)
- **Tall sedge** \(\text{Carex appressa}\)
- **Native plum** \(\text{Cenarrhenes nitida}^*\)
- **Native currant** \(\text{Coprosma quadrifida}\)
- **Gypsy fern** \(\text{Ctenopteris heterophylla}\)
- **Pink berry** \(\text{Cyathodes juniperina}\)
- **Blue berry** \(\text{Dianella tasmanica}\)
- **Tree fern** \(\text{Dicksonia antarctica}\)
- **Dwarf sundew** \(\text{Drosera pygmaea}\)
- **Native Solomons Seal** \(\text{Drymophila cyanocarpa}\)
- **Rice Grass** \(\text{Ehrharta sp}\)
- **Smithton peppermint** \(\text{Eucalyptus nitida}^*\)
- **Leatherwood** \(\text{Eucryphia lucida}^*\)
- **Cutting grass** \(\text{Gahnia grandis}\)
- **Scrambling coral fern** \(\text{Gleichenia microphylla}\)
- **Finger fern** \(\text{Grammitis biltardi}\)
- **Bats wing fern** \(\text{Histiopteris incisa}\)
- **Long clubmoss** \(\text{Huperzia varia}\)
- **Tiny pennywort** \(\text{Hydrocotyle muscoides}\)
- **Shiny filmy fern** \(\text{Hymenophyllum flabellifolium}\)
- **Narrow filmy fern** \(\text{Hymenophyllum rarum}\)
- **Club rush** \(\text{Isolepis sp}\)
Huon pine
Woolly tea-tree
Shiny tea-tree
Riverine tea-tree
Manuka
Pretty grass flag
Guitar plant
Swamp paperbark
Scented paperbark
Kangaroo fern
Golden wood
Macquarie vine
Myrtle-beech
Musk
Lancewood/Satinwood
Celery-top pine
Cherry rice-flower
Mother shield fern
Dogwood
Climbing heath
Tassel cord-rush
Pandani
Leathery shield-fern
Bog rush
Pink swamp heath
Gunn’s spyridium
Mountain pepper
Fork fern
Water ribbons
Straggling trochocarpa
Ivy-leaf violet

Lagarostrobos franklinii *
Leptospermum lanigerum
Leptospermum nitidum *
Leptospermum riparium *
Leptospermum scoparium
Libertia pulchella
Lomatia polymorpha *
Melaleuca ericifolia
Melaleuca squarrosa
Microsorum pustulatum
Monotoca glauca *
Muehlenbeckia gunnii
Nothofagus cunninghamii
Olearia argophylla
Phebalium squameum
Phyllocladus asplenifolius *
Pimelea drupacea
Polystichum proliferum
Pomaderris apetala
Prionotes cerinthoides *
Baloskion tetraphyllum
Richea pandanifolia *
Rumohra adiantiformis
Schoenus sp
Sprengelia incarnata
Spyridium gunnii *
Tasmania lanceolata
Tmesipteris billardieri
Triglochin procerum
Trochocarpa cunninghamii *
Viola hederacea
Plants of Heritage Landing — an identification guide

Heritage Landing offers visitors the opportunity to view a number of species typical of the cool temperate rainforests of Tasmania. Although the focal point of the walk is the Huon pine that grows along the track, there are a number of other species of note. The whitey wood, which is common along the boardwalk, is in fact listed as a rare species. It is confined to the riverine environments of the west. Many other species are endemic, that is, they are found in Tasmania and nowhere else in the world.

**Huon pine Lagarostrobus franklinii**
Restricted to the west of the State, this endemic pine is one of the most famous of all our trees. Apart from the bristle-cone pine of North America, it is the longest living organism on Earth, with ages in excess of 3000 years having been recorded. A large fallen Huon pine near the Heritage Landing boardwalk is over 2000 years of age. The species is a representative of an ancient family of native conifers dating back 135 million years.

**Whitey wood Acradenia frankliniae**
Whitey wood is found only in Tasmania, where it is restricted to rainforests by the margins of rivers in the west. Although locally common along the lower Gordon River and some other western rivers, the species is considered rare.

**Myrtle-beech Nothofagus cunninghamii**
The dominant species of the cool temperate rainforest, the myrtle-beech is representative of species that once grew extensively throughout not only Australia, but also the southern continents of South America and Antarctica. It was part of the distinctive suite of plants that evolved on the supercontinent of Gondwana. Today the species finds its stronghold in Tasmania.
Horizontal  *Anodopetalum biglandulosum*
Restricted to Tasmania, the aptly-named horizontal forms tangled thickets. These are the result of its habit of bending over as it grows and sending up new vertical branches which in turn bend over. The result is a nightmare to walk through.

Leatherwood  *Eucryphia lucida*
Found only in Tasmania, the large, delicate flowers of the leatherwood form the basis of Tasmania's leatherwood honey industry. The distinctive paddle-shaped leaves aid recognition outside the flowering period. Flowering period is December to January.

Native laurel  *Anopterus glandulosus*
Native laurel is found only in Tasmania, where is can commonly be found as an understorey shrub in wet eucalypt forests and rainforest. It has large, glossy green leaves. Flowers in October.

Sassafras  *Atherosperma moschatum*
A dominant species within the rainforest, the sassafras is able to reproduce vegetatively by sending new stems upwards from the base of the trunk after the tree has fallen. It flowers from September to October.
**Scented paper-bark** *Melaleuca squarrosa*

The loose, cork-like bark of this species allows it to maintain oxygen around the base of its trunk in swampy areas. This enables the roots to survive. It grows in moorlands and rainforests, but requires disturbance for its regeneration. It has a bottle brush-like flower in October to December.

**Hard water fern** *Blechnum wattsii*

This plant is one of the most common ferns in Tasmania’s western rainforests. It has thick leathery fronds which rattle when walked through — hence the alternative common name of ‘rattle fern’. It is also common in forests throughout eastern Australia.

**Mother shield fern** *Polystichum proliferum*

This fern is most common in rainforests on fertile soils, rather than the poor soils that characterise the western rainforests. It resembles a tree fern without a trunk.

**Batswing fern** *Histiopteris incisa*

The batswing fern is a close relative of bracken. Like bracken, it thrives on disturbance and is abundant in areas where trees have fallen after flooding. It is widespread throughout the temperate regions of the southern hemisphere.
Plants of Sir John Falls —
an identification guide

Tasmania’s cool temperate rainforests are very different from rainforest communities that many visitors are familiar with, such as the tropical rainforests of northern Queensland. Indeed, the very structure of the forest is different. Gone are the buttressed roots and vines and epiphytes that characterise the tropical rainforests. Even the sheer diversity of tropical rainforests is much reduced in cool temperate rainforests. There is also a distinct difference in the atmosphere that our rainforests evoke. Many liken them to ancient green cathedrals — cool, silent and evocative. Indeed, our rainforests are ancient and representative of a flora that once covered much of Australia long before the rise of the eucalypt forests that today dominate much of the continent. Many of the species contained in these forests are endemic to Tasmania: that is, they grow nowhere else in the world. Sir John Falls offers visitors the opportunity to discover many of these species.

**Myrtle-beech *Nothofagus cunninghamii***
The dominant species of the cool temperate rainforest, the myrtle-beech is representative of species that once grew extensively throughout not only Australia, but also the southern continents of South America and Antarctica. It was part of the distinctive suite of plants that evolved on the supercontinent of Gondwana. Today the species finds its stronghold in Tasmania. Note the beautiful flush of red leaves on the growing tips during the summer months.

**Huon pine *Lagarostrobus franklinii***
Restricted to the west of the state, this endemic pine is one of the most famous of all our trees. Apart from the bristle-cone pine of North America, it is the longest living organism on Earth, with ages in excess of 3,000 years having been recorded. The pines in the Sir John Falls area are about 500-800 years old. The species is a representative of an ancient family of native conifers dating back 135 million years.

**Blackwood *Acacia melanoxylon***
Often found as the dominant component of regenerating wet forest, the fast-growing blackwood is a member of the *Acacia* genus — the wattles. Note how the leaves lack a central vein — indeed they are not leaves at all, but rather phyllodes (flattened leaf stems). Blackwoods can be found towering into the canopy along the eastern section of the boardwalk at Sir John Falls.
Dogwood *Pomaderris apetala*
A common species in disturbed areas, such as along riverbanks. The raised veins of the light-coloured undersurface aid recognition.

Leatherwood *Eucryphia lucida*
Found only in Tasmania, the large, delicate flowers of the leatherwood form the basis of Tasmania’s leatherwood honey industry. The distinctive paddle-shaped leaves aid recognition outside the flowering period. Flowering period is December to January.

Sassafras *Atherosperma moschatum*
A dominant species within the rainforest, the sassafras is able to reproduce vegetatively by sending new stems upwards from the base of the trunk after the tree has fallen. It flowers from September to October.
**Native plum  *Cenarrhenes nitida***

Native plum is endemic to the state. It is similar in appearance to native laurel, although the leaves are duller and more spaced out along the branch. The species has a touch-sensitive anther which is activated by pollinating insects. As its name suggests, native plum produces a succulent fruit that is a favourite among birds. Flowers November to December.

**Native laurel  *Anopterus glandulosus***

Native laurel is found only in Tasmania, where it can commonly be found as an understorey shrub in wet eucalypt forests and rainforest. It has large, glossy green leaves and attractive sprays of white flowers in October.

**Whitey wood  *Acradenia frankliniae***

Whitey wood is found only in Tasmania, where it is restricted to rainforests by the margins of rivers in the west. Although locally common along the lower Gordon River and some other western rivers, the species is considered rare.
Pandani  
*Richea pandanifolia*

Found only in Tasmania, the pandani is the largest heath plant in the world. Although it resembles its near name-sake, the pandanus palm of tropical Australia, the pandani is in no way related to it.

Climbing Heath  
*Prionotes cerinthoides*

Climbing heath is an endemic species common in the rainforests of the west and south-west. It is a climbing plant, often seen draped around the trunks of trees. Flowers November to April.
Filmy fern *Hymenophyllum sp.*
As its name suggests, this tiny fern has very thin leaves. In fact, they are just one cell thick. The filmy fern creeps along on rhizomes (hair-like roots) at the base of tree trunks and on tree ferns.

Kangaroo fern *Microsorum pustulatum*
A species found as far north as tropical Queensland, the kangaroo fern is typically seen decorating the mossy trunks of rainforest trees such as myrtle-beech and sassafras.

Tree fern *Dicksonia antarctica*
The trunk of the tree fern is greatly increased in diameter by the outgrowth of fibrous rootlets. This often forms a surface on which large forest trees such as sassafras can germinate and grow. The starchy pith found in the apex of the trunk was a food source for Tasmanian Aboriginal people.
**Hardwater fern  *Blechnum wattsii***
This plant is one of the most common ferns in Tasma-nia’s western rainforests. It has thick, leathery fronds which rattle when walked through — hence it is sometimes called the ‘rattle fern’. It is common in forests throughout eastern Australia.

**Fish-bone water fern  *Blechnum nudum***
This species has its pinnules (leaflets) arranged like the bones joined to the spine of a fish. Like the hard water fern, it is distinguished from other fern families by fertile reproductive fronds, which look very different from the fronds used for photosynthesis.

**Batswing fern  *Histiopteris incisa***
This soft-leafed fern is a close relative of bracken. Like bracken, it thrives on disturbance and is abundant in areas where trees have fallen after flooding. It is widespread in the southern hemisphere.
**Horizontal Anodopetalum biglandulosum**
Restricted to Tasmania, the aptly-named horizontal forms tangled thickets. These are the result of its habit of bending over as it grows and sending up new vertical branches which in turn bend over. The result is a nightmare to walk through.

**Prickly Moses Acacia verticilata**
Widespread in damp areas throughout Tasmania, Victoria, New South Wales and South Australia. Like the blackwood, to which it is related, the 'leaves' of the prickly moses are actually flattened leaf stems, known as phyllodes. The true leaves are found only on the juvenile plant. Flowers September to November.

**Manuka Leptospermum scoparium**
One of several species of tea-tree that grow along the Gordon River, the manuka is common throughout south-eastern and eastern Australia and New Zealand. Flowers spring to summer.

**Lancewood Phebalium squameum**
Found only in Tasmania, lancewood is a common understorey shrub or tree in wet forests. It is recognised by its leathery leaves, the underside of which are dotted with translucent oil glands. Flowers in spring.
**Tree fern** *Dicksonia antarctica*

The trunk of the tree fern is greatly increased in diameter by the outgrowth of fibrous rootlets. This often forms a surface on which large forest trees such as sassafras can germinate and grow. The starchy pith found in the apex of the trunk was a food source for Tasmanian Aborigines.

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**Filmy fern** *Hymenophyllum sp.*

As its name suggests, this tiny fern has very thin leaves. In fact they are just one cell thick. The filmy fern creeps along on rhizomes (hair-like roots) at the base of trunks and on tree ferns.

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**Kangaroo Fern** *Phymatosorus pustulatus*

A species found as far north as tropical Queensland, the kangaroo fern is typically seen decorating the mossy trunks of rainforest trees such as myrtle-beech and sassafras.
Mammals of the Macquarie Harbour region

Tasmania is fortunate in being home to a number of unique mammals that occur nowhere else in the world, and in acting as a refuge for several species that have recently become extinct on the mainland. In contrast to many other areas on mainland Australia, Tasmanian mammals remain abundant and relatively easily seen by visitors to the State.

Tasmania has 39 species of non-marine (and 41 species of marine) mammals. An additional 13 species have been introduced, often to the detriment of the native mammals. All three major groups of mammals — monotremes, marsupials and placentals — are found in Tasmania. Indeed, Australia and New Guinea are the only countries in the world where all three groups occur. Representatives of all three groups can be found in the Macquarie Harbour region.

Monotremes
The monotremes are represented by only three species (one of which — the long-beaked echidna — is restricted to New Guinea). Monotremes are egg layers — a reproductive feature which does not occur in any other mammals. Although most active at dusk and dawn, the platypus is occasionally seen during daylight hours along the Gordon River. It also occurs in Hogarth Falls Creek and Manuka Creek in Strahan, and has even been observed in freshwater streams that run onto Ocean Beach.

The platypus feeds on the muddy bottom of the river, locating crustaceans and worms through the remarkable ability to detect the electric fields that surround its prey. Interestingly, the platypus is one of the few mammals in the world which is venomous — the male possesses a spur on the inside of its hind leg. It is thought that this is used by males during territorial disputes.

The short-beaked echidna is commonly seen by visitors along the margins of roads during the summer months. The female echidna has a pouch into which she deposits her single egg. The young hatches within this pouch, using an egg-tooth analogous to those found in birds to break out of the shell. The young laps milk which is extruded from glands within the pouch — monotremes do not possess teats as do other mammals. Pouch life lasts for nearly two months — the age, not suprisingly, at which spines develop.

Marsupials
The majority of land mammals in Tasmania (and Australia in general) are marsupials. They are characterised by the presence of a pouch in the female, although in some species the pouch may not be present, or only present during the breeding season. Marsupials give birth to extremely small, embryo-like young which suckle within the pouch. Nineteen species occur in the State.

The Tasmanian devil is a well known carnivorous marsupial which is confined to Tasmania. The animal once occurred on mainland Australia, but became extinct there about 500 years ago, possibly due to predation or competition with the dingo and the increasing aridity of the mainland environment. The devil is primarily a scavenger. It undertakes wide ranging forays in search of carrion. It is widespread across a number of habitats in the Macquarie Harbour region.
The strikingly beautiful spotted-tail quoll and its close relative, the eastern quoll are predatory marsupials. They are also known as the tiger cat and native cat, respectively. These names, however, are somewhat illogical — the tiger cat is spotted, not striped and is definitely not a cat! The eastern quoll has in recent years become extinct on the Australian mainland, largely due to habitat loss and competition and predation by introduced animals such as the fox and cat.

The dusky antechinus and its relative the swamp antechinus, as well as the little-known white-footed dunnart, occur in the Macquarie Harbour region. These are the smallest of the carnivorous Tasmanian marsupials.

A common marsupial often seen at Heritage Landing is the Tasmanian pademelon. The rather unusual common name is derived from the Aboriginal word for the animal. Like a number of Tasmanian marsupials, the pademelon until relatively recently occurred on mainland Australia but has become extinct there due to loss of habitat and predation by introduced animals. For the pademelon, and a number of other species, Tasmania acts as a last refuge.

The Bennetts wallaby also occurs in the Macquarie Harbour region. This common species is often inaccurately referred to as a kangaroo; however the only kangaroo in Tasmania — the Forster kangaroo — does not occur in the area. The potoroo is a small macropod which is also found in the Macquarie Harbour area.

Wombats also occur in the region. Their characteristic square droppings and burrows can be seen in the Bird River area. Large excavations often thought to be due to wombats, however, are often the work of echidnas.

Tasmania has two species of bandicoot. The brown bandicoot occurs in the Macquarie Harbour region, while the barred bandicoot is restricted to the drier, eastern half of the state. Both species are omnivorous — that is, they eat both plant and animal matter.

The ringtail possum, the brushtail possum, and the eastern pygmy possum have been recorded from the Macquarie Harbour region. The pygmy possum, as its name implies, is tiny. At a mere 30 grams, it weighs less than a hundredth the weight of the better known brushtail possum. Like many of our native mammals, they make their homes in the hollows of trees in old-growth forest.

Placental mammals
The third group of mammals — and the group to which we ourselves belong — are known as placentals, a reference to the structure which affords nourishment to the developing embryo. The only native placental land mammals to occur in Tasmania are rodents and bats.

Two rodents, the swamp rat and the beautiful, endemic long-tailed mouse are regular inhabitants of the rainforest of the lower Gordon River. Water rats occur in the streams of the region and can sometimes be seen in the Hogarth Falls area. The broad-toothed mouse occurs in the moorlands that surround Macquarie Harbour. Its droppings can be observed in the buttongrass plains around the harbour. Possibly five of Tasmania’s eight species of bat occur in the region. Unfortunately, little work has been done on this poorly understood group of mammals, so distribution records are patchy.

Victims of the highway
Visitors to the State often comment on the distressingly high number of road-killed mammals they see during their stay. In many cases, this can be avoided by driving more slowly at night. Rangers regularly remove carcasses from the road in an effort to prevent scavenging Tasmanian devils, or animals such as the endangered wedge-tailed eagle, from becoming the next casualty. Often, female marsupials will have young in their pouch which has survived the accident and are able to be hand-raised and eventually released back into the wild.

Further reading

The Tasmanian tiger

It is a sad irony that the mammal which is most often asked about by visitors to Tasmania, and which supports the State’s coat-of-arms, is also the only Tasmanian mammal to have become extinct since European settlement. Despite no conclusive evidence of its existence since 1936, alleged sightings have led to the thylacine, or Tasmanian tiger, becoming one of the most fabled of animals.

Biology
The thylacine (Thylacinus cynocephalus) was the world’s largest carnivorous marsupial. An adult weighed about 25 kg, stood about 60 cm high at the shoulder and measured about 180 cm from nose to tail tip. Distinctive black stripes ran down the upper surface from the shoulders to the base of the tail. The large, wolf-like head (from which the animal derives its scientific name — ‘cynocephalus’ is Greek for ‘wolf head’) was equipped with powerful jaws capable of a remarkable 120° gape. Indeed, the thylacine’s similar appearance to other large, non-marsupial carnivores led to it being variously known as the native hyena and Tasmanian wolf.

Females gave birth to up to four young, which like other marsupials, were tiny, embryo-like and carried in a pouch. The pouch contained four teats and opened backwards, as is the case in a number of ground-dwelling marsupials such as the Tasmanian devil and the wombat. When the young became too large for the pouch they were left in a den while the mother hunted.

Our knowledge of the behaviour and ecology of the thylacine is very poor. Much of the information available is based on anecdotal accounts and casual observations — the animal’s demise leaving no opportunity for scientific study. It would appear that the thylacine was usually active at night, hunting either singularly or in pairs. Prior to the introduction of sheep, kangaroos and wallabies, possums and smaller mammals probably formed a major part of their diet. The thylacine was relatively slow and could not outrun its prey. Instead, it relied on stalking and stamina to wear down the animals it hunted. Thylacines were generally mute, although coughing, growling, hissing and distinctive terrier-like yapping vocalisations have been recorded. Early accounts suggest that the animal was secretive and shy.

Fossil evidence reveals that the thylacine was once widespread on mainland Australia and New Guinea. Aboriginal rock paintings of the animal can be found in the Northern Territory and Western Australia. It is believed to have disappeared from the mainland at least 2000 years ago due to competition with the dingo and Aborigines, possibly combined with loss of habitat associated with climatic change. The animal was probably never very abundant in Tasma-
nia. As is the case with other predators that occupy the top of the food chain, such as wedge-tailed eagles, population levels are by necessity much lower than those of their prey. Historical accounts suggest it was widespread throughout a variety of habitats, possibly preferring hilly terrain with thick, dry eucalypt forest.

Persecution

Shortly after European settlement, sheep became an important part of the fledgling economy of Tasmania. It was not long before farmers came into conflict with ‘an animal of the panther kind, which commits dreadful havoc among the flocks’ (J. Lycett, 1824). The thylacine certainly preyed upon sheep, particularly lambs; but, regrettably, also became the scapegoat for stock losses caused by poor management practices, harsh weather or other native and feral predators.

The Van Diemen’s Land Company introduced a bounty scheme on their north west sheep properties as early as 1830 in order to control thylacines and other perceived predators, such as the Tasmanian devil and feral dogs. A Government bounty system operated from 1888 to 1909, which resulted in the payment of 2184 bounties. The number of bounty payments peaked at the turn of the century, but declined markedly during the next 10 years.

As early as 1850, concerns that the thylacine would become extinct were being expressed. The famous naturalist, John Gould, wrote in 1863 that, like the wolf in England and Scotland, the thylacine would soon be an ‘animal of the past’. Nonetheless, indiscriminate persecution continued unabated, largely spurred on by the Government bounty system.

The last definite record of the thylacine’s existence occurred in 1936, when the world’s last captive animal died in Hobart Zoo. Ironically, in the same year, the animal was added to the list of protected wildlife.

Is it extinct?

By definition, an animal is extinct if there is no reasonable doubt that it no longer exists. Following this definition, the thylacine is presumed to be extinct.

However, unverified sightings of the animal have been reported consistently since 1936. Most sightings occur at night and are of fleeting duration. Given the large area of relatively remote bushland still intact in Tasmania, there is some possibility that the animal continues to survive as yet undetected. However, if the population is of sufficient size to remain viable, it would be expected that clear evidence would have by now been found.

Several attempts have been made to systematically search for the thylacine using photographic equipment triggered by infrared sensors. Photographs of a variety of animals were obtained, but none were thylacines.

Thylacines at Macquarie Harbour

There are relatively few reports of thylacines from the Macquarie Harbour region. Between 1888 and 1909, only four bounty payments were made at Strahan. Since 1936, a number of thylacine sightings have been reported from the desolate coastline to the west of Macquarie Harbour and to the north-west of Strahan. In 1956, a sighting was reported from the Strahan-Queenstown road, while a further sighting was reported from the Strahan-Zeehan road in 1959. In January 1957, headline news around the world was made when a dog-like animal was photographed from a helicopter on a beach west of Macquarie Harbour. The photograph, however, was too indistinct to identify the animal.

Further reading


Whales and whales strandings at Macquarie Harbour

Whales and dolphins belong to a group of mammals collectively known as cetaceans. Like their land-based mammal cousins, whales are warm-blooded, breathe air and suckle their young on milk. Some species even have some hair development. Their ancestors adopted a marine existence over 50 million years ago.

Cetaceans are divided into two groups — the baleen whales and the toothed whales. The toothed whales, as their name suggests, use teeth for feeding, possess only one blowhole opening and have asymmetrical skulls. Baleen whales use baleen (vertical strips of rigid, keratin-like material hanging from the upper jaw) as sieves to filter out the small crustaceans (krill) on which they feed. Baleen whales are primarily solitary, while toothed whales range from solitary to highly social.

The most frequently seen cetacean is the common dolphin, which often rides the bow waves of the Gordon River cruise boats. During the winter months, southern hemisphere baleen whales migrate to warmer waters to breed. While most species migrate some distance off the continental shelf, the humpback and southern right whale come sufficiently close to the coast to allow regular sightings from land. Humpbacks travel northward between May and July and return southward to their Antarctic feeding grounds between September and November. Southern right whales travel north from June to September and return southward between September and late October.

Whale strandings

Of all Australian States, whale strandings occur most frequently in Tasmania. Around 400 stranding events have been reported, with a disproportionate number of these occurring in the Circular Head and Macquarie Harbour-Ocean Beach areas.

At least 25 strandings have been reported from the Macquarie Harbour-Ocean Beach area. 11 of these involved mass strandings. In 1981, after a stranding of 26 sperm whales, nine individuals were returned to the water, one of which subsequently restranded and died. The following year, a mass stranding of 51 pilot whales occurred on Pelican Spit, some two kilometres inside the harbour entrance. The use of refined rescue techniques resulted in all but four being successfully rescued. Two weeks later, a further 14 sperm whales were discovered in a state of decomposition. The longest of these individuals measured over 14 m in length. In 1992, two stranding events involving pilot whales were reported. In March of that year 69 animals were reported, while in October a further 76 individuals were discovered. In both cases most of the animals had already died. In February 1998, 66 sperm whales stranded. Three individuals were returned to the water but their eventual fate is unknown.

Why do whales strand?
The reasons whales strand are not yet clearly understood. While some single strandings may be accounted for by a whale dying at sea and being washed ashore, many strandings are believed to occur due to other factors. Occasionally, stranded whales are found to be suffering from infections of the inner ear which
may affect their ability to navigate using echo location. Confronted with rough seas, a single individual may stray too close to the shore. On touching the bottom, the resultant distress calls can lead to the rest of the pod encountering a similar fate as they attempt to maintain the social cohesion of the pod. Also, certain topographical features may lead to strandings. Wide, gently sloping intertidal zones are not detected by the reflection of sonar pulses, resulting in the whales going too close to the shore. Heavy seas, combined with ebb-tides may result in the pod becoming stranded. Similarly, bays with narrow mouths flanked by rocky headlands may give the impression of being trapped, causing panic which may result in beaching.

**What can you do to help?**
The first priority in any attempt to save a stranded pod of whales is to seek help. Contact the Parks and Wildlife Service (the Strahan Office number is 64717 122), or any authority which can pass the information on. Provide details on the exact location of the stranded animals, their numbers, condition, the species (if you know), their size — any details which may be useful. Once this is done, it is important to ensure that the animals are stabilised. Whales can survive for a considerable time provided the dangers to them are minimised. After removing nearby sharp objects, such as shells, place the whale on its belly. Sand and water can enter the blowhole causing the animal to drown if they are left lying on their side. Try to turn the animal so it is facing the shore. This will allow it time to close its blowhole should a wave wash over the animal. Don’t use the fragile tail or fins as handles. Dig holes for the flippers so that they are hanging free and allow water to enter these holes to assist in cooling. Cover the body from the burning and drying effects of sun and wind — towels or seaweed will suffice — but don’t cover the blowhole. Wet the animal down, ensuring that water does not enter the blowhole.

Once authorities have arrived, the animals are taken to a holding area and the release is coordinated so that the entire surviving pod is released. If released individually, the animal will often restrand simply because it does not know where to go or responds to the continued distress calls of the individuals that are still stranded. Whales are highly social creatures. Don’t underestimate the need to maintain their group structure.

**Take care**
Despite their formidable size, whales appear reluctant to cause any harm to their rescuers. Nonetheless, accidents can happen. Don’t stand on the shoreward side of a whale, as a wave can easily roll the animal on top of you. Beware of sudden movements of the tail. Most importantly, beware of hypothermia. Tasmanian waters are cold. Rescuers should be well equipped with thick wetsuits and a change of warm clothes. Keep track of how long you’ve been in the water.

**Further reading**


Drawings courtesy of Fauna of Tasmania Committee, University of Tasmania
Land mammal list for the Macquarie Harbour region

MONOTREMES

Platypus | Ornithorhynchus anatinus
Echidna | Tachyglossus aculeatus

MARSUPIALS

Dasyurids (Carnivourous marsupials)
- Tasmanian devil | Sarcophilus harrisii
- Spotted-tail quoll | Dasyurus maculatus
- Eastern quoll | Dasyurus viverrinus
- Dusky antechinus | Antechinus swainsonii
- Swamp antechinus | Antechinus minimus
- White-footed dunnart | Sminthopsis leucopus

Peramelids (Bandicoots)
- Brown bandicoot | Isoodon obesulus

Burramyids (Pygmy possums)
- Eastern pygmy possum | Cercartetus nanus

Phalangerids (Brushtail possums)
- Brushtail possum | Trichosurus vulpecula

Land mammal list for the Macquarie Harbour region

Platypus (drawing by Jane Burrell, courtesy of Tasmanian Museum and Art Gallery)

Tasmanian devil

Eastern quoll (drawing by Jane Burrell, courtesy of Tasmanian Museum and Art Gallery)
**Petaurids (Ringtail possums and gliders)**

- Ringtail possum  *Pseudocheirus peregrinus*
- Sugar glider  *Petaurus breviceps*

**Vombatids (Wombats)**

- Common wombat  *Vombatus ursinus*

**Macropods (Wallabies and kangaroos)**

- Tasmanian pademelon  *Thylogale billardierii*
- Bennetts wallaby  *Macropus rufogriseus*
- Long-nosed potoroo  *Potorous tridactylus*

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**PLACENTAL MAMMALS**

**Murids (Rats and mice)**

- Swamp or velvet furred rat  *Rattus lutreolus*
- Long-tailed mouse  *Pseudomys higginisi*
- Water rat  *Hydromys chrysogaster*
- Broad-toothed mouse  *Pseudomys fuscus*

**Vespertilionids (Small bats)**

- Chocolate waffled bat  *Chalinolobus morio*
- Lesser long-eared bat  *Nyctophilus geoffroyi*
- Large Forest vespadelus  *Vespadelus darlingtoni*
- King River vespadelus  *Vespadelus regulus*
- Tasmanian long-eared bat  *Nyctophilus timorensis sherrin*

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* Presumed to occur in the region, but not as yet recorded. This is a reflection of the paucity of studies on the bats of Tasmania, and how little we know about them.
Birds of the Macquarie Harbour region

Birds are among the most conspicuous group of animals to be seen in Tasmania. Of the 325 species recorded from the State, some 200 can be considered to be regular inhabitants. Many species are migratory and can only be seen during the summer months. Twelve species of bird are endemic to the State (ie found only in Tasmania).

These are:
• green rosella
• Tasmanian thornbill
• scrubtit
• yellow wattlebird
• yellow throated honeyeater
• strong-billed honeyeater
• black-headed honeyeater
• forty-spotted pardalote
• black currawong
• Tasmanian native hen
• dusky robin
• brown scrub wren

Biology of birds
Many of the characteristics which we associate with birds are intimately linked with their capacity for flight. Feathers are perhaps the most obvious of these, yet there is debate as to whether these evolved for the purpose of flight or to act as insulation which allowed the development of homeothermy (warm bloodedness). Feathers are composed of non-living keratin, a material similar to that of reptilian scales and our own fingernails. The wing acts both as an efficient airfoil and as a means of propulsion through the air. The large pectoral muscles that power the wings can make up more than 30% of the body weight of strong flying birds such as pigeons and falcons.

Many of the adaptations of birds act to reduce weight. Modern birds lack teeth — the heaviest part of the vertebrate body. Instead, birds break up their food in the crop — a muscular, grinding machine that is more suitably located close to their centre of gravity. The skeleton is composed of hollow bones that are strengthened structurally by an internal framework of struts.

The high body temperature, fast metabolism and a consistent foraging campaign of seeking out high energy foods such as seeds or nectar provide birds with the energy needed to power their flight muscles. Other species such as the marine albatrosses and shearwaters are beautifully adapted to gliding. Such species are remarkably attuned to the variations in wind velocity above the surface of the oceans and the rising air produced by waves to gain height, before gliding forward and repeating the process.

Birds of the lower Gordon River
The number of species occurring along the lower reaches of the Gordon River is considerably less than is found in the drier regions of eastern Tasmania. The cool temperate rainforest that dominates the vegetation communities in this area
is generally poorer in species than drier forest communities. This is partly due to the lower diversity of plants found in the rainforest as compared to the drier forests of the east, as bird species diversity is known to increase with increasing diversity of plant species and forest structure. Further, the steepness of the banks along much of the river means that there is little available habitat for wading birds. However, at least 58 species occur in the area, including six endemic species: green rosella, Tasmanian thornbill, scrubtit, yellow-throated honeyeater, strong-billed honeyeater and black currawong.

The most commonly seen species in the lower Gordon River area are the great cormorant, green rosella, grey fantail, olive whistler, Tasmanian thornbill, white-browed scrub wren, pink robin and the crescent honeyeater.

The beautiful azure kingfisher has also been recorded along the lower Gordon River. This little-known species is restricted to the west of the state, where its preferred habitat is along forested streams and rivers. The majestic sea eagle and the largest of Australia's cormorants, the great cormorant, hunt along the Gordon River. Black ducks may also be seen along the lower reaches of the river. Even the little penguin is a frequent visitor to the lower Gordon. Black swans, once a common food item for Aboriginal people, early explorers and convicts alike, are found on both the river and the harbour, although in presumably vastly lower numbers than at the start of the nineteenth century. It has been estimated that during the convict period from 1822-1826, some two million swans were killed.

**Birds of the Macquarie Harbour foreshores**

At dusk and dawn, the moorlands that surround Macquarie Harbour ring with the distinctive ascending call of the stunningly beautiful ground parrot *Pezoporus wallicus*. This bird, one of only three ground parrots in the world, is vulnerable to extinction on the mainland. Western Tasmania is the species’ stronghold.

Another species of parrot which may occasionally be seen foraging among the scrublands along the Macquarie Harbour coast is the orange-bellied parrot. This endangered species breeds only in the south-west of the State. It migrates to southern Victoria for the winter.

Along the sandy shores of the harbour and on Ocean Beach, a number of wading birds can be found. The two species of oyster catcher which occur in Tasmania can both be seen along the coast. The all black sooty oyster catcher prefers rocky coastlines, while the black and white pied oyster catcher can be seen on Ocean Beach. Both species forage on a range of marine worms and molluscs. The long bill of oyster catchers allows them to probe inside the shells of bivalve molluscs and snip the muscle which closes the valves. Thus the bird can feed on the flesh within without the risk of its bill being trapped.

The pied oyster catcher and several other wading birds, such as the red-capped and hooded plovers, nest on the ground just above the high water mark. Consequently, their nests are very prone to destruction by recreational vehicles. Obviously, it is important that vehicles on Ocean Beach do not drive above the high water mark.

A number of other wading birds are migrants from as far afield as Siberia. The red-necked stint, sanderling and ruddy turnstone are among the species which spend the southern winter in their breeding grounds in the northern hemisphere. These birds are not seen in their full breeding plumage in Tasmania.

**Further reading**


The muttonbirds of Macquarie Harbour

One of the many fascinating birds of the Macquarie Harbour region is the short-tailed shearwater or ‘muttonbird’ (Puffinus tenuirostris). An ambitious and long term program of research has made the shearwater one of the most studied birds in Australia, and has revealed fascinating insights into their lives.

The short-tailed shearwater belongs to the family Procellariidae, a group comprising over 60 species which includes the petrels and prions. All members of the family have distinctive tube-like nostrils along their upper beak and are believed to be one of the few bird families with a sense of smell. Almost all breed in burrows and, like the albatrosses, are truly impressive oceanic fliers.

‘Flying sheep’
The name muttonbird was first used by the early settlers on Norfolk Island, who harvested providence petrels (Pterodroma solandri) and wedge-tailed shearwaters (Puffinus pacificus) for food. The name was given by an officer in the Royal Marines, who called them ‘flying sheep’. Unfortunately, the providence petrel became extinct on Norfolk Island due to over-harvesting and the introduction of pigs. The name muttonbird has been applied to the short-tailed shearwater ever since.

Harvesting
The muttonbird is one of the few Australian native birds that is commercially harvested. During the muttonbird season, chicks are taken for their feathers, flesh and oil. The industry was established by early European sealers and their Aboriginal families and today forms an important part of Aboriginal culture in Tasmania. The chicks are taken under strict controls and the season is limited to a two week period in April.

Distribution and migration
Short-tailed shearwaters breed in about 285 colonies throughout south-eastern Australia. The largest concentrations occur on the Bass Strait islands, with an estimated three million burrows on Babel Island alone.

With an estimated total population of 23 million, the shearwater is one of the most abundant seabirds in Australia. Early accounts suggest that the population was once considerably higher. In 1798, Matthew Flinders estimated that there were at least one hundred million birds within a single flock sighted in Bass Strait.

The short-tailed shearwater undertakes one of the most spectacular migrations of the animal world. Their migratory path takes them northward along the western margin of the Pacific to the Aleutian Islands near the Bering Strait — a distance of over 15 000 km. Shearwaters have been known to fly this remarkable distance in six weeks. The return route is along a broad path across the central Pacific. Mortality among young birds on their first migration is very high, and it is common to see shearwaters washed up along
beaches on the eastern seaboard of Australia during the spring and along the Japanese coast in May.

The adults depart during the first two weeks of April. Two to three weeks later, the young, which have by now lost up to half their body weight and replaced their downy feathers for flight feathers, are ready to undertake the migration as a separate group. Clearly, they must possess an innate capacity to navigate over such vast distances.

**Breeding**

Breeding occurs between September and April. On arriving back at their colonies during the last week of September, the birds meet with their mates and refurbish their old burrows, or excavate new ones. Their burrows are about one metre long. Each bird generally remains with the same partner throughout their life, and occupy the same burrow each year.

The synchronicity of breeding is one of the most remarkable aspects of the short-tailed shearwater. In the first few days of November, the birds disappear from the colony to spend three weeks feeding at sea. During this time the females are developing their eggs. A single white egg is laid a few days after their return to the colony in late November, with a distinct peak at 27-28 November. The male takes the first incubation shift, which lasts for two weeks, followed by the female which takes the second shift for a further two weeks. Each parent completes one more shift before the egg hatches. During each shift, the “duty” bird does not leave the burrow, nor is it fed by its mate.

The young hatch after 53 days in the third week of January. Both parents participate in feeding the chick, which quickly puts on weight, reaching nearly twice the weight of its parents. In early April, the chicks, still clad in downy feathers, leave their burrows at night. They congregate in open areas to exercise their wings in preparation for their upcoming epic migration. The young will not breed until their fifth year.

**Feeding**

Shearwaters feed predominantly on krill, but also take squid and fish. Their hooked beak allows them to hold onto their prey, while their webbed feet allow them to pursue prey underwater. Shearwaters feed mainly from the surface, although they occasionally plunge dive. It is possible that krill abundance determines the migration of the species, allowing them to exploit the high concentrations of krill which occur each summer at both polar regions.

**Threats**

Shearwater colonies are very sensitive to disturbance. Walking across their colony can easily destroy their burrows. Similarly, erosion caused by recreational vehicles can destroy suitable sites for burrowing, as can fire. Predation by introduced pests such as feral cats can have a similarly devastating impact. Gillnet fisheries in the North Pacific accidentally drown several thousand birds each year, while a further 250,000 are harvested by commercial operators.

**Seeing them at Macquarie Harbour**

Although a number of colonies occur along Ocean Beach, a viewing platform near the carpark gives visitors the best opportunity to observe the birds returning to the rookery after their daily fishing excursions. This spectacular sight can best be seen each dusk from early October to late February.

On greeting their mate and offspring within their burrows, the colony becomes alive with their raucous calls. The birds call again just before dawn as they make their way to their favoured take off positions. Please stay on the boardwalk as walking on the rookery can easily destroy the burrows in which the birds nest.

**Further reading**


Bird List for Macquarie Harbour and Lower Gordon River

**Family Anatidae**
Black swan
Australian shelduck
Maned duck
Grey teal
Chestnut teal
Pacific black duck
Musk duck

**Family Podicipedidae**
Hoary-headed grebe

**Family Spheniscidae**
Little penguin

**Family Procellariidae**
Fairy prion
Short-tailed shearwater

**Family Pelecanoididae**
Common diving-petrel

**Family Diomedeidae**
Black-browed albatross
Shy albatross

**Family Sulidae**
Australasian gannet

**Family Phalacrocoracidae**
Little pied cormorant
Great cormorant
Black-faced shag

**Family Ardeidae**
White-faced heron
Great egret
Cattle egret

**Family Accipitridae**
White-breasted sea eagle
Wedge-tailed eagle
Swamp harrier
Grey goshawk
Brown goshawk

**Family Falconidae**
Brown falcon

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**Family Anatidae**
Cygnus atratus
Tadorna tadornoides
Chenonetta jubata
Anas gracilis
Anas castanea
Anas superciliosa
Biziura lobata

**Family Podicipedidae**
Poliocephalus poliocephalus
migratory

**Family Spheniscidae**
Eudyptula minor

**Family Procellariidae**
Pachyptila turtur
at sea
Puffinus tenuirostris

**Family Pelecanoididae**
Pelecanoides urinatrix
at sea

**Family Diomedeidae**
Diomedea melanophrys
at sea
Diomedea cauta
at sea

**Family Sulidae**
Morus serrator
at sea

**Family Phalacrocoracidae**
Phalacrocorax melanoleucos
Phalacrocorax carbo
Leucocarbo fuscescens

**Family Ardeidae**
Ardea novaehollandiae
Ardea alba
migratory
Ardea ibis
migratory

**Family Accipitridae**
Haliaeetus leucogaster
Aquila audax
K
Circus approximans
migratory
Accipiter novaehollandiae
Accipiter fasciatus
K

**Family Falconidae**
Falco berigora
**Family Phasianidae**
- Brown Quail: *Coturnix australis*
- Family Phasianidae

**Family Rallidae**
- Lewins rail: *Rallus pectoralis*
- Tasmanian native hen: *Gallinula mortierii* endemic
- Eurasian coot: *Fulica atra*
- Family Rallidae

**Family Scolopacidae**
- Lathams snipe: *Gallinago hardwickii* migratory
- Ruddy turnstone: *Arenaria interpres* migratory
- Sanderling: *Calidris alba* migratory
- Red-necked stint: *Calidris ruficollis* migratory
- Curlew sandpiper: *Calidris ferruginea* migratory
- Family Scolopacidae

**Family Haematopodidae**
- Pied oystercatcher: *Haematopus longirostris*
- Sooty oystercatcher: *Harmatopus fuliginosus*
- Family Haematopodidae

**Family Charadriidae**
- Red-capped plover: *Charadrius ruficapillus*
- Double-banded plover: *Charadrius bicinctus* migratory
- Hooded plover: *Charadrius cucullatus*
- Masked lapwing: *Vanellus miles*
- Family Charadriidae

**Family Stercorariidae**
- Arctic jaeger: *Stercorarius parasiticus* migratory
- Family Stercorariidae

**Family Laridae**
- Pacific gull: *Larus pacificus*
- Silver gull: *Larus novaehollandiae*
- Caspian tern: *Hydropoge caspia*
- Crested tern: *Sterna bergii*
- Fairy tern: *Sternula nereis* Orange-bellied parrot
- Family Laridae

**Family Columbidae**
- Brush bronzewing: *Phaps elegans*
- Family Columbidae

**Family Cacatuidae**
- Yellow-tailed black cockatoo: *Calyptrorhynchus funereus*
- Sulphur-crested cockatoo: *Cacatua galerita*
- Family Cacatuidae

**Family Platycercidae**
- Swift parrot: *Lathamus discolor* migratory endemic breeder
- Green rosella: *Platycercus caledonicus* endemic
- Ground parrot: *Pezoporus wallicus* V
- Blue-winged parrot: *Neophema chrysostoma* migratory
- Orange-bellied parrot: *Neophema chrysogaster* migratory endemic breeder
- Family Platycercidae

**Family Cuculidae**
- Fan-tailed cuckoo: *Cuculus flabelliformis* migratory
- Horsfields bronze-cuckoo: *Chrysococcyx basalis* migratory
- Southern boobook: *Ninox novaehollandiae*
- Family Cuculidae

**Family Strigidae**
- Tawny frogmouth: *Podargus strigoides*
- Family Strigidae

**Family Podargidae**
- Australian owlet-nightjar: *Aegotheles cristatus* K
- Family Podargidae

**Family Apodidae**
- White-throated needletail: *Hirundapus caudacutus* migratory
- Family Apodidae
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<thead>
<tr>
<th>Family Alcedinidae</th>
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<tr>
<td>Azure kingfisher</td>
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<td>Spotted pardalote</td>
<td>Pardalotus punctatus</td>
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<td>Striated pardalote</td>
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<tr>
<td>White-browed scrubwren</td>
<td>Sericornis frontalis</td>
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<td>Scrubtit</td>
<td>Sericornis magnus</td>
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<tr>
<td>Striated fieldwren</td>
<td>Sericornis fuliginosus</td>
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<td>Brown thornbill</td>
<td>Acanthiza pusilla</td>
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<td>Tasmanian thornbill</td>
<td>Acanthiza ewingii</td>
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<th>Family Ephthianuridae</th>
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<tr>
<td>White-fronted chat</td>
<td>Epthianura albifrons</td>
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<th>Family Meliphagidae</th>
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<td>Yellow wattlebird</td>
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<td>New Holland honeyeater</td>
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<td>Tawny-crowned honeyeater</td>
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<td>Eastern spinebill</td>
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<td>Colluricincla harmonica</td>
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<td>Grey fantail</td>
<td>Rhipidura fuliginosa</td>
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<td>Whites thrush</td>
<td>Zoothera dauma</td>
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<td>Blackbird</td>
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<td>Superb fairy-wren</td>
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<td>Southern emu-wren</td>
<td>Stipiturus malachurus</td>
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<td>Dusky woodswallow</td>
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<th>Family Corvidae</th>
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<td>Corvus tasmanicus</td>
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<td>Alauda arvensis</td>
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Family Motacillidae
Richards pipit  
Family Passeridae
House sparrow  
Family Ploceidae
Beautiful firetail  
Family Fringillidae
European greenfinch  
Family Hirundinidae
Welcome swallow  
Family Zosteropidae
Silvereye  
Family Sturnidae
Common starling

Explanation of Symbols
E – Endangered. In danger of extinction and whose survival is unlikely if the casual factors continue operating.
V – Vulnerable. Believed likely to become endangered in the near future if the casual factors continue operating.
K – Insufficiently Known. Suspected of belonging to one of the above categories, but not definitely known because of lack of information.
Endemic. Wild populations of the species live only in Tasmania.
Introduced. Introduced by humans from outside Tasmania or Australia
Migratory. Migrates to and from Tasmania on an annual basis, or from a specific region within the state to another.
At sea. Unlikely to be seen on land as the bird spends the greater part of its time at sea.
Reptiles of the Macquarie Harbour region

Reptiles are essentially inhabitants of warm climates. It is not surprising, therefore, to find a relatively modest reptile fauna in the State, particularly compared to the remarkable diversity to be found in central Australia.

Twenty-one land-dwelling species of reptile occur in Tasmania. Of these, seven are endemic — that is, they are found nowhere else in the world. Most are lizards, with all except one in the skink family. In alpine areas, the small skinks that are seen basking on rocks are the main component of the vertebrate fauna. One species of the dragon family (which includes the frillneck lizard and thorny devil) occurs in the state. This is the egg-laying mountain dragon, *Tympanocryptis diemensis*, which occurs in the north and east of the State.

Only three species of snake occur in Tasmania, although a further three species of sea snake have been recorded as vagrants from our coastal waters.

**Biology of reptiles**

Reptiles rely on external sources of heat to bring their body temperature up to that suitable for activity. There is a far greater diversity of species in the tropics and deserts, where day time temperatures are generally warmer than those in Tasmania.

Those species which do occur in Tasmania are of great interest because of the adaptations they have to the cooler Tasmanian climate. While most reptiles lay eggs, in Tasmania all except four species give birth to live young. Embryos develop much more rapidly if they can be warmed in the body of a basking female than if left buried in the cold ground. In some species, females are able to store sperm within their oviducts over winter so that fertilisation occurs at the onset of milder conditions, even in the absence of a male.

The ability of skinks to shed their tails to escape predators is well known. What is less well known is that the break does not occur between tail vertebrae as might be expected but actually occurs between fracture planes within the individual vertebrae. Blood loss is prevented by muscles which seal the major vein and artery. The new tail does not contain vertebrae, but rather is composed of a cartilaginous rod.

The ability of snakes to swallow prey larger than their own heads is the result of some remarkable adaptations of the jaw. The two halves that make up the lower jaw are not fused as in most vertebrates but are able to separate due to the elastic nature of the ligaments that hold them together. The lower jaw bones are attached to the upper half of the skull by elastic ligaments. Snakes have four rows of teeth in the
The innermost rows (palatal teeth) are fixed to the skull and act as a ratchet whilst the outermost rows of teeth (including the fangs of venomous species), which are attached to the movable maxillary bone, “walk” the prey into the mouth. The windpipe is protruded like a snorkel to allow the snake to breathe while swallowing.

The use of venom by snakes is primarily to catch prey, not as a means of defence. A snake which bites a person is putting itself at great risk getting so close to a large animal capable of inflicting serious injury simply by stepping on it. The risk of damage to the delicate fangs is also very high. Although the venom of the three Tasmanian species is toxic, death from snake bite is very rare. In fact, more people have died in Australia from being kicked by mules than through snake bite. Notwithstanding, it is worth bearing in mind that the recommended procedure for snake bite is a pressure bandage—not a tourniquet.

Reptiles of the Macquarie Harbour region

Our knowledge of the distribution of Tasmanian reptiles, and indeed many aspects of reptile ecology, is still poor. Species other than those listed below may be found in the Macquarie Harbour region.

**Metallic skink**

*Niveoscincus metallicus*

The most widespread reptile in Tasmania, the metallic skink can be found from sea level to the tops of mountains. It reaches 55 mm from its snout to its vent and is variable in colour, ranging from light to very dark metallic brown. Their scales have ridges or ‘keels’ on them. Specimens from the Macquarie Harbour area usually have fine striping along the body, with a dark stripe down the centre of the back. The lizards often have a pink or orange belly. The metallic skink gives birth to up to seven live young at a time.

**Tasmanian tree skink**

*Niveoscincus pretiosus*

This lizard is slightly flattened in appearance, with a ragged-edged dark stripe running down the centre of its black-speckled back and a strong white stripe running from its top lip to its back leg. The species has longer legs and smaller scales on its back than its close relative the metallic skink. Despite its name, the Tasmanian tree skink is just as much at home on the rocky shores of the west coast as it is 15 metres up a tree. Tree skinks forage widely for invertebrates on tree trunks, beneath bark and even between the high and low tide marks.

**Tiger Snake**

*Notechis ater*

The tiger snake can reach a length of 1.8 m, while the Chappell Island subspecies reaches nearly 2.5 m. Tiger snakes occupy a wide variety of habitats, from dry rocky areas, wet marshes and moorlands through to wet and dry forests. It preys on small mammals, lizards, smaller snakes and frogs. Tiger snakes are proficient swimmers and are also capable of climbing trees in their search for nesting birds.

**White-lipped whip snake**

*Drysdalia coronoides*

This small snake (25-50 cm) is generally an olive green to green-grey on the upper surface and pale grey underneath. They prefer heathland and dry forests and are often active on fine days during the winter, as their small body size allows them to heat up quickly. This species generally feeds on small lizards.

Further reading


Amphibians are composed of three diverse groups of species. Salamanders and newts comprise some 300 species which are widespread through Asia, the Americas and Europe, while the Gymnophiona are a little known group of some 150 species of legless burrowing or aquatic amphibians predominantly confined to the tropics of Africa, Asia and South America.

The Anurans, or frogs, comprising some 2500 species, are the best known group and the only Order of amphibians found in Australia. Some 94% of all Australian species — and all Tasmanian species — are believed to have evolved on the ancient southern continent of Gondwana, of which Australia and South America were a part. It is therefore not surprising to find that Australia’s frogs have their closest affinities with South American species.

Strictly speaking, there are no toads in Australia, with the exception of the introduced cane toad, Bufo marinus, which is becoming increasingly widespread across north-eastern Australia. However, many Australian species, including Tasmania’s southern toadlet, Pseudophryne semimarmorata, are commonly known as toads or toadlets. This has arisen due to their superficial similarity to the warty toads that were familiar to the first European settlers. The use of such inappropriate, European-based common names is widespread across many groups of the unique Australian fauna and flora.

**Biology**

Most — not all — species of frog pass through a larval stage (tadpoles). The word ‘tadpole’ is derived from a medieval English word meaning ‘toad head’. The duration of the larval stage varies from species to species. The banjo frog, Limnodynastes dumerili, spends 12-15 months as a tadpole, while the common froglet, Crinia signifera, has a larval life span of 6-10 weeks. It has been shown that, in some species at least, the growth rate of tadpoles is related to the population density within the pond and the available food supply. All other things being equal, tadpoles in high densities grow at a slower rate than those occurring in lower numbers.

Adult frogs are carnivorous, unlike tadpoles which are herbivorous. The major part of their diet consists of a variety of insects. Food location is by sight. Prey needs to be moving to stimulate the frog into capturing its prey.
like ‘quank-quank-quank’ during the spring and summer. It is up to 60 mm long.

Common froglet
*Crinia signifera*
Up to 30 mm long, this widespread species is by far the most abundant in the state. Its call is a rapidly repeated ‘craak, craak, craak, craak’ heard throughout the year.

Tasmanian froglet
*Crinia tasmaniensis*
Found only in Tasmania, this species is common around Strahan, but appears to be rare at the southern end of Macquarie Harbour, where it is replaced by the abundant common froglet. It is often found at high altitudes. The undersurface of the thighs and groin are often a brilliant red. Up to 30 mm long, the call of this species is an unusual lamb-like bleating, ‘baa-aa-aaa’, mainly heard in the spring and summer.

Eastern banjo frog
*Limnodynastes dumerili*
Found to the north of Macquarie Harbour, this species is a large and squat frog up to 65 mm long. It is a capable burrower, digging with its hind legs and descending backwards into its burrow. Its call is a remarkable banjo-like ‘bong’ heard in the spring and summer.

Further reading
Freshwater fish of the Macquarie Harbour region

Tasmania boasts only a relatively small number of native freshwater fish. This is to be expected, as the island is part of one of the driest continents on Earth. Of the 180 species that occur in Australia, 25 are found in Tasmania.

Over half of those species occurring in the State belong to a group known as galaxiids. Galaxiids are also found in New Zealand, prompting some scientists to suggest that they evolved from Tasmanian species which migrated across the Tasman Sea. Other species are also found in South America, suggesting that the group derives from Gondwanan ancestors.

Some of the most threatened vertebrates in the State are galaxiids. Many species have very restricted distributions. For example, the critically endangered Pedder galaxias was found only in Lake Pedder and its tributaries prior to its flooding. The endangered Clarence galaxias is restricted to Clarence Lagoon, while the endangered Swan galaxias is restricted to the small upper tributaries of the Swan and Macquarie rivers. Predation and competition with introduced trout place considerable pressure on the species’ prospects of survival.

Freshwater fish of the Gordon River
The Gordon River supports a number of native freshwater fish, including the vulnerable Australian grayling. At least ten species are found in the lower Gordon River — most of which are galaxiids:

- **Short-finned eel Anguilla australis** and **long-finned eel Anguilla reinhardtii**
  Of the 16 species of Anguillid eel worldwide, four occur in Australia, two of which can be found in Tasmania. In common with other eels in this genus, both species breed at sea. Their larvae drift passively with the ocean currents until they arrive near estuaries, where they turn into unpigmented glass eels. As they migrate into freshwater rivers, they become pigmented and are known as elvers. Short-finned glass eels move into estuaries from March to November, while long-finned glass eels do so during February to April. Adults spend a significant part of their life — over 30 years in the case of long-finned eels — upstream before returning to the sea to breed.

- **Climbing galaxias Galaxias brevipinnis**
  Common in both coastal streams and rivers and landlocked lakes, the climbing galaxias is the largest of the Tasmanian galaxiids (up to 270 mm). River populations spawn in the upper reaches of streams during autumn. The larvae drift downstream, the juveniles returning as part of the whitebait run in the spring. The fish is a capable climber, the low-slung pectoral and pelvic fins aiding it in climbing rocky barriers. As a result, the species has colonised many highland lakes and tarns.

- **Tasmanian mudfish Galaxias cleaveri**
  Juvenile mudfish pass through a marine stage which lasts for two to three months. They form a part of the whitebait run as they return to the lower sections of coastal streams and rivers.

- **Jollytail Galaxias maculatus**
  The jollytail is common in freshwater
Sandy

Pseudaphritis urvillii

The sandy, or freshwater flathead, is the only species of an otherwise predomi-
nantly marine group which is found in freshwater. It is common throughout streams in coastal Tahas-
mania and the south-east coast of the mainland. However, its popula-
tion has declined markedly. The construction of weirs prevent its upstream migration, while the loss of river vegetation diminishes both its cover and food source. It is now listed as vulnerable.

Tasmanian whitebait

Lovettia sealii

Found only in Tasmania, the Tasmanian whitebait occurs in the lower reaches of streams and rivers around the State. Spawning occurs in spring.

Australian grayling

Prototroctes maraena

The Australian grayling was once abundant in coastal streams throughout Tasma-
nia and the south-east of the mainland. However, its popula-
tion has declined markedly. The construction of weirs prevent its upstream migration, while the loss of river vegetation diminishes both its cover and food source. It is now listed as vulnerable.

Tasmanian smelt

Retropinna tasmanica

Found only in Tasmania, the smelt is found in the lower reaches of streams and rivers. It is often found in association with schools of whitebait.

Spotted galaxias

Galaxias truttaceus

This species breeds in autumn, the larvae being taken to sea and returning as part of the whitebait run in spring. Adults can often be found in quieter streams, particularly in the vicinity of logs.

Jollytail

Tasmanian mudfish

Spotted galaxias

Climbing galaxias

The sandy, or freshwater flathead, is the only species of an otherwise predom-
nantly marine group which is found in freshwater. It is common throughout streams in coastal Tasmanian and the south-east coast of the mainland.

A number of other species also occur in the waters of the lower Gordon. Two spe-
cies of lamprey, the short-
headed lamprey (Mordacia mordax) and pouch lamprey (Geotria australis) mig-
rate between the sea and freshwater to breed. The jawless lampreys are the most primitive of living fish. They are parasitic, attaching themselves to other fish with the rasp-like teeth of their mouth disc and feeding on the host's body fluids.

Several species have been introduced into the Mac-
quarie Harbour region. The native blackfish, Gadopsis marmoratus, has been intro-
duced into a lake near Strahan. Northern hemi-
sphere species such as rainbow trout (Oncorhynchus mykiss), brown trout (Salmo trutta) and Atlantic salmon (Salmo salar) occur in the waters of the harbour and lower Gordon River.

Further reading


GORDON RIVER TOUR OPERATORS

Rare and threatened species of the Macquarie Harbour region

Tasmania’s isolation as an island since the end of the last Ice Age has served to protect the State from the devastating impacts of several introduced species. Neither the fox nor the dingo reached Tasmania because both arrived on mainland Australia after the flooding of Bass Strait. This isolation, and particularly the relative intactness of some of the State’s ecosystems, has allowed Tasmania to serve as a refuge — a last chance — for many species of animal which have become, or are perhaps about to become, extinct on the mainland.

Nonetheless, like almost every other region on Earth, the native fauna and flora of Tasmania has suffered more since the arrival of European settlers than it has over the last 65 million years.

What does threatened mean?
Threatened is a term used to cover both vulnerable and endangered species. These latter terms are defined by the Threatened Species Protection Act 1995.

Extinct. An animal is extinct when there is no reasonable doubt that the last individual has died.

Endangered. A species is endangered when it is facing a very high risk of extinction in the near future. The criteria used to establish this include:
• a population of less than 250 mature individuals, or;
• a decline in numbers of at least 50% during the last 10 years.

Vulnerable. A species is listed as vulnerable when it is not endangered but is facing a high risk of extinction in the medium-term future. Species in this listing may:
• number less than 1000 mature individuals, or;
• have suffered a decline in numbers of 50% over the last 20 years.

Additionally, rare species are those with small populations, often within restricted geographical areas or thinly scattered over a more extensive range.

What causes an animal to become threatened?
Extinction is a natural part of the evolutionary history of life on Earth. Indeed, the vast majority of species that have lived have subsequently become extinct. The difference today is that the massive ability of humans to rapidly alter and destroy the natural balance of nature has meant that the rate at which extinctions occur has increased dramatically. Given that people remain inextricably tied to the vast and complex web of life, the rapid loss of so many strands of this web is of grave concern.

Clearing for agriculture, mining, forestry, and residential development has depleted the habitat available to native species. Indeed, on a global level, habitat loss is the single greatest cause of extinction. Introduced animals such as hard-hoofed sheep and cattle have similarly had a devastating impact on the fragile soils of the Australian continent. Introduced species such as the fox, cat and dog, and indeed ourselves, have competed...
with or preyed directly upon many native species.

Humans have the potential to impact on the global environment through the depletion of the ozone layer, global warming and massive pollution. This raises the question of the impact that these changes will have on the species, including ourselves, that occupy the Earth today.

**Rare and threatened species of Macquarie Harbour**

**Vertebrates.** Of the 54 species of vertebrates listed as rare or threatened in Tasmania, at least five occur in the lower Gordon River region. Among the mammals, the thylacine (Tasmanian tiger), which was once widespread throughout the State, has become extinct due to persecution by humans. It is the only Tasmanian mammal to have become extinct since European settlement. This contrasts greatly with the post-settlement decline of mammals on the mainland, where 20 species are known to have become extinct. Several marine mammals which occur off the west coast are endangered. These include the humpback and southern right whales, both of which were hunted to near extinction.

The orange-bellied parrot is endangered, with less than 200 individuals in existence. This species breeds only in the southwest of the state. It migrates north to southern Victoria and South Australia during the winter months, often feeding along the Macquarie Harbour coast enroute. The endangered swift parrot, whose numbers have plummeted to 1000 breeding pairs, can also be found in the region. The beautiful and secretive ground parrot finds its stronghold in the moorlands of western Tasmania. The mainland populations of this bird have suffered from the loss and fragmentation of their habitat, as well as predation from introduced animals. Although not listed as rare, it is one of many species which require monitoring to ensure that it does not become threatened in the future. The world’s only two other species of ground parrot — the kakapo and the night parrot — are on the verge of extinction.

Other endangered birds which occur in the area include the wedge-tailed eagle. Species such as the grey goshawk are rare, while others such as the azure kingfisher are so little known that evaluations of their status cannot be accurately made.

Nearly one third of Tasmania’s freshwater fish are rare or threatened. Of these only the vulnerable Australian grayling occurs in the Macquarie Harbour region.

**Invertebrates**

Across Tasmania, 118 species of invertebrate are listed as threatened or rare. However, our knowledge of the invertebrate fauna is so incomplete that such a figure will undoubtedly prove to be a gross underestimate. For some threatened species, we do not even know their name. For example, a stonefly — an undescribed species belonging to the genus *Neboissoperla* — is listed as rare, while an undescribed species of aquatic snail is known from only two localities on the Franklin River. Other species listed as rare include a spider, stonefly and at least 13 species of caddisfly.

**Plants**

In Tasmania, 462 species of native plants are listed as rare or threatened. The endemic lily, *Milligania longifolia* and *Oreomyrrhis gunnii* are both restricted to cliff faces on the lower Gordon River and a few other western river sites. Such a precarious habitat acts as a refuge for these rare species.

Other rare, endemic species of plant found in the lower Gordon River region include *Pseudopanax gunnii*, the heath *Epacris mucronulata* and *Spyridium gunnii*. Non-endemic rare species include *Veronica plebeia* and *Colobanthus affinis*.

Whitey wood is a rare species that can be seen at Heritage Landing. The species also occurs in the levee bank rainforest downstream of Sir John Falls, where it is a component of the understorey. Such a vegetation type is not known from any other river system in the State.
What is World Heritage?

The World Heritage Convention was adopted by the UNESCO General Conference in 1972. Its aim is to promote the protection of the Earth’s irreplaceable natural and cultural heritage. Unlike the seven wonders of the ancient world, of which only one remains, it is envisaged that World Heritage properties will be conserved for all time for all people. In order to follow this policy, member countries undertake a commitment to engage in the ‘appropriate legal, scientific, technical, administrative and financial measures necessary for the identification, protection, conservation, presentation and rehabilitation of this heritage.’

The process of listing
The World Heritage list, as of December 2000, comprises 690 sites in 122 countries. Each has been nominated by the national government of the member country and accepted by the World Heritage Committee. When nominations are received at the annual meeting of the World Heritage Bureau, rigorous assessment of the nominated property is conducted in collaboration with international non-government organisations such as the International Council for Monuments and Sites (ICOMOS) and the International Union for the Conservation of Nature and Natural Resources (IUCN). Only sites deemed to be of outstanding universal value are accepted onto the World Heritage List.

Criteria for selection
In order for a nominated site to be selected for World Heritage status, it must meet one or more specific criteria to ensure that the site is of outstanding value from either a cultural or natural point of view. There are six cultural and four natural criteria.

The natural criteria require that areas listed for World Heritage:
1) be outstanding examples representing the major stages of the Earth’s evolutionary history; or
2) be outstanding examples representing significant ongoing geological processes, biological evolution and man’s interaction with his natural environment; or
3) contain superlative natural phenomena, formations or features; or
4) contain the most important and significant natural habitats where threatened species of animals or plants of outstanding universal value still survive.

The cultural criteria require the nominated World Heritage property to:
1) represent a unique artistic achievement, a masterpiece of the creative; or
2) have exerted great influence on developments in architecture, monumental arts or town planning and landscaping; or
3) bear a unique or at least exceptional testimony to a civilisation which has disappeared; or
4) be an outstanding example of a type of building or architectural ensemble which illustrates a significant change in history; or
5) be an outstanding example of a traditional human settlement which is representative of a culture and which has become vulnerable under the impact of irreversible change; or
6) be directly and tangibly associated with events or with ideas or beliefs of outstanding universal significance.
Of the 690 World Heritage properties on the World Heritage List, 529 are listed for their cultural heritage values and 138 are listed for their natural heritage values. Only 23 are listed for both natural and cultural heritage values.

The Tasmanian Wilderness World Heritage Area satisfies all natural criteria and cultural criteria iii), v) and vi). Only one other World Heritage property — Mt Taishan in China — satisfies as many criteria for selection.

The World Heritage Properties Conservation Act 1983
Listing of a site on the World Heritage List does not imply international administration or management of the site. The management of a World Heritage Site is the sole responsibility of the member nation. Australia is one of the few countries to have passed legislation — The World Heritage Properties Conservation Act 1983 — that specifically gives some protection to the integrity of the natural or cultural features for which a World Heritage Site is listed. It was the application of this Act that led to cessation of work on the Gordon-below-Franklin hydro-electric power scheme. While the Act does not make any provision for the Commonwealth Government to assume responsibility for the management of a property, it does allow for Federal intervention in order to prevent the damage or destruction of a World Heritage Property.

Australia’s World Heritage areas
Australia became the seventh country to ratify the convention, in 1974. As of December 2000, Australia has 14 properties listed on the World Heritage List, each representing a considerable diversity of features which ensure their place among those regions of the world which are of outstanding universal significance. The properties are (in order of listing):

• Great Barrier Reef
• Kakadu National Park
• Willandra Lakes Region of Western NSW
• Lord Howe Island Group
• Tasmanian Wilderness
• Central Eastern Rainforest Reserves
• Uluru–Kata Tjuta National Park
• Wet Tropics of Queensland
• Shark Bay, Western Australia
• Fraser Island
• Australian Fossil Mammal Sites (Riversleigh, Naracoorte)
• Heard and McDonald Islands
• Macquarie Island
• The Greater Blue Mountains Area

Benefits of World Heritage listing
The inscription of a property on the World Heritage list gives the property an international recognition which promotes local and national pride, and engenders feelings of national responsibility to protect the area. Listing also promotes opportunities for greatly increased tourist visitation and accompanying increases in employment and revenue generation. Local communities benefit from improvements in the planning and management of the property.

Further reading


The UNESCO World Heritage emblem symbolizes the interdependence of cultural and natural properties — the central square is a form created by humans and the circle represents nature, the two being intimately linked. The emblem is round like the world, but at the same time is a symbol of protection.
World Heritage values

The Tasmanian Wilderness World Heritage Area (WHA) encompasses a diverse array of both natural and cultural features which make the region of outstanding universal significance to all humanity. The same features led to the listing of the area as a World Heritage property in 1982.

The Tasmanian Wilderness WHA is one of only 23 World Heritage properties that satisfy all natural criteria for selection, one of only 17 that satisfy both natural and cultural criteria, and one of only two World Heritage properties that satisfy as many as seven of a possible ten criteria. The area is indeed unique and of outstanding global significance to all of humanity.

Geology and geomorphology
The WHA comprises 1.38 million hectares, or about 20% of the state. Within its boundaries is a profusion of complex and well-exposed geological features and the most significant examples of glaciated landscapes in Australia. The region is one of the few places in the world where an understanding of climatic change can be gained free from the complications of continental influence. The array of landscapes and geological types underlie a great diversity of soil types of high conservation value and a landscape of tremendous beauty. The karst (cave) features and the invertebrate fauna that inhabit them are of international significance. The landscape reveals geomorphological features that represent the tectonic events associated with the separation of the Australian and Antarctic plates during the latter stages of the break-up of the great southern ‘supercontinent’, Gondwana. Ancient mountain rocks studded with marine fossils tell of much earlier periods when this region of the world was beneath a shallow sea.

Vegetation
The WHA is rich in habitats containing rare and endemic (found only in Tasmania) plants. Of the 462 plant species in Tasmania that are listed as rare or threatened, nearly one-third occur within the boundaries of the WHA.

The lily *Milligania longifolia*, is one such rare species. It is found along the lower Gordon River and nowhere else. It is consequently at risk should its habitat be disturbed. Similarly, the levee bank rainforests of the lower Gordon River are unique in the State. The rare Huon pine, famed for its longevity, also occurs in the region.

The WHA is the Australian stronghold of cool temperate rainforest and alpine vegetation. These plant communi-
ties provide living evidence of a remote past in which Tasmania was part of Gondwana. These species hold a key to understanding the relationships of the flora to that of the rest of Australia and other southern continents.

**Fauna**

Nineteen rare and threatened vertebrates are found within the boundaries of the WHA. This represents 80% of such species in Tasmania. The endangered orange-bellied parrot, of which less than 200 individuals remain, breeds solely within the south-west corner of the WHA, while the few remaining individuals of the highly endangered Pedder galaxias (a species of freshwater fish) are restricted to a single lake. The remarkable Pedra Branca skink, with a population of only 400 individuals, is confined to the tiny rock island, Pedra Branca, some 30 km off the south-east tip of the state. The island is incorporated within the boundaries of the World Heritage Area.

The fauna of the WHA also shows a high degree of endemism, with many groups revealing links with the ancient Gondwana. The most ancient representative of the crustaceans, the mountain shrimp (*Anaspides tasmaniae*) and the unique velvet worm (*Peripatus* sp.), inhabit the WHA. The latter species is considered a ‘missing link’ between the annelids (worms) and the arthropods (crustaceans and insects). Many invertebrates that are internationally recognised as threatened, such as the velvet worm, are found within the WHA.

**Aboriginal heritage**

The WHA is rich in cultural diversity, with some of the richest and best preserved archaeological deposits known in Australia. Examples of some of the earliest known forms of art, in the form of Aboriginal hand stencils, lie within caves deep in the heart of the WHA. Caves and rock shelters, as well as a profusion of coastal middens and stone scatters, bear testimony to the Aboriginal people who lived in the area during the height of the last Ice Age — the most southerly humans on Earth.

**European heritage**

The wilderness has never really been an untrodden land — as Aboriginal occupation over at least the last 36 000 years clearly demonstrates. The region is similarly rich in European history. The earliest of Tasmania’s penal settlements, Sarah Island, represents a dark chapter in the history of colonisation which was to have an impact on the Tasmanian psyche for generations to come. Piners, prospectors and trappers who extracted the resources of the region have all carved out a legacy within the wilderness of Tasmania.

Today, the lower Gordon River acts as the western gateway to the WHA. As visitors travel up the river to Heritage Landing they are experiencing a taste of the incredible beauty and undisturbed natural and cultural riches of the Tasmanian wilderness.

**Further reading**


What is interpretation?

**Origins**
The art of interpretation was born in the United States of America during the closing years of last century. Nature guides such as Enos A. Mills (1870-1922) felt that their task was more than to merely guide, but to share and inspire visitors with a holistic appreciation and knowledge of the environment. Mills fine-tuned his techniques through evaluation of what did and didn’t work — an important component of interpretation today.

Freeman Tilden was an American writer who travelled for many years observing the ways in which national park interpreters communicated with the public, all the time analysing and assessing which techniques worked best. As a result of his research, Tilden published *Interpreting Our Heritage* in 1957, which encapsulates the philosophies, goals and principles of interpretation.

Today, natural and cultural heritage educators in many parts of the world adopt the principles of interpretation to enhance the quality of their presentations, to increase the relevance and immediacy of the information or ideas they wish to express and to introduce visitors to a fuller understanding and appreciation of the area they are visiting. Outdoor guides and tour operators use interpretation to enhance the experience of the visitor, thereby helping to ensure satisfied customers.

**Definitions**
So what is interpretation? This is a difficult question to answer, as interpretation is more than education, more than just giving names, more than just providing facts. Perhaps contrary to popular belief, passing on knowledge is not the sole, central purpose of interpretation. Although education does play a role in interpretation, it is not necessarily the most important aspect.

Interpretation is used to help a visitor gain a knowledge of, and affinity for, the natural and cultural world. Effective interpretation uses both accurate information and a variety of interpretive techniques which help visitors respond to the environment on both an intellectual and emotional level.

Perhaps some interpreters’ own comments can shed some light on the definitions and purposes of interpretation:

’Interpretation is an educational activity which aims to reveal meanings and relationships through the use of original objects, by firsthand experience, and by illustrative media, rather than simply to communicate factual information.’

Freeman Tilden

’Interpretation is the revelation of a larger truth that lies behind any statement of fact’.

Freeman Tilden

’...awaken people's curiosity. It's enough to open minds, do not overload them. Put there just a spark. If there is some good flammable stuff, it will catch fire’.

Anatole France

’...Knowledge revealed imaginatively’.

’Through interpretation, understanding. Through understanding, appreciation. Through appreciation, protection.’

**Principles of interpretation**
Freeman Tilden, the founding father of interpretation, outlined the following six principles of interpretation:

i) Any interpretation that does not somehow relate what is being displayed or described to something within the personality or experience of the visitor will be sterile.

ii) Information, as such, is not interpretation. Interpretation is revelation based upon information. But they are entirely different things. However, all interpretation includes information.

iii) Interpretation is an art, which combines many arts, whether the materials presented are scientific, historical, or architectural. Any art is in some degree teachable.

iv) The chief aim of interpretation is not instruction, but provocation.

v) Interpretation should aim to present a whole rather than a part, and must address itself to the whole person rather than any phase.

vi) Interpretation addressed to children (say, up to the age of twelve) should not be a dilution of the presentation to adults, but should follow a fundamentally different approach. To be at its best, it will require a separate program.

An old Chinese proverb is often cited which captures the spirit of interpretation:

I hear, I forget.
I see and hear, I remember.
I see, hear, and do, I understand.

This proverb suggests techniques that work well — hands on, multi-sensory, participatory interaction.

**The role of the interpreter**

The interpreter’s role is to facilitate the visitor’s enjoyment, understanding and appreciation of the region they are visiting. His or her job is to interpret the ‘language’ of nature and the tapestry of history to those people who find themselves in a situation removed from their own realms of experience. In this way, the interpreter can open new windows of perception and inspire and add perspective to visitors’ lives.

Through interpretation, a visitor can come to more fully appreciate the natural and cultural heritage of a region, and be moved to empathise with the need to ensure that such heritage is preserved. In this respect, interpretation is about helping people form appropriate attitudes towards the natural and cultural heritage of the area they are visiting, to encourage appropriate behaviour in fragile landscapes and to encourage visitors to take an active interest in the management and future of the area.

Another aspect of the interpreter’s role is to provide an interesting, entertaining and fun experience for visitors. Those people who participate in tours do so by choice rather than compulsion. They are on holiday. They are out to have a good time. The last thing they want is to be lectured to. They want to be involved. A good interpreter involves his or her audience.

Finally, good interpretation will enhance the image and reputation of the tour operator. Such an outcome will only prove beneficial to the success and continuing profitability of the operation.

**Indoctrination**

As an interpreter you are trying to indoctrinate people — indoctrinate them with an appreciation, respect and, hopefully, love for nature and our cultural heritage. You may find that some of your guests are already there, and feel that you are preaching to the converted. For others you may get no reaction at all. But for many, you can act as a catalyst which helps them to develop a better understanding and appreciation of the world to which they are inextricably tied, and for which we all have become increasingly instrumental in determining the fate of. If you can achieve this with just one person, then you will have succeeded. This is the joy of interpretation.

**Further reading**


Successful interpretation can be achieved through a vast variety of means. However, there are many elements which are common to a successful interpretation program. Some of the most important techniques are employed before you even meet your audience — planning — and after they have gone home — evaluation.

Some of the ideas given below may not suit your operation, or even your own personal style. Techniques which involve close interaction with your audience — an important component of successful interpretation — may not be possible with large numbers of people aboard a vessel, but may be more appropriate for 4WD tours or trips aboard smaller vessels.

The first step — planning
Think about what you want to say and achieve beforehand. Jot down your ideas on paper. Such planning allows you to identify the main components of the topic you wish to interpret and can reveal effective ways of doing so. Planning allows you to concentrate on those elements that will contribute to the message that you wish to get across. For example, if you wish to highlight the trees that are unique to Tasmania, think about where this can best be done. You may already know of special little spots where all the illustrative species occur together, and all you have to do is walk along to discover examples of the different plants which will illustrate your talk.

Understanding your audience
Knowing what kind of people comprise your audience gives you the opportunity to tailor your interpretation to that particular group. This is particularly useful for large audiences, where circumstances require you to develop your talk around the characteristics of the ‘typical’ visitor.

With smaller audiences it is possible to gain considerable background knowledge about your clients simply through the important pre-tour chat. If the great majority of your visitors are from the mainland, then it is useful to relate what they will see here in Tasmania to what occurs on the mainland. Similarly, point out those things that are unique to Tasmania.

For example, many mainland visitors may believe they already know what a rainforest is, for they may have visited the tropical rainforests of Daintree or other areas in northern Australia. However, they may never have seen a cool temperate rainforest (the type we have in Tasmania). The differences between the two are huge. Point them out. Ask them if they see any buttressed roots on the trees here in our rainforests. Can they see a profusion of lianas and epiphytes? Can they see large-leaved species? These are all features of tropical rainforests which do not occur in Tasmania’s cool temperate rainforests. Point out those species that are found only in Tasmania — Huon pine, King Billy pine, whitey wood, leatherwood and many other plants and animals. Highlight the differences so that your audience is better able to appreciate the uniqueness of the environment that they are in.
Developing the message
The use of a theme in any interpretive activity is vital. As you talk with your guests try building up a story that illustrates a theme that you want to get across. For example, you may wish to talk about where the plants and animals in Tasmania come from. At the risk of oversimplifying things, you might take the following tack:

Mention that the Bennetts wallaby you just glimpsed hopping into the scrub is a marsupial, a group of mammals that is only found in Australia and South America. That yellow-tail black cockatoo you just heard is a member of the parrot family. Australia is known as the ‘land of the parrots’. So is South America. Half of the fresh water fish that are native to Tasmania — the galaxids — have their closest relatives in South America. That trigger plant that we just set off is a member of a family that also occurs in South America. Many of the trees in this rainforest that we are now walking through have their closest relatives in South America. That beautiful, gnarled, old myrtle belongs to a group of plants that occur in South America and Antarctica...

Now, by this time people are either wondering what the hell your obsession with South America is, or that you are daft for thinking that trees grow in Antarctica. Chances are someone will ask, ‘Why the South American connection?’ or pipe up, ‘There’s no trees in Antarctica!’

And there is your chance to talk about how Australia, South America and Antarctica were once joined together in the great super-continent, Gondwana, and that many of the plants and animals that are now found in those places are derived from common, Gondwanan ancestors.

Help your audience relate
An important aspect of interpretation is to help your guests relate to whatever it is that you are interpreting. Educational psychologists suggest that deep learning is achieved through the attachment of bits of information to related, pre-existing bits of information. Make the link. Don’t just name an object. If you can’t think of something interesting to go along with the name, forget it. If you can tie an unfamiliar object within the natural environment to a familiar object within the increasingly artificial world we have built around us, then all the better.

A nice analogy for our cool temperate rainforests, for example, is an ancient cathedral — huge, open vaults, dark and silent and spiritual: a place for meditation on the glory of Nature (or the glory of God — take your pick). If you’re in a whimsical mood you can point out the gnomes that run about the forest floor!

Knowing it all
Nobody knows the answers to everything about the area that they are interpreting. Indeed, the more we learn, the clearer it becomes how much more there is to know. Your knowledge and experience however is much greater than that of the people who come to visit. Share what you know, but if you don’t know the answer to a question, don’t make up an answer. For example, if someone asks you what kind of bird that is, and you have no idea, then say you don’t know. Don’t invent a new species just to satisfy your inquirer’s curiosity or to satisfy your own ego. Carry books or notes to cater for such situations. Offer them the chance to look through them to discover what it was for themselves.

Evaluating your performance
An important aspect of interpretation is evaluation. It is through evaluation that an activity, such as talking to a large group of people, can be improved upon. You can identify areas of weakness which may simply be the result of using the wrong words, or perhaps even putting your own words in a funny order. Try recording your dialogue and listening to it. Ask a colleague or a friend to listen and provide feedback. Seek ideas from wherever you can, and incorporate or dismiss them as you see fit. We all benefit from the collective knowledge and experience of others.
Tips for effective interpretation

Enthusiasm
If you are enthusiastic about the subject you are interpreting, show it! The enthusiasm will rub off. Your clients will walk away inspired. It may mark the beginning of a newfound passion. They may rave to their friends about the experience — certainly good for business.

Be friendly
It may be obvious, but people like people who like them. If you are warm and friendly with your audience, they will tend to listen more, and will be more likely to be moved by what you have to say.

Try different approaches
Some of the most effective interpretation is done in silence. An important aspect of interpretation is to help facilitate an emotional response. Stop for a rest break within the heart of the rainforest. Tasmania’s rainforests are unique in their ability to evoke a silent, contemplative atmosphere. Try to encourage everybody to remain silent so that they may hear the silence of the rainforest itself.

For some, it may be one of those rare times that they have allowed themselves to be free of the cares and worries of everyday life.

Use all your senses
Encourage your guests to use as many of their senses as possible. It helps to reinforce learning. Encourage your guests to touch the moss that cloaks the myrtles. Smell it. Listen to the silence of the rainforest. Feel its cool and damp atmosphere. They may remember these things long after they have forgotten the names of the plants.

Put people in the picture
Whether it be natural or cultural heritage that you are interpreting, your audience is likely to prick their ears at the mention of human involvement. While the involvement of people in cultural heritage is obvious, what is less obvious is how to include them in an interpretation of a convict ruin that has long been silent. Stories of particular characters (of which there is no shortage) who lived within the confines of the penitentiary on Sarah Island, say, or the piners who pioneered the wilderness of the wild rivers are just some examples of the human element that lies behind all of our (European) cultural sites. If you can bear in mind the lives of such people as you research and formulate your story about a place, then those people can potentially bring a most valuable perspective to your story.

With respect to natural heritage, there seems to be an unspoken message that wilderness is devoid of humanity. It’s almost as though those tremendous photographs that Dombrovskis took were done without him actually being there. To make the link between the many positive human interactions, perceptions and experiences with nature, try to find a story that revolves around such a theme. For example, what were the perceptions of escaping convicts when they found themselves confronted with the rugged mountains of the west? What were the perceptions of the early piners who
worked deep in the heart of the wild rivers? What are your own perceptions today as a tour operator?

**If you have a story or anecdote, tell it!**

Those who have lived and worked within an area have a rich treasury of experience. Stories of your experiences can be laced throughout your interpretation. Such stories quickly gain the interest of people, and offer them the gift of sharing such experiences with a person who has gained a wealth of personal experience in the area.

**Interpretation by example**

Those nice, old adages about taking nothing but photos and leaving nothing but footprints are at the heart of minimal impact bushwalking. Take the centre path when you come to a section of track that spreads out. On encountering the inevitable muddy patch, set a good example by going straight through the middle of it. Tottering around the edges only serves to widen the quagmire. Let your guests know why you are doing it. Perhaps some might follow your lead!

All plants are protected within our National Parks. Picking flowers is not a good example. Interpret them where they are. Pick up any rubbish that you might find along the way. Let your guests see you do so. You don’t even have to say a word. Maybe you will find that some will do likewise, spontaneously sharing in a concern for their environment. This is interpretation at its best.

**Put people into novel situations**

If you can get an immaculately dressed, high-heeled, high society socialite wearing a fur coat down on the forest floor scouring through the leaf litter in search of bugs, then good luck to you! Kids will do it unhesitatingly; but for adults, the idea is the same and the need perhaps more pressing. For example, try lying down on the forest floor beneath towering trees and look up to where the canopy reaches the sky. Some visitors may not have done such a thing since their childhood. Help them rediscover it.

**Take advantage of unexpected events**

Nature is full of surprises. If a thylacine wanders by while you’re interpreting the adaptive responses of plants to the alpine habitat, don’t ignore it and continue doggedly on with your talk. Be flexible enough to interrupt what you are doing to take advantage of those typically fleeting glimpses of animals or the brief and spectacular interplay of light on the mountains.

Also be flexible to the interests and knowledge of your group. If you have a thylacine expert in your group, use him or her. If someone visited Strahan in 1962 encourage him or her to share that experience. The beauty of this approach is that you will be constantly learning and adding to your collection of stories.

**Don’t overload people**

Too little is better than too much. The human brain, it would seem, has a very limited capacity to store information! In fact, psychologists have found that people tend to remember no more than seven items or ‘chunks’ of information at a time. This would suggest that stopping and talking more than seven times will be less effective than limiting your number of stops. Each of your stops should revolve around a specific aspect of the wider theme that you are interpreting. Give just a few of the most interesting, relevant, special features of the object you’re interpreting. Don’t stop at everything and try to describe it in a way that might do it justice. You’ll never get home!
Resource Directory

Additional information about subjects of interest can be found on the Parks and Wildlife Service website at:

http://www.parks.tas.gov.au

This information kit is also available at this web-site in PDF format.

The following bibliography gives listings alphabetically for further reading by subject heading. Under some of the subject headings you will find the name and telephone number of various specialists, researchers or managers within the Department of Primary Industries, Water and Environment who may be able to provide further information.

**Aboriginal Heritage**


**Contacts:**

Aboriginal Heritage Unit
Parks and Wildlife Service, Ph. 62 333927

**Animals**


**Amphibians**


**Contacts:**

Peter Brown
Parks and Wildlife Service. Ph. 62 336139

**Abt Railway**


**Contacts:**

Aboriginal Heritage Unit
Parks and Wildlife Service, Ph. 62 333927

**Animals**


Contacts
*Nature Conservation Branch, Parks and Wildlife Service*. Ph. 62 336556

**Birds**


Contacts:
*Mark Holdsworth*
*Parks and Wildlife Service*. Ph. 62 336033

**Convict History**


Contacts:
*Cultural Heritage Section, Parks and Wildlife Service*. Ph. 62 336569

**Endangered Species**


Contacts:
*Threatened Species Unit*
*Parks and Wildlife Service*. Ph. 62 336139

**Erosion (of the Gordon River banks)**


Contacts:
*Jason Bradbury*
*Earth Scientist Project Officer, Parks and Wildlife Service*. Ph. 62 336132

**Exploration**


Fish (native freshwater)

Contacts
Inland Fisheries Commission. Ph. 62 334140

Franklin Debate


Frogs

Contacts:
Peter Brown
Parks and Wildlife Service. Ph. 62 336139

Gordon River (history)


Gordon River Erosion

Contacts:
Jason Bradbury
Earth Scientist Project Officer, Parks and Wildlife Service. Ph. 62 336132

History General


Contacts:
Cultural Heritage Section, Parks and Wildlife Service. Ph. 62336569

Huon pine


**Interpretation**


Contacts:
*Interpretation Section*
Parks and Wildlife Service.
Ph. 62332836

**Invertebrates**


Contacts
*Nature Conservation Branch*
Parks and Wildlife Service.
Ph. (002) 336556

**King River (history)**


**King River (pollution)**

Department of Environment and Land Management (1993). *Fish Kills in Macquarie Harbour - a review*. Division of Environmental Management, DELM

**Mammals**


Contacts
*Nature Conservation Branch*
Parks and Wildlife Service.
Ph. 62 336556

**Management**


**Mineral History**


**Pining History**


**Plants**


**Contacts**
Nature Conservation branch
Parks and Wildlife Service.
Ph. 62 336556

**Railways**


**Rainforest**

**Reptiles**


**Sarah Island**


**Shipwrecks**

**Tasmanian Tiger**


**Contacts:**
Nature Conservation branch
Parks and Wildlife Service.
Ph. 62 336556

**Vegetation**


**Contacts:**
Nature Conservation branch
Parks and Wildlife Service.
Ph. 62 336556
**Wildlife**


**Contacts**
Nature Conservation branch
Parks and Wildlife Service.
Ph. 62 336556

**Whales**


**Contacts**
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**World Heritage Area**


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