

Mawson's Huts Historic Site

Management Plan 2007-2012



Australian Government

Department of the Environment, Water, Heritage and the Arts

Australian Antarctic Division

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Mawson's Huts Historic Site–Management Plan 2007-2012
Australian Antarctic Division

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Cover photography credits

Frank Hurley	Bage in the entrance to the Astronomic Observatory, also known as the Transit Hut
Frank Hurley	Raising the flag at Cape Denison after erection of hut, March 1912
Simon Mossman	Living quarters after over-cladding, 2006
David Killick	East wall of living quarters

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Acknowledgments

This management plan draws on the expertise and the work of numerous people who have been involved over several decades in the campaign to value and protect Mawson's Huts. Some have contributed to the campaign—and the debate over its methods—as specialists, and others as enthusiasts. Some have voyaged to Antarctica, while others remained in Australia to guide, support and promote their efforts.

The Australian Antarctic Division of the Department of the Environment and Water Resources prepared this plan to meet our *Environment Protection and Biodiversity Conservation Act* obligations arising from the National and Commonwealth Heritage listings of Mawson's Huts Historic Site. While the Antarctic Territories Environment and Policy Section of the AAD is responsible for the contents of the plan, it acknowledges the direct and indirect contributions of this diverse community of interest.

The source of much of the technical and contextual information and many of the policy directions was the *Mawson's Huts Historic Site Conservation Management Plan 2001*, commissioned by the AAP Mawson's Huts Foundation and prepared by Godden Mackay Logan Pty Ltd (under a steering committee of the AAD, Mawson's Huts Foundation and the Australian Heritage Commission). The 2001 plan is not cited in every section of the text that draws on it, but the reader is advised to bear in mind that Godden Mackay Logan's excellent work was a key source.

This plan was improved and enriched by several reviewers. An exposure draft was circulated to heritage experts and organisations with a known interest in the conservation and management of Mawson's Huts from 27 March to 18 May 2007. The AAD was grateful for comments in this phase from Mr Duncan Marshall (heritage consultant, ACT), Dr Estelle Lazer (archaeologist, University of Sydney), Dr Ian Godfrey (materials conservator, WA Museum), the Mawson's Huts Foundation (via Mr Robert Easter, expedition manager), Mr Michael Staples (heritage carpenter) and the ANARE Club Council (via Mr Bill Burch).

The Heritage Division of the Department of the Environment and Water Resources reviewed a revised draft in June 2007, and the version formally released for public comment from 25 July to 27 August 2007 incorporated responses to the Heritage Division's suggestions. The AAD received correspondence from several parties during the public comment period expressing support for the conservation of the huts—and none arguing against conserving the site. The AAD's editorial committee was grateful for specific suggestions from Mr Duncan Marshall (heritage consultant, ACT) and Godden Mackay Logan Pty Ltd (heritage consultants, NSW—via Prof Richard Mackay).

The AAD wishes to thank the State Library of New South Wales for granting the permission to use photographs from its AAE collection, and the photographers from recent conservation expeditions, whose images also illustrate this plan.

Preface

Mawson's Huts Historic Site is a national treasure. As the first base for Australia's scientific and geographical discovery of Antarctica, it is the birthplace of and the forerunner to the work now carried out and supported by the Australian Antarctic Division.

The Australasian Antarctic Expedition (AAE) of 1911 to 1914 was the first large-scale scientific inquiry after Federation. AAE expeditioners braved the isolation and severe climate to gather valuable scientific and geographical information. Two of their comrades perished in the attempt. The AAE made the first radio communication from Antarctica, and carried the first aeroplane to the Antarctic. Today, the Australian Antarctic Division is establishing a jet air service between Australia and Antarctica—the last two continents to be linked by air.

As we approach the centenary of Mawson's inspirational expedition, we need plans in place to preserve the sense of what the site was like when the AAE abandoned their huts to the elements in December 1913, while also allowing an appreciation of the powerful effects of a hundred years of exposure in the world's windiest place at sea level. We also need to find ways to encourage Australians who may never set foot on Antarctica to appreciate the experiences and achievements of the men who lived there.

To date, the Australian Antarctic Division has worked closely with the Mawson's Huts Foundation and other bodies interested in the site and its story. We have provided funding, advice, staff and in-kind support, and facilitated access to enable conservation work. We also supported the development of the 2001 Conservation Management Plan commissioned by the Foundation.

During the life of that plan, recognition of the outstanding significance of the site has expanded, and major conservation works were completed.

The site gained the highest level of Australian recognition, becoming a National Heritage place and a Commonwealth Heritage place. International protection was bolstered: the site is now contained in an Antarctic Specially Protected Area, and an Antarctic Specially Managed Area.

Major structural conservation work is now largely complete. Thanks to innovative techniques, the main buildings are stabilised. This gives us the confidence to embark on a new phase, of monitoring and addressing the objects scattered in and around the huts.

This management plan meets our obligations from the new heritage listings, is consistent with Antarctic Treaty requirements, and will foster a new focus — on artefacts — in the lead-up to the AAE centenary.

I commit the Australian Antarctic Division to working with all interested organisations to achieve the goals identified in this blueprint, to protect and manage what is surely the jewel in the crown of Australia's Antarctic heritage.



AJ Press, Director
Australian Antarctic Division

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Conservation Philosophy

Mawson's Huts Historic Site should be valued, protected and understood.

Valued The **primary historical reference point is December 1913**, when the Australasian Antarctic Expedition abandoned the base.*

The 1913 internal configuration of the intact buildings (the Main Hut and Magnetograph House) should be cautiously revealed (by removing ice, subject to conditions) and where necessary repaired (by reconstructing fixtures broken by ice).*

A secondary reference point is January 1931, for those parts modified by the British, Australian and New Zealand Antarctic Research Expedition.

The effects of a century of exposure should not be obscured, unless to prevent structural failure. The Transit Hut and Absolute Magnetic Hut should be preserved as ruins evoking the sense of time elapsed.

Protected Significant fabric should be **conserved in its original context**.

Interventions at Cape Denison should do as much as is necessary (preserve, restore or reconstruct) in order to conserve the site's integrity, but otherwise change as little as possible so that the site's cultural significance is retained.

Objects inside the huts should be kept in or returned to their documented or likely original context, not arranged for display. Significant objects may be treated to stall further deterioration, preferably on site.

Objects in the external scatters should only be removed from the site or into a hut if they are exceptional to interpretation, and such treatment is the sole practical means of ensuring their survival. No replica objects should be introduced.

Understood **Research and conservation partnerships** will enrich the interpretation and awareness of the site.

Partnerships between the Australian Antarctic Division and heritage experts and philanthropic organisations such as the Mawson's Huts Foundation continue the 1911-14 model of non-government contributions to Antarctic endeavours.

Collections agencies and others holding Australasian Antarctic Expedition objects and related documents should be involved in improving the links between on-site and off-site interpretation of the place.



1. Introduction

Mawson's Huts Historic Site, at Cape Denison, George V Land in the Australian Antarctic Territory, is the setting of the intact buildings, structures and relics of the Main Base of the Australasian Antarctic Expedition (AAE) of 1911-1914, led by Dr (later Sir) Douglas Mawson. The AAE was unique, as the only expedition organised, manned and supported predominantly by Australians during the 'Heroic Era' of Antarctic exploration. Cape Denison is one of only six sites remaining from this era, and is the least disturbed of the six.

The cultural heritage significance of the huts and their setting is recognised internationally. They have been inscribed since 1972 on the Antarctic Treaty List of Historic Sites and Monuments (HSM No. 77), and since 2004 placed within an Antarctic Specially Protected Area (ASPA No. 162) and an Antarctic Specially Managed Area (ASMA No. 3) under the Protocol on Environmental Protection to the Antarctic Treaty.

National recognition has come from inclusion on the Register of the National Estate in 1980, and both the Commonwealth Heritage List (2004) and the National Heritage List (2005) under the *Environment Protection and Biodiversity Conservation (EPBC) Act 1999*. The historic site is listed, and the huts are listed separately as structures within a listed site. Henceforth, to avoid confusion, 'the site' refers to Mawson's Huts Historic Site and the huts within the site, as described in the Commonwealth and National Heritage listings.

The EPBC Act requires the Australian Antarctic Division to make a written plan to protect and manage the National and Commonwealth Heritage values of a place it owns or controls. Under the departmental *Heritage Strategy* (DEH, 2005), such management plans are to be in place by 2009.

This management plan has been prepared in accordance with the requirements of the EPBC Act and Regulations, in particular the regulations that came into effect in January 2004. See Appendix II for the details of EPBC Regulations Schedule 5A (*Management plans for National Heritage places*), Schedule 5B (*National Heritage management principles*), Schedule 7A (*Management plans for Commonwealth Heritage places*) and Schedule 7B (*Commonwealth Heritage management principles*). The plan is largely structured in accordance with the guidelines *Management Plans for Places on the Commonwealth Heritage List* (DEH, 2006).

A management plan is a tool intended to provide sufficient information for managers to conserve and protect the Commonwealth Heritage values of places included in the Commonwealth Heritage List. It is a written document identifying, in detail, the values of a heritage place and conservation policies to be followed to ensure that the identified heritage values are protected and conserved. A management plan seeks to achieve good heritage conservation outcomes within the real management situation of the place.

DEH, Management Plans for Places on the Commonwealth Heritage List (2006)

I

Places of cultural significance enrich people's lives, often providing a deep and inspirational sense of connection to community and landscape, to the past and to lived experiences. They are historical records.

...do as much as necessary to care for the place and to make it usable, but otherwise change it as little as possible so that its cultural significance is retained.

AICOMOS, Burra Charter (1999)

Objective of the Plan

The objective of this plan is to guide management decisions and on and off site actions to identify, protect, conserve, present and transmit to all generations, the National and Commonwealth Heritage values, and other values, of the Mawson's Huts Historic Site.

This plan sets out how the National and Commonwealth Heritage values of the site will be managed and protected, to ensure that the Australian Antarctic Division meets its obligations. It also supports the fulfilment of Australia's obligations under the Antarctic Treaty.

Management actions under this plan, including planning and conducting conservation work, will strive to ensure that Mawson's Huts Historic Site is **valued, protected and understood**, particularly in the lead-up to the centenary of the Australasian Antarctic Expedition of 1911-14.

Plan Structure

This plan is based on the significance assessments and draws on the site management principles in previous conservation documents for the site, particularly the *Mawson's Huts Historic Site Conservation Management Plan*, commissioned by the Mawson's Huts Foundation and prepared by heritage consultants Godden Mackay Logan Pty Ltd in 2001. While it builds on this plan and earlier documents (Blunt, 1985 and Pearson, 1993), it is intended to stand alone as a blueprint for management decisions regarding the site.

Because of the large amount of interrelated physical and documentary evidence relating to both the place itself and to collections in Australia, the previous conservation management plan integrated its discussion and analysis of evidence. The plan by Godden Mackay Logan (2001) was informative about the site and the AAE, and included many historical photographs. The Australian Antarctic Division is creating other products to present the history of the site, its uses and associations. Therefore, the focus of this plan is less on presentation than on addressing legal obligations, conservation policies and site changes which have arisen since the previous plan. Some excerpts and photographs from primary sources are included, to illustrate key points.

The Management Plan is structured in accordance with legislative requirements:

1. Introduction

2. Description of the Site

Location, physical features, condition, historical context and current use.

3. Heritage Values

National and Commonwealth Heritage values and any other heritage values of the place.

4. Condition of Values

Condition and integrity of the National and Commonwealth Heritage values.

5. Management Framework

Statutory requirements and agency mechanisms for the protection of the National and Commonwealth Heritage values.

6. Management Requirements

Management requirements and goals, including proposals for change and any potential pressures on the Commonwealth or National Heritage values.

7. Management Policies

Policies to manage the National and Commonwealth Heritage values, including guidance on key processes, arrangements and protocols.

8. Implementation Plan

Who is responsible, a rolling works programme developed from the plan's policies with a focus on management priorities, resources to fulfil the works programme, and an annual review process.

9. Implementation Monitoring

How the implementation of policies within the plan will be monitored and the effectiveness of the management objectives and policies evaluated.

10. Review of Management Plan

How the management plan will be reviewed.

11. Bibliography

Appendices

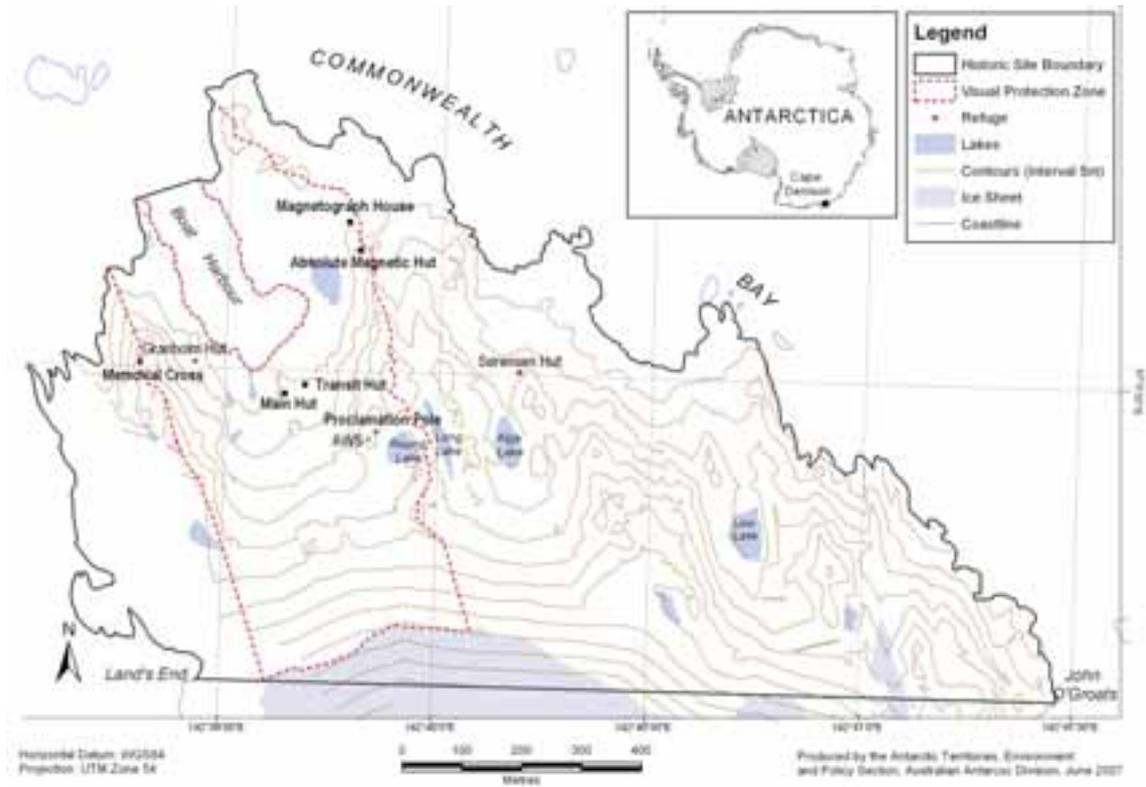
mawson's huts

HISTORIC SITE

2. Description of the Site

2.1 Location

The Mawson's Huts Historic Site is located at Cape Denison, George V Land, Australian Antarctic Territory. Cape Denison, approximately 130 hectares, is a 1.5 km-wide peninsula projecting into the centre of Commonwealth Bay, a 60 km-wide stretch of coast some 3000 km south of Hobart.



Frank Hurley, 1912: In the catacombs leading to the Hut at Cape Denison;
Ninnis is the figure in the foreground (Australasian Antarctic Expedition, 1911-14 collection, State Library of NSW)



The boundaries of the site are specified more precisely in its entry on the National Heritage List than the Commonwealth Heritage List entry, and in the life of this plan, all boundaries referring to the site should be aligned with the boundaries given in the National Heritage List. The National Heritage place boundaries are: a line commencing at the intersection of the coastline and latitude 67°00'47"S at Land's End (approximately 67°00'47"S, 142°39'28"E), then northerly via the low water mark (LWM) to the intersection of the coastline with latitude 67°00'21"S (approximately 67°00'21"S, 142°39'18"E), then northeasterly via a straight line to the intersection of the eastern coastline of Boat Harbour with latitude 67°00'20"S (approximately 67°00'20"S, 142°39'27"E), then northerly and southeasterly via the LWM to its intersection with latitude 67°00'47"S at John O'Groats (approximately 67°00'47"S, 142°41'27"E), then westerly via a straight line to the point of commencement.

The formal Commonwealth Heritage place boundaries are: a line commencing at the most southerly point of a bay about 120m northeast of Magnetograph House then running southerly along the ridgeline between Long and Alga Lakes to 40m ASL, then westerly at that altitude to Lands End, then northerly and easterly via the coastline to the commencement point. Since this is less precise, and in fact covers a smaller part of Cape Denison than the National Heritage place boundaries, this plan should be read as covering the larger (National Heritage) area.

Within these boundaries, the Antarctic Specially Managed Area management plan establishes a Visual Protection Zone containing the historic structures. It is the area enclosed by the western and eastern ridge lines of the valley, extending from the coastline (67°00'24.9"S, 142°39'14.3"E) and running southeast along the western side of the westernmost ridge to the ice plateau (67°00'46.8"S, 142°39'37.2"E); northeast along the edge of the ice plateau to 67°00'43.9"S, 142°40'5.6"E; north-northwest between Round Lake and Long Lake to 67°00'33.7"S, 142°39'59.8"E; then as far as Magnetograph House (67°00'20.3"S, 142°39'46.6"E); and then northwest along the eastern side of the eastern ridge line to the sea (67°00'15.7"S, 142°39'28.2"E).

Mawson's Main Hut (67°00'31"S, 142°39'39"E) was erected as close as was practicable to the landing point for supplies—about 65 m southeast of Boat Harbour. From the Main Hut, the Transit Hut (67°00'30"S, 142°39'42"E) is 40 m northeast; the Magnetograph House (67°00'21"S, 142°39'37"E) is approximately 310 m north-northeast; and the Absolute Magnetic Hut (67°00'23"S, 142°39'48"E) is about 275 m northeast. On the west ridge of Main Valley is the Memorial Cross of 1913, and on a ridge to the southeast is Proclamation Hill, marking the formal possession of George V Land proclaimed in 1931.

2.2 Physical Features

2.2.1 Cape Denison Landscape

Cape Denison is a rugged, 1.5 km wide tongue of ice, snow, rock and moraine projecting into Commonwealth Bay from the steeply rising ice cap of continental Antarctica. The ice cliffs at either end of the Cape (Land's End and John O'Groats) and the sea hemming the northern shore form a natural sense of enclosure.

The most striking feature on approach to Cape Denison is the towering height, behind the cape, of the massive Antarctic ice cap. It extends as far as the eye can see up and down Commonwealth Bay and terminates in huge ice cliffs which periodically calve into the sea as icebergs.

The topography is defined by a series of four rocky ridges, running south-southeast to north-northwest, and three valleys filled with ice, snow, and glacial moraine. The largest, most westerly valley contains the four AAE huts. At the seaward end of this valley is Boat Harbour, a 400 m long indent in the coast.

The landscape is strewn with glacial deposits that have left large boulder fields, many of which are now covered with colourful lichen, the only flora on Cape Denison. There are six melt water lakes associated with glacial action.

The landscape provides suitable habitat for breeding colonies of Adélie penguins—the principal fauna on Cape Denison during summer—primarily at the eastern and western edges of Cape Denison and on Penguin Knob at the northern edge of Boat Harbour. The perimeters of the colonies are guarded by scavenging south polar skuas. Other nesting sea birds include snow petrels and Wilson's storm petrels. Weddell seals (and the occasional elephant seal) rest around the margins of Boat Harbour.

Wind is the dominant feature that has shaped occupation of this place, and continues to define the landscape. It makes it different from most other Antarctic landscapes, and sets it apart from the sites of other Heroic Era huts. Sun, cloud and seasonal changes in daylight and darkness are largely irrelevant compared to the cycle of katabatic winds that creates an annual average daily maximum wind speed of 71 km per hour (the windiest place on earth at sea level). Frequent blizzards and gusts exceed 100 km per hour: in 1913 the wind was recorded at 143 km per hour for twelve continuous hours.

Humans perceive this wind as a constant force (rather than the perception of eddies and gusts usually associated with winds). This force, always from the south, carries huge amounts of drift snow and ice before it, often creating blizzards—hence Mawson's *Home of the Blizzard*—and whips the sea into a chop, topped with fierce spume only metres from the shore. Surface temperatures,



Frank Hurley, 1912: Out in the blizzard at Cape Denison adjacent to Winter Quarters (Australasian Antarctic Expedition, 1911-14 collection, State Library of NSW)

not including the wind chill factor, generally range from -21° and lower in winter, to -3° in summer, with occasional days approaching zero.

The average wind at Commonwealth Bay is thus a gale ... A remarkable feature of the wind is its extraordinary steadiness. ...After some practice the members of the expedition were able to abandon crawling, and walked on their feet in these 90-mile torrents of air, "leaning on the wind".

Cecil Madigan, Meteorological Records of the Cape Denison Station,
AAE Scientific Reports Series B (1929)

The area contains many geological features that are important for the understanding of the Gondwana break-up 55 million years ago, as it was roughly opposite what is now the Gawler Craton in South Australia. Little has been studied on the geomorphology of the area since the AAE report of Stillwell (1918). The area can be divided into a 'lower zone of relatively polished rock and a higher zone of relatively unpolished rock'. Glacial plucking is common and generates a *roches moutonnee* effect with gentler, smoother surfaces towards the ice source and a rougher, more plucked downslope area. There are abundant glacial erratics and striated surfaces.

The 'upper' moraine, close to the ice edge and containing a great diversity of rocks, many unknown in outcrop in the area, is a genuine moraine. Boulders are more angular and sorting less obvious than in the 'lower' moraine. The rocks, including little studied red sandstone and crystalline limestone, from which no fossils have been recovered, may provide an insight into the rocks that underlie the ice of this part of Antarctica.

The 'lower' moraine is generally below 12 m above sea level and is dominated by local rocks: this may be a result of 'ice push' from the sea rather than a genuine glacial moraine. The boulders are more rounded and sorted to some extent into bands where grain size is more constant. This material shows some signs of having been water worn and includes some lithified beach sand with foraminifera and other organic remains.

Valleys and lakes (with one exception) are generally oriented parallel to the foliation of the basement rocks. The basement of the Cape Denison area consists mainly of partly migmatized, massive felsic orthogneiss intruded at about 2350 million years ago into an older metamorphosed sequence, originally of mudstone, perhaps Archaean in age. This entire sequence was intruded, probably at about 2350 million years ago, by mafic dykes which were metamorphosed at about the same time.

The AAE was the principal expedition to describe and map the natural features of Cape Denison. Additional work was done by expeditions primarily focused on cultural heritage features, including ANARE in the 1970s, Project Blizzard in 1984–1986, Don and Margie McIntyre in 1995 and the AAP Mawson's Huts Foundation expedition in 1998.

The carbonate sediments from which these rocks have been derived were characterised to a greater or lesser degree by the presence of detrital material, which in the process of metamorphism has reacted with the carbonate minerals. This group of rocks, however, with two exceptions, still possesses a content of free carbonate material. Its quantitative amount is dependent in some cases on the degree of metamorphism of the rocks concerned, and in others on the quantity of foreign material present in the original sediment, capable of chemical reaction with calcite or dolomite.

C.E. Tilley, Geology, AAE Scientific Reports Series A (1923)

2.2.2 Cultural Features on Cape Denison

Evidence of human endeavour at Cape Denison survives from all four phases of occupation: the original AAE expedition (January 1912–December 1913), the overnight BANZARE visit to the site (January 1931), the short and sporadic visits by scientific parties (1950–1967) and finally the more organised and prolonged expeditions to the site, primarily for conservation, since 1974.

AAE fabric (1912-1913)

- Main Hut (intact with living section and workshop partially ice-filled, and verandahs 90% ice-filled).
- Magnetograph House (intact and ice-free).
- Absolute Magnetic Hut (standing ruin with no roof).
- Transit Hut (standing ruin with no roof).
- Puff-Anemometer pole (later known as BANZARE Proclamation Pole) on Anemometer Hill and other possible remains of scientific instrument sites.
- Timber alignment posts for magnetic observations (east and west [below surface]); Bench Mark just to the east of the Main Hut; eleven survey marks east of Main Valley; transit survey posts (timber pillar in Transit Hut and north mark north of Transit Hut).
- Two fallen wireless masts and associated chains and aerial wire and insulators.
- Memorial Cross (and replica plaque 1986) on Azimuth Hill.
- Artefact groups associated with Main Hut (fourteen groups).
- Seal and penguin meat caches in several places.
- Scattered artefacts (scattered by humans and the wind).

Frank Hurley, 1912: Walking against the wind
(Australasian Antarctic Expedition, 1911-14 collection, State Library of NSW)



BANZARE fabric (1931)

- Proclamation Flag Pole (AAE Puff-Anemometer mast) and canister attached to pole, replica plaque (1986) and copy of proclamation (1978) on Anemometer Hill.

Scientific party fabric (c1950–1967)

- Log book notes left by visiting parties in an AAE tin in the Magnetograph House.

Conservation expeditions (1974 to present)

- Granholm Hut (1978) on the west side of Main Valley.
- Interpretive/information plaque near the Main Hut (1978).
- Steel weather recording frame near Granholm Hut (1985).
- Wind scatter test for objects near Main Hut (1985).
- Automatic Weather Station (AWS) established by the US (and associated timber debris) on Anemometer Hill (on the sub-bridge just west of the BANZARE Proclamation area) (1990).
- New fabric associated with repair work on and monitoring of the Main Hut (1974–present).
- Other new fabric associated with conservation work: Magnetograph House, Absolute Magnetic Hut, Transit Hut, and the Memorial Cross arm bracket (1998).
- Works party base: Sørensen Hut (1986, with two 1998 extensions) and Apple Hut, 500 m west of Main Hut in a second valley.

2.2.3 Fabric Description

The historic site consists of four huts, memorials and plaques and scattered relics. The Main Hut (originally two separate huts) is in the centre of the valley, the Transit Hut 30 m to the east and the Magnetograph House and Absolute Magnetic Hut are on the northern end of the eastern ridge. There is a memorial cross and plaque on the summit of Azimuth Hill, masts from the wireless station to the north and south of Main Hut, various survey and sighting marks within the valley and the ridges, and meteorological instruments on a rock shelf between the Main Hut and Transit Hut, and on the eastern ridge on a knoll known as Proclamation Hill (the site of the Proclamation Pole and plaque). There are also seal and penguin caches and various other scattered artefacts within the Historic Site area.

mawson's huts

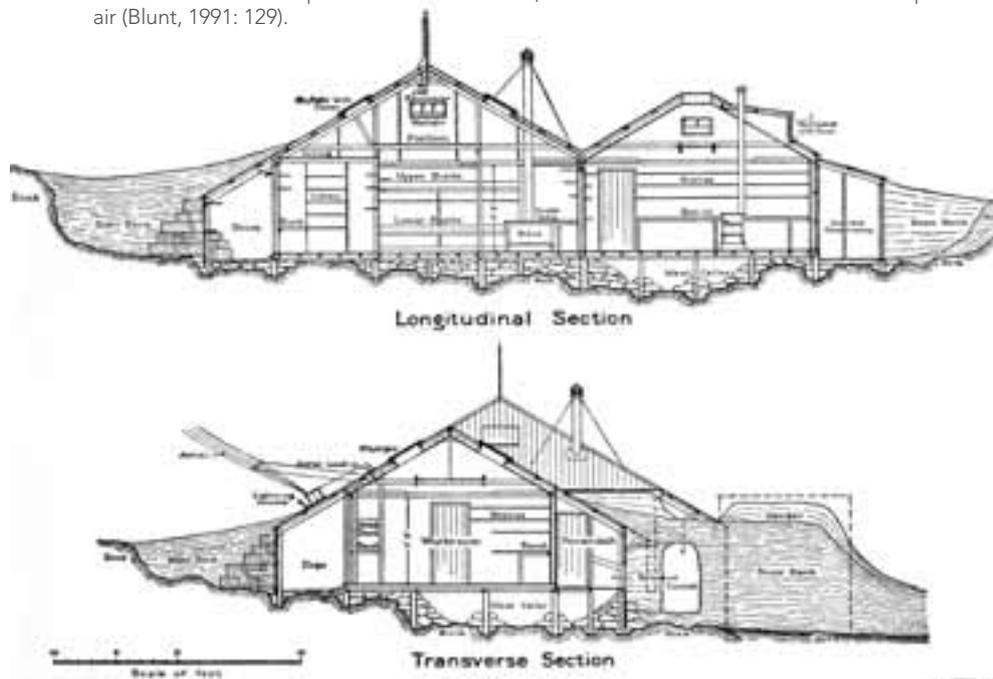
HISTORIC SITE

Main Hut

The Main Hut consists of two prefabricated Oregon timber huts with foundations set in 50 tonnes of loose rocks in February 1912. Structural timbers are bolted together with tongue-and-groove Baltic pine used for internal and external cladding. A 1.5 m wide verandah surrounds the structure on three sides.

The living section, prefabricated by George Hudson & Son (Sydney) is 7.3 m by 7.3 m, with a pyramid shaped roof supported in the centre by four 100 mm by 100 mm posts. There are four skylights, all with glass and timber covers which can be opened. Bunks are arranged in two tiers around the walls, leaving a central living space for the stove and dining table. There are two separate rooms: Mawson's cubicle and Hurley's small dark room. The design was similar to 'The Grottoes' hut at the expedition's Western Base, which used tunnels for access and a trapdoor for air (Blunt, 1991: 129).

ILLUSTRATIONS:
Alfred Hodgeman's plans
of the Main Hut (from
Home of the Blizzard)





There is no direct external access. Entry is via the workshop, which is attached to the northern side of the living section. The rectangular workshop, prefabricated by Messrs Anthony (Melbourne), 5.5 m by 4.9 m, has a hipped roof and two skylights. The western verandah contains access to the cellar and roof as well as a latrine.

Strength to resist hurricanes, simplicity of construction, portability and resistance to external cold were fundamental ... All three huts were essentially of the same construction. The largest, on account of its breadth, had four special supporting posts, symmetrically placed near the centre, stretching from the ground to the roof framework. The only subdivisions inside were a small vestibule, a photographic darkroom and my own room. This rough idea I had handed over to Hodgeman, leaving him to complete the details and to draw up the plans.

Douglas Mawson, Home of the Blizzard (1915)

mawson's huts

HISTORIC SITE

Frank Hurley, 1912: The Magnetograph House viewed from the southeast
(Australasian Antarctic Expedition, 1911-14 collection, State Library of NSW)



Magnetograph House

The Magnetograph House is an Oregon frame timber hut, prefabricated by Risby Brothers (Hobart) and erected in March 1912. Structural timbers are bolted together, using copper nails to prevent interference with the recording instruments. Tongue-and-groove Baltic pine was used for internal and external cladding, and the walls are reinforced by rock piles. There are also sheets of tar paper cladding below the timber boards. The plan is rectangular—5.5 m by 2 m. The shallow-pitched skillion roof has a copper ventilator. There is an inner and outer porch with three door sets. The external door is a double 'stable' ship's door taken from the shipwrecked Clyde at Macquarie Island.

Magnetograph ran in this hut from March 1912 to Nov. 1913

In event of station being reoccupied it is earnestly requested that neither this hut nor the absolute hut (100 yds south) be interfered with, e.g. stores etc. removed, in order that the magnetic elements may be determined at any time under precisely the same condition.

...E.N. Webb ran the magnetograph throughout 1912 while I carried on during 1913.

Good luck to anyone who does so again!

Robert Bage, note left in Magnetic Hut, 18 December 1913.

Keith Gooley, 1974: Astronomical hut,
main hut in background (iMAGEAntarctica, AAD)



Absolute Magnetic Hut

The Absolute Magnetic Hut, erected in February 1912, is a deteriorated ruin consisting of only a complete south wall with portions of the east wall and the framing of the north and west walls. The frame was constructed of leftover Oregon timber with timber boarding and tar paper lining. The plan is 1.8 m square, sited on a rock shelf and originally anchored to the ground. The skillion roof was removed by BANZARE expeditioners in January 1931.

Transit Hut

The Transit Hut is the roofless ruin of what was originally known as the Astronomical Observatory, built on a rock ledge in May 1913 to house a theodolite to take star sights. The Oregon timber frame braced by metal shelf brackets was lined with packing case timber and clad in sheepskin and canvas. The structure had one door in the northeast corner.



Linda Clark, 2002:
Magnetic Absolute Hut (AAD)

Simon Mossman, 2006: Transit Hut (MHF / AAD)





Memorial Cross and Plaque

The memorial cross to Ninnis and Mertz, built by Bickerton, was erected on Azimuth Hill, to the northwest of the Main Hut, in November 1913. The upright and cross bar were fabricated from remnant timber—apparently from the radio masts—of approximately 170 mm by 170 mm. The upright projects 3.4 m above the surrounding rocks and is capped by a 65 mm wide metal collar. The crossbar is 2.2 m long with a 65 mm wide collar at each end. The crossbar is fixed to the upright 2.2 m above the rocks.

The crossbar has been blown off numerous times. It was re-attached in 1931 by BANZARE, in 1978 by ANARE and a third time by the AAP Mawson's Huts Foundation expedition in 1997-98. A plaque attached to the cross, probably made of wood from the dining table, was inscribed by Hodgeman: 'Erected to commemorate the supreme sacrifice made by Lieut. B.E.S. Ninnis, R.F. and Dr. X. Mertz in the cause of science A.A.E. 1913 A.J. Hodgeman'. The plaque is a replica of the original, which was removed to Australia in 1977 and returned to the site in 1978, and then removed in 1985 and replaced by a reconstruction in 1986.

Proclamation Pole and Plaque

A small plaque and proclamation were affixed to the mast of the AAE anemometer station during the BANZARE territorial claim ceremony in 1931, on what was thereafter known as Proclamation Hill. The original proclamation was removed to Australia in 1977 and replaced with a replica in a bronze cylinder in 1978. The original plaque, which had been removed to Australia in 1977 and returned to the site inside a transparent plastic and metal frame, was removed to Australia in 1985 and replaced with a replica in 1986.

Cultural heritage objects

Cultural heritage objects associated with the AAE are distributed across Cape Denison, but are concentrated around the Main Hut, often roughly sorted to type. To date, several thousand have been recorded. Some are representative of the time, others are particularly related to the expedition. The extensive distribution of AAE relics was underlined by the 1997 discovery of the remains of a husky dog some 6 km inland.

Archaeological investigations in the Main Hut over more than twenty years have recorded more than 1200 items left behind, including food tins and foodstuffs, bottles, photographic plates, reference books, newspapers, novels, notices, pictures, chemicals and developing paper.



Frank Hurley, 1913 (Memorial cross to Mertz and Ninnis erected at Cape Denison (Australasian Antarctic Expedition, 1911-14 collection, State Library of NSW)

Dave Killick, 2005-06: Granholm Hut, southwest corner (MHF / AAD)



Post-BANZARE fabric

Granholm Hut, a temporary shelter and workshop established by the 1978 ANARE party 160m northwest of the Main Hut (67° 00' 29" S, 142° 39' 26" E), remains within the historic site, despite plans since 1993 to remove it. Successive works parties have prioritised other tasks and not removed it due to time constraints. It has also been retained due to safety concerns, given its value as an emergency refuge (MHF, 2001; Godfrey et al, 2007).

The main temporary shelter for conservation works parties is Sørensen Hut, built by ANARE in 1986 in a valley 400m east of the Main Hut (67° 00' 29" S, 142° 40' 12" E). Conservation parties generally use this for dining and office facilities.

Adjacent to Sørensen Hut is an expanded Apple Hut (brought to the site by Project Blizzard in 1984, and moved from the Granholm Hut vicinity by the AAP Mawson's Huts Foundation in 1997/98) as toilet/shower and stores.

A wooden platform nearby is suitable for pitching polar pyramid tents for sleeping. The 1997/98 party which established these facilities named them "Jubilee Base" in honour of the jubilee anniversary of the Australian Antarctic program.

Since 1990 an automatic weather station at 67° 00' 33" S, 142° 39' 51" E—on a rise near Round Lake and approximately 150 m southeast of the Main Hut—has collected meteorological data. It remains the property of the University of Wisconsin, Madison.



Simon Mossman, 2006:
Works party accommodation
(MHF / AAD)

2.3 Historical Context

An Australasian expedition

The late nineteenth century saw the beginning of the Heroic Era of Antarctic exploration. Interest in continental exploration and scientific study was renewed by European nationalism. From 1897 to 1917 teams from Britain, Norway, Germany, France, Belgium, Australia, New Zealand, Scotland and Japan carried out fifteen land-based expeditions—to explore unclaimed land and collect magnetic, meteorological, geological and biological data. The expeditions captured the public imagination, and made many explorers national heroes for their bravery, physical strength and endurance.

For the first time the expedition teams built shelters and lived on the Antarctic continent for extended periods. Of the era's nine prefabricated huts, six survive—Borchgrevink's *Southern Cross* hut, Cape Adare (Norway/UK, 1899); Scott's *Discovery* hut, Ross Island (UK, 1901); Nordenskjöld's *Antarctic* hut, Snow Hill (Sweden, 1901); Shackleton's *Nimrod* Cape Royds hut, Ross Island (UK, 1908); Scott's *Terra Nova* Cape Evans hut, Ross Island (UK, 1911); and Mawson's *Aurora* huts, Cape Denison.

The Australian geologist Douglas Mawson, 'perhaps the greatest of Antarctic scientists' (Fogg, 1992:125), first voyaged to the Antarctic in 1907 as part of Ernest Shackleton's British Antarctic Expedition, aboard the *Nimrod*. He was part of a three-man team that reached the South Magnetic Pole and climbed Mount Erebus. Having returned to Adelaide as a local hero, in 1910 he began to plan a second southern journey. Rather than joining Scott's *Terra Nova* party in the single-minded quest for the South Pole, he envisaged a locally-planned expedition heavily focused on geology and other sciences.

Australia and New Zealand have always been anxious for further knowledge of the great frozen continent lying to the southward of them. ... Lying within wireless telegraphic distance of our borders, this region has a special call upon Australians. Alive to the value of scientific data there massed, waiting to be collected, I have ardently sought for an opportunity to reap the harvest.

Douglas Mawson, *Geographical Journal* (1911)

Mawson intended that his Australasian Antarctic Expedition (AAE) would be a scientific, not an athletic, quest: including magnetic charting for navigational purposes, geological and biological studies and the establishment of a wireless weather station, and targeting the area directly south of Australia, which was of both scientific and national interest. However, it may well have been the association with heroic adventure that persuaded Australian and multinational companies to donate supplies—from stationery to fuel, medicines to cigarettes, tinned food to photographic plates, soap to sleeping bags. Three well provisioned bases were to be established in Antarctica and another on Macquarie Island, to transmit news back to Hobart by wireless telegraph.

Frank Hurley, 1911-13: In the Monagasque trawl just after hauled on board with catch (Australasian Antarctic Expedition, 1911-14 collection, State Library of NSW)



The object of the expedition was to investigate the Antarctic Continent to the southward of Australia, a region where the continent was supposed to extend far to the north, but concerning which only the most scanty information was at hand. Most of the expeditions of late years have had as their objective the South Pole. Consequently, in order to secure the most promising route, their fields have much overlapped, and the area of the unknown has not diminished commensurably with the magnitude of those undertakings.

Douglas Mawson, *Geographical Journal* (1914)

On 2 December 1911, twenty-nine year-old Dr Douglas Mawson, leading a team of thirty men and accompanied by a professional crew of sailors, departed Hobart on the 50 m steam yacht *Aurora*, built in Dundee in the 1870s for Newfoundland whaling and sealing. The 600 tonnes of cargo included numerous cases of supplies, timber for hut building, and fifty Greenland dogs, which had been on board since Cardiff. Some supplies and passengers were carried for the first leg of the journey by the *Toroa*, which departed five days later. Many of the men were graduates from Australian universities, and they were young: the average age was approximately twenty-six. Four were New Zealanders, three British and one Swiss. The other twenty-two were Australian residents. Three of the leaders (Mawson, Wild and Davis) were veterans of other Antarctic voyages. At least two others had applied for expeditions and been rejected (Ninnis was not selected by Scott, and Murphy was rejected by Shackleton).

Londoner John King Davis, like Mawson a veteran of Shackleton's *Nimrod* expedition, was deputy commander of the expedition and captain of the *Aurora*. The first stop was on 11 December at Macquarie Island (54° 30'S, 158° 57'E), a remote oceanic island, approximately half way between Tasmania and Antarctica, just north of the Antarctic Convergence (or Antarctic Polar Front, where Antarctic Circumpolar Current waters meet warmer waters to the north). The five-man party they left behind, led by meteorologist George Ainsworth, were to establish a wireless relay station and scientific base on the island, which until then had been largely known as the domain of sealing gangs and commercial penguin oil harvesters.

The station was erected on the northern end of Macquarie Island on a narrow spit of land between Hasselborough Bay and Buckles Bay. Radio contact was established with passing ships in the first months, and with New Zealand and Hobart by the time winter was approaching. A working link to Cape Denison would prove more challenging (it was not fully operational until 1913, when the party remained on the island for an unscheduled second year).

The *Aurora* departed Macquarie Island on 23 December 1911 and arrived at Cape Denison, Commonwealth Bay on 8 January 1912. Due to poor weather only two bases were established. The larger than planned Main Base at Cape Denison combined the huts intended for two separate bases, and was occupied by eighteen men: thirteen Australians, two New Zealanders, two Britons and a Swiss.

mawson's huts

HISTORIC SITE

Frank Hurley, 1912: Landing equipment at Boat Harbour (Australasian Antarctic Expedition, 1911-14 collection, State Library of NSW)



Frank Hurley, 1912: Living Hut nearly completed; framework of workshop going up (Australasian Antarctic Expedition, 1911-14 collection, State Library of NSW)



Frank Hurley, 1913: Group on SY Aurora after leaving Western Base (Australasian Antarctic Expedition, 1911-14 collection, State Library of NSW)

The *Aurora* carried an eight-man party—seven Australians led by Frank Wild (a British veteran of both Scott's and Shackleton's expeditions) – more than 2000 km to the west, to establish the Western Base known as 'the Grottoes' by the end of February. The Western Base was built on the Shackleton Ice Shelf in Queen Mary Land, a region first visited by the 1901-1903 German South Polar (*Gauss*) expedition under Erich von Drygalski. The site, which was used only for a year, has been little visited since it was occupied. The hut, erected on floating ice 27 km from land, is presumed to have long ago disappeared into the sea with the inevitable calving of the ice shelf.

The first year: building and sledging

Mawson had Alfred Hodgeman, who would serve as the Main Base's cartographer, design the accommodation huts before leaving Australia. Based on Mawson's knowledge from the *Nimrod* expedition, the designs incorporated the need for wind resistance and insulation from the cold, with the convenience of being portable and straightforward to erect. The final design was a pyramid on a square base. The prefabricated huts were obtained from building companies in four Australian states. Two pyramid huts, one small hip-roofed hut and another smaller hut were acquired.

The chosen site for the Main Hut that would have to serve as living quarters, workshop, storeroom and kennels, was a level section of rocky ground located in a valley, 65 m from the edge of Boat Harbour. It was quickly erected, to minimise the time its eventual occupants had to sleep in tents. The completion of the hut was an opportune time to unfurl the Union Jack, upon which Mawson claimed possession of the area for the British Empire. He would repeat this in other places, and eventually named the sectors George V Land and Queen Mary Land, and Wild would perform a similar ceremony at the end of the year at the Western Base. While the claims were not formally commissioned or acted upon by the British government, they helped to lay the foundation of the formal claim two decades on, which established the Australian Antarctic Territory.

The Main Hut was a combination of a pyramid hut that, with the change of plan, would have to accommodate eighteen men, and a small hip-roofed hut, which was originally intended as the third base, but instead was attached and used as a workshop. It was reinforced by stacked boxes of stores on the three sides facing the prevailing weather. On the west side of the hut a makeshift hangar was annexed, made from packing cases. In the first two months, drift snow buried the hut to its roof, and its occupants improvised caulking to keep the tiny ice particles at bay, by plugging gaps between boards with rags, hessian and socks.

Frank Hurley, 1912: Raising the flag at Cape Denison after erection of the hut (Australasian Antarctic Expedition, 1911-14 collection, State Library of NSW)



Frank Hurley, 1912: The Puff-anemometer, Cape Denison (Australasian Antarctic Expedition, 1911-14 collection, State Library of NSW)



Frank Hurley, 1912: The wind direction recorder, Cape Denison (Australasian Antarctic Expedition, 1911-14 collection, State Library of NSW)

The site chosen was a rocky platform quite close to the water-front at the head of Boat Harbour. The building was erected on wooden stumps frozen securely into holes let into the rock. Erratics from the adjacent moraine were then piled in between the stumps, filling all the space below the floor.

...An old sail was laid over the roof on the weather side and secured by cover battens. As rain is unknown on the Antarctic mainland, the simple wooden roof of tongued and grooved boards was adequate. Finally, steel wire cables were passed over the roof and firmly secured to the underlying rock formation.

Thus, it is to be observed, every precaution was taken to ensure that the Hut would resist winds of hurricane force.

Douglas Mawson, Narrative, AAE Scientific Reports Series A (1942)

The Magnetograph House was erected in March 1912 on a cleared site approximately 400m northeast of the Main Hut, where the party had to use explosives to clear and flatten site. Their first attempt was blown over by strong winds. Large rocks were moved to line the walls, and sheepskins and hessian attached to the roof. Some of the materials (copper nails and the door) were salvaged from the *Clyde*, whose shipwrecked crew the *Aurora* had met on Macquarie Island. It was used to house the magnetograph equipment, which Eric Webb used to measure variations in the South Magnetic Pole.

In the worst weather, Webb and his assistant on leaving the Living Hut made their way as best they could, largely on hands and knees, maintaining a definite course on the wind until reaching the rocky ridge at the northern end of which the Absolute Hut and Magnetograph House were situated. Then by a process of groping along and recognising the rock outcrops, principally by their shape judged by feel, the goal would be eventually reached.

Douglas Mawson, Introduction to Terrestrial Magnetism, AAE Scientific Reports Series B (1925)

mawson's huts

HISTORIC SITE

The Absolute Magnetic Hut—used in association with, and as a reference point for, observations made in the Magnetograph House—was the other main structure achieved in 1912. This building, made from scrap timber and anchored to the rock to prevent it from being blown away, was erected 52 m south of the Magnetograph House.

Anticipating being confined indoors throughout winter, in the early months the Main Base party killed numerous seals and penguins and stockpiled the meat for both dog and human consumption. While sledging to explore the unknown territory was an immediate priority, the first experimental journeys in February 1912 found most of the dogs to be in poor condition after the voyage, and major journeys were put off until after winter. The dogs sheltered in the eastern verandah of the workshop.

To civilise daily life, there was a good library for private and public reading, and gramophone records to enliven the evenings. Night watchman duty rotated, and with it came the rare opportunity of a bath (the men washed every eighteen days). In the tradition of polar quests, novice cooks experimented on tinned foods and locally slaughtered wildlife, with varying results, and diversions from board games to plays were encouraged.

Personal space was at a premium. The men made idiosyncratic alterations to their modest personal space, which was limited to a bunk for all but Mawson: the commander, or 'the Dux', had his own cubicle. Many posted pictures on walls and marked their initials on their bunks. The convivial young group of Mertz, Ninnis, Bickerton and Madigan—a Swiss, two Britons and an Australian—occupied bunks in the southeast corner of the living section, 'Hyde Park Corner'. In the small dark room in the northwest corner, Hurley developed short plays as well as his famous photographs.

Routine scientific observations were made regardless of the conditions. Mawson viewed regular magnetic and meteorological observations as imperative in order to ensure that his expedition obtained a comprehensive record and therefore made a genuine contribution to scientific knowledge. Complete weather observations, made every six hours regardless of the conditions, filled well over a thousand pages of note books. The men also dispatched messages in bottles. The notes asked the finder to return them to the Secretary of the Australasian Association for the Advancement of Science in Sydney, with a note of the time and place at which it was found, in order to learn something of the Southern Ocean currents.

My previous experience in Antarctica was very beneficial in securing the best lay-out of the instruments to meet the exigencies of the special circumstances presented in so remarkable a climate. After the routine of recording was well established, Mr. C. T. Madigan was thereafter appointed Chief Meteorologist which post he occupied with great credit throughout the two years occupation. The meteorological records were conducted with great system and perfect regularity throughout that time. The information obtained is unique in that it deals with an area which, it would appear, is the most windy spot on the earth's surface.

This is obviously owing to the situation of the station on the seaward-sloping margin of an elevated circumpolar ice plateau of continental proportions.

Douglas Mawson, Introduction to Meteorology, AAE Scientific Reports Series B (1929)

By August, field work became possible when a sub-surface sledging depot known as Aladdin's Cave was established 8 km inland from Cape Denison. Mawson and his teams began making inland sledging trips to chart the area and make scientific observations, as did Wild in the vicinity of his Western Base. Some used dogs, but most of the major journeys were man-hauled. All proceeded into the unknown, and required both navigational skills and physical and mental strength. They faced invisible hazards in the unpredictable ice scape, and other dangers arising from their equipment (one party nearly succumbed to carbon monoxide poisoning while cooking in an unventilated dugout). The long sledging journey epitomised the Heroic Era quest, a 'raw, elemental fight with nature where humanity is stripped to its essentials' (Griffiths, 2007: 25).

The Australasian Antarctic Expedition was essentially a scientific expedition. As King George V Land had never been seen, much less trodden, before, Mawson aimed to cover the maximum possible area by sledging. Three men were needed at base to tend the meteorological and magnetic recording instruments, and to make the scheduled observations; which left 15 men for field work. These constituted 5 sledging parties of 3 men each, 4 for coastal exploration and one inland towards the South Magnetic Pole.

Eric Webb, Magnetic Polar Journey 1912 (1965, unpublished)

There were five major expeditions from the Main Base:

Southern Party: Bage, Webb and Hurley, observing magnetic conditions, appear to have reached within 80 km of the South Magnetic Pole, despite bad weather. They were helped by a Southern Supporting Party (Murphy, Hunter, Laseron).

Things are now serious. We have but a few days ration left, and have the choice of remaining here to gambol with the weather, or make a desperate dash for the hut. If we stay here and the weather does not clear we starve miserably. (In my opinion we are as good as dead, if we decide on this latter course) We held a consultation and decided that if the weather is bad on the morrow we will make a bid for the hut. It will be our desperate yet only chance ...

Frank Hurley, Magnetic Pole sledging journey diary entry, 7 January 1913

mawson's huts

HISTORIC SITE



Frank Hurley, 1912: Sledge dog
(Australasian Antarctic Expedition, 1911-14
collection, State Library of NSW)

Western Party: Bickerton, Hodgeman and Whetter investigated the coastal regions to the west of Cape Denison. After abandoning the air tractor, the team reached 254 km from Cape Denison. They sighted the first-known Antarctic meteorite.

Near-Eastern Party: Stillwell, Close and Hodgeman (later replaced by Laseron) explored and charted the coast from Cape Denison to the Mertz Glacier.

Eastern Coastal Party: Madigan, McLean and Correll investigated the coast to the east of the Mertz Glacier. They reached Horn Bluff, a large cliff 434 km from the Main Base.

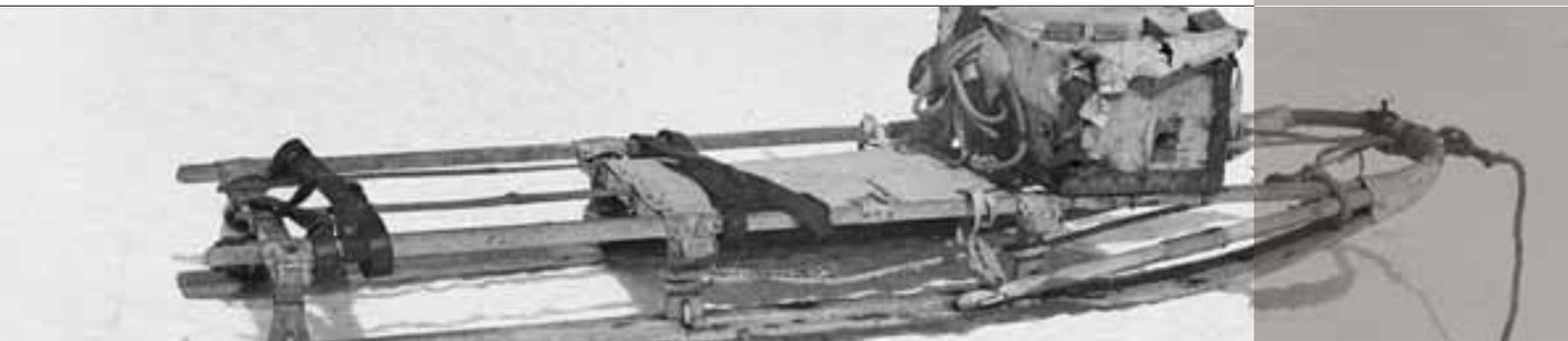
Far Eastern Party: On 10 November Mawson took the two dog handlers, Mertz and Ninnis, eighteen dogs and three sledges, to explore and map the far east coast, expecting to return by mid-January. This became a long and tragic journey which only Mawson survived, and the story of his survival did much to elevate Mawson in the public esteem.

On 14 December Ninnis fell into a crevasse and was never seen again. On the return journey, lacking the provisions that had been carried on Ninnis's sledge, rations ran out, and dogs died of exhaustion or were killed for food. Mertz fell ill—from toxins, food deprivation or sheer stress—and had to be towed on a sledge until he too died, and was buried by Mawson on 8 January 1913.

Mawson then cut his sled in half, and—starving, dehydrated, frostbitten and at times delirious—marched 160 km to Cape Denison alone, kept alive towards the end by a depot of provisions left by a rescue party. He was delayed again at the next food depot, being trapped for an entire week by poor weather in Aladdin's Cave, barely a day's march from his goal.

Mawson arrived back utterly exhausted on 8 February 1913. After three months away from the Main Base, including the tortuous solo trek, he arrived just hours after the departure of the *Aurora*, which was immediately contacted by the volunteers who had elected to remain behind and continue the search. However, due to the risks associated with returning, Captain J.K. Davis decided to leave Mawson and a six man team—Bickerton and Madigan, hoping in vain for the return of their fellow Hyde Park Corner residents; Bage, Hodgeman, McLean, and newcomer Jeffryes—for another year in Antarctica. The bare essentials accompanying Mawson were a doctor turned biologist, two engineers, a cartographer, magnetician and wireless operator.

Frank Hurley, 1913: Half sledge brought back by Dr Mawson on return from fateful sledging journey.
(Australasian Antarctic Expedition, 1911-14 collection, State Library of NSW)



They took my sledge in tow and we proceeded to the Hut. What a grand relief! To have reached civilization after what appeared utterly impossible. What a feeling of gratitude to Providence for such a deliverance.

I had intended to push on to the utmost in the hope of reaching a point where my remains would be likely to be found by a relief expedition, but I had always hoped against hope for more.

Douglas Mawson, diary entry, 8 January 1913

There were two major expeditions from the Western Base, leaving just one man (Moyes, the meteorologist) behind to look after the Grottoes for nine weeks of 'immense' silence, while he hoped for the safe return of his comrades:

Western expedition to Gaussberg: Jones, Hoadley and Dovers crossed the Helen Glacier and islands adjacent to Haswell Island. This party climbed Gaussberg (Mount Gauss: 370 m) and charted coastline.

Eastern Expedition to Denman Glacier: Wild, Watson, Harrisson and Kennedy charted 650 km of coast (Bay of Winds, Delay Point, Redi Glacier, and Cape Gerlache) but did not reach the Denman Glacier before meeting the *Aurora* in February 1913.

The unplanned second year

Captain Davis's decision not to retrieve Mawson, due to the impossibility of entering Boat Harbour and the need to retrieve the party from the Western Base, stretched the AAE into an unplanned second year.

... as we cannot possibly waste another minute we cleared off out of it at 6:20 P.M. I think the Captain's idea is that as this Party ashore have their quarters built on land, where as the Party at Gaussberg are quartered on the Barrier ice, so you see they are on danger all the time. I suppose he reckoned it would be the wisest plan to look to their safety first which in my idea he was justified in doing.

SGR Taylor, diary entry, 9 February 1913

Now there were only seven of us; we knew what was ahead; the weather had already given ample proof of the early approach of winter; the field of work which once stretched to the west, east and south had no longer the mystery of the "unknown"; the Ship had gone and there was scant hope of relief in March.

Against all this there remained the Hut—a proven shelter from the wind; and, most vital of all, there was abundant food for another year. Every avenue of scientific work was not yet closed. Even the routine of meteorological and magnetic work was adding in no slight degree to the sum of human knowledge. Our short mile of rocks still held some geological secrets, and there were biological discoveries yet to make. A wireless telegraphic station had at last been established, and we could confidently expect communication with the outside world at an early date. These were some of the obvious assurances which no one had the heart to think about at first; and then there was always our comradeship, most enduring of all.

Douglas Mawson, Home of the Blizzard (1915)

Mawson lost most of his hair and his feet were badly damaged. The doctor, McLean, nursed him back to health, and the small party set out to improve the general living conditions in the Main Hut, which now housed seven rather than eighteen men. With little in the way of planned activities to complete, the second year was a contrast to the very active first year, and most accounts of the expedition pay it scant attention.

Food was moved inside, the wireless was transferred to the living section and new shelves were constructed. The *Aurora* had delivered a new set of dogs, formerly used by Amundsen, which proved worthy replacements of the original teams that had been lost. The party continued on a smaller scale their study of geology and biology, and their collection of magnetic and meteorological data.

In May 1913 the Transit Hut, originally known as the Astronomical Observatory, was erected on a 900 mm high rock ledge approximately 30 m northeast of the Main Hut. It housed a theodolite which Bage used to take star sights and determine Cape Denison's exact longitude.

The strain of isolation, boredom and grief for the two lost comrades and the narrowly missed chance to return home took its toll on the remaining party. Mawson described it as a dreary and difficult time. In particular, Madigan experienced depression, while Jeffryes developed a debilitating mental illness, becoming increasingly paranoid and delusional.

Shortly after midwinter Jeffryes declared he was resigning his post, and his condition required constant medical observation from McLean. This left Bickerton to teach himself Morse code and run the radio. The expedition's typewriter was pressed into regular service to draft scientific reports, and Mawson used the long winter dealing with difficult personalities, preparing biological specimens, cultivating yeast to make bread, and writing his memoirs, which would become *The Home of the Blizzard*.

The hut was not so cold the second winter and we were not so crowded ...

But the wind was unvarying as ever, the food we knew too well in every possible combination, and we felt badly the need of occasional entertainment with people not subject to our routine or monotonous climate. We came to accept our life as normal and an effort of the imagination was needed to see oneself in a world supplied with grass and friendly weather and modern plumbing.

Frank Bickerton, Australian Antarctic Expedition (1927)

The most pressing maintenance task was the wireless. Although two-way communication had been established in February, which signalled 'a new era in the development of communities in the south' (Martin, 1996: 147), bad weather broke its upper mast in May. The weather was not sufficiently calm to repair the structure and resume communications until August.

In November 1913, having received news that the *Aurora* was headed south, the party gathered the remaining provisions they thought worthy of returning to the ship, and readied themselves to abandon the huts. It was imperative to return to Australia everything of value, in order to recover the expedition's funding shortfall of several thousand pounds.

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For instance, the extensive library of educated gentlemen's reference books, novels and plays to which the men referred in their diaries was packed for home, by and large leaving disposable 'penny dreadfuls'.

The same spirit gave rise to the year's only sledge journey of note, which unsuccessfully tried to retrieve valuable equipment from field depots. Back at the Main Base, Bickerton erected a memorial cross to Ninnis and Mertz on Azimuth Hill, northwest of the Main Hut. Hodgeman inscribed a plaque constructed from two pieces of scrap timber, which was screwed onto the face of the cross.

Mawson and the remaining men had secured the huts and left Cape Denison by Christmas 1913.

Mawson who was on shore superintending the getting on board of every little thing, charged round the winter quarters all yesterday, tearing down and gathering together, all the most frightful rubbish, so that nothing should be left behind! ... all this stuff, which was fit for nothing else but the scrap heap ... A broken foot scraper was hoisted in the bow, and old kerosene lamps without any burners, pumps without any valves etc. and high above all on an oar an old coffee grinder that they had never used because it wouldn't work properly, and which is now rusted beyond recognition.

... Thank goodness we are independent of the shore at last! Everything is off, including twelve dogs, and the hut is nailed up. I wonder if it will ever be visited by man again. I doubt it, after our tale of the weather.

Percival Gray, diary entries, 18 and 23 December 1913

The *Aurora* would spend a further two months at sea, before returning to a hero's welcome in Adelaide. Publishing the findings of the expedition, however—twenty-two volumes drafted by expedition members and experts in various countries, delayed by war, lack of funds and tardy contributors, issued between 1916 and 1947—would prove to be 'the most infuriating project' Mawson ever undertook (Ayres, 1999: 140).

Frank Hurley with cinema camera at foreshore
(Australasian Antarctic Expedition, 1911-14 collection, State Library of NSW)



AAE photography

Frank Hurley, a Sydney photographer working in the picture postcard industry, was the official photographer of the AAE, although other AAE members also recorded their observations. He carried more than ten still cameras and one cine camera, recording 2500 images (many of these on glass plates and some in colour) and hundreds of metres of cine film in the first year (see Ferguson, 1995: 32). His images are a comprehensive visual record of the Antarctic landscape, the expeditioners, their dogs and their activities.

Hurley images of the AAE are held by various institutions including the Mawson Collection in Adelaide, the Barr Smith Library, the State Library of New South Wales, the National Gallery of Australia, the National Library of Australia, the National Film and Sound Archive, and the National Archives of Australia.

The 1997-98 AAP Mawson's Huts Foundation expedition gained access for the first time to Hurley's darkroom. On his own return visit, Hurley had found the door frozen closed and had only been able to 'gain a glimpse into its crystal lined interior' (Hurley, 1931: 238). Bottles of chemicals, photographic paper and glass plates have been found, indicating the photographic techniques used in Antarctica in the early years of the twentieth century.

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Frank Hurley, 1912: Raising a wireless mast at Cape Denison (Australasian Antarctic Expedition, 1911-14 collection, State Library of NSW)



Frank Hurley, 1912: Hannam and the wireless instruments at Cape Denison (Australasian Antarctic Expedition, 1911-14 collection, State Library of NSW)



Wireless communication

The AAE set up a wireless relay station and scientific base on Macquarie Island on their way south. Wireless masts, a receiving hut and an engine house were erected at the summit of a 45 m hill, now known as Wireless Hill. It was intended to be a lifeline between the ice and the home front.

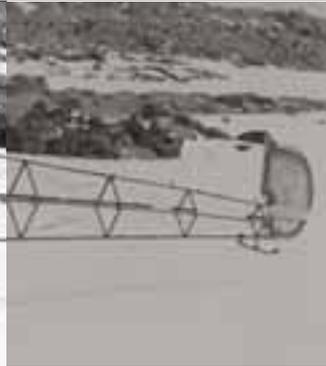
The establishment of radio communications and the installation of the necessary equipment at the Main Base at Cape Denison was not an easy task. Two radio masts were erected by late August 1912, and a temporary aerial enabled messages to be sent to Macquarie Island by 25 September, until one of the masts was broken by wind in October. The wireless operator was based in the workshop, and later in the living section of the Main Hut, where warmer and drier conditions improved the operations of the equipment. The reconstructed apparatus successfully sent messages, but was not able to receive them. Two-way communication resumed in February 1913.

On October 7th the aerial system was further improved by raising a topgallant section on the northern mast, bringing it up to 90 feet in height, and an optimistic note appears in the record for October 12th, stating that the wireless masts had held remarkably well up to date and pointing out that one fine day with wind less than 30 miles per hour was all that was required to complete the aerial system. Unfortunately, a hurricane arose on October 12th-13th, and the northern mast collapsed. The gusts of wind were estimated by Mawson to have reached something like 250 miles an hour.

Eric Webb, *Terrestrial Magnetism*, AAE Scientific Reports Series B (1925)

When Mawson visited Macquarie Island with BANZARE two decades on, the accommodation hut was standing but in a poor state, and on Wireless Hill the masts were down and the engine house was unroofed, but the transmission house (wireless hut) was intact. The accommodation hut was demolished by ANARE in March 1948 to make way for a new station. Today, stumps of the wireless masts remain.

Frank Hurley, 1912: The air-tractor
(Australasian Antarctic Expedition, 1911-14 collection, State Library of NSW)



Frank Hurley, 1912: Bickerton repairs the Air-tractor in the Hangar: L to R Bage, Ninnis, Bickerton (Australasian Antarctic Expedition, 1911-14 collection, State Library of NSW)

The air tractor

Mawson obtained an REP Monoplane from Messrs Vickers & Co for the expedition. It was hoped that this relatively rare machine would generate much-needed publicity during the preparation for the expedition and, when in Antarctica, assist with exploration (Blunt, 1991: 102). However, the aeroplane was damaged during a test flight in Adelaide (with Wild on board), and was modified for use as a wingless 'air tractor'. The expeditioners appreciated the irony of using a state-of-the-art aeroplane engine to haul conventional sledges.

In 1912, the Western sledging party took the air tractor on their expedition. However, the engine's pistons seized and the machine was abandoned when the party was only 14 km from Cape Denison. Several months later, the air tractor was retrieved. The machine, minus its engine, was left near the Main Hut, where it was found seventeen years later by the BANZARE expedition.

Our first visit was made to the old aeroplane, which lied partly buried in the ice close to the hut where it was abandoned after removing the engine. The framework was all of steel tubing—very heavy compared with today's construction, & was in a remarkably good state of preservation. In fact all the objects about the hut were in this condition, due to the dry condition of the air & the continual attrition of the snow particles blasting them.

Frank Hurley, diary entry, 5 January 1931

Little evidence of the air tractor survives. A section of the tail which had been blown towards the water's edge has been stored inside the workshop since 1978, and a tyre remains in the external artefact scatter.

BANZARE visit

Seventeen years later Mawson—who had been knighted for his AAE achievements—returned. In the summers of 1929-30 and 1930-31 he led the British, Australian and New Zealand Antarctic Research Expedition (BANZARE). Organised in Australia, with a vessel from the British government (the *Discovery*, used by Scott in 1901) and financial assistance from New Zealand, the voyages had a prominent political goal, which was to claim possession of George V land, and any other additional lands possible. Mawson made five territorial proclamations, as well as extensive marine and coastline surveys.

The BANZARE landing on 5 January 1931 was the first at Cape Denison since Mawson and his remaining AAE members had left. His party hoisted a flag on the old mast on Anemometer Hill, which became Proclamation Hill. After the requisite ceremonial declaration and singing of the national anthem, the party deposited a proclamation in a casket at the foot of the pole, claiming formal possession in the name of His Majesty King George the Fifth, His Heirs and Successors.

Apart from the proclamation, the visit—one of few landings punctuating a voyage also focused on marine science—was nostalgic. The Main Hut was entered through a skylight, to reveal that many objects and the floor were embedded in thick ice, or encrusted in frost. Several expeditioners—including Mawson and Frank Hurley, who were amazed to see so much intact evidence of their AAE years—spent the night ashore in tents.

Members of the expedition took some items as souvenirs, including books, and supplemented their fuel stores by taking some oil and petrol cans from the dump behind the Main Hut. They also removed the roof of the Absolute Hut in order to gain access and replicate the AAE's measurements.

... the Absolute Hut was found to be in fair order, except that the sliding doors had been blown in and several boards were loose, with the result that the Hut was tightly filled with snow and hard ice, the latter partly due to the relegation of thaw water during summer months. The hut roof had to be removed to enable this accumulation of snow and ice to be cleared, and in order to lay bare the tripod leg 'dabs'. ... The original timber roof was not replaced owing to lack of time and material. Had it been replaced the roof would have had to be removed again in the event of any subsequent reoccupation of the station.

AL Kennedy, in C Coleridge, *Terrestrial Magnetism*, BANZARE Scientific Reports Series A (1944)

Australia became the administrator of the subject land in 1933 when the British Government handed over control. Approximately 42 percent of Antarctica is now Australian Antarctic Territory. Mawson, the AAE and BANZARE all contributed to the establishment of Australia's enduring national interest in this vast portion of the Antarctic continent.

Modern scientific expedition visits

Until the 1970s, there were only brief visits to the site in the course of broader scientific expeditions, which often used the Absolute Hut to take further magnetic measurements. French parties visited the site en route to Port Martin in 1950 and 1951, and from the new Dumont D'Urville station in 1959, 1967 and 1968. New Zealand and U.S. parties visited the site, again for magnetic observations, in 1962 (Blunt, 1985c, Vol 3: 4-53).

The first Australian visit since BANZARE took place in 1962. The short visit allowed expeditioners to take magnetic measurements and photographs during a station resupply voyage led by Dr Phillip Law, first Director of the Antarctic Division.

Comparison: Mawson's Huts and other Heroic Era huts

Mawson's Main Hut belongs to a small group of polar huts—it is one of the six remaining prefabricated accommodation huts of the Heroic Era of Antarctic exploration.

The expeditions centering on the 'heroic age' of Scott, Amundsen, Shackleton and Mawson were, with one or two exceptions, specifically directed to increasing knowledge of the Antarctic itself ... It had become recognized that geographic discovery and scientific exploration are different and require different kinds of expeditions.

GE Fogg, *A History of Antarctic Science* (1992)

The heroic era of Antarctic exploration was 'heroic' because it was anachronistic before it began, its goal was as abstract as a pole, its central figures were romantic, manly and flawed, its drama was moral (for it mattered not only what was done but how it was done), and its ideal was national honour. It was an early testing-ground for the racial virtues of new nations such as Norway and Australia, and it was the site of Europe's last gasp before it tore itself apart in the Great War.

Tom Griffiths, *Slicing the Silence* (2007)

Heroic Era huts were (to varying degrees) purpose-built for polar winter accommodation, to support specific scientific expeditions. The rarity value of these huts is underlined by the scarcity of extant early Arctic expedition huts (where ship accommodation was generally used). The design form, construction materials, structure, functional planning and services of these huts reflect the function of the expeditions and their polar location.

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General characteristics of the group include: building forms and structures to resist winds; prefabricated timber construction (including a numbering and colour system for ease of erection and the pre-construction of some huts prior to the expeditions); materials and insulation to resist the cold (double layers of plank and/or boards, together with natural fibre and tar paper insulation); and particular services for remote locations including heating (compressed coal) and lighting (acetylene gas).

Mawson's Main Hut, the last constructed in this era, benefited from the lessons learned with other huts. It used similar construction techniques and heating and lighting technology to the British huts. It appears to have achieved a reasonable balance between insulation, heating and ventilation. It has not yet been determined whether there was no insulation throughout, apart from tar paper (Pearson, 1993: 10), or whether a straw-like cellulose material found in parts of the living section wall cavity served this purpose (Godden Mackay Logan, 1998: 27).

As a group, Mawson's Huts probably retain the most intact and diverse range of accommodation and scientific facilities (although two of them are partly ruined) of the Heroic Era complexes. The strength and clarity of the spaces and functional arrangements in the living section of the Main Hut is, perhaps, greater than that revealed in the plans of other surviving Heroic Era huts. The arrangement of bunks around the central communal area, reinforced as a focus by the platform over the area, and the soaring raking pyramid ceiling, creates a spatial volume of great character. These characteristics indicate a building of considerable design and construction significance, in addition to its historic values.

All of the surviving structures of the Heroic Era are designated as Historic Sites and Monuments under the Antarctic Treaty, and most of them are within Antarctic Specially Protected Areas (ASPAs). The different countries responsible for these sites are applying various levels of intervention in their management of these places:

- Borchgrevink's *Southern Cross Huts*, Cape Adare (designated as ASPA No. 159): preservation with stabilisation, and repair (restoration and reconstruction) since the 1970s. New Zealand Antarctic Heritage Trust's current plan allows for some reconstruction (new canvas over the main living hut roof and a new roof over the stores hut, which has been roofless since 1902) and some minimal repairs—restoring only the porch of Scott's ruined Northern Party Hut. Intrusive modern interventions are to be removed, and artefacts prioritised for conservation on the basis of their iconic or non-iconic status. There is no attempt to return the site to a particular period in time.
- Nordenskjöld's *Antarctic Hut*, Snow Hill Island: preservation with stabilisation, and repair (restoration) by Argentina since 1981, with maintenance and archaeological surveys. Related stone hut on Paulet Island is a ruin within a penguin fence. Both areas are subject to Antarctic Treaty site-specific site use guidelines for visitors.
- Scott's *Discovery Hut*, Ross Island (designated as ASPA No. 158): preservation with stabilisation, and repair (restoration and reconstruction) since the 1960s. The New Zealand Antarctic Heritage

Phillip Law, 1962: The first Australian visit to Commonwealth Bay since Mawson's return visit in 1931 (iMAGEAntarctica, AAD)



Simon Mossman, 2006:
Carpenters removing the Main
Hut flagpole (MHF / AAD)

Trust is reversing changes made since 1964, to present the Heroic Era use of the hut—from the original occupation of 1902-1904 through various occupations and alterations until 1917. Artefacts out of their 1917 context will be relocated, ones in poor condition may be replaced by replicas, and deteriorated artefacts may be disposed of.

- Shackleton's *Nimrod* Cape Royds Hut, Ross Island (designated as ASPA No. 157): preservation with stabilisation, and repair (restoration and reconstruction) since the late 1950s. New Zealand Antarctic Heritage Trust undertakes reconstruction (fixing a new roof covering, replacing windows and doors), restoration (repaired chimney), and removal (of decaying stores). Modern interventions to the internal layout have been reversed. Artefacts requiring conservation have been temporarily removed to a field laboratory and returned to the hut.
- Scott's *Terra Nova* Hut, Cape Evans, Ross Island (designated as ASPA No. 155): preservation with stabilisation, and repair (restoration and reconstruction) since the late 1950s. Intervention has included insulating the roof with rubber sheeting. New Zealand Antarctic Heritage Trust views the hut as threatened by snow and ice, and plans to begin a new conservation phase. Campbell's related Cape Adare Hut is regarded as a ruin.

2.4 Current Uses

The current uses of the site are limited to heritage conservation and tourism, with opportunistic meteorological and other scientific observations.

2.4.1 Heritage Conservation

Site visits have been undertaken specifically for heritage conservation since the 1970s. ANARE visits took place in 1974, 1975, 1977, 1978 and 1981, against the backdrop of a growing campaign to raise awareness of the national significance of the site, and a heated debate over how best to preserve the Mawson legacy.

In 1967, the ANARE Club established a 'Mawson's Hut Restoration Committee'. Returned Australian expeditioners and others campaigned for recognition and preservation of the significance of the site—although they differed on whether this would be best achieved by not intervening at all, by minimal intervention using new timber to stabilise the structures, by a major intervention such as enclosing the historic huts in a dome, or by removing the huts from the site and re-erecting them in an Antarctic museum in Australia.

While most of the early visits did not set out to conserve the site, they documented observations on the condition of its features, and raised awareness of the challenges. Some of the reports may have over-estimated the rate or uniformity of timber loss, but they all registered genuine concerns

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about the future of the huts, and these concerns generated a debate on how best to preserve what remained from the time of Mawson's occupation. A key question was whether the Main Huts could be preserved *in situ*, or whether the costs of maintenance expeditions to a place that was at that stage rarely visited would be prohibitive. One proposal was to dismantle and repatriate to Australia the key fabric, to be reconstructed for a museum display (Burch, 1968: 12).

If this weathering is allowed to continue within about twenty years some weakened timbers will blow off and the hut and the historical relics it contains will vanish into Commonwealth Bay—the blizzard will have won.

Bill Burch, Aurora (ANARE Club Journal) June 1968

Probably, I am the only survivor of the Main Base party who took an active part in the building of that hut ... the hut has become snowed and iced up almost completely. Certainly, it will be no small operation to clear, dismantle and transport the hut, if it is to be preserved in a fit state for re-erection.

...Needless to say, I shall be most interested to learn whether any further move is being made, either to remove our old hut to Australia, or to restore, reinforce & maintain it on its present site.

Eric Webb, Letter to the Editor, Antarctic (copied to Antarctic Division), January 1969

On-site recording and conservation work began in the 1970s, reflecting a growing awareness of the significance of the site, and of historic places generally. These efforts coincided with the growth of the heritage conservation movement and related professions, and reflected changes in the prevailing philosophy of heritage management (Mackay, 2005: 112). The huts were registered on the Register of the National Estate in 1980. While each step in the site's conservation has achieved tangible results, each expedition has also kept a public focus on the place, paving the way for current cooperative efforts between the public and private sectors.

Since 1978, successive Australian governments have endorsed a policy of preserving the huts *in situ*. This policy is consistent with national best practice: Burra Charter article 9 states that a 'building, work or other component of a place should remain in its historical location', and relocation is 'generally unacceptable unless this is the sole practical means of ensuring its survival'. It is also consistent with Australia's international obligations, as article 8 of Annex V of the Protocol on Environmental Protection to the Antarctic Treaty states that listed historic sites and monuments 'shall not be damaged, removed or destroyed'.

Proposals to repatriate at least the outer boards and some of the contents of the huts nonetheless persist. The key rationale of such proposals is no longer concern about the cost of on-site maintenance, so much as concern that recent preservation work has obscured some of the original fabric, the outer

boards of which could be removed, replaced and made safely visible as a second hut in an Australian museum (for the ANARE Club Council's 'two huts' concept, see Ellyard and Burch, 2006). The philosophy of preserving the huts in their original context rather than removing them, in light of how important the context is to the significance of the huts, has continued to guide government policy, and has received widespread support from heritage professionals and historians (e.g. Blunt, 1985; Hughes, 1992; Pearson, 1993; Godden Mackay Logan, 2001; Mackay, 2005; Griffiths, 2007).

Since the site is not in the vicinity of an operational Australian research station, conservation work has been achieved by special expeditions, which in recent years have been launched by private foundations. The Mawson's Huts Foundation has mounted expeditions since 1996, viewing its role as akin to a contractor to the Australian Antarctic Division (Easter, pers. comm., 4 May 2007). The following summarises the key works to date.

Year	Main on-site conservation works	Works party
1931	Memorial cross crossbar reattached	BANZARE
1974	Memorial cross repaired	Antarctic Division (ANARE)
1977	Main Hut skylight covers repaired Repatriation: memorial cross plaque, BANZARE proclamation, sledge, wheel, pipe, spanners and dividers returned to Australia	Antarctic Division (ANARE)
1978	Memorial cross crossbar reattached and replica plaque installed Main Hut workshop roof patched, ice removed, some interior lining replaced, artefacts recorded and stored under a bench Main Hut living section artefacts extensively recorded	Antarctic Division (ANARE)
1981	Retrieval of artefacts for display in Australia, and film-making for a documentary	Antarctic Division (ANARE)
1982	Main Hut minor roof repairs	Oceanic Research Foundation
1984-86	Main Hut internal platform stabilised with metal and timber props Artefact scatters: initial archaeological site survey Main Hut and Magnetograph House artefacts documented Main Hut ice excavated	Project Blizzard

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Year	Main on-site conservation works	Works party
1984-86	<p>Condition assessments</p> <p>Memorial and proclamation plaques removed and replaced with replicas</p> <p>Experimental work for future conservation of materials on the site</p>	
1996	<p>Short survey visit to gather information for a works plan</p>	AAP Mawson's Huts Foundation
1997-98	<p>Main Hut skylights, ridge capping, gutters and flashings repaired and ice removed</p> <p>Main Hut workshop roof over-clad</p> <p>Main Hut living section central platform restored</p> <p>Magnetograph House roof re-clad, door and tar-paper lining repaired</p> <p>Absolute Magnetic Hut excavated from ice and original building fabric restored</p> <p>Transit Hut structure restored—loose boards re-fixed</p> <p>Memorial cross crossbar reattached with stainless steel brackets</p> <p>Internal environmental monitoring equipment installed</p> <p>Archaeological site survey; artefacts documented; ice cores taken</p>	AAP Mawson's Huts Foundation
2000-01	<p>Main Hut battens added to cover gaps on southern roof plane</p> <p>Magnetograph House post-BANZARE artefacts removed</p> <p>Site clean-up: post-BANZARE rubbish removed, including rubbish from Granholm Hut and seatainers and fuel drums</p> <p>Internal environmental monitoring equipment maintained</p> <p>Archaeological site survey; artefacts documented</p>	AAP Mawson's Huts Foundation
2002-03	<p>Main Hut structural investigations and workshop roof structure repaired</p> <p>Main Valley post-BANZARE drums and scattered debris removed</p> <p>Site GIS framework and artefacts inventory established</p> <p>Living section and workshop artefacts catalogued</p> <p>Artefact scatters around Main Hut, Penguin Knob and the two seal caches documented</p> <p>Environmental sensors and data loggers reinstalled</p> <p>Internal environmental monitoring equipment maintained</p> <p>Archaeological site survey; artefacts documented</p>	Antarctic Division

Year	Main on-site conservation works	Works party
2005-06	Main Hut parts affected by snow and melt water ingress repaired / monitored Main Hut living section roof battens secured and ice removed Monitoring equipment serviced Workshop skylight covers replaced	AAP Mawson's Huts Foundation
2006	Main Hut living section original roof encapsulated (over-clad with fabric membrane and Baltic pine); south wall partly over-clad Internal environmental monitoring maintained; vibration sensors installed Main Hut living section snow and ice removed Mould outbreaks on artefacts sampled Main Hut flagpole returned to Australia for conservation with a view to returning it to its context; replica installed Timber stack removed from Granholm Hut to Sørensen Hut Workshop single barrel door lock replaced with two locks Works party accommodation improved (Sørensen Hut)	Mawson's Huts Foundation

2.4.2 Tourism

Antarctica, of course, has commercial possibilities... I believe that in the near future we shall see palatial tourist liners moored along some ice barrier or ice cliff, and men, women, and children skating and climbing ice peaks. There is no reason why hotels should not be established in suitable areas. This is no wild dream, because in the summer time the frailest constitution would benefit by the balmy, germ-free atmosphere.

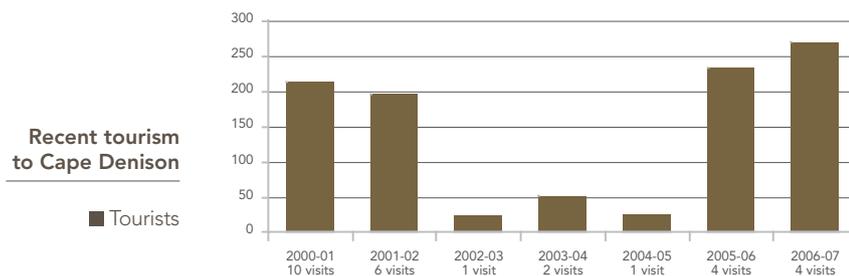
Frank Hurley, Sydney Morning Herald, 5 April 1930

From 1912 to 1998, two-thirds of the 650 people estimated to have ever visited the site were tourists (Hayman et al, 1998). In the decade since then, organised tours have been offered regularly as part of voyages to East Antarctica and the Ross Sea region, and more than 1000 tourists have visited the site. From season to season there is no definite pattern of growth in visits to the site, and its isolation and unreliable access have kept tourist visits to a very low level compared with other visited parts of the Antarctic.

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Throughout Antarctica, the total number of tourists making landings per season has risen beyond 29 500. However, 98 per cent of passengers do not venture beyond the Antarctic Peninsula region, several thousand kilometres west of Cape Denison (IAATO, 2007). In a typical season, there are more than fifty sites on the Antarctic Peninsula, and nine sites on the Antarctic continent, which receive more tourists than Cape Denison (IAATO, 2007b; Powell, 2006).



The Australian Government recognises the legitimacy of tourism activities in Antarctica provided they further the principles and objectives of the Antarctic Treaty and their conduct is ecologically sustainable and socially responsible ...

...ecologically sustainable if it is assessed in accordance with the Madrid Protocol as having no more than a minor or transitory impact on the Antarctic environment and the intrinsic values of Antarctica.

Socially responsible activities are activities that (a) are of a peaceful nature; (b) do not degrade, or pose a substantial risk to, areas of biological, scientific, historic, aesthetic or wilderness significance; (c) will not detrimentally affect any other activity in the Antarctic Treaty area, in particular scientific research activities and their associated support activities; and (d) have the capacity to respond promptly and effectively to accidents and emergencies.

Australia's Antarctic Tourism Policy, 2004

The typical tourist visit sees thirty to one hundred people visiting for several hours, under the supervision of the ship's guides, who brief their passengers on appropriate protocol, drawing on the Australian Antarctic Division visitor's guide. The only interpretive material on-site is a small plaque near the Main Hut which explains, in several languages, that Mawson's Hut is on the list of Antarctic Historic Sites and Monuments.

Simon Mossman, 2006: Spirit of Enderby passengers at Cape Denison. (MHF; AAD)



Tim Higham, 1995: Tourists around Mawson's main hut (iMAGEAntarctica, AAD)



Tourists may only enter the Main Hut if they are carrying a permit to do so. Entry is subject to the condition that tourists are accompanied by a suitably qualified guide, and that no more than three tourists plus a guide enter the Main Hut at any time, and no more than two tourists plus a guide enter the Magnetograph House at any time.

Most tourists who visit the site now travel on small expedition-style cruise ships chartered by mainstream Antarctic tour operators, although some arrive by yacht. This is a departure from the 1990s, when there were a number of privately-organised visits, notably by Don and Margie McIntyre, who, with Australian Antarctic Division approval, occupied their own 'Gadget Hut' at Cape Denison throughout 1995. Their hut was used twice more by people who made arrangements with the McIntyres, namely Alfred Winklemeyer in 1997 and Jim and Yvonne Claypole in 1999. The McIntyres also carried paying passengers on other vessels, including the expedition in early 1999 that deployed monitoring equipment. Gadget Hut has been removed.

3. Heritage Values

3.1 Method and Basis of Assessment of Heritage Values

Assessments of the heritage values of Mawson's Huts Historic Site have determined that the site is a place of outstanding heritage significance to the nation. This plan adopts these assessments, since they were based on the advice of the Australian Heritage Council that the site's values met virtually all the National Heritage and Commonwealth Heritage historic criteria, and led to the decision of the responsible minister to include the site on the National Heritage List and Commonwealth Heritage List. While it will be timely in the life of this plan to conduct a formal review of these assessments, in preparing this plan, the existing assessments were used, with only one addition: a summary of the site's natural values, drawing on the assessment which produced the Antarctic Specially Protected Area management plan.

The site's heritage 'significance' – in other words, why the place is of value to present and future generations (see the Burra Charter) – derives from an understanding of its heritage values, and forms the foundation upon which conservation policy for the place is developed. The EPBC Act (section 528) defines the 'heritage value' of a place as including the place's natural and cultural environment having aesthetic, historic, scientific or social significance, or other significance, for current and future generations of Australians. This plan includes statements of significance taken from the entries on the National Heritage List and Commonwealth Heritage List.

Previous assessments

Mawson's Huts, comprising the Main Hut, Transit Hut, Magnetograph House, Absolute Magnetic Hut and Memorial Cross, were assessed as worthy for their historic values for inclusion in 1980 on the Register of the National Estate, which was Australia's national inventory of natural and cultural heritage places. The place was included as an historic site on the Register in 2002. This was based on the Australian Heritage Commission's assessment that the site met various criteria of national estate significance. The statement of significance stated that:

The place is significant as the site of Australia's first scientific work in Antarctica, as a tangible link with the explorations of Sir Douglas Mawson, as the least disturbed of the nine sites of the heroic period of Antarctic exploration, as the location of Australia's first claim to Antarctic territory and is a most powerful symbol of the nature of Australia's research early this century.

The Main Hut and the Memorial Cross have been recognised as Historic Monuments under the Antarctic Treaty since 1972, on the basis of consensus among Antarctic Treaty Parties that they belonged to the category of 'historic monuments which should be preserved' (this category is not subject to assessment criteria). The Register of the National Estate and Antarctic Treaty listings show that the place had recognised heritage significance long before its inclusion on the National and Commonwealth Heritage Lists.

Allom Lovell Marquis-Kyle (1988) and Pearson (1993) included assessments and statements of heritage significance, applying the significance assessment criteria in section 4 (1A) of the *Australian Heritage Commission Act 1975* and Australian Heritage Commission guidelines (AHC, 1990). The 2001 conservation management plan commissioned by the AAP Mawson's Huts Foundation, under the auspices of a steering committee formed by the Foundation, the Australian Antarctic Division and the Australian Heritage Commission, was required to update the identification of cultural resources of the site and assess the value or significance of those resources, as well as developing conservation policies and implementation strategies. In doing so (Godden Mackay Logan, 2001: 99-110), it adopted the previous assessments, with amendments to reflect new information. The resulting statement of significance was the basis for the statements in the Commonwealth and National Heritage listings in 2004 and 2005.

Limitations

Major conservation works on the Main Hut have been completed since the formal assessments of the site's significance. While the impact of over-cladding of the original timber roofs has been acknowledged in the condition assessment below, expert opinion should be sought during the life of this plan on whether this work has affected the site's significance.

Previous assessments have identified observable social associations with the place, but have focused on the fabric of the site as the elements reflecting heritage values, at the expense of associative values. The Commonwealth and National Heritage listings are somewhat imprecise in identifying which elements of fabric represent which heritage values—in many cases referring to the entire site, the AAE fabric or all of the historic fabric—and therefore some interpretation has been required for the purposes of this plan. It would also be useful to seek expert opinion on which social groups should be viewed as associated with the site, and even on whether the decades of public and private efforts to interpret and conserve the site have social significance in themselves.

While noting the above limitations and suggestions for future work, the recent assessments and statements remain good summaries of the site's significance. Therefore, it has been viewed as unnecessary to undertake a reassessment of values for this management plan.

3.2 Description of National and Commonwealth Heritage Values

Commonwealth and National Heritage criteria

The site was entered on the Commonwealth Heritage List in 2004 (Place ID 105435). As a Commonwealth property managed by the Australian Antarctic Division, the site was assessed against the Commonwealth Heritage criteria prescribed by the EPBC Act and Regulations, which define the ways in which the place has '**significant heritage value**' (see Appendix III). The site was found to meet criteria A, B, C, E, F, G and H (see below).

The site was entered on the National Heritage List in January 2005 (Place ID 105713). The National Heritage listing criteria prescribed by the EPBC Act and Regulations are identical to the Commonwealth Heritage criteria, but define the ways in which the place as '**outstanding heritage value to the nation**' (see Appendix III). The site was found to meet criteria A, B, C, D, E, F, G and H (see below).

The following statements of significance and descriptions of the National and Commonwealth Heritage values of the site are taken directly from the National and Commonwealth Heritage listings.

3.2.1 Statements of Significance and Values–National Heritage Listing

Summary Statement of Significance:

Mawson's Huts Historic Site is a place of great historical and social significance. The site is significant as the first base for scientific and geographical discovery in Antarctica by Australians. The Australasian Antarctic Expedition 1911-1914 (AAE) was the first large-scale scientific inquiry after Federation. Mawson's Huts is a complex historical site, a remnant of the 'Heroic Era' of exploration in Antarctica. The expedition carried out major scientific experiments and laid the foundation for the eventual claim to a very large portion of the Antarctic continent by Australia.

Mawson's Huts Historic Site is rare as one of only nine wintering expedition bases built and as the only surviving site representing the work of an Australian expedition of the Heroic Age. It is one of only six sites, of all nationalities, remaining from this era. The expedition survived the isolation and the severe climate and the site illustrates this through its form and setting. The overall site with its range of buildings, scientific equipment and artefacts demonstrates life in Antarctica during this period. This base is the least disturbed by human activities making it one of the most diverse and unique bases that remain.

The place has a strong symbolic association with Sir Douglas Mawson, the AAE party and their heroic activities, and is evocative of Mawson's leadership and the scientific endeavours undertaken. Mawson's story has become part of Australia's exploration history and, as such, is part of the nation's cultural tradition. The place is directly associated with Sir Douglas Mawson's major Antarctic expedition, which made him a hero to much of the Australian population. The AAE has become an integral part of Australia's exploration history and has gained a mythic quality. The place is highly prominent in the consciousness of large numbers of Australians; in particular, the science and veterans community value the AAE for its role in Antarctic scientific research and for the way it became a model for further exploration in the Antarctic.

The Site remains as isolated and remote as it did in 1912, with its historic structures clinging to the small peninsula of rock that is Cape Denison. This sense of a truly isolated place is powerful, both visually and symbolically. The Main Valley and adjacent ridges exhibit an aesthetic landscape value by providing a strong sense of place, with the Main Hut located snugly near the water's edge and the group of scientific huts contained within a defined valley, dominated by the Memorial Cross and the BANZARE Proclamation Pole on adjacent ridges. The building form of the huts themselves shows the functional and efficient planning that was undertaken in response to the site position and the elements. The aesthetic qualities of the interior pyramid space, defined by the raked timber ceiling, timber beams and skylights rising over the central area, together with the evocative evidence of its historic use, produce an emotive response in visitors and viewers alike.

The place is strongly evocative of the endeavours of a group of Australians and others in one of the fiercest environments on Earth. The weathered buildings, as well as the artefacts and the memorial cross, and their relationship to the vast Antarctic landscape around them with its snow, ice, rocks and relentless winds, and the sea beyond, combine in creating an outstanding aesthetic entity conveying a strong sense of time and isolation. The weathering and survival of the huts and the decay of other artefacts, as a result of years of exposure to hostile conditions, provide archaeological and scientific research potential in the area of materials deterioration and conservation. It also serves as a gauge of time elapsed since the AAE and of the conditions endured by its members in this remote and hostile environment.

The AAE is significant as the first expedition to pioneer the use of wireless communication on the Antarctic continent, linking the main base at Cape Denison with mainland Australia via the relay station established on Macquarie Island. This expedition was also the first to obtain an aeroplane for use in Antarctica, although due to damage it was utilised by the expeditioners as an air tractor. The AAE is also significant for the photography of Frank Hurley, including his innovative use of colour images and cinematography. The surviving fabric, such as wireless masts and artefacts on site and in collections in Australia and overseas, demonstrate the intense period of AAE occupation between 1912-13.

mawson's huts

HISTORIC SITE

The whole of Cape Denison contains evidence of the AAE, with a concentration of evidence in the Main Valley. This is an area of substantial archaeological deposit and archaeological potential. The site has already yielded archaeological evidence providing insight into the living conditions experienced by the AAE. The interiors of the huts are important in that they contain evidence of the domestic and work life of the AAE. The site still retains a great deal of physical evidence which can be interpreted by archaeological study. Associated scientific specimens and cultural object collections from Cape Denison, in situ or now in Australia, have continuing potential to yield information. Within Cape Denison, original points from which surveying, cartographic, meteorological and magnetic observations were made are still extant, including the three science huts, which still provide the facility to continue comparative scientific research.

The Huts are of technical significance being excellent examples of the innovation and technology used to combat the extreme conditions of the Antarctic and provide functional living and working quarters. The huts were designed by Douglas Mawson and pre-fabricated in Australia before the expedition. The Main Hut illustrates ideas learned by Mawson during earlier expeditions, as well as ideas borne out of collaboration with an architect and the suppliers of materials. The use of verandahs and hipped roofs reflects common Australian design features adapted to provide strength and insulation. The designs incorporated the need for wind resistance, simplicity, portability and resistance to the cold. The Main Hut is, perhaps, a climax of the Heroic Era building type, and is clearly designed for its functional purpose.

Official Values

National Heritage Criteria	Values
A. Events, Processes	<p>Mawson's Huts Historic Site was the first base for scientific and geographical discovery in Antarctica by Australians. The site of Mawson's Huts marks the location of the earliest large-scale scientific inquiry by Australians outside Australia following Federation. The Australasian Antarctic Expedition (AAE) 1911–1914, carried out major scientific experiments and laid the foundation for the eventual claim to a large portion of the Antarctic continent by Australia. The expedition was also the first to pioneer the use of wireless communication and the first to attempt to obtain an aeroplane for use in Antarctica. The place is one of six surviving Heroic Era (1897 to 1917) expedition bases which symbolise the first period of land-based scientific research and geographic discovery in Antarctica.</p> <p>The attributes are embedded in the AAE fabric including four timber buildings, two intact and two as standing ruins. These include the Main Hut with living section, workshop and verandahs (intact), the Magnetograph House (intact), Absolute Magnetic Hut (standing ruin with no roof), and Transit Hut (standing ruin with no roof). Mawson's Huts Historic Site also includes wireless masts (ruins), survey markers and memorials, and a large amount of stores, equipment, animal food caches and AAE artefacts remain in concentration around the Main Hut and across the whole of Cape Denison.</p>
B. Rarity	<p>The AAE was the first and the only expedition organised, manned and supported by Australians during the Heroic Era. It is, therefore, unique in Australian history. The Mawson's Huts Historic Site is the only surviving site representing the work of an Australian expedition of the Heroic Age. It is one of only six sites remaining from the international contribution to the Heroic Age exploration of Antarctica.</p> <p>The site has a high level of integrity, retaining the Main Hut, plus the three scientific huts and a large number of artefacts.</p> <p>The attributes are the same as criterion (a).</p>

mawson's huts

HISTORIC SITE

National Heritage Criteria

Values

C. Research

The whole of Cape Denison contains evidence of the AAE, with the largest concentration in the Main Valley. This is an area of substantial archaeological deposit and archaeological potential. The interiors of the huts contain evidence of the domestic and work life of the AAE during the period of occupation (1912-1913). The site retains a great deal of physical evidence which can be interpreted by archaeological study.

As an archaeological resource, the significance of Mawson's Huts Historic Site lies not only in the provisions and equipment available to expeditions during the early twentieth century, but also in the insights they provide into human responses to isolation and confinement and extreme climactic conditions. Of all the remaining historical hut sites in the Antarctic region, it appears to have been subject to the least intervention. The scientific huts still allow for research to be undertaken, with potential to yield information on climatic impact and environmental change as well as material deterioration and conservation in arctic environments.

The significance of the site comes from the powerful interplay of documentary and physical evidence in Australia and physical evidence on-site. Unlike sites where only physical evidence or only documentary evidence is available, the significance of the site has the potential to be accessed and understood both on-site and elsewhere.

The attributes are the AAE fabric including the four timber buildings, and the original points from which surveying, cartographic, meteorological, and magnetic observations were made. The interiors of the Main Hut and the Magnetograph House include foodstuffs, personal memorabilia and clothing. A large amount of stores, equipment, animal food, caches and AAE artefacts remain in concentration around the Main Hut and the whole of Cape Denison.

National
Heritage Criteria

Values

D. Principal
characteristics
of a class of
places

Mawson's Huts Historic site is one of six surviving Heroic Era wintering bases. It demonstrates the range of building uses, scientific equipment and artefact types typical of its class and period. All elements of the site contribute to the demonstration of what a Heroic Era base was like.

The buildings were purpose built for polar winter accommodation and were associated with specific scientific and exploration expeditions. The design form, construction materials, structure, functional planning and services of these huts all reflect the function of the expedition and their polar location. As a group, Mawson's Huts retain the most intact and diverse range of accommodation and scientific huts of all the Heroic Era complexes.

The site of the extant AAE Main Base demonstrates, in its surviving form and setting, the isolation and harsh conditions encountered by members of the expedition in their important work. It shares the typical characteristics of Heroic Era huts, it is located in a remote area for temporary occupation associated with scientific and geographic discovery, the design and placement of the buildings, the artefacts, materials used, the type of scientific equipment and the scientific data and samples collected.

The intactness of the buildings as a group demonstrates their function during a particular and intense period of time. The weathering of the huts and the patination of the building fabric and of other artefacts serves as a gauge of time elapsed since the AAE. The Main Hut contains a clear and strong internal structure and an efficiently planned use of space which provided both the functional requirements of accommodating eighteen men and a strong sense of communal focus and camaraderie around the central table, so well documented in Hurley's photographs.

Mawson's Huts Historic Site demonstrates the types of building uses, scientific equipment and artefacts typical of Heroic Era scientific and discovery expeditions. The use of verandahs and hipped roof form provides Mawson's Main Hut with distinct Australian design characteristics.

The strength and clarity of the spaces and functional arrangements in the living section of the Main Hut are greater than that revealed in the plans of other surviving Heroic Era huts.

mawson's huts

HISTORIC SITE

National Heritage Criteria

Values

...D continued

The arrangement of bunks around the outside of the central communal area, reinforced as a focus by the raking pyramid ceiling, creates a spatial volume of great character.

Mawson's Huts Historic Site is one of the small set of Heroic Era expedition bases which symbolise the first period of land-based scientific research and geographic discovery in Antarctica.

The attributes are the same as criterion (a).

E. Aesthetic
characteristics

Mawson's Huts Historic Site is a cultural landscape that retains a sense of historic time and place. The weathering of the huts and the patination of the building fabric and of other artefacts has aesthetic value and serves as a gauge of time elapsed since the AAE and of the conditions endured by its members in this remote and hostile environment.

The weathered buildings of the Mawson's Huts site, as well as the artefacts and the memorial cross, and their relationship to the vast Antarctic landscape around them with its snow and ice scapes, rocks and relentless winds, and the sea beyond, combine in creating an aesthetic entity conveying a strong sense of time and isolation.

The external form of the Main Hut is comprised of pyramid and hip roofs over low external walls. The building has aesthetic value, sitting with great repose in the landscape, made even more dramatic with a build-up of snow around it. The two different room forms also express the change in the AAE's plans that brought them together in the first place.

This sense of awe inspiring isolation experienced by the expeditioners was first demonstrated in the evocative images of the AAE photographer, Frank Hurley. Mawson's Huts Historic Site has continued to inspire artists, writers and visitors.

The attributes are encompassed in the entire Mawson's Huts Historic Site.

National
Heritage Criteria

Values

F. Creative or
technical
achievement

The place is strongly evocative of the endeavours of a group of Australians in one of the fiercest environments on Earth. The remaining buildings reflect the development of building design for Antarctica and extensive experimentation in coping with a new and extreme environment. The pyramid-form Main Hut illustrates ideas learned by Mawson during earlier expeditions, as well as ideas borne out of collaboration with an architect and the suppliers of materials. The whole emphasis of the building is toward the weather, and the vital need for a sturdy yet liveable base in a highly inhospitable climate.

The AAE Main Hut is part of the group of Heroic Era huts where pragmatic considerations for shelter in a foreign and remote environment created the development of the expedition hut form appropriate for polar regions. The Main Hut is, perhaps, a climax of this building type and is clearly designed for its functional purpose.

The AAE is the first Antarctic expedition to pioneer the use of wireless communication and the first to attempt to obtain an aeroplane for use in Antarctica.

The attributes are the Main Hut with living section, workshop and verandahs.

G. Social value

In Australian popular memory, the place is strongly associated with the heroic endeavours of a group composed primarily of Australians in the early twentieth century in one of the wildest and least known natural environments on Earth.

Mawson's Huts Historic Site generally, with the Main Hut and Memorial Cross in particular, are symbolic of the AAE, its members, its achievements and its sacrifices.

The place has symbolic cultural value in the stories of the exploits of the AAE, particularly Mawson's epic return from the tragic Far-Eastern Sledging expedition, and the role this has had in legend building and national psyche.

mawson's huts

HISTORIC SITE

National Heritage Criteria	Values
...G continued	<p>The 'communities' who value these associations include the community of Antarctic veterans, the scientific community, and the Australian community as a whole. The place is especially important to the community of Antarctic workers past and present.</p> <p>The attributes are the same as criterion (a).</p>
H. Significant people	<p>Mawson's Huts Historic Site is significant for its associations with all members of the AAE and the crew of the expedition vessel SY Aurora. The site's association is not only with the eighteen members of the Main Base at Cape Denison, but also the eight members of the Western Base, and five members of the Macquarie Island Base. These activities and associations are important to Australia's history in terms of early achievement in Sub-Antarctic and Antarctic scientific exploration and discovery.</p> <p>Mawson's Huts Historic Site is particularly associated with AAE members who continued their Antarctic associations (including Davis, Wild, Hurley and Moyes) and those who continued careers in science and applied science (including Madigan, Webb, Laseron, Stillwell and Kennedy). The AAE is significant for the photography of Frank Hurley, including his innovative use of colour images and cinematography.</p> <p>The place is directly associated with Sir Douglas Mawson's major Antarctic expedition, one which made him a hero to much of the Australian population. Mawson is a major figure in Australian science and played a huge role in Australia's Antarctic history. The place is similarly, though less prominently in the public mind, associated with all the members of the AAE. A number of these men went on to have significant careers either in Antarctica and/or in science. Perhaps the best known of the other expeditioners is photographer and filmmaker Frank Hurley, who made a major contribution to his fields of endeavour.</p> <p>The attributes are the same as criterion (a).</p>

3.2.2 Statements of Significance and Values—Commonwealth Heritage Listing

Summary Statement of Significance:

Mawson's Huts Historic Site is a place of great historical and social significance. The site is significant as the first base for scientific and geographical discovery in Antarctica by Australians. The Australasian Antarctic Expedition 1911-1914 (AAE) was the first large-scale scientific inquiry after Federation. Mawson's Huts is a complex historical site, a remnant of the 'Heroic Era' of exploration in Antarctica. The expedition survived the isolation and the severe climate and the site illustrates this through its form and setting. The site is, for Australia, of political significance as the location for what eventually became sovereignty claims. The site fabric demonstrates the intense period of AAE occupation between 1912-13. The external relationship of buildings and artefacts illustrates the way the AAE organised their activities spatially. (Criterion A.4)

The site is significant as one of only nine wintering expedition bases built in Antarctica during the 'Heroic Era' of exploration, of which only six now survive. This base is the least disturbed by human activities making it one of the most diverse and unique. The site is a fundamental part of the history of Antarctic exploration and of the two bases constructed by Australians during this period it is the only surviving base. The overall site with its range of buildings, scientific equipment and artefacts demonstrates life in Antarctica during this period. (Criterion B.2)

The site is significant for its association with Sir Douglas Mawson and the members of the AAE for whom the site was a base and home for two years. It is a memorial to the members who lost their lives, and also to the contribution that Mawson and his team made to Antarctic science and geography. (Criterion H.1)

The scientific community, the Antarctic veterans community and the larger Australian community view Mawson's Huts as a symbol of the achievements of the AAE and Mawson himself. The AAE has become an integral part of Australia's exploration history and has gained a mythic quality. The science and veterans community value the AAE for its role in Antarctic scientific research and for the way it became a model for further exploration in the Antarctic. (Criterion G.1)

The Mawson's Huts Historic Site is of aesthetic value. The location of the huts on a small rocky peninsula surrounded by a vast area of ice and sea evokes a powerful sense of isolation. Important visual elements also include the setting of the AAE hut structures and memorial cross and the British and New Zealand Antarctic Research Expedition (BANZARE) Proclamation Pole. The building form of the huts themselves shows the functional and efficient planning that was undertaken in response to the site position and the elements. The weathering of the huts and decay of the remains gives a feeling of time elapsed and relates to the exposure to the elements. (Criterion E.1)

mawson's huts

HISTORIC SITE

The Mawson's Huts Historic Site is an area of substantial archaeological deposit and archaeological potential. The site has already yielded archaeological evidence providing insight into the living conditions experienced by the AAE. The interiors of the huts are important in that they contain evidence of the domestic and work life of the AAE. The site still retains a great deal of physical evidence which can be interpreted by archaeological study. (Criterion C.2)

The Huts are of technical significance being excellent examples of the innovation and technology used to combat the extreme conditions of the Antarctic and provide functional living and working quarters. The huts were designed by Douglas Mawson and pre-fabricated in Australia before the expedition. Mawson developed the huts using his own knowledge and experience. The designs incorporated the need for wind resistance, simplicity, portability and resistance to the cold.

Mawson's Huts are significant as evidence of Mawson's design theory that included modifying Australian building form for Antarctic conditions. Mawson's Huts were functionally designed using theory and experience. The use of verandahs and hipped roofs which are design features common to Australia were adapted to provide strength and insulation. (Criterion F.1)

Australian Historic Themes: 3.03 Surveying the continent; 3.16 Struggling with remoteness and hardship; 5.01 Working in harsh conditions; 8.10.05 Advancing knowledge in science and technology; 8.11 Making Australian folklore.

Official Values

Commonwealth Heritage Criteria Values

A. Events, Processes

Mawson's Huts Historic Site is a place of great historical and social significance. The site is significant as the first base for scientific and geographical discovery in Antarctica by Australians. The Australasian Antarctic Expedition 1911-1914 (AAE) was the first large-scale scientific inquiry after Federation. Mawson's Huts is a complex historical site, a remnant of the 'Heroic Era' of exploration in Antarctica. The expedition survived the isolation and the severe climate and the site illustrates this through its form and setting. The site is, for Australia, of political significance as the location for what eventually became sovereignty claims. The site fabric demonstrates the intense period of AAE occupation between 1912-13. The external relationship of buildings and artefacts illustrates the way the AAE organised their activities spatially.

Attributes

All of the historic fabric including its form, layout, setting, external relationship of buildings, and associated artefacts.

B. Rarity

The site is significant as one of only nine wintering expedition bases built in Antarctica during the 'Heroic Era' of exploration, of which only six now survive. This base is the least disturbed by human activities making it one of the most diverse and unique. The site is a fundamental part of the history of Antarctic exploration and of the two bases constructed by Australians during this period it is the only surviving base. The overall site with its range of buildings, scientific equipment and artefacts demonstrates life in Antarctica during this period.

Attributes

The integrity of the overall site with its range of buildings, scientific equipment and artefacts.

mawson's huts

HISTORIC SITE

National Heritage Criteria

Values

C. Research

The Mawson's Huts Historic Site is an area of substantial archaeological deposit and archaeological potential. The site has already yielded archaeological evidence providing insight into the living conditions experienced by the AAE. The interiors of the huts are important in that they contain evidence of the domestic and work life of the AAE. The site still retains a great deal of physical evidence which can be interpreted by archaeological study.

Attributes

The whole site including archaeological deposits external to the huts, and associated artefacts.

E. Aesthetic characteristics

The Mawson's Huts Historic Site is of aesthetic value. The location of the huts on a small rocky peninsula surrounded by a vast area of ice and sea evokes a powerful sense of isolation. Important visual elements also include the setting of the AAE hut structures and memorial cross and the British and New Zealand Antarctic Research Expedition (BANZARE) Proclamation Pole. The building form of the huts themselves shows the functional and efficient planning that was undertaken in response to the site position and the elements. The weathering of the huts and decay of the remains gives a feeling of time elapsed and relates to the exposure to the elements.

Attributes

The location and setting of the huts, memorial cross and Proclamation Pole, the form of the huts and their weathered patina.

National Heritage Criteria	Values
F. Creative or technical achievement	<p>The Huts are of technical significance being excellent examples of the innovation and technology used to combat the extreme conditions of the Antarctic and provide functional living and working quarters. The huts were designed by Douglas Mawson and pre-fabricated in Australia before the expedition. Mawson developed the huts using his own knowledge and experience. The designs incorporated the need for wind resistance, simplicity, portability and resistance to the cold.</p> <p>Mawson's Huts are significant as evidence of Mawson's design theory that included modifying Australian building form for Antarctic conditions. Mawson's Huts were functionally designed using theory and experience. The use of verandahs and hipped roofs which are design features common to Australia were adapted to provide strength and insulation.</p> <p>Attributes</p> <p>All aspects of the huts including their manufacture, design, form, fabric, detail, structure and thermal properties.</p>
G. Social value	<p>The scientific community, the Antarctic veterans community and the larger Australian community view Mawson's Huts as a symbol of the achievements of the AAE and Mawson himself. The AAE has become an integral part of Australia's exploration history and has gained a mythic quality. The science and veterans community value the AAE for its role in Antarctic scientific research and for the way it became a model for further exploration in the Antarctic.</p> <p>Attributes</p> <p>All of the historic fabric including form, layout, setting, external relationship of buildings, and associated artefacts.</p>

National Heritage Criteria	Values
H. Significant people	<p>The site is significant for its association with Sir Douglas Mawson and the members of the AAE for whom the site was a base and home for two years. It is a memorial to the members who lost their lives, and also to the contribution that Mawson and his team made to Antarctic science and geography.</p> <p>Attributes</p> <p>All of the historic fabric including its form, layout, setting, external relationship of buildings, and associated artefacts.</p>

3.3 Natural Heritage Values

Antarctica is a wilderness unique on Earth, and Cape Denison features many of those elements of harsh beauty for which the continent is renowned. Perhaps the most striking natural feature of Cape Denison is the towering height of the Antarctic plateau, which dwarfs Mawson's Huts. This ice cap extends along Commonwealth Bay in the form of huge ice cliffs, which periodically calve into the sea.

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While the site is listed nationally and internationally for its historic values, it is also located in a wilderness universally recognised for its unique natural features. The natural setting of the site contributes to its aesthetic values.

The huts, perched on a small rocky peninsula dwarfed by the vast Antarctic ice cap with its snow and ice scapes, rocks and relentless winds, convey a strong sense of time and isolation. As such, the setting meets criterion (e) on both National and Commonwealth Heritage Lists. No further assessment of the natural values of the site has to date been considered necessary, as it seemed outside the scope of management plans focused on the historic site.

The natural values of Antarctica as a whole are comprehensively protected by the Protocol on Environmental Protection to the Antarctic Treaty, which sets aside the entire continent as a natural

reserve devoted to peace and science, and establishes requirements for environmental impact assessments preceding activities. This is reflected in Australian legislation. The natural features of the site, including its fauna and flora, are protected by provisions in the management plans Australia prepared for the Antarctic Treaty ASPA and ASMA, which are reflected in this plan.

The ASMA management plan notes that there is a 'paucity of relatively ice-free areas in the immediate region', and therefore the rocky site offers habitat supporting an important assemblage of fauna and flora (Antarctic Treaty Consultative Meeting, 2004: 79). Only approximately 0.3 per cent of Antarctica is ice-free, and the nearest ice-free areas of equal or greater size are approximately 20 km to the east, and approximately 60 km to the west.

In summer (from November), species breeding at or near the site include over 18 000 pairs of Adélie penguins (*Pygoscelis adelia*), Wilson's storm petrels (*Oceanites oceanicus*), snow petrels (*Pagodroma nivea*) and the south polar skua (*Catharacta mccormicki*). Other species sighted in the area include the Cape petrel (*Daption capense*), Antarctic petrel (*Thalassoica antarctica*), southern giant petrel (*Macronectes giganteus*) and emperor penguin (*Aptenodytes forsteri*). Weddell seals (*Leptonychotes weddellii*), southern elephant seals (*Mirounga leonina*) and leopard seals (*Hydrurga leptonyx*) have been recorded as hauling out and, in the case of elephant seals, moulting at Cape Denison.

The only flora evident at the site are thirteen lichen species, identified by the AAE and BANZARE and distributed on boulders and other moraines, and non-marine algae associated with thirteen small glacial lakes, generally parallel to the foliation of the basement rocks, and melt streams which flow in summer.

4. Condition of National and Commonwealth Heritage Values

4.1 Methodology

The condition of the fabric which reflects the site's heritage values has been assessed by various expeditions, particularly since 1984-85. Following an early Antarctic Division report on deterioration of the fabric at Cape Denison (Ledingham, 1978), the first formal condition report was prepared by Project Blizzard (Blunt, 1985c, Vol 2: 64-229). Further assessments and observations made by subsequent expeditions were incorporated into updated but briefer condition reports in the conservation / management plans developed for the site (Pearson, 1993; Godden Mackay Logan, 2001). Recent expeditions working on the site have also reported the condition of the fabric (Godfrey et al, 2002; Bugg et al, 2006; Godfrey et al, 2007).

The condition assessments have largely been based on the premise that the site's heritage value resides in the historic fabric as a whole. In addressing the condition of the fabric, they have applied different measures. They have not uniformly stated conditions in the currently preferred range of 'good' to 'poor', and there have been few direct reports on the associative values of the place or the relative 'integrity' – 'high' to 'low' – of the fabric elements. Moreover, any expedition to this site can only ever assess those parts of the fabric that were revealed at the time given the levels of snow and ice, the extent to which weather conditions allowed outside work, and the time available.

Therefore, in order to summarise the condition of the site, or of the National and Commonwealth Heritage values of the site, it is necessary to review and draw together the key condition assessments from various reports over the past two decades. The discussion below addresses themes common to various elements of significant fabric on site (e.g. the condition of external cladding). The table which follows the discussion links particular fabric or associations with National or Commonwealth Heritage values, and outlines each element's condition and integrity.

The terms used below are consistent with State of the Environment guidelines for assessing the condition of heritage places (see Pearson & Marshall, 2006: 31-32). Three levels of judgement are used to indicate the 'condition' of the value, or in other words the state of the fabric reflecting the value:

Good	Structurally sound, weather tight, important features well maintained, no significant repair needed.
Fair	Structurally sound, retains major features, needs minor repairs.
Poor	Damaged, structurally unstable, erosion, disturbance, walls or floors missing or dilapidated.

Gavin Johnstone, 1978: ANARE Commonwealth
Bay party (iMAGEAntarctica, AAD)



PHOTO: Alasdair McGregor,
1997-98: Over cladding roof of
workshop with new Baltic pine
(iMAGEAntarctica, AAD)

Three levels of judgement are used to indicate the 'integrity' of the value, or in other words the intactness of the fabric reflecting the value:

- High** Features largely intact, no significant removals, modifications or additions.
- Medium** Some important elements lost, retains enough significant fabric to be understood and interpreted.
- Low** Significant elements destroyed, removed, replaced, rearranged or altered.

4.2 Condition of Significant Fabric

Mawson's Huts Historic Site cannot be experienced by the vast majority of people to whom it is important. Its epic history, stories and sagas could survive alone in theory, but rely on the known physical presence of the distant remains.

Richard Mackay, 'Ice, icon and identity: the meaning of Mawson's huts' (2005)

Until the 1970s, most elements on the site were gradually deteriorating, due to ongoing exposure. Since the expedition which built the structures only needed them to stand for a year or two, the fact that any buildings at all remained structurally sound many decades later was evidence of the effectiveness of the design, and the success of the AAE's subsequent efforts to weatherproof their base. In recent years, works parties have documented various aspects of the structures' deterioration, and submitted recommendations on the relative priorities for intervention to preserve them from further deterioration.

Of the four key timber huts, two (both sections of the Main Hut and the Magnetograph House) are in sound condition—the original structures and cladding are largely intact, and the buildings have been secured in recent years by the intervention of over-cladding on top of the original roofs.

The Magnetograph House has consistently been viewed as structurally sound, demonstrating the careful manner in which the AAE expeditioners, particularly Eric Webb, sited, erected, reinforced and lined the hut. Internally, the hut is in good condition, and of high integrity, as post-BANZARE items left by various visitors using the hut for measurements or shelter have been removed. Externally, the hut's visual integrity has been altered by the timber over-cladding on the roof which became necessary in 1998.

Evidence of repairs to the Main Hut date back to 1977, when holes were patched, awaiting a more comprehensive plan for long-term conservation. Other evidence of works to stabilise the hut remain from the 1985-86, 1997-98, 2000-01, 2002, 2004-05 and 2006 expeditions. Internally, the living section

collar ties and platform structure, which had failed due to internal snow/ice load, are restorations and reconstructions dating to 1998. Snow/ice loads on the small platform in the workshop also led to failure of the collar ties that supported that section's platform, and five of the eight rafters are split or broken at the joint with the collar ties. Externally, the new timber used in the 1998 and 2006 over-cladding of the roof has had an impact on the hut's external visual integrity. The integrity of the interior is higher, given the minimal human intervention over the years.

The two other key timber structures, Transit Hut and Absolute Magnetic Hut, are in poor condition. They have lost their roofs and significant amounts of cladding. The condition of the Absolute Magnetic Hut was influenced by the BANZARE visit in 1931, which removed its roof in order to position their recording instruments. The Transit Hut was—even when it was in use—the most ephemeral of the huts, and its deterioration shows the effects of the passage of time on less sturdy constructions. The remaining framing and cladding of both huts has been stabilised with a view to preserving them as standing ruins, with medium integrity. These structures have been subject only to minor intervention for stabilisation, and the ruins demonstrate the impacts of exposure of the original timbers to more than ninety years of exceptionally harsh weather.

The Memorial Cross is in good condition. This has been secured by the frequent restoration of the cross arm after it was repeatedly blown off, and the removal of the eroded original plaque, which has been replaced by a reconstruction. The overall integrity of the structure may therefore be viewed as medium.

Magnetograph House free of ice & drift. Main Living Hut at head of Boat Harbour full of ice & drift—two ceiling skylights missing. Absolute Hut 100 yds south of Mag. Hut full of drift & ice & one wall only is standing. ... Owing to blizzard conditions the Mag. Hut was used as a living hut.

A Hanley & AL Burrows (NZ Dept of Scientific & Industrial Research),
note left in Magnetic Hut (16 February 1962)

4.2.1 Wall and Roof Cladding

The original roof claddings of the Main Hut and Magnetograph House are elements of high integrity in poor condition—the eroded original roof boards are now encapsulated beneath new timber over-cladding. Abrasion of the roof cladding by wind-driven ice, coupled with the large spans between supports for the cladding, meant that the roofs on the workshop of the Main Hut and the Magnetograph Hut were close to failure when inspected in 1997. In the decade since, both roofs have been over-clad. This intervention secured the structural integrity of the buildings at the cost of some of the value embodied by a feeling of time elapsed and exposure to the elements.



The walls and roof, both inside and outside, were of tongued and grooved pine-boards, made extra wind-proof by two courses of tarred paper. As rain was not expected, this roofing was sufficient. There were four windows in the roof, one on each side of the pyramid. We should thereby get light even though almost buried in snow.

Douglas Mawson, *Home of the Blizzard* (1915)

Over-cladding of the workshop roof was completed in 1998 on the basis that structural failure was likely due to the abrasion of the original timber boards, from a thickness of 16 mm to less than 10 mm. This work preserved the structure, provided additional diaphragm bracing and reduced snow ingress. It also produced some unintended consequences. The first was visual: the new boards could only be installed with the acrylic coating on the exposed side, and since the coating was more durable and visible than expected, this had an impact on the appearance of the workshop roof. This is beginning to lessen, as it slowly abrades. The other consequence was the loss of all but three of the original battens that were refixed on top of the over-cladding, due to the failure of nails and silicon.

Over-cladding of the living section of the Main Hut roof, which had thicker (25 mm) boards but was also deteriorating (the edges and corners had abraded at the rate of 1 mm every ten years since construction), was completed in December 2006, in a manner which entirely encompasses the boards. Over-cladding was considered 'the only remaining option to secure the interior ... from future snow/ice ingress and preserve the significant fabric', and was noted to be a 'temporary and reversible measure' (AAD, 2006: 12). This work was done to reduce snow and melt water ingress, protect and retain the remaining cover battens, and maintain the structural integrity of the roof plane. Learning from the workshop experience, the roof was re-clad in a different manner—using uncoated timber and a vapour permeable fabric membrane between the original roof and the over-cladding. The timber is expected to weather in the medium-term, which should lessen its visual impact.

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Simon Mossman, 2006:
Living section before over-cladding
(MHF / AAD)



Simon Mossman, 2006:
Living section after over-cladding
(MHF / AAD)

With the over-cladding in place, the roof is expected to be in good condition structurally, although snow may still penetrate at some of the junctions between the roof and the walls in both the workshop and the living quarters (Godfrey et al, 2007: 10).

Each year battens and fabric (remnants of sailcloth, canvas and rope) were being blown from the roof and subsequently lost from the building. Over cladding the roof has ensured that all of this remaining evidence of Mawson's attempts to 'snow-proof' the building will be retained and protected.

Ian Godfrey, Field Leader's Report (2007)

The south verandah wall of the living section is in poor condition: wall boards are abraded to the point that they are on the verge of failure, and cover battens are being lost. Openings in the wall contribute to the ablation of the snow bank that has built up in the verandah, threatening to reduce the buffer effect that this provides to the internal environment and the thermal mass this gives to the whole building.

4.2.2 Structural Capacity of the Main Hut

A structural analysis of the capacity of the Main Hut timber members was undertaken in 2001, using predicted upper levels of wind speed and snow loads on the roof. Generally, members were found to be satisfactory under wind loading and are around maximum permissible stresses.

Even though it was concluded that some structural elements do not comply with calculated strength requirements for snow loading, it was assumed that extreme conditions in Commonwealth Bay would have occurred a number of times over the decades. Therefore, it was considered that the Main Hut should be taken as structurally adequate for conditions, provided deterioration of elements and fixings does not occur. Issues that may require consideration in future include progressive deterioration of the building with age, the additional weight of the over-cladding and any changes that may occur as a result of ice removal, such as increased vibration.

4.2.3 Corrosion of Metal Connectors

All timbers in the framing of the Main Hut have bolted connections, and cladding was originally fixed with plain mild steel nails. The bolted connections are generally in good condition, showing only minor surface corrosion. Inspection and, where necessary, replacement of bolts and nails will become necessary, particularly if ice is removed, as this may result in increased salt deposition inside the building and some corrosion. Apart from the loss of cladding, failure of bolts or nails is the event most likely to lead to significant damage to the buildings.

Frank Hurley, 1912: Mertz leaving the Hut by the trapdoor on the verandah roof (Australasian Antarctic Expedition, 1911-14 collection, State Library of NSW)



4.2.4 Ice and Anchorage

We had decided that the air temperature of the Hut should, so far as possible, be maintained at about 40° F. measured at breast height in the centre of the room. Of course the temperature near the walls or on the floor was always lower, actually at or below freezing point. Under these circumstances moisture from the air inside the Hut condensed on the walls and parts of the ceiling. There was now a thickness of 5 inches of ice on the inside of the windows notwithstanding that they were sealed up on the outside by a wooden lid over the glass. On the wall under my bunk there was ice several inches thick. On the side of the bed against the wall, the blankets were frozen together and to the wall with ice formed from the freezing of moisture in the Hut air.

Douglas Mawson, Narrative, AAE Scientific Reports Series A (1942)



Alasdair McGregor, 1997-98: Bottles in darkroom, including Coleman's Mixed Mustard bottle and ointment tin (iMAGEAntarctica, AAD)

The relative contribution to the foundation strength of the Main Hut of fifty tons of rocks placed around the floor structure during construction, and the ice-welding of the posts placed into holes exploded into the bedrock, is unclear. When the hut is partly filled with ice, the ice helps to hold the hut in place. However, it may be that the posts frozen into place and/or the rocks themselves provide effective anchorage.

Ice beneath the floor of the Main Hut is effectively permanent, and there has been no intention to remove ice from its verandahs, which is another potential source of structural reinforcement. Since there is a possibility that removal of ice from within the hut could increase the temperature around the foundations, removal of ice from the floor, if ever required, should be undertaken carefully, and any changes to the internal environment monitored. In light of inconclusive evidence, recent excavations have left a precautionary ice layer at least 600 mm thick on the floor.

4.2.5 Artefacts

The cultural heritage objects on site are in the process of being documented and mapped—over 1 700 items have been recorded to date. Some objects were removed from the site in 1931 or by visitors between the 1950s and the 1980s. Some have been displaced from their original contexts onto shelves or into storage boxes, generally after the location in which they were found was documented. However, those remaining in the hut are objects that were left on the site by the AAE, and are therefore of high integrity.

The condition of objects inside the Main Hut is variable: some are in good condition, while others are sound other than mould stain (on paper and fabrics) or surface corrosion (on metal). Objects in poor condition include boxes almost entirely consumed by mould, food remains in a state of advanced decay, the damp detritus congealed on the dark room floor, and tins represented only by rust rings.



Simon Mossman, 2006: Acetylene plant, Main Hut (MHF/AAD)

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Rod Ledingham, 1978: Mawson's cubicle
(iMAGEAntarctica, AAD)



- Simon Mossman, 2006: Floor of Hurley's dark room (MHF / AAD)

- Estelle Lazer, 2002: Old biscuit tin and broken glass bottles among the rocks of Cape Denison (iMAGEAntarctica, AAD)

- Alasdair McGregor, 1997-98: Artefacts including stove door and shoes (iMAGEAntarctica, AAD)

Attitudes to the detritus have changed markedly since work began to conserve this site. Early works parties, for instance, viewed the undifferentiated mass of material on the floor as 'compost' that should be dug out and discarded (Ledingham, 1978: Section 8), whereas archaeologists now view the litter as a resource that enriches our understanding of the site's use beyond what the documentary sources provide (Pearson, 2004: 39; Lazer, 2007: 7).

Artefacts outside the huts are in various conditions, with seasonal variations in snow levels limiting the monitoring of some items. Wind also damages and moves artefacts.

The Australian Antarctic Division developed interim guidelines in consultation with the then Australian Heritage Commission for the treatment of artefacts for the 1998 expedition, including criteria for repatriation based on assessed significance and threat. A metal artefact known as Webb's Lantern, in very poor condition from frequent cycles of snow cover and summer melt, was repatriated to Australia with Antarctic Division approval. The remains of an AAE husky dog, retrieved from the ice-cap, are now located inside the workshop. If ice were removed from the workshop, options for this object's location would include one of the verandahs—the original home of the dogs. If the remains can be conserved on-site, there appears to be no necessity for repatriation to Australia.

4.2.6 Limited Data and Unknown Factors

While knowledge of and confidence in the sound condition of the Main Hut's structure, foundations and anchorage is increasing, there remain unknown factors and areas of limited data in relation to the condition of the huts, including:

- limited data on the internal environment after over-cladding
- any points of ingress for snow and melt water
- long-term rate of snow and melt water ingress, once the known ingress points are blocked
- the physical and environmental impacts of stopping snow and melt water ingress by use of a membrane over a significant area
- the precise impact of further ice removal on the Main Hut structure and its internal environment.

Monitoring equipment recording relative humidity and temperature has been installed in a number of positions inside the Main Hut since January 1999. These records, together with weather records collected by the AAE and recent expeditions, assist in understanding the environment inside the Main Hut and the likely effect of removing ice and stopping ingress.

Dave Killick, 2005-06: Living section looking southeast (MHF / AAD)



Linda Clark, 2002: Memorial cross (AAD)

Black plastic deployed inside the Main Hut has enabled expeditions to monitor the quantity of 'new' ice and snow deposited over fixed periods, and to identify possible sources of ingress. In 2000, approximately 190 kg of snow/ice was removed from black plastic deployed in the living section in 1998 and from other obvious places of collection, and in 2006 2m³ of ice had accumulated on black plastic deployed in Mawson's cubicle in 2002, and 3m³ of new ice was removed from the southern corners of the living section. The most likely source was through gaps between roof boards, in particular the south-facing plane (and presumably through tears in the original tar-paper lining), and as melt water through the skylights, which lacked flashing. This information contributed to the decision to over-clad the roof in 2006.

4.3 Condition and Integrity of Values–Summary

Value to be assessed	Condition before the previous (2001) management plan	Current condition (most recent expedition to access and assess the item, if relevant)	Integrity
The AAE fabric including four timber buildings, two intact and two as standing ruins—the form, layout, setting and relationship between buildings and artefacts (NHL A, B, C, D, E, G, H; CHL A, B, C, E, F, G, H)	Remains the most diverse and complete of the 6 surviving Heroic Era bases (2001).	Fair – although there are concerns over the Transit Hut and Absolute Magnetic Hut, even as ruins (2002, 2006).	Medium to High the historic site layout and setting remains intact, (provided the ruins continue to stand)
The pyramid-form Main Hut—illustrating Mawson's ideas and pragmatic considerations (NHL F), as well as adapting Australian building form for Antarctic conditions (CHL F)	<p><i>Workshop</i></p> <p>11-12 mm of the 16 mm thick workshop boards remained, with 5-15 mm gaps between boards which appeared to have shrunken (1985).</p> <p>Workshop skylights: eastern in good condition but modern board nailed over broken glass; western glass missing and modern intervention led to splitting and deterioration (1985).</p> <p>The roof of the workshop section of the Main Hut was over clad in 1998 (2001).</p>	The original boards beneath the modern over-cladding are poor . (2006).	Medium (structural integrity has been secured at the cost, in the medium term, of visual integrity), but the new timber is weathering in most parts

Value to be assessed	Condition before the previous (2001) management plan	Current condition (most recent expedition to access and assess the item, if relevant)	Integrity
	<p><i>Living section</i></p> <p>20 mm of the 25 mm thick living section cladding boards remained, and 1978 lead sheeting, silicone and tape on roof had failed (1985).</p> <p>Living section skylights: north = glass missing, reconstructed cover, frame in good condition; east = cover and glazing frame missing, modern boards nailed over; south = good condition with one cracked pane; west = good condition with one pane missing and one broken (1985).</p> <p>Entry door hinges failed and repeatedly fixed by modern nails (1985).</p> <p>Nothing recognisable of hangar remained; north-west passage (wall and mattress covering from front porch to verandah) destroyed since the 1970s (1985).</p> <p>...this column continued over page.</p>	<p>The original roof planes appeared to be structural sound, the hips reasonably true and rafter planes straight, but the boards, battens and fabric remnants were failing (2006).</p> <p>'Over cladding the roof has ensured that all of this remaining evidence of Mawson's attempts to "snow-proof" the building will be retained and protected.' (Godfrey, 2007)</p> <p>South wall cladding is poor (2007).</p> <p>The original flagpole at the apex was poor: very fragile and visibly moved in winds (2002). It has been removed for conservation, as structural failure was imminent (2007).</p>	<p>Medium to High</p> <p>(new timber of over-cladding boards and the temporary replica flagpole obscures the original roof but allows the AAE fabric to remain in place)</p>

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Value to be assessed	Condition before the previous (2001) management plan	Current condition (most recent expedition to access and assess the item, if relevant)	Integrity
	<p>The living section roof retained its structural integrity 'but in the medium or long-term will need to be replaced, over-clad or strengthened in some other manner' (2001). The original boards, especially the roof and the south wall, are poor: thinning, with gaps between boards, severely reducing the hut's capability to withstand high wind speeds (2002).</p>		
<p>The interior of the Main Hut, including foodstuffs, personal memorabilia and clothing evidencing domestic and work life (NHL C; CHL C) and the strength and clarity of spaces and functional arrangements (NHL D)</p>	<p>Floor in reasonable condition. Living section internal lining boards were mouldy but in sound condition. Northeast and southeast hip rafters split; northern supporting beam for the roof platform fractured and eastern supporting beam had a severe deflection (1985).</p> <p>Workshop roof framing had lost some internal boarding where collar ties had failed and the platform collapsed (1985).</p>	<p>Fair: Some spaces and objects remain obscured by snow and ice, the weight of which has also made some exposed shelving collapse (2002).</p> <p>Ice removal on eastern side exposed bunks and artefacts not seen since the 1970s, and bottles and other artefacts on kitchen shelves (2007).</p> <p>Shelves and artefacts are fair to poor, contorted by ice loads: ice and snow that had accumulated since 2002 was removed in 2006: 3m³ from the south-western and south-eastern corners and 2m³ from Mawson's cubicle (2007).</p>	<p>Medium to High</p> <p>Although modern sensors and experimental artefacts deposited in 2002 have been removed, some wiring from removed environmental sensors could not be reached (2007).</p>

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Value to be assessed	Condition before the previous (2001) management plan	Current condition (most recent expedition to access and assess the item, if relevant)	Integrity
	<p>Chimney collapsed between early 1970s and 1978; its corroded but sound top section was lying against north wall of workshop (1985).</p> <p>Shelves are in various conditions: sound in the southern living section, others collapsed under the weight of ice (1985).</p> <p>Bunks in relatively good condition, but most supporting planks removed (1985).</p> <p>Inner doors and wool and hessian weather seals in good condition (1985).</p> <p>Compacted snow and ice build-up inside the Main Hut has broken roof and platform structural members (2001).</p>	<p>The recent over-cladding of the roof of the living quarters should prevent ingress of snow and ice, without affecting the internal environment (2007).</p>	
	<p>Bolted connections of framing in the living section were in good condition, showing only minor surface corrosion (2001).</p>	<p>Fair: nails from the ceiling and bolts retrieved from the workshop collar ties indicate normal corrosion, not sufficient to affect their performance, and consistent with bolts from the living section (2002).</p> <p>Low corrosion of flagpole bolts matched previous findings (2007).</p>	<p>High</p>

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Value to be assessed	Condition before the previous (2001) management plan	Current condition (most recent expedition to access and assess the item, if relevant)	Integrity
	<p>Objects inside the Main Hut generally in fair condition, with some mould stain on paper and fabrics and surface corrosion on metal objects (2001).</p>	<p>Good to poor: Heritage objects are in various conditions due to exposure, but photographic and other evidence indicates that many objects have been moved out of context (2002).</p> <p>Some artefacts and fixtures are clearly suffering due to ice ingress and mould (2007).</p>	<p>High</p> <p>(few items have been removed since 1913, and photographic documentation should enable items stored or moved elsewhere in the hut to be returned to their 1913 or 1931 locations)</p>
<p>The three functionally-specific scientific huts, allowing for research on climatic impact, environmental change and material deterioration and conservation (NHL C)</p>	<p>Magnetograph House was relatively stable—original outer covers eroded away, some timber boards eroded, entry door hinges had failed, ventilator cowl missing. Non-historic items from the 1962 occupations were found inside (1985).</p> <p>Magnetograph House had intact structure and cladding. The roof was over-clad in 1998 (2001).</p>	<p>Magnetograph House good: substantially intact and structurally sound. (2002).</p> <p>Magnetograph House walls battered and wind harried (2005-06).</p>	<p>Medium to High</p> <p>(Non-historic items have been removed from the Magnetograph House, new timber over-cladding boards obscures the original roof but allows the AAE fabric to remain in place)</p>

Value to be assessed	Condition before the previous (2001) management plan	Current condition (most recent expedition to access and assess the item, if relevant)	Integrity
	<p>Absolute Magnetic Hut was in a state of partial collapse: only the south wall and portions of the north wall and framing remained (1985).</p> <p>Transit Hut was in a state of marked deterioration: sound frame but missing cladding (1985).</p> <p>Transit Hut and Absolute Magnetic Hut had lost significant amounts of cladding but could be preserved as standing ruins (2001).</p>	<p>Transit Hut poor—the whole structure becoming marginal (2002).</p> <p>Absolute Magnetic Hut poor - wall boards very thin, only secured by the ice embedded around the boards (2002).</p> <p>Transit Hut (largely buried 2006) timber had deteriorated markedly - risk that some planks will break and blow away unless there is an intervention in the form of an internal support to stabilise the structure (2007).</p>	<p>Medium</p>
<p>Memorial Cross, associated with heroic endeavours and evoking a sense of isolation (NHL A, E, G; CHL E)</p>	<p>Cross bar had blown off, and was found 7 m from the upright—bolt and fixing plates had failed and the ring band had failed, allowing the timber to split; erosion of southern upright timber had reached 33 mm. Plaque had bronze disease and 'Antarctic wood fur' – removed (1985).</p> <p>Cross bar not reattached; conflicting views on whether it should be reattached <i>in situ</i> (1993).</p> <p>1986 replica plaque and 1998 restoration works to the cross arm were in good condition (2001).</p>	<p>Wind has caused the rotation and blowing-off of the cross arm on countless occasions, 1931 to 1998.</p> <p>Repaired cross good—sound, no action necessary (2002).</p> <p>Backing board of the replica plaque is poor—has virtually worn away at its extremities—timber loss almost 1 mm per year, 2002 to 2006 (2007).</p>	<p>Medium (modern repairs and replica plaque)</p>

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Value to be assessed	Condition before the previous (2001) management plan	Current condition (most recent expedition to access and assess the item, if relevant)	Integrity
The remains associated with the pioneering use of wireless and air tractor (NHL A, F)	Two wireless masts remained in ruins, with associated chains, aerial wire and insulators (1993).	Poor	Low (little remains, and it appears to have been moved from time to time to reduce hazards)
	Frame of the air tractor last seen near the water's edge in 1975; tail in the workshop; wheel and ski removed to Australia in 1975 (1993).	Remains of air tractor tail located but poor , so stored on a specially prepared wooden framed string support on collar ties below the workshop's west skylight. Portions of tyres found in the artefact scatter to the northwest of the Main Hut (2002).	Low (little remains of what was left in 1913)
Original points from which surveying, cartographic, meteorological and magnetic observations were made, which allow for comparative scientific research (NHL C)	Two of the three siting poles (north and east marks) for magnetic observations remained in cairns, but timber was heavily eroded. West mark had slipped out of sight between rocks. Bench mark carved into rock east of Main Hut painted red (1985).	Fair: Exposed timber posts from survey markers were inspected and it was determined that no action was necessary (2002).	High
	North and east marks still visible (1993). Other known points included eleven survey marks east of Main Valley (2001).		

Value to be assessed	Condition before the previous (2001) management plan	Current condition (most recent expedition to access and assess the item, if relevant)	Integrity
	AAE/BANZARE fabric left inside the Magnetograph House includes metal objects that could affect the results of re-measurement (2001).	Good: AAE/BANZARE cultural heritage objects can readily be moved temporarily to allow repeat measurements.	High
A large amount of stores, equipment, animal food, caches and AAE artefacts which remain in concentration around the Main Hut and the whole of Cape Denison (NHL C)	The extent of artefacts on site not fully documented. Objects outside the huts in various conditions, with wind damaging and moving them (2001).	Items vary from very good to poor: the most sensitive exposed objects, finnesko (reindeer hide) boots and items of clothing, appear to be in very good condition (2002).	High (no items appear to have been taken recently as souvenirs, and the likelihood of exposed objects being blown into Commonwealth Bay seems low)
The BANZARE Proclamation Pole and Plaque (CHL E)	Proclamation plaque metal casing was in good condition, but the original timber had eroded and rubber backing was rapidly deteriorating—removed (1985). Plaque is a 1986 replica; original was repatriated to Australia and is in the Antarctic Division Library (2001).	Good	Medium (photocopied document and replica plaque)

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Value to be assessed	Condition before the previous (2001) management plan	Current condition (most recent expedition to access and assess the item, if relevant)	Integrity
The site as a cultural landscape retaining a sense of historic time and place (NHL E, CHL B)	Post-BANZARE fabric and objects remain in the historic AAE/BANZARE visual catchment: Granholm Hut, seaintainers, Automatic Weather Station and Gadget Hut (2001).	Good: Remains the least disturbed of the Heroic Era sites. Seaintainers and Gadget Hut have been removed (2002) and modern timber construction materials removed (2007).	High (two non-historic items remain: Granholm Hut, which remains in place for works parties and as a refuge, and the University of Wisconsin Automatic Weather Station)
The weathering and patination of the huts and decay of the remains, serving as a gauge of time elapsed and exposure (NHL D, E; CHL E)	Many artefacts deteriorating rapidly. Timber coating on workshop roof resulted in a loss of authenticity (2001).	Good to poor: Transit Hut and Absolute Magnetic Hut and artefact scatters are clear evidence of exposure and time elapsed.	Medium to High (over-cladding timber protects but obscures the weathered original boards)
The natural setting: huts in the vast Antarctic landscape and the sea beyond, conveying a strong sense of time and isolation (NHL E, CHL E)	Described natural setting as the most striking feature (2001).	Good: The natural setting is unchanged.	High

Value to be assessed	Condition before the previous (2001) management plan	Current condition (most recent expedition to access and assess the item, if relevant)	Integrity
Accessibility of physical evidence from Cape Denison, now in Australia and elsewhere (NHL C)	Antarctic Division could draw together a full inventory of all AAE material to assist in the assessment and categorisation of collections (2001).	Various: A reference collection of building materials has been repatriated to Australia, awaiting cataloguing and appropriate storage (2002).	--
Accessibility of documentary evidence relevant to the site, including the photography of Frank Hurley (NHL C, E, H)	<p>Hurley images are held by the Mawson Collection, Adelaide, the Barr Smith Library, the State Library of New South Wales, the National Gallery of Australia, the National Library of Australia, the National Film and Sound Archive, and the National Archives of Australia (2001).</p> <p>Only a small percentage of the data on the site generated by works expeditions and other research projects has been fully catalogued and archived with the Antarctic Division (2001).</p>	<p>Good: Copies of primary sources (diaries, reports, photographs) are becoming available on the Internet for free public access.</p> <p>Hurley images of the AAE are accessible on-line (State Library of NSW; National Library), and through permanent and temporary exhibitions, and for research through the access provisions of the institutions.</p>	High
Associations with heroic endeavours (NHL G) and a model of scientific research and exploration (CHL G)	-	Good: The site has not been adapted for re-use and is therefore directly associated only with the AAE endeavours, with some bias towards Mawson rather than the group, and towards heroic survival rather than systematic research.	High

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Value to be assessed	Condition before the previous (2001) management plan	Current condition (most recent expedition to access and assess the item, if relevant)	Integrity
<p>Accessibility of information on those AAE members who continued their Antarctic associations (Mawson, Davis, Wild, Hurley and Moyes) and/or continued careers in science (Madigan, Webb, Laseron, Stillwell and Kennedy) and in photography (Frank Hurley) (NHL G, H; CHL H)</p>	<p>Full biographies published: John King Davis, Frank Hurley, Cecil Thomas Madigan, Douglas Mawson, Morton H Moyes, Herbert Dyce Murphy, Frank Wild.</p> <p>More limited biographical information: Alexander Lorimer Kennedy, John George Hunter, Archibald Lang McLean, Charles Francis Laseron, Frank Leslie Stillwell, George Frederick Ainsworth, Charles Archibald B Hoadley.</p>	<p>Good: Australian Dictionary of Biography entries for 12 key AAE members became available on-line in 2006 (Ainsworth, Davis, Hoadley, Hurley, Hunter, Laseron, Madigan, Mawson, Moyes, Murphy, Stillwell, Watson). All emphasise the significance of the AAE experience.</p> <p>Eric N Webb is not in the NZ Dictionary of National Biography–1975 interview (Lennard Bickel) held by the National Library of Australia.</p>	<p>High</p>

5. Management Framework

Mawson's Huts Historic Site is on Commonwealth (Crown) land and the Commonwealth of Australia is the owner of the site, its structures and its objects. The Australian Antarctic Division of the Department of the Environment and Water Resources is the agency through which ownership is expressed and through which Commonwealth control of the site is exercised. Responsibility for the protection, conservation and management of the site is also vested in the Australian Antarctic Division as administrator of the Australian Antarctic Territory on behalf of the Australian Government.

Mawson's Huts and Mawson's Huts Historic Site are afforded protection under international treaty obligations, Australian legislation and the Department of the Environment and Water Resources Heritage Strategy. The Australian Antarctic Division's role is to ensure that this plan is implemented, the heritage values of the site are conserved, and to ensure that the heritage values are interpreted and presented to the Australian community.

5.1 International Treaties and Australian Statutory Requirements

5.1.1 Antarctic Treaty and Protocol on Environmental Protection to the Antarctic Treaty

Australia, as a party to the Antarctic Treaty (1959) and its Protocol on Environmental Protection (Madrid Protocol), is bound by these instruments' provisions on cultural and natural heritage.

The first Antarctic Treaty Consultative Meeting (Canberra, 1961) acknowledged the importance of Antarctic historic heritage. It adopted Recommendation I-9, which urged governments interested in Antarctic tombs, buildings or objects of historic interest to consult each other on their condition, restoration or preservation, and to adopt all adequate measures to protect historic sites from damage or destruction. Since 1972, Antarctic Treaty parties have maintained a list of historic sites and monuments. This expanding list has always included Mawson's Huts.

The Madrid Protocol (1991) establishes a comprehensive environmental protection regime for Antarctica. All activities in Antarctica must be planned and conducted so as to limit adverse impacts on the environment. Annexes to the Protocol deal with specific environmental management and protection concerns. While no annex applies specifically to historic heritage values, provisions for environmental impact assessment and for area protection and management are relevant. Many historic sites are contained within designated Antarctic Specially Protected Areas (ASPA), which require permits to enter, and activities are limited to those specified in a management plan. Activities in an Antarctic Specially Managed Area (ASMA) must be in accordance with a code of conduct in the management plan.

In addition to its listing as an Antarctic Treaty Historic Site and Monument, the Mawson's Huts Historic Site was afforded further protection in 2004 when the annual Antarctic Treaty Consultative Meeting designated the site as ASMA No. 3 and ASPA No. 162, and approved management plans for the site (see Appendices V and VI). Management plans explain reasons for designation, identify zones (such as the Visual Protection Zone in this site), and set conditions under which permits may be granted, and other conditions applying to access and activities which may be carried out in the area. The provisions of these management plans apply to all Parties to the Madrid Protocol.

5.1.2 Australian Legislation

Antarctic Treaty (Environmental Protection) Act 1980

Most of Australia's obligations under the Madrid Protocol are given effect by the *Antarctic Treaty (Environmental Protection) Act 1980* (ATEP Act). Works parties, tourist visits and other private visits to Cape Denison are subject to the ATEP Act.

The ATEP Act requires that all Australian activities in the Antarctic undergo an environmental impact assessment (EIA) before they commence. The proponent of the activity must provide a preliminary assessment of the likely environmental impacts of their proposed activity, which assesses whether the activity is likely to have (i) more than a minor or transitory impact; (ii) a minor or transitory impact; or (iii) no more than a negligible impact on the environment. The Australian Antarctic Division then advises the Minister or delegate of this assessment.

If the Minister (or delegate) considers that the environmental impact is likely to be no more than minor or transitory, the Minister may grant the proponent a written authorisation to carry on the activity. The Minister may choose to impose conditions to protect the environment and take into account other relevant considerations. More detailed assessments (initial or comprehensive environmental evaluations) are required for activities likely to involve higher levels of impact. For the purposes of the Madrid Protocol and the ATEP Act, the environment includes heritage values.

The ATEP Act (section 19(1) (d)) prohibits anyone from entering, or carrying on any activity in, an ASPA without a permit. An environmental impact assessment of such an activity is a prerequisite for a permit authorising access to the ASPA. In issuing a permit, the Minister is authorised to impose such conditions as he or she sees fit. Officers of the Australian Antarctic Division, as delegates of the Environment Minister, are empowered to grant permits on behalf of the Minister.

Environment Protection and Biodiversity Conservation Act 1999

Mawson's Huts Historic Site is listed on National and Commonwealth Heritage Lists under Part 15 Divisions 1A and 3A of the EPBC Act. The Act requires the responsible government agency, in this case the Australian Antarctic Division, to make a plan to protect and manage the National and Commonwealth Heritage values of such places that it owns or controls.

The Department of the Environment and Water Resources (DEW) Heritage Strategy commits the Department—and therefore the Australian Antarctic Division—to finalising management plans for listed Commonwealth Heritage places by 2009.

The site is also listed on the Register of the National Estate. Under the EPBC Act assessments for the Register of the National Estate remain as one basis for assessing the potential impacts of activities at the site.

Since the site is listed as both a National and Commonwealth Heritage place, section 324S of the EPBC Act requires that the Environment Minister make a plan to protect and manage the place's National Heritage values and the Commonwealth agency which owns or controls the place to make a plan. Such plans are binding on the Commonwealth and Commonwealth agencies (sections 324U and 341V).

The EPBC Act (Chapter 2 Part 3 Divisions 1 & 2) prohibits any action that has, will have or is likely to have a significant impact on a 'matter of national environmental significance'. A National Heritage place is one such matter of national environmental significance. In addition an action on Commonwealth land which is likely to have a significant impact on the environment, or an action taken elsewhere that is likely to have a significant impact on the environment on Commonwealth land, must be referred to DEW for approval under the Act. Mawson's Huts are situated on Commonwealth land (sections 27 and 525). 'Environment' is defined to include 'the heritage values of places' (section 528).

Any action relating to the site and referred to the Minister will be subject to an environmental impact assessment, if the Minister decides that the action is likely to have a significant impact. The Minister decides whether to approve the action, and what conditions to impose, after considering the assessment.

Protection of Movable Cultural Heritage Act 1986

The Protection of Movable Cultural Heritage Act regulates the export of Australia's significant cultural heritage objects (potentially covering, therefore, artefacts at or associated with Mawson's Huts Historic Site).

Historic Shipwrecks Act 1976

The Historic Shipwrecks Act protects historic wrecks and relics in Commonwealth waters, extending from below the low water mark to the edge of the continental shelf (covering, therefore, the *Aurora's* anchor, should it be discovered in Commonwealth Bay).

5.2 Agency Mechanisms

The Australian Antarctic Division's intention is that this management plan contains the primary policies and guidelines for the management of activities at the site.

Determination under ATEP Act

To date, conservation works at the site have been subject to individual environmental impact assessments under the ATEP Act at the Initial Environmental Evaluation level. The Australian Antarctic Division proposes to seek a determination under section 12C of the ATEP Act, that Part 3 (Environmental Impact Assessment) of the Act does not apply to activities undertaken in accordance with this plan of management. The Minister may make such a determination if the Minister is satisfied that the activities are likely to have no more than a negligible impact on the Antarctic environment.

In essence, this would relieve the Australian Antarctic Division of the burden of assessing each season of conservation works. However, an environmental impact assessment would still be required for any activity not detailed in the Implementation Plan.

Antarctic Division Asset Management System

All Australian Antarctic Division built assets are managed through a centralised asset management system which provides for a periodic cyclical maintenance programme. While the system principally covers permanently occupied stations, the Division's built heritage assets may also be managed with this system—to identify interventions likely to be required from time to time to stabilise the structures and fittings of the huts. Any proposed activity at the site is managed within the permit application system and decision-making structure described in the previous section. The Division will investigate the feasibility of incorporating the site into the asset management regime in the future.

5.3 Decision Making Process for Management of the Site

The Minister for the Environment and Water Resources is responsible for provision of advice on and approval of activities at the site, under the ATEP and EPBC Acts. The decision to authorise an activity under the ATEP Act is currently delegated to the Australian Antarctic Division Director, Deputy Director and the Manager of the Antarctic Territories Environment and Policy Section (ATEPS).

The Australian Heritage Council advises the Minister on identification, assessment, conservation and monitoring of heritage, and in particular provides comment to the Minister on plans of management for listed sites.

The Australian Antarctic Division Director, broadly responsible for Australian Antarctic operations, takes major decisions on the management of the site within the context of the direction provided by the DEW Heritage Strategy, and with advice from the Heritage Division.

The Deputy Director, as General Manager of the Policy and Coordination Branch, is broadly responsible for heritage management policy and major planning activities related to heritage.

The Manager, ATEPS, is directly responsible for approving proposed activities at the site under the ATEP Act, ongoing liaison with stakeholders, coordinating referrals for proposed activities under the EPBC Act, and coordinating the implementation of this plan, including conservation works at the site.

The process envisaged by this plan, in light of the Australian Government grant to the Mawson's Huts Foundation for works in support of the conservation of the site from 2007-08 to 2010-11, is that works plans prepared by or submitted for the approval of the Australian Antarctic Division will precede each season of on-site works. The terms of the funding agreement will require works plans and progress reports to detail how works in support of the conservation of the site—including the monitoring and maintenance of building structures, repairs to internal fittings, reporting on the condition of fabric or the site's heritage values, and onsite or offsite assessment and conservation of material and artefacts—are in accordance with this management plan.

The Australian Antarctic Division will consult registered stakeholders and the Heritage Division when preparing works plans or reviewing draft works plans that have been submitted for its consideration. The Australian Antarctic Division will address their feedback when recommending to the decision maker which elements of the proposed works should be prioritised and authorised and which conditions should be applied to the authorisation, or when forwarding its comments to the Heritage Division (should a referral under the EPBC Act be required).

6. Management Requirements, Constraints & Opportunities

We concluded that the hut, from all the evidence and the work we were able to complete, should remain at Commonwealth Bay, that the task of returning it would be a major and highly expensive one, outside the capabilities of a small party and the present effort involved. It could also result in the total loss of the hut if for any reason there was any delay in completing the operation quickly.

We recommend that the hut be repaired in situ, with timber from Australia, work which involves the removal of the outer skin of planking and the replacement of several structural beams. The outer would be reclad with pine and sealed with modern sealing compounds.

Rod Ledingham, Commonwealth Bay Report–Antarctic Division (1978)

The restoration and preservation of Mawson's hut in situ would not only provide a lasting memorial to Sir Douglas Mawson and his colleagues upon the continent where he devoted so much of his efforts, but also be a reminder to all of the significant contribution which Australia has made and is continuing to make towards the exploration and scientific investigation of Antarctica.

BO Jones MP, KL Fry MP, AJ MacKenzie MP, Petition to House of Representatives (1982)

It has been said that 'the ways in which people view their past are to a considerable extent reflected in those objects that they choose to preserve as reminders of themselves'. The significance of preserving physical relics of Australia's past, both assists an understanding of our roots and cultural identity and must be considered as a finite, non-renewable cultural resource which must be treated with the extreme care that such a fragile inheritance merits.

William Blunt & Margaret Thornton, Statement of Significance,
Draft Conservation Plan–Project Blizzard (1983)

It is not a miracle that Mawson's Huts survive. They survive because of the skills and forethought of those who planned and built them. They survive because the severe cold limits normal timber deterioration. However, unless immediate action is taken, the katabatic winds in the 'windiest place on earth' will continue to corrode the fabric until one day it starts to fall (or blow away) like a pack of cards.

Geoff Ashley (Godden Mackay Logan), Conservation Works Report (1997)

6.1 Goals

The Australian Antarctic Division's objectives for the site are encapsulated in the conservation philosophy of this plan, and the implementation plan, which outlines how the National and Commonwealth Heritage values and other values of the Mawson's Huts Historic Site should be conserved, presented and transmitted to all generations.

- At Cape Denison, this involves managing access to and activities at the site appropriately, and ensuring that there is an appropriate programme of works to conserve and present the historic buildings, associated cultural heritage objects and natural features.
- Off-site, this involves documenting and interpreting the site in a manner that encourages Australians to appreciate the experiences and achievements of the members of the Australasian Antarctic Expedition, particularly during their occupation of Cape Denison. Innovative technology should enable people to appreciate the site's values without having to travel to Antarctica.

The Australian Antarctic Division aims to ensure, through the implementation plan which forms part of this management plan, that on-site conservation and off-site documentation and interpretation are substantially complete by the centenary of the construction of the AAE main base, in 2012. When Australia marks the 100th anniversary of the AAE, visitors should be able to stand inside the Main Hut and experience this unique place—either in reality or virtually and know that the remains are fully documented and stabilised, in the hope that they may be similarly available for the next generation.

In implementing this plan, the Australian Antarctic Division aims largely to shift away from the recent focus on stabilising the buildings on the site, towards finalising investigations of the movable cultural heritage in and around the huts, while continuing to monitor and maintain the structures as required.

The 2006 Mawson's Huts Foundation expedition, with Australian Government funding, completed the Australian Antarctic Division's works plan to encapsulate, i.e. over-clad, the Main Hut roof. This was a major step towards preserving the Main Hut, ensuring the retention of original roof fabric and preventing further snow and ice from entering the rooms in which Mawson and his expeditioners lived for two Antarctic winters.

Over-cladding of the roof has provided much greater confidence in the long-term security of the structure. Importantly, this will enable future expeditions to concentrate their resources on the next stage of works, focusing on documentation of cultural heritage objects. Continued careful snow and ice removal from the interior of the Main Hut should reveal further spaces, fabric and objects, allow restoration of some broken fittings, such as shelves, where appropriate, and enable more complete archaeological investigation. It will also allow further investigation, monitoring and maintenance of the Main Hut structure.

6.2 Proposals for Change

Rather than envisaging major changes, this plan formalises existing management arrangements for the site. The Australian Antarctic Division will continue to be responsible for authorising activities at the site, in accordance with legislation that it administers, and it will continue to consult the Heritage Division of DEW, the Australian Heritage Council and other authorities and interested parties as appropriate. This plan also formalises the management zones established by the Australian heritage listings and the Antarctic Treaty management plans for the area. The only proposal for change within the Visual Protection Zone (see map, page 4) is to eliminate the intrusion of post-BANZARE materials (principally by camouflaging the Granholm Hut). Should additional accommodation or works facilities be proposed, these should continue to be outside the Visual Protection Zone, attached to or beside the other non-historic fabric.

6.3 Pressures on National and Commonwealth Heritage Values

6.3.1 Environmental Pressures

Wind

Cape Denison is the windiest place on earth at sea level, with an average daily maximum of 71 kph. Gusts and frequent blizzards exceed 100 kph. The greatest single long-term threat to the structures is abrasion from wind-driven snow and ice ('corrasion'), which wears down the surface of softer fabrics such as timber. Abrasion resistance in timber is generally a function of density. Timbers with a density greater than 800 kg/m³ have good abrasion resistance. Baltic pine, used as cladding on Mawson's Huts, with a density of 550 kg/m³, is relatively susceptible to abrasion.

Since its construction, the roof-cladding boards on the edges and corners of the two sections of the Main Hut have weathered at a rate of up to 1 mm every ten years. Because the workshop roof was constructed of thinner boards (16 mm to the 25 mm on the living section) it reached a dangerously deteriorated state earlier than the living section roof, and was the first to be over-clad with new timber. The testing of clear timber coatings on-site in 1997 did not return positive results—on this basis, and similar findings in the Ross Sea (Harrowfield, 2006), it is considered unlikely that coatings would be an effective long-term retardant to abrasion.

The wind severely constrains outside work by greatly lowering the perceived and effective temperature on exposed skin, even during the relatively mild summer. Weather conditions may disrupt plans for work to protect the site's values for days or weeks, or even compromise whole seasons.

Simon Mossman, 2006: Living section shelves
(MHF / AAD)



Simon Mossman, 2006:
Main Hut artefacts
(MHF / AAD)

Snow/ice/melt water

Wind-driven drift snow can include very fine particles (0.1–0.4 mm) that penetrate even minute gaps, filling buildings and covering their contents. Seasonal variation in drift snow and ablation can make it difficult to record and monitor cultural heritage objects.

Snow and ice on, in and around the huts exert various forces on the structures and their contents. Compacted snow and ice build-up inside the Main Hut (an estimated 301 m³) has broken roof and platform structural members, warped shelves and obscured or damaged artefacts. However it has also added a thermal and physical mass to the building that may have assisted in resisting wind loads and suppressed daily and seasonal variations in temperature and relative humidity. It has therefore only been removed cautiously, in conjunction with environmental monitoring. The main influence of ice in the verandahs has been to help to stabilise the structure, therefore it has been left in place.

In winter, the Main Hut is typically buried at least to its roof by drift snow. The AAE party had to dig out tunnels daily to ensure they maintained access to their living quarters. In summer, much of the external snow melts, and melt water pools and streams form around the Main Hut. The Oregon frame of the Main Hut, where it has been subjected to continual exposure to water in these pools, shows no signs of damage.

Later on, snow accumulated until the whole of our buildings were nearly completely buried. This was a fortunate occurrence, for though the huts were specially built to withstand wind-pressure, it is doubtful if they would otherwise have survived the winter hurricanes. Means of ingress and egress became somewhat complicated as the snow deepened.

Only one door led from the inner to the outer hut, and from here another door led to the verandah, and a further door opened outside. This rapidly became blocked, and then a curved tunnel was dug through the snow to the outer verandah. From here a hole in the snow in one corner was so windswept that it was clear throughout the winter, and was the only place where one could enter or leave the hut.

Charles Francis Laseron, South with Mawson (1947)

Water has no deleterious effect on the structural capacity of timber. Both the bending and compressive strengths of timber are enhanced by low temperature when the moisture content is at Fibre Saturation Point. In 1998, the structural timbers inside the Main Hut were recorded at a high moisture content of around 20%. The low temperatures and high moisture content may assist the structural capacity of the internal framing of the Main Hut.

Temperature, relative humidity and salt

While the snow and ice associated with cold temperatures have some adverse impacts on the fabric of the huts, the cold also has several advantages. In particular, the cold does not support the two most important factors in timber deterioration in temperate climates: fungi and insects.

Various stain fungi and mould fungi are found at low temperatures, and moulds have been recorded on fabrics and papers in the Main Hut (the moulds probably arrived with the AAE). However, these do not cause structural damage. Fungi that might attack the timber structure, rather than simply surface staining (generally *Basidiomycetes*) exist at 20-30° Celsius, with an optimum range of 23-25°.

There is no evidence of insect attack at the site. Generally, insects such as termites and woodborers require similar temperatures to fungi and are therefore unlikely to survive in Antarctica.

Relative humidity is the amount of water vapour in the air as a percentage of the amount of water vapour required to saturate the air. Cold air cannot hold much water vapour and the level of relative humidity is consequently generally high. High relative humidity can lead to corrosion and fungal growth, but structural steel and metal objects inside the Main Hut are largely not threatened by corrosion. The daily variability of relative humidity is low, and therefore the associated risks appear to be low. Some metal objects located elsewhere on the site, such as Webb's Lantern, often have higher levels of corrosion.

There is only limited evidence of salt damage, possibly as a result of the powerful effect of the prevailing offshore winds that limit the movement of salt-bearing winds from the sea onto land.

Fauna impacts

Although Cape Denison contains Adélie penguin colonies, none is located near buildings. However, the historic fabric does have the potential to injure fauna. The 1996 expedition, for example, released a penguin that was entangled in a strand of wire from the wireless aerial. There is no evidence of fauna damaging huts or artefacts (such as seals rubbing against structures or objects).

Fire

One of the greatest risks to timber buildings in polar or alpine areas is fire as a result of accidental or deliberate human action. There are no known instances of fire caused as a result of atmospheric disturbance in Antarctica.

The environmental monitoring system installed inside the Main Hut requires batteries and wires which could spark in the case of a fault. This risk is minimised either by ensuring that the system's components are not in direct contact with timber, or by designing the circuit design to incorporate a fusible link.

6.3.2 Logistical Constraints

Remoteness

The remoteness of the site from Australia and from Australian Antarctic stations is a major logistical constraint on conservation works. Cape Denison is not within the re-supply zone for Australian stations and therefore requires a dedicated voyage or an opportunistic 'piggy-back' on other vessels that operate in the area from time to time, including other national Antarctic programmes and tourist vessels.

Ship-to-shore operations are difficult, with no safe anchorage in Commonwealth Bay. Small boat operations are very constrained by the strong offshore winds. Helicopter access from vessels has proven the more sensible option for small payloads.

Resources

The Australian Antarctic Division is responsible for ensuring the site's conservation and management and the preparation and implementation of this plan, and will accord the conservation of the heritage values of Mawson's Huts Historic Site the highest priority, within the capacity of its Antarctic heritage management resources.

The Australian Antarctic Division is not specifically resourced to undertake on-site conservation of Mawson's Huts Historic Site. During the life of this plan, the Australian Government is providing funds to the Mawson's Huts Foundation to prepare and mount conservation expeditions between 2007-08 and 2010-11. Therefore, while the role of the Australian Antarctic Division may include participation in expeditions to the site, its primary role will be to provide expertise and advice to ensure that works programmes are planned and executed in a manner which is consistent with legal requirements, best practice standards, and this plan.



6.3.3 Risks to Structural Integrity

Conservation works

No major structural interventions of the scope and scale of the over-cladding of the roof of the workshop of the Main Hut in 1998 and the living section in 2006 are anticipated in the life of this plan. Nonetheless, maintenance required to address structural deficiencies, and conservation works to reconstruct fittings broken by ice loads, reveal spaces or objects or otherwise preserve key elements of the site, may pose risks to other fabric or the visual integrity of the site. Such works programmes need to be cautiously designed, assessed and implemented in order to minimise these risks. This does not, however, preclude emergency intervention in the event of unanticipated threats to the structures.

Prevention of snow and melt water ingress into the Main Hut

The over-cladding of the Main Hut roof should largely prevent snow and melt water from penetrating the hut. This management action was designed to prevent further damage to interior structural members and fittings—including the collapse of shelves and bunks—caused by the melt-freeze cycles, which had been producing ice that encapsulated objects and stressed load-bearing features.

Although the over-cladding was designed to have minimal impact on the Main Hut's internal microenvironment, the additional buffering created by new air spaces, the additional layer of timbers, and the fabric membrane over the living quarters roof may alter the internal environment (Godfrey, 2007). This will be determined by continued environmental and corrosion monitoring.

Ice removal

The careful removal of accumulated ice and snow from the workshop of the Main Hut and, particularly, the living section but not the verandahs, has been a principle of site management since conservation expeditions began (see Ledingham, 1978: Section 8; Blunt, 1985: 238; Godden Mackay Logan, 2001: 139).

Snow and ice that entered the building due to the failure of cladding and insulation over the years had damaged fittings, covered objects and obscured the open internal space that had characterised the hut when it was abandoned in 1913. Ice removal to restore this internal form and allow an appreciation of the hut's 1913 configuration has, on balance, been viewed as the best way to conserve and present the place, provided monitoring continues to ensure that the removal does not alter the internal environment of the hut in such a way that would compromise other heritage values.

Simon Mossman, 2006: Packing cases, Main Hut interior (MHF / AAD)



Simon Mossman, 2006: Shelves, Main Hut interior (MHF / AAD)

Since ice that has formed over and around objects is difficult to remove and bears a risk of damaging them, further works to remove accumulations of hard snow and ice to reveal the significant fabric, detail and spaces in the hut should be guided by archaeological and conservation experts.

Monitoring has shown that the internal environment is not substantially altered by the removal of some of the ice. Temperature and relative humidity sensors in place since 1999 have found no significant variation since the removal of large volumes of ice in 2002. It is essential that monitoring continues, as it is a key tool to guide decisions on further removals (Daniel and Ashley, 2002). Moreover, the recently over-clad roof seals the Main Hut more effectively, and this may increase the rate of ablation. As floor ice helps to stabilise the structure and contains embedded artefacts, excavation should both be overseen by a suitably qualified archaeologist, and—unless circumstances dictate otherwise—stop at a precautionary level (600 mm above the floor) to avoid compromising the ice layer's thermal and physical mass.

I was not prepared for what confronted my lens and self ... this abode had been untenanted for seventeen years, save by 'Jack Frost' who had decorated it with festoons of glittering crystal ...

Now the rafters were several sizes larger with glittering incrustations of plate like crystals. Fate's Irony had extended a joke to the kitchen, where icicles pended from the shelves & a huge snow ball like a wedding cake sat on the stove. Bottles too were adorned with fine crystal that glinted & scintillated like tinsel as I moved the candlelight ...

The entire floor of the hut was carpeted with an unbroken sheet of ice about 18 inches thick, & in it boxes, door & sundry fragments were immovably imbedded.

Frank Hurley, diary entry, 5 January 1931



Simon Mossman, 2006: Transit Hut: (MHF / AAD)

The Transit Hut and Absolute Magnetic Hut

A key component of the significance of the site is its completeness, in particular the integrity of its three functionally-specific scientific huts, which possess uncommon, rare or endangered aspects of Australian's cultural history. The loss of any of the three huts would substantially detract from this value.

Site management to date has viewed the Transit Hut and Absolute Magnetic Hut as standing ruins requiring minimal intervention. However, recent works parties (e.g. Godfrey, 2002) reported that elements of the Transit Hut were so eroded that the whole structure was becoming marginal, and that the wall boards on the Absolute Hut were so thin that only the ice embedded around the boards stopped them from detaching.



- Simon Mossman, 2006:
Main Hut artefacts (MHF / AAD)

- Simon Mossman, 2006: Murphy's
bunk & ration bag (MHF / AAD)

- Simon Mossman, 2006: Mawson's cubicle,
showing black plastic deployed to
monitor ice accumulation (MHF / AAD)

The implication of these findings is that there may be a risk of losing the remaining fabric of these two buildings, for instance through demolition by a blizzard. Rather than standing ruins, this might leave only foundations and disjointed failed building materials. Therefore, work programs should include options prepared by conservation experts on the necessity, appropriateness and practicality of stabilisation works on these huts to extend their life as standing ruins.

6.3.4 Risks to Cultural Heritage Objects

Management and documentation of objects inside the buildings

It is likely that conservation work and removal of snow and ice from the Main Hut will displace cultural heritage objects from their context (although some of these objects appear to have been moved, during early visits, from the contexts in which they were left when the AAE party abandoned the site). To preserve the archaeological (as opposed to interpretive or aesthetic) value of these objects, their location should be documented before they are moved or deteriorate (for example before labels become illegible). The values may similarly be compromised if the documentation is not accessible for research.

Significant objects may be treated to stall further deterioration, preferably on site. The storage of items such as failed building materials (tar paper, nails or other fabric) within the huts is at odds with the objective of preserving the aesthetic values and conveying a sense of the space in which the men of the AAE lived and worked. It would be acceptable for representatives of such items to be removed to the reference collection of building materials in Australia, for future research and to inform conservation works programmes, with less significant items stored elsewhere on the site.

Deterioration and loss of objects associated with the wireless and aeroplane

The pioneering use of wireless telegraph and the first attempt to use an aeroplane in the Antarctic are unique aspects that set apart the AAE from other Heroic Era expeditions. However, over time most of the material evidence of the technologies has been lost, probably due to wind. The few remains demonstrate a high degree of creative or technical achievement, and therefore should be identified and assessed. Drawing on reports to come from on-site work, specific management recommendations will be required for their ongoing conservation.



Linda Clark, 2002: Part of air tractor stored inside hut (AAD)

Documentation of cultural heritage objects and artefact scatters

Mawson's Huts appear to have been subject to the least intervention of all the surviving Heroic Era sites. At other sites, particularly those that have been more regularly visited, there was until recently a tendency for historic artefact scatters to have either been collected and displayed out of context for the convenience of visitors, or else removed and disposed of without a heritage assessment, because the items were regarded as rubbish. In the case of the four Ross Sea sites from the era, there is a concerted effort to reverse much of this intervention, which is now viewed as inappropriate.

The original locations and patterns of deposition of cultural heritage objects may contain information on human behaviour beyond that in documentary sources. While it is likely that the placement of artefact scatters on the site are influenced by wind and melt water, the patterns of placement of these objects could yield information that will contribute to a wider understanding of history. Therefore, it is important that site management aims to document the items in context, as exposure permits, and prioritise items that are exceptional and require treatment to ensure their survival.

Objects images and papers relating to the AAE and to Sir Douglas Mawson are found throughout Australia:

Antarctic Division (papers, failed building materials, debris, sledging and other equipment, specimens)

Australian Museum (objects and scientific specimens)

Powerhouse Museum (Australian Museum objects and Laseron items)

Newcastle Regional Museum (Australian Museum objects on permanent loan)

State Library of New South Wales (AAE manuscripts, correspondence, objects and over 2500 photographs)

Queensland Museum and Western Australian Museum (duplicates of AAE fish specimens)

Museum of Victoria (duplicates of AAE bird, mammal and marine specimens)

Tasmanian Museum and Art Gallery (Harrison objects from Western Base)

National Museum of Australia (1931 proclamation)

National Gallery of Australia (Hurley photographs)

National Library of Australia (AAE photographs; diaries of several AAE members)

National Film and Sound Archive (cine films and related posters)

National Archives of Australia (Laserson photographs, BANZARE proclamations and canister)

Royal Botanic Gardens, Sydney (AAE algae specimens)

Barr Smith Library, Adelaide (images)

University of Adelaide: Tate Museum (Mawson's rocks and minerals), Mawson Estate Trustees Collection (Mawson's polar library, photographs and artefacts)

South Australian Museum (Mawson Collection – part of Australian Polar Collection)

Canterbury Museum, Christchurch, NZ (magnetometer)

University of Sydney (geological specimens and other objects)

7. Management Policies

In meeting its international and Australian obligations to conserve the heritage values of Mawson's Huts Historic Site, the Australian Antarctic Division will ensure that the site is managed in accordance with the highest conservation standards.

7.1 Key Principles and Conservation Philosophy

Management policies will uphold the key principles of the previous conservation management plan (Godden Mackay Logan, 2001: 131-149) and the conservation philosophy of this plan, as well as addressing legislative obligations.

Policy (1) Site management will uphold key conservation principles

The key principles, developed by meetings of experts during the preparation of the previous conservation management plan, remain relevant and appropriate.

(A) Conservation is the primary objective

In order to achieve long-term conservation and retention of cultural significance, conservation has primacy over other management objectives.

(B) Significance is embodied in the fabric of the place and its setting

The Mawson's Huts Historic Site combines original historic fabric, a distinctive visual presence, and a remote and evocative landscape. These three elements—fabric, design and setting—will be conserved *in situ* to preserve the site's significance.

(C) Significance is embodied in associations and meanings

The Mawson's Huts Historic Site has strong associations with other related AAE sites, objects and collections, and with AAE personnel. There are also less tangible, but broadly held, meanings associated with the iconic value of the place that will be respected when making decisions.

(D) Revealing significant fabric and spaces

It is desirable to reveal significant fabric and spaces by removing snow and ice from the internal rooms of the Main Hut (but not the verandahs, or below 600 mm above the floor) to restore its original configuration. This will only occur, however, on the basis of an assessment determined by ongoing environmental monitoring, that ice removal (i) will not have a detrimental impact on the

long-term conservation or structural stability of significant fabric, either through changed environmental conditions, physical intervention to prevent snow and melt water ingress or structural stability, and (ii) is sustainable given the maintenance programme likely to be provided over time.

(E) Conservation plans must address the remoteness of the place

Mawson's Huts Historic Site is in an extremely remote and often inaccessible location—remote not only from Australia, but also from nearby Antarctic stations. The vagaries of weather and the limited accessibility will be taken into account in decisions relating to conservation actions such as fabric replacement, monitoring or inspection. The processes that arise from the management plan must be workable and practical to be effective.

(F) Conservation must have regard to the total resource

The significance of the Mawson's Huts Historic Site arises from a combination of elements and values. In addition to the fabric, design and setting, the place includes aesthetic, historic, social, and potential natural heritage values, cultural heritage objects (both on and off-site) and records.

(G) Decisions must be based on an understanding of cultural significance and proper scientific practice

All management decisions which have the potential to affect the heritage values of the place must be founded on a clear understanding of those values. The heritage impact of decisions should be stated and evaluated as part of the decision-making process. The impact and appropriateness of particular actions should be determined based on scientific analysis of relevant data.

(H) A cautious approach is required where actions may have adverse heritage impacts

Where management actions or decisions may result in a loss of cultural significance, these actions should only be pursued if there are no alternatives which avoid impacts, and only if the actions are reversible or, at the very least, involve the minimum amount of change possible.

(I) Conservation should be undertaken in accordance with accepted guidelines

To date, works at the site have generally been in accordance with the principles and guidelines of the *Burra Charter*, the *Australia ICOMOS Charter for the Conservation of Places of Cultural Significance*. The *Burra Charter* should continue to be applied in conjunction with other relevant guidelines, including the Australian Institute for the Conservation of Cultural Material's Code of Ethics and Code of Practice, and the ICAHM Charter for the Protection and Management of Archaeological Heritage.

(J) The state of the Mawson's Huts Historic Site environment should be monitored

Monitoring of the physical condition of the site, over time, is imperative both to measure the effectiveness of conservation actions, and to obtain data for decision making. In conjunction with considerations of the physical, cultural and natural environment, the appropriateness and effectiveness of visitor management actions should be monitored, to achieve better conservation and improved visitor experience.

(K) Interested persons and organisations should be involved

There is a substantial constituency of people and organisations who have the potential to contribute to the conservation of the Mawson's Huts Historic Site. These include identified stakeholders such as the Australian Antarctic Division, the Australian Heritage Council, the Mawson's Huts Foundation, conservation practitioners, Antarctic tour operators and Antarctic Treaty parties. It is essential to involve these people/organisations to bring their interests and expertise to bear upon the management of the site.

The site management recognises the legitimacy and inevitability of future tourist visits and should include appropriate mechanisms for visits.

(L) The Mawson's Huts Historic Site story should be told

Because of the remoteness and inaccessibility of this site, interpretation is even more important than for other significant places. Interpretation is integral to conservation, and is pivotal to off-site management. Provision of an informative and interactive experience for those who wish to learn about Mawson's Huts, without setting foot on the place itself, continues to be a fundamental aim.

(M) There should be clear responsibilities and processes for decision making

The Australian Antarctic Division, as the body through which Commonwealth ownership is expressed, has formal responsibility for the site's conservation and management.

(N) Records and artefacts/off-site elements should be managed

The evidence associated with the AAE and Mawson's Huts Historic Site forms a large and widely distributed collection. Management should include maintaining a full record of fabric on and off-site, and of all works undertaken. Wherever possible, mechanisms will be put in place so that all parts of this collection can be identified and made available for research and interpretation, as a whole or in parts, regardless of who is responsible for their management.

Policy (2) Site management will work towards long-term goals consistent with the conservation philosophy

Long-term goals for site management should be consistent with the conservation philosophy articulated at the beginning of this plan. While the overall goal for the site is to conserve, interpret and transmit the heritage values of the cultural landscape, this is best achieved by conserving different elements in different ways. While there will be a focus in the life of this plan on heritage objects, it will remain necessary to conserve the structural fabric through ongoing maintenance.

(A) Conservation of the Main Hut and Magnetograph House should retain their December 1913 configurations

The intact buildings, which have had their original structures conserved (through repairs and over-cladding), should be maintained to ensure their structural stability. The long-term goal is for the huts to be stable, clear of internal ice (other than a precautionary layer on the floor and in the verandahs of the Main Hut), and with internal spaces, fittings and objects in their December 1913 configuration.

(B) Conservation of the Transit Hut and Absolute Magnetic Hut should not obscure the effects of a century of exposure

The standing ruins, which have been subjected to minimal intervention to prevent total destruction, should be conserved as necessary to preserve them as roofless weathered ruins, preventing their collapse. The long-term goal is for the ruins to evoke the effects of almost a century of exposure, rather than be returned to their 1912-1913 state.

(C) Conservation of other remains and objects should be prioritised by significance, and should preserve their original context

Significant fabric should be conserved in its original context, and exceptionally significant objects should be treated to prolong their lifespan (preferably on-site, and returned to their original location; although it may be necessary to remove them into a hut or off-site for conservation), but the external scatters should not be re-arranged for display. The long-term goal is for the site to appear as it was left in 1913 (or 1931, for those parts modified by the BANZARE), while allowing for an appreciation of the effects of almost a century of exposure.

7.2 Key Processes

Policy (3) Management will comply with Antarctic Treaty requirements and Australian law

Management of the site will comply with the requirements of the Antarctic Treaty and the Protocol on Environmental Protection to the Antarctic Treaty. Activities at the site will be managed in accordance with the management plans for Antarctic Specially Protected Area No. 162 and Antarctic Specially Managed Area No. 3, endorsed by the Antarctic Treaty Consultative Meeting.

The National and Commonwealth Heritage values of the site will be conserved in accordance with the *Environment Protection and Biodiversity Conservation Act 1999*, particularly the Commonwealth and National Heritage management principles (see Appendix II) and the Burra Charter: the Australia ICOMOS Charter for Places of Cultural Significance.

Policy (4) Minimal intervention and impact conservation processes will be preferred

The AAE and BANZARE fabric will be conserved, using the conservation processes of maintenance, preservation, restoration and reconstruction where appropriate.

- Maintenance and preservation are generally appropriate.
- Restoration of fabric and spaces is appropriate for reassembling displaced original components, or to remove non-significant fabric or accretions, such as snow or ice, which should be removed from the living section and workshop of the main hut, subject to ongoing environmental monitoring confirming that their removal poses no risk to structural integrity.
- Reconstruction of lost elements will be permitted if required for structural integrity.
- Introduction of new fabric is the least preferred process, but may be required for security, and structural or environmental integrity. It should not adversely impact on the structure or environmental integrity of the buildings.

The primary criteria for determining priorities and suitable processes for the preservation of National and Commonwealth Heritage values are cultural significance and threat. The feasibility of providing for public access for interpretation is a lesser priority.

During the life of this plan, the Australian Antarctic Division will prepare—in light of the achievements and recommendations of conservation works parties—a proposed maintenance schedule for the site, which will establish the long-term cyclical maintenance tasks likely to be required to conserve the National and Commonwealth Heritage values of the site.

Policy (5) No development, adaptive reuse or property divestment

No new development will occur within the site. The only works proposed are to maintain or improve the temporary non-historic accommodation and other facilities for works parties outside the Visual Protection Zone, to ensure that those facilities are adequate to enable their work to conserve the site's National and Commonwealth Heritage values.

No adaptive reuse of the site will take place.

The buildings and associated material constituting the site remain the property of the Commonwealth Government of Australia and there are no plans for property divestment. Proper site management requires visits from time to time by the Australian Antarctic Division or others delivering works or monitoring programs on its behalf.

Policy (6) Heritage impact assessments will be used

Heritage impact assessments, including where necessary amendments to the management plan, will precede and be considered when planning:

- any works on the site, other than routine maintenance or urgent stabilisation work, which are not specified in the Implementation Plan;
- any proposal to substantially modify an existing use or to introduce a new use to the site; and
- any proposal to restore to a natural condition or otherwise modify the landscape containing cultural features.

Work that may affect subsurface archaeological evidence will be preceded by an archaeological assessment and recording.

Policy (7) Environmental impacts will be avoided or minimised

All conservation and management actions will have regard to the total environmental impact and will endeavour primarily to avoid adverse impact to either the built or natural environment. If impacts are unavoidable, they should be minimised.

Threats posed to the natural environment by cultural elements (e.g. AAE explosives or hazardous chemicals, if any more are found) will be removed where possible, provided there is no major adverse impact on the Commonwealth or National Heritage cultural values.

Where there is a direct conflict between cultural and natural heritage values (e.g. wireless cables potentially interfering with penguin movements), management decisions that protect the Commonwealth and National Heritage cultural values will prevail on the site.

The adverse impacts of post-BANZARE developments (e.g. Granholm Hut) on the Commonwealth and National Heritage aesthetic values of the site will be addressed by removal, relocation or camouflage.

New developments on site (e.g. a museum to house artefacts or a shelter for tourists) which will adversely impact on the National and Commonwealth Heritage values of the site will not be permitted. This does not prohibit upgrades or expansion, as required to conduct works to conserve the site's values, to the temporary works party facilities (Jubilee Base) which are outside the Visual Protection Zone.

Policy (8) Cultural heritage objects will be registered and conserved

All cultural heritage objects, both at the site and held by the Australian Antarctic Division, will be registered on a database, which may also be linked to information on collections held by other organisations or individuals.

Movable objects will be conserved and interpreted in situ, under the supervision of an archaeologist, wherever possible. If objects are to be removed from the site—to allow essential conservation works to ensure their survival, or temporarily for education or display—they will be fully documented before they are removed and then will only be removed in accordance with a permit issued by the Australian Antarctic Division. Objects that are removed should be returned to the site once the conservation work or display for which they were removed is complete.

No cultural heritage object will be repatriated unless it has been clearly established who will take responsibility for ensuring that conservation work is undertaken (including making the necessary arrangements, meeting the costs, and storage). It is acceptable, however, to remove failed building materials (tar paper, nails or other fabric) from within the huts and store them elsewhere on site, and to remove representatives of such items to a reference collection of building materials in Australia.

Cultural heritage objects which do not have an association with the site will not be introduced for any purpose.

7.3 Access and Security

Policy (9) Controlled public access will be permitted

Subject to protection of National and Commonwealth Heritage values and public safety, public access to the site will be permitted. Access to within 5 m of the huts and entry to the huts will be managed by permit and conditions prescribed in the management plan for Antarctic Specially Protected Area No. 162 (see Appendix IV).

Annex V of the Protocol on Environmental Protection to the Antarctic Treaty prohibits entry into an ASPA, except in accordance with a permit. Permits may be issued by an Antarctic Treaty party (in the case of Australia by the Environment Minister) and may contain general and specific conditions. Antarctic Treaty parties other than Australia may issue permits for activities in the site, but those activities must comply with the management plan for the ASPA.

Permits may be issued for on-site:

- conservation, inspection, maintenance, management, research and/or monitoring work
- educational activities, including tourism, consistent with the aims and objectives of this management plan
- scientific research (using non-historic infrastructure rather than establishing new infrastructure)

Day visits by tourists and educational groups will be permitted. Longer-term visits will be discouraged and overnight stays not permitted, given the significance and vulnerability of the site. Permits may be subject to an overall carrying capacity for the site or specific parts of the site, and closed zones may be introduced if required. A permit may allow entry to the Main Hut and Magnetograph House (but not the standing ruins of the Transit Hut or Absolute Magnetic Hut), provided that:

- each group is accompanied by a person with cultural heritage skills (to the satisfaction of the permitting Party) who remains in the Area for the duration of the visit and accompanies all visitors inside the huts;
- briefings on the ASPA management plan and the values of the ASPA are conducted prior to visits and adequate site interpretation materials are made available to each visitor;
- visitors accessing the Area avoid sensitive historic cultural heritage objects, such as the cultural heritage objects scatter to the immediate north of the Main Hut, and other sensitive areas, such as lichen communities;

- visitors do not touch the exterior fabric of the buildings or any cultural heritage objects. Visits to the interior of the huts are limited to four persons (including the guide) at any one time inside the Main Hut, and three persons (including the guide) in the Magnetograph House;
- cultural heritage objects, scientific and related conservation management equipment and the interior building fabric are not touched.

Camping is not allowed within the Visual Protection Zone. Mawson's Huts must not be used for accommodation.

The Australian Antarctic Division will retain records of all visits, incidents and impacts at the site as a fundamental element of ongoing management and as a tool for future decision making.

7.4 Liaison and Consultation

Policy (10) Stakeholders should be encouraged to contribute

The Australian Antarctic Division recognises that participation of stakeholders is essential to ensuring commitment and cooperation in the conservation of the site, and will promote stakeholder involvement. Stakeholders were consulted during the development of this plan, and will be consulted on any changes to it, and on other key management decisions which affect the site.

The Australian Antarctic Division will ensure that information about the site is publicly available, including information about works programmes. It will establish a register of interested parties and give them an opportunity to submit comments on proposed activities. It will also invite all visitors to make management recommendations as part of their post visit report. Consultation should use the Internet, where possible.

The stakeholders who should be consulted include:

- The Australian community generally
- International polar organisations—including the Antarctic Treaty Consultative Meeting and the International Polar Heritage Scientific Committee of ICOMOS
- Australian heritage organisations, collections agencies, professional groups and individuals
- Australian government agencies—including Geoscience Australia
- Families of AAE members
- Tourists and tour operators who have visited the site

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- People who have worked on or at Mawson's Huts—including former Antarctic Division expeditioners, the ANARE Club, and members of Project Blizzard and Mawson's Huts Foundation expeditions
 - Other Antarctic Treaty countries, especially France, the United States, the United Kingdom and New Zealand, which have logistic operations in the region or parallel heritage management responsibilities.

Consultation processes are also prescribed in the management plans for ASMA No.3 and ASPA No. 162: inviting the contributions of other national Antarctic programmes operating in the region, and those with an interest or experience in Antarctic historic site management, with a view to ensuring the management provisions of those management plans are implemented effectively.

Public comments on this management plan

Under section 324S of the EPBC Act, the Environment Minister seeks comments from the public on draft management plans prepared for National Heritage places, and seeks and considers comments from the Australian Heritage Council about matters raised by the public.

This management plan was circulated in exposure draft form for a period of informal consultation, between 27 March and 18 May 2007.

This process, intended to give an opportunity for stakeholders to comment at an early stage in the preparation of the plan, attracted many constructive comments and demonstrated the value of offering more than the formally required public consultations. A revised draft was placed on public exhibition and made available for public comment between 25 July and 27 August 2007. The final version incorporates amendments made in response to comments received during that period and some minor changes that were made in light of advice received from the Australian Heritage Council.

7.5 Planning and Management of Works

Policy (11) Expert heritage advice and qualified personnel

All management decisions which have the potential to affect the Commonwealth or National Heritage values of the site will be founded on expert heritage advice, obtained through either consultation with qualified professionals or by employing specialist technical expertise. The Australian Antarctic Division will ensure that conservation works plans are prepared by qualified conservation experts, who may be required to supervise works on site.

The following professions may be relevant to Antarctic heritage conservation, depending on the situation: archaeologists, architects, archivists, conservators (textiles, paper, stone, metal or timber), contaminants experts, cultural heritage managers, engineers, heritage planners, historians, conservation and heritage tradespeople.

All assessment works shall be carried out by suitably qualified and specialised staff, consultants or contractors. All construction works shall be carried out by licensed, suitably qualified and, where appropriate, specialised tradespersons.

Excavation of cultural heritage objects from snow and ice should be undertaken by suitably qualified heritage experts, including an archaeologist (to supervise and document the exercise) and a conservator (to assess and manage the objects revealed), or by appropriately trained staff overseen by heritage professionals.

Policy (12) Only works required to conserve heritage values will be undertaken

There are no plans to install new structures within the Visual Protection Zone or to alter the historic huts. The only scope for installing new structures or equipment is to improve the temporary accommodation and working facilities in the vicinity of the Sørensen Hut (Jubilee Base).

The Australian Antarctic Division will ensure that works programmes for the site are developed in consultation with appropriately qualified professionals and relevant stakeholders, and that works at the site are overseen by appropriately qualified professionals.

In accordance with Annex V, article 8 (4) of the Madrid Protocol, no historic structure or artefact at Cape Denison (including Mawson's Huts) should be damaged, removed or destroyed except in accordance with an approved conservation and/or archaeological work programme.

Works party accommodation and safety

Existing non-historic infrastructure should be used by parties undertaking activities in accordance with this management plan, and adapted as required to meet seasonal needs. In light of hazardous materials, including asbestos and unlabelled chemicals, works programs need to be designed to ensure that human health and safety is protected.

Field leader responsibilities

The Australian Antarctic Division will brief conservation work teams about the policy framework and operational requirements of their project. Familiarity of the team with the management plan, relevant work plan and associated drawings will be ensured through formal team meetings with Australian Antarctic Division staff and informal discussions throughout the planning period for each season.

The field or team leader will have overall responsibility for undertaking the work specified in the work plan and according to any authorisations. If any unexpected issues arise during the works, the team leader will ensure the Manager, Antarctic Territories Environment and Policy Section at the Australian Antarctic Division, is contacted before further action is taken. Should an emergency demand immediate action, the field leader will decide what action to take, and notify the Australian Antarctic Division as soon as it is safe to do so.

Emergency works

In the event that emergency works are required, the field leader and the Australian Antarctic Division shall take all reasonable steps to ensure that these occur as expeditiously as possible. Permissible emergency works are works which are urgently required to arrest an imminent threat to life, safety, public liability, and/or a threat to the fabric or property.

Policy (13) Materials and organisms will not be introduced

No living animals, plant material, micro-organisms or soils shall be deliberately introduced into the site, and all reasonable precautions shall be taken to prevent accidental introductions.

No pesticides or herbicides may be brought into the site, except those used for the purposes of conservation or preservation of historic structures or cultural heritage objects, which shall be allowed into the site in accordance with a permit.

Fuel, food and other materials are not to be deposited in the site, unless required for essential purposes connected with the activity for which a permit has been granted.

Use of combustion-type lanterns and naked flames is not permitted inside the historic huts without express prior assessment and approval. Smoking is not permitted in the ASPA (i.e. inside and within 5 m of the huts).

The collection or removal of anything not brought into the area by the permit holder

No historic structure or other artefact may be handled, disturbed or removed from the site unless for conservation, preservation or protection purposes, or for scientific reasons, and then only in accordance with a permit issued by the Australian Antarctic Division.

The replacement of the artefact to the location from which it was removed is generally preferable unless further damage may result from replacement.

Material of human origin that is likely to compromise the values of the site, and which was not brought into the site by the permit holder or otherwise authorised, may be removed unless the impact of removal is likely to be greater than leaving the material in situ. If material is to be removed, the Australian Antarctic Division must be notified and approval obtained.

Disposal of wastes

All non-historic wastes, including human wastes, will be removed from the site.

Policy (14) Discoveries are to be reported to the Australian Antarctic Division

Australian Antarctic Division decisions on the management of unforeseen discoveries or disturbance of heritage at the site will be based upon an understanding of cultural significance and proper scientific practice. The heritage impact of management decisions will be stated and evaluated and fully considered during the decision-making process.

Unforeseen discoveries outside the site will be managed in accordance with Resolution 4 (2001) of the Antarctic Treaty Consultative Meeting on the discovery of pre-1958 remains, which requires that such discoveries be granted interim protection and assessed, and other Treaty parties notified.

7.6 Monitoring, Recording and Reporting

Policy (15) Site monitoring should be integrated and annual

The Australian Antarctic Division will ensure that the condition of the site and its National and Commonwealth Heritage values are monitored and reported upon, in an integrated and annual fashion. The primary aim of the monitoring programme shall be to detect and evaluate incremental change affecting the National and Commonwealth Heritage values of the site, in order to identify the need for strategies to respond to any potential or actual adverse impacts.

An integrated monitoring programme will be managed through the Australian Antarctic Division's Environmental Management System, and prepared within twelve months of the commencement date of this plan. The programme will integrate monitoring activities which are already under way, and address what is to be monitored, how, by whom, how often, and how the results will be reviewed and responded to.

The programme shall monitor:

- historic heritage—including the condition of buildings and structures, their internal environment, landscape features, moveable heritage and conservation works progress
- flora and fauna—including general monitoring during conservation works programmes and operation phases
- staff and contractor training—including induction programmes, briefings and emergency training

As part of its annual environmental report and comprehensive audit, the Australian Antarctic Division shall produce a monitoring report outlining results from the integrated monitoring programme. The report shall:

- analyse monitoring results and trends; and
- identify measures taken or proposed to respond to any adverse or unexpected impacts identified.

The Australian Antarctic Division shall adjust conservation and works programmes in light of monitoring outcomes, and review the overall integrated monitoring programme regularly, in consultation with the relevant authorities.

Policy (16) Visitors will be monitored

The visitor monitoring programme will monitor:

- visitor numbers and site capacities
- duration of visit
- mode of access to the site
- visitor profiling (to include age, cultural background, language spoken, geographic origin, disability status) if available
- visitor impacts on the site's values, including both physical impacts (such as measurable damage or wear to fabric, impacts on fauna behaviour, etc) and non-physical impacts (such as amenity)
- measures taken, or proposed to be undertaken, to minimise visitor impact
- the interpretive programme (quality of visitor experience, visitor understanding and presentation performance)

Should the visitor monitoring programme identify adverse impacts, the Australian Antarctic Division, in consultation with the Heritage Division, will identify and implement appropriate management responses (for example, altering the activity, temporarily ceasing activities or ceasing some uses altogether).

The visitor monitoring programme will be integrated with reporting and exchange of information requirements which currently exist under the ASPA management plan, which requires Antarctic Treaty parties to ensure that the principal holder of a permit submits a report describing the activities undertaken. Visit report forms lodged with the Australian Antarctic Division are reviewed annually and summarised for insertion into the annual Exchange of Information report circulated to all Antarctic Treaty parties.

Policy (17) Recording should precede and follow conservation works

The Australian Antarctic Division will comply with its obligations under the Archives Act and EPBC Act to hold records on the management of the site. Archival recording shall be carried out prior to any conservation work on a building, object or cultural landscape element, and on completion of conservation works. Archival recording will also be required during the removal of any fabric on site that exposes significant fabric or details.

Archival recording before conservation works commence shall include references to measured drawings of all buildings and structures and photographic recording. Archival recording after conservation works are complete shall comprise 'as-built' drawings and photographs of all

buildings and structures that have been the subject of conservation works, indicating the location and detail of changes.

The Australian Antarctic Division will develop a computer-based information management and Geographic Information System (GIS) for the site, linked to the Division's Environmental Management System. This will help to coordinate information about site management, which is currently accessible via various databases maintained by the Australian Antarctic Data Centre (AADC), and files held by the Australian Antarctic Division.

The primary role of the GIS will be to document decision-making by providing a record of all works and management actions taken, and current information on resources and assets at the site. The system will be regularly updated and record a range of information, including:

- all approvals issued for works
- all works undertaken, including renovation, construction and regular maintenance works (date, what work, location etc)
- monitoring programmes
- references to building plans, files, maps, design specifications and other documents
- conservation works programme schedules

The GIS data layers will cover:

- ASMA, ASPA, National and Commonwealth Heritage place boundaries and management zones
- standing buildings, cultural landscape features and other historic structures, works and paths
- archaeological information, including artefact scatters
- flora species
- fauna species, in particular breeding and haul out sites
- disturbed areas—from which post-BANZARE objects have been cleaned up
- site services and infrastructure
- new works (including signs, boardwalks and paths)
- data from monitoring programmes, as relevant.

The system will be linked to the Australian Antarctic Artefacts Database, to ensure that information on the site is current.

The Australian Antarctic Division will review the information management and GIS system every five years after the commencement date. The review shall focus on the effectiveness of the system for managing data (see the current datasets listed overleaf), and currency of its information.

Current Datasets on Management of the Site

Type of Record	Location	Comment
Approvals issued for works	Antarctic Division—individual project files, filed by project number	More detailed information on project approvals and outcomes could be posted on the Antarctic Division website to improve public access.
Description of work undertaken, including progress & final reports	Antarctic Division—individual project files	
Monitoring programmes implemented	Antarctic Division—individual project files, AADC AAS Projects and Metadata	
Building plans	Conservation Management Plan	The Antarctic Division needs to acquire electronic copies or original plans
Files	Antarctic Division file system	Not linked to other data sets
Maps (including ASMA and ASPA boundaries and zones, flight operations and bird colonies, site services and infrastructure, all new works—signs, boardwalks & paths, but not flora species)	AADC Map catalogue	Publicly available via the Antarctic Division website

Type of Record	Location	Comment
Aerial photographs	AADC Metadata	
Satellite images	AADC Metadata	
Design specification & other documentation	Antarctic Division–Individual project files AADC Antarctic Programme Publications; Scientific Bibliographies; Library Monographs	
Conservation Works Programme schedules	Antarctic Division–Individual project files	
Cultural heritage objects	AADC Antarctic Artefacts–includes some images.	Covers more than 1700 <i>in situ</i> objects. Publicly available via the Antarctic Division website
Images	Antarctic Division–iMAGEAntarctica (some not yet catalogued)	Publicly available via the Antarctic Division website. A large number of images are awaiting scanning or indexing.
Locations of standing buildings, cultural features, landscape features & historic structures, works & paths	AADC Metadata	

Type of Record	Location	Comment
Archaeological information, artefact scatters	Survey data held by Mawson's Huts Foundation	Artefact scatters not yet mapped. An accurate survey of the site, ideally with aerial photography, is required.
Areas which have been cleaned up, including a history of works	Antarctic Division—individual project files, conservation works reports.	Not mapped.
Data from monitoring programmes	AADC AAS Projects and Metadata	

7.7 Research, Training and Resources

Policy (18) Research will be encouraged and coordinated

The Australian Antarctic Division will, as resources permit:

- promote and co-ordinate research undertaken at the site
- undertake and encourage research associated with conservation works at the site
- provide logistical support to others to undertake approved research at the site
- seek to acquire and hold in the Australian Antarctic Division Library copies of any research undertaken on the site
- liaise with other authorities with an expertise and interest in managing similar sites, e.g. Antarctic Heritage Trust New Zealand, Antarctic Heritage Trust United Kingdom, and the International Polar Heritage Committee.

Simon Mossman, 2006: Mawson's Huts Foundation works party (MHF / AAD)



Policy (19) Works must be done by qualified or trained personnel

The Australian Antarctic Division shall ensure that all contractors and consultants working on the site are aware of the management plan for the site and have been provided with sufficient training and awareness regarding its heritage values.

An induction and training programme shall be developed and provided by a suitably qualified person for all contractors and volunteers involved in on-site works (who should be required to attend such a programme by a clause in their contracts or agreements), and for any Australian Antarctic Division staff working on the site.

Policy (20) Private resources should be encouraged to supplement public resources

The Government has for many years viewed work on Mawson's Huts as a partnership between government and the private sector. The Australian Antarctic Division should continue to provide support to bodies that are interested in conserving the site.

The Mawson's Huts Foundation

The Mawson's Huts Foundation was established with the sponsorship of the Australian Associated Press (AAP) in 1995. Its mission is to 'to conserve in perpetuity for the Australian people the unique, historical buildings known as Mawson's Huts, base for one of the most significant expeditions in Antarctic history' (MHF, 2007).

The Foundation, which has raised several million dollars of financial and in-kind support from the public and corporate sector, together with financial assistance from the Australian Government and with the cooperation and assistance of the Antarctic Division, Heritage Division and Australian Heritage Commission, mounted conservation expeditions in 1996-97, 1997-98, 2000-2001, 2005-06 and 2006, and provided funding assistance for the monitoring equipment which a private expedition deployed in January 1999.

Visiting Cape Denison is very difficult and expensive because of its remoteness from the Australian Antarctic programme's normal area of operation. The Mawson's Huts Foundation (which is no longer associated with the AAP) has stimulated public interest in the site and Australia's Antarctic heritage, capturing public attention with its association with Australian cultural icons, Australian heroes and Antarctic exploration.

The Foundation also funded the development of the previous conservation management plan. In October 1998, a Mawson's Huts Seminar was held in Sydney as the first stage of the management review process. This identified stakeholder expertise and viewpoints, and arrived at consensus on the need to undertake on-site monitoring. In December 1998, Godden Mackay Logan Pty Ltd was commissioned to prepare the plan, which was published in 2001.

The current plan is premised on the understanding that the Mawson's Huts Foundation intends to continue to raise financial support for, and to organise, site works, research, monitoring, interpretation and promotion. During this plan's preparation (in May 2007), the Australian Government announced a grant of \$1.3 million to the Foundation to fund further conservation work that the Foundation intends to pursue, with the approval of the Australian Antarctic Division and consistent with this management plan, between 2007-08 and 2010-11.

The Australian Antarctic Division

The Australian Antarctic Division will continue to be responsible for authorising activities at the site, in consultation with the Heritage Division, the Australian Heritage Council and other parties as appropriate. In deciding which works to approve, or to undertake, the Australian Antarctic Division will be guided by this management plan and by new information, such as that resulting from on-site work.

This plan will be regarded as a blueprint for future decision-making. The Australian Antarctic Division is responsible for ensuring the plan is implemented effectively, and for committing adequate resources to do so.

The Australian Antarctic Division will keep under review its capacity to provide logistic and other support for conservation works. The Australian Antarctic Division has worked closely with the Mawson's Huts Foundation, by approving works plans, providing advice and in-kind support (such as the loan of equipment), and by facilitating access to the site to enable conservation work. It will continue to respond to opportunities for cooperation with bodies wishing to undertake conservation activities at the site.

The Australian Antarctic Division will continue to do what it can to assist appropriate conservation work undertaken by the Mawson's Huts Foundation or by others.

7.8 Interpretation and Promotion

Policy (21) The Australian Antarctic Division will prepare and coordinate interpretive material

In ensuring that the site is interpreted, both on and off-site, the Australian Antarctic Division will seek to maximise public access to interpretive information. However, interpretation devices on-site will be limited to signage specifically required under the Antarctic Treaty.

Themes to be used in the interpretation of the site will include the National and Commonwealth Heritage values of the site, the key dates of the centenary of the AAE (2011-2014), lives of the AAE members, other related AAE sites and collections, and the history of site conservation.

The Australian Antarctic Division will prepare an Interpretation Plan, which will include a strategy for improved off-site interpretive material, including printed and Internet material. The Australian Antarctic Division should also liaise with collections agencies, foundations and stakeholders on how the AAE centenary will be marked.

8. Implementation Plan

This plan of management is part of a system of management which the Department of Environment and Water Resources is developing for Commonwealth Heritage and National Heritage places.

Under section 341V(1) of the EPBC Act, this plan shall be carried out and given effect to by the Director of the Australian Antarctic Division, and no operations shall be undertaken unless they are in accordance with this plan. The environmental impact of works and conservation proposals will continue to be assessed at all stages, and any necessary investigations undertaken in accordance with established environmental assessment procedures.

If Commonwealth or National Heritage management principles change and the plan is inconsistent with them, this plan may be amended, or revoked and replaced in accordance with section 341S(5) of the Act. Should other lands be added to the site during the term of this plan, they will be managed in accordance with the objectives and policies of this plan.

This plan will be implemented as feasible within the annual programmes of the Australian Antarctic Division, supplemented by the contributions of private groups interested in the conservation of the site. The Australian Antarctic Division will evaluate season-by-season works programmes against the objectives and policies laid out in this plan. The extent to which the Australian Antarctic Division participates in works programmes will be determined in the context of strategic planning for the entire Australian Antarctic programme, and will be subject to the availability of staff and funds, and to any special requirements of the Director or Minister.

The following tables outline the phases of programmes for conservation works, monitoring, collections management, interpretation, visitor management, research, and records management.

The remoteness of the site, and the seasonal conditions encountered there, will influence the extent to which this implementation plan can be delivered from year to year. There may be years in the life of this plan in which no suitable vessel is available to transport a works team to the site, or in which resources are applied to off-site rather than on-site work. There may also be years in which snow, ice or wind conditions at the site prevent a team from achieving some or any of its goals. Therefore, the following outlines phases rather than annual programmes.

8.1 Implementation–Conservation Works

Phase	Action	Responsibility	Resources	Comment
(1) Structural Stabilisation	Finalise over-cladding of Main Hut living section, and monitor and remediate in any remaining areas of snow ingress (e.g. wall/ceiling junctions).		\$320 000 for 2006 expedition (government funding) plus Antarctic Division logistical support	Roof complete 2006; the south wall has not been over-clad, and the inner ceiling-wall junction needs to be sealed.
	Review whether 'standing ruins' (Transit and Absolute Magnetic Huts) are likely to require any stabilisation	Antarctic Division – delivered by works teams, likely provided by Mawson's Huts Foundation	Architectural and other expertise	Assess during an expedition early in the life of this plan.
(2) Ice removal	Remove snow & ice in the central rooms of the living and workshop sections of the Main Hut		Part of expeditions, which as a whole are likely to cost over \$300 000 per season	Under archaeological supervision, recording & labelling objects before they are disturbed, and not excavating the floor ice below a precautionary 600mm level.
(3) Restore broken internal fittings	Identify Main Hut shelves and bunks damaged since 1913 by snow/ice ingress, and repair		Included in an expedition budget	Needs a cautious approach: only to be restored when their original position is clear. No new timber to be introduced.

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Phase	Action	Responsibility	Resources	Comment
(4) Clean-up	Continue to remove post-BANZARE structures & objects from the Main Valley	Antarctic Division – delivered by works teams, likely provided by Mawson's Huts Foundation	Included in an expedition budget	Nearly complete, other than Granholm Hut, which in the medium term should be camouflaged to reduce visual impact, and in the long-term removed from the Visual Protection Zone, subject to a safety assessment.
(5) Maintenance planning	Develop a building and structures maintenance system to track and guide essential work	Antarctic Division	ATEPS	Costs dependent on the nature of the programme.

8.2 Implementation–Monitoring

Phase	Action	Responsibility	Resources	Comment
(1) Checklist of observations	Prepare a checklist of observations required during all visits to Cape Denison		ATEPS	Draft trialled during 2006 conservation works. Finalise before the first conservation expedition in the life of this plan.
(2) Integrated monitoring programme	Integrate existing visitor monitoring programme (from permit reporting system) into the integrated monitoring programme		ATEPS (Permits Officer: may require development funds)	Finalise before the first conservation expedition in the life of this plan.
(3) Monitoring report	Prepare a monitoring report as part of the annual Antarctic Division environmental report and comprehensive audit	Antarctic Division	ATEPS (Environment Officer)	Annual requirement.
(4) Updated condition report	Prepare a formal condition report on significant fabric, using primarily Blunt (1985) as a baseline.		ATEPS	Specific condition reports to be made a requirement of on-site works parties.
(5) Integrated monitoring programme review	Review the integrated monitoring programme		ATEPS (may require expert review)	Required every 5 years.

8.3 Implementation—Objects and Collections

Phase	Action	Responsibility	Resources	Comment
1) Mapping	Produce accurate baseline map of artefact scatters	Antarctic Division	ATEPS (may require training in use of equipment).	Ideally early in the life of this plan, but likely to take multiple seasons for all artefacts to be revealed.
(2) On-site documentation	Document cultural heritage objects on-site, focusing on identifying original patterns of placement of types of objects—i.e. site use and differentiation	Archaeologist on the works teams	Included in an expedition budget	As objects are identified or exposed—ablation and therefore exposure is likely to increase after ingress stops and the building is sealed.
(3) On-site assessment	Document and assess cultural heritage objects to prioritise for treatment and stabilisation in conjunction with Main Hut snow and ice removal	Archaeologist and conservator on works team.		
(4) Antarctic Division collection: assessment	Assess the contribution to heritage values of collections associated with the site, held at the Antarctic Division	Antarctic Division	ATEPS	To be done in 2007. Part of assessment of all collections at Antarctic Division headquarters.
(5) Antarctic Division collection: policy	Prepare a moveable heritage management policy		ATEPS	To be done in 2007.

8.4 Implementation–Interpretation

Phase	Action	Responsibility	Resources	Comment
(1) Website	Develop a website to be the definitive source on the site, and canvass other opportunities to tell the story of its national heritage values		ATEPS (Heritage Officer) and Gifts to the Nation funding	Website to be established in 2007. External funding may be required depending on the other opportunities identified.
(2) Interpretation plan	Prepare an interpretation plan for the site	Antarctic Division	ATEPS	An interpretation plan, based on the conservation philosophy in the management plan, should inform conservation processes and visitor management.
(3) Review heritage listing information			ATEPS	National and Commonwealth Heritage place boundaries should be aligned; statements of significance need to be reviewed to remain current.

8.4 Implementation–Interpretation cont.

Phase	Action	Responsibility	Resources	Comment
(4) Centenary	Liaise with collections agencies, foundations and stakeholders on how the AAE centenary will be marked (Dec 2011 onwards)	Antarctic Division	ATEPS	While it is appropriate that multiple events or products are planned across Australia, the site manager should monitor these and seek opportunities to coordinate.

8.5 Implementation–Visitor Management

Phase	Action	Responsibility	Resources	Comment
(1) Controlled site access	Maintain ASPA permit system, observe tourist visit when possible		ATEPS (Permits Officer)	
(2) Interpretation package	Prepare an interpretation package for visitors, including information on the National and Commonwealth Heritage values of the site	Antarctic Division – partly delivered by works teams or others	ATEPS	2003 AAD pamphlet to be updated.
(3) Signage	Install signage to indicate the boundaries of the ASPA		ATEPS	Signage to be minimal, in accordance with ASPA management plan.

8.6 Implementation–Research

Phase	Action	Responsibility	Resources	Comment
(1) Research coordination	Coordinate research undertaken at the site, through the ASPA permits system	Antarctic Division	ATEPS (permits officer)	
(2) Logistical support to researchers	Provide logistical support to others undertaking research work at the site		Determined by Antarctic Division resource levels and season-by-season logistical commitments	Requirements for logistical support are identified through the permit application process.
(3) Review values assessments & statements of significance	Review the 2001 assessments and statements, particularly in light of changes to the site		Heritage expertise, probably commissioned from external source	To be done before the next management plan (2012+) is prepared.
(4) Archaeology of the Macquarie Island base	Prepare an archaeological investigation of the AAE base on Macquarie Island to assess the contribution of any remains to the heritage values of Cape Denison	Antarctic Division–in conjunction with Tasmanian Parks & Wildlife Service	Seek external funding and participation	Ideally scoped and begun within the life of the management plan.
(5) Advances in conservation techniques	Liaise with experts to identify improving best practices, especially in materials conservation (e.g. new methods for timber protection)	Antarctic Division	Expertise, probably identified by stakeholder consultation	

8.7 Implementation–Record Management

Phase	Action	Responsibility	Resources	Comment
(1) Prepare GIS	Adapt the existing Antarctic Division computer-based information management and GIS for site management	Antarctic Division	ATEPS	Before the first expedition in the life of this plan.
(2) Archival recording	Undertake archival recording prior to and on completion of any conservation works on the site	Archaeologist on conservation works team	Included in an expedition budget	During each season of conservation works.
(3) Information management system	Ensure information from each season's works programme is included in the information management system	Antarctic Division–reports/input by works teams, likely provided by Mawson's Huts Foundation	ATEPS	
(4) Cataloguing and archiving	Scope the task of completing the cataloguing and archiving of existing data sets held by the Antarctic Division	Antarctic Division	ATEPS (scoping–delivering the project may require separate funding)	Information yet to be catalogued: Project Blizzard data; reports on material performance; photogrammetric, artefact and photographic records from Mawson's Huts Foundation.

9. Monitoring of Implementation

The implementation of the management plan will be monitored by the Antarctic Territories Environment and Policy Section of the Australian Antarctic Division.

The implementation of the management plan and its effectiveness in conserving National and Commonwealth Heritage values will be monitored by comparing the actions and phases outlined in the Implementation Plan with the results. Monitoring will need to take account of the remoteness of the site and the challenges presented by the prevailing seasonal conditions there.

Monitoring will be undertaken annually and the results will be incorporated into the Australian Antarctic Division's annual environmental report and comprehensive audit.

10. Review of Management Plan

The management plan will be reviewed by the Australian Antarctic Division at least once every five years. The review will:

1. Assess whether the plan addresses the matters prescribed in the regulations including the Commonwealth and National Heritage management principles.
2. Assess the effectiveness of the plan in protecting and conserving the National and Commonwealth Heritage values (including a condition assessment of the values).
3. Identify new or changed information from monitoring, community input and/or further research which may require changes to the management plan.
4. Identify any significant damage or threat to the Commonwealth or National Heritage values of the site through the analysis of conservation works team reports, visitor reports and the integrated monitoring programme.
5. Recommend ways to improve the protection of values.

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11.4 AAE Members: Biographical Information

In the *Home of the Blizzard* (1915), Mawson gave brief biographical notes for each member of the AAE, including his age at the start of the expedition, and the positions he held. The following table quotes from this source, in some cases corrects Mawson's errors (on ages when the *Aurora* sailed), provides information on post-AAE lives, and lists other biographical sources. The *ADB* is the Australian Dictionary of Biography. Entries that are available on-line may be accessed at www.adb.online.anu.edu.au

Frank Hurley, 1912: Midwinter Dinner, Adélie Land (Australasian Antarctic Expedition, 1911-14 collection, State Library of NSW)



Name	Age & origin	Positions	Biographical information (Mawson, 1915) & sources
Main Base party			
Dr Douglas Mawson	29, Australian (Adelaide, born Yorkshire)	Commander of the expedition	<p><i>Organiser and Leader of the AAE and was, previous to it, a member of Sir Ernest Shackleton's Antarctic Expedition of 1907-1909, being one of the party under Professor David which reached the South Magnetic Pole. A graduate in Science and Engineering of Sydney and Adelaide Universities, he had filled for some time the post of Lecturer in Mineralogy and Petrology at the Adelaide University. The only survivor of a party sledging to the east from the Main Base in the summer of 1912-1913.</i></p> <p>Returned to Adelaide and set about publishing results and paying off debts, and knighted and married in 1914. After war service in munitions and explosives supplies, returned to University of Adelaide for 30 years of research on precambrian rocks and glaciation.</p> <p>Led the BANZARE of 1929-31, which surveyed, and through Mawson, claimed sovereignty over, the sector that would become Australian Antarctic Territory. Received numerous awards, served as president of the Australian and New Zealand Association for the Advancement of Science, and advised the government through the Antarctic Planning Committee and did not retire until aged 70. Australia's first permanent continental Antarctic station named in his honour in 1954. Died 1958.</p> <p>Jacka, FJ (1986). 'Mawson, Sir Douglas (1882-1958)', <i>ADB</i>, Vol 10: 454-457. Available on-line.</p> <p>Taylor, G (1962). <i>Douglas Mawson</i>.</p> <p>Mawson, P (1964). <i>Mawson of the Antarctic</i>.</p> <p>Bickel, L (1975). <i>Mawson's Will: the greatest survival story ever written</i>.</p> <p>Ayres, P (1999). <i>Mawson, A Life</i>.</p> <p>Hall, L (2000). <i>Douglas Mawson: the Life of an Explorer</i>.</p> <p>Mawson papers held by the National Library of Australia.</p>

Name	Age & origin	Positions	Biographical information (<i>Mawson, 1915</i>) & sources
Main Base party			
Lieut. (Edward Frederick) Robert Bage	23, Australian (Melbourne)	Astronomer Assistant magnetician Recorder of tides	<p><i>A graduate in Engineering of Melbourne University and a lieutenant in the Royal Australian Engineers ... leader of the Southern Sledging Party, he remained in the Antarctic for two years. During the first year he was in charge of chronometers, astronomical observations and tidal records, and throughout the second year continued the magnetic work and looked after stores.</i></p> <p>Enlisted in August 1914 as second in command of the Third Field Company of Engineers, promoted to captain and then killed less than two weeks after landing at Gallipoli, in May 1915.</p>
Cecil Thomas Madigan	22, Australian (Adelaide)	Meteorologist	<p><i>Through the courtesy of the Trustees of the Rhodes Scholarship, the necessary leave to accompany the Expedition was granted just as he was on the eve of continuing his studies at Oxford University. ... acted as Meteorologist for two years, and during the second year (1913) was also in charge of the Greenland dogs. An important journey in the spring and one to the east in the summer were made under his leadership, and the Party, left in Adélie Land in 1913, was to have been under his charge, but for my return.</i></p> <p>Completed one term in geology at Oxford before leaving for the War in France with the Royal Engineers, before completing with honours. Specialised in desert geology, ultimately at the University of Adelaide. Crossed the Simpson Desert in 1939. Died 1947.</p> <p>Parkin, LW (1986). 'Madigan, Cecil Thomas (1889–1947)', <i>ADB Vol 10: 374-376</i>. Available on-line.</p>

Name	Age & origin	Positions	Biographical information (<i>Mawson, 1915</i>) & sources
Main Base party			
Lieut. Belgrave Edward Stanley Ninnis	23, British	In charge of Greenland dogs	<i>Lieutenant in the Royal Fusiliers prior to joining the Expedition in London. On December 14, 1912, while on a sledging journey, he lost his life by falling into a crevasse three hundred miles east of Winter Quarters.</i>
Dr Xavier Mertz	28, Swiss	In charge of Greenland dogs	<i>Graduate in Law of the Universities of Leipzig and Berne. Prior to joining the Expedition he had gained the Ski-running Championship of Switzerland and was an experienced mountaineer. ... assisted by B. E. S. Ninnis in the care of the Greenland dogs. On January 7, 1913, during a sledging journey, he lost his life, one hundred miles south-east of Winter Quarters.</i>
Dr Archibald Lang McLean	26, Australian (Sydney)	Chief medical officer Bacteriologist	<i>Acted as Chief Medical Officer ... and carried out observations in Bacteriology and Physiology during the first year. In 1913 (the second year) he was Biologist, Ice-Carrier and Editor of the 'Adelie Blizzard'. He took part in a sledging journey along the eastern coast in the summer of 1912-1913.</i> <i>Invalided from the War in France, awarded the Military Cross, helped write a medical history of the war, but succumbed to tuberculosis in 1921.</i>

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Name	Age & origin	Positions	Biographical information (<i>Mawson, 1915</i>) & sources
Main Base party			
Francis Howard Bickerton	22, British	In charge of air-tractor sledge	<p><i>Had studied engineering ... Leader of the Western Sledging Party, he remained in the Antarctic for two years, during which time he was in charge of the air-tractor sledge, and was engineer to the wireless station. For a time, during the second year, he was in complete charge of the wireless plant.</i></p> <p>Fighter pilot on the Western Front, then an extraordinarily varied life: farming in Newfoundland, establishing a golf club in California, African safaris, and an editor and screenplay writer at Shepperton Studios in England. Died 1954.</p> <p>Haddelsey, S (2005). <i>Born Adventurer: the life of Frank Bickerton, Antarctic pioneer.</i></p>
Alfred James Hodgeman	26, Australian	Cartographer Sketch artist	<p><i>For four years he was an articled architect, and for five years a draughtsman in the Works and Buildings Department, Adelaide. ... took part in several sledging journeys, and throughout two years in the Antarctic acted in the capacity of Cartographer and Sketch Artist, as well as that of Assistant Meteorologist.</i></p> <p>Prepared maps and diagrams for the Royal Geographical Society and AAE publications on his return. Died in England in 1964.</p>

Name	Age & origin	Positions	Biographical information (Mawson, 1915) & sources
Main Base party			
James Francis (Frank) Hurley	24, Australian (Sydney)	Official Photographer	<p><i>He had been the recipient of many amateur and professional awards for photographic work ... obtained excellent photographic and cinematographic records and was one of the three members of the Southern Sledging Party. He was also present on the final cruise of the 'Aurora'.</i></p> <p>Returned to receive a silver polar medal for his work, and then earned a second on Shackleton's fateful <i>Endurance</i> expedition, when was stranded with the Elephant Island party. From 1917 served as official war photographer with the AIF. Later travelled widely with his cameras, then again with Mawson on the BANZARE voyage. His films, professionally produced, became the key ways in which the public understood the Antarctic expeditions. He was a war photographer again in the Second World War and earned an OBE. Died 1962.</p> <p>Pike, AF (1983). 'Hurley, James Francis (Frank) (1885–1962)', <i>ADB Vol 9</i>: 411-412. Available on-line.</p> <p>Bickel, L (1980). <i>In Search of Frank Hurley</i>.</p> <p>McGregor, A (2004). <i>Frank Hurley: A photographer's life</i>. Hurley papers held by the National Library of Australia. His diaries are available on-line.</p>
Eric Norman Webb	22, New Zealander	Chief Magnetician	<p><i>Civil engineer. For the five months previous to joining the Expedition, carried out magnetic observations under the Carnegie Institute of Washington, U.S.A. Chief Magnetician, accompanying the Southern Sledging Party.</i></p> <p>Joined the British Army and rose to the rank of Major. In civilian life he was a senior engineer to hydroelectric schemes, including in Canada. Died in 1984—the last of the AAE members.</p>

Name	Age & origin	Positions	Biographical information (<i>Mawson, 1915</i>) & sources
Main Base party			
Percy Edward Correll	19, Australian (Adelaide)	Mechanic Assistant Physicist	<i>Science student. Accompanying the Eastern Coastal Party during their sledging journey. He spent three summers and one winter in the Antarctic, acting as colour photographer during the final cruise of the 'Aurora'.</i>
John George Hunter	23, Australian (Sydney)	Biologist	<p><i>A graduate in Science ... carried on the work of Biologist during two summers and one winter; and in the same capacity accompanied the 'Aurora' in her final summer cruise.</i></p> <p>Served with the Australian Army Medical Corps, then returned to work in Sydney hospitals. Became an expert in medical ethics and took a leading role in medical associations (British then Australian) and hospital contributions funds, opposing the nationalised health scheme. Appointed CBE, and died 1964.</p> <p>Heagney, B (1996). 'Hunter, John George (1888–1964)', <i>ADB Vol 14</i>: 523-524. Available on-line.</p> <p>Hunter diaries held by the National Library of Australia.</p>

Name	Age & origin	Positions	Biographical information (<i>Mawson, 1915</i>) & sources
Main Base party			
Charles Francis (Carl) Laseron	25, Australian (Sydney-born United States)	Taxidermist Biological collector	<p><i>For some years was Collector to the Technological Museum ... during 1912, he acted as Taxidermist and general Collector, taking part, as well, in sledging journeys to the south and east of Winter Quarters.</i></p> <p>Brought samples back to the Technological Museum, a position interrupted by the War—he enlisted with the AIF but was discharged after being wounded at Gallipoli. Pursued various interests: philately, geological publications, mapping instruction in the Second World War. Died 1959.</p> <p>Vallance, TG (1983). 'Laseron, Charles Francis (Carl) (1887–1959)', <i>ADB Vol 9</i>: 675-676. Available on-line.</p> <p>McMichael, DF & Whitley, GP (1958). 'A Bibliography of Charles Francis Laseron with an Index to his New Genera and Species', in <i>Proceedings of the Royal Zoological Society of New South Wales</i>: 114-121.</p>
Frank Leslie Stillwell	23, Australian (Melbourne)	Geologist	<p><i>Graduate in Science ... leader of two sledging parties who did detailed work for about sixty miles along the coast eastward of Winter Quarters.</i></p> <p>Earned a doctorate in science for his AAE research. Withdrawn from the AIF to help establish new federal research organisations, and taught and practised mineralogy, petrology and mineragraphy, including with the CSIRO. Remained single, viewed as serious and quiet, appointed OBE, and had a long association with the Royal Society of Victoria to which he left a major bequest on his death in 1963.</p> <p>Wilcock, Arthur A (1990). 'Stillwell, Frank Leslie (1888–1963)', <i>ADB Vol 12</i>: 94-95. Available on-line.</p> <p>Anon (1966). 'Stillwell, Frank Leslie—AAS Biographical Memoir' in <i>Records of the Australian Academy of Science Vol 1</i>.</p>

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Name	Age & origin	Positions	Biographical information (Mawson, 1915) & sources
Main Base party			
Herbert Dyce Murphy	32, Australian (Melbourne)	In charge of expedition stores	<p><i>One-time Scholar in History of Oxford University. At the outset he was to have been leader of a third Antarctic Base which was eventually amalgamated with the Main Base ... had charge of the stores and during the early summer of 1912 was leader of the Southern Supporting Party.</i></p> <p>Most notable for the enigmatic tales of his life before the AAE—exploring the Arctic at an early age, and then living as a woman for several years while spying on France and Belgium. Returned to serve in army intelligence in the War, then ran an orchard and sheep farm outside Melbourne and was known for helping underprivileged children. Took on seasonal work for decades as ice master on Norwegian whaling ships until it was discovered he was 85. Died 1971.</p> <p>Murray-Smith, S (1986). 'Murphy, Herbert Dyce (1879–1971)', <i>ADB</i> Vol 10: 637-638. Available on-line.</p> <p>Watson, M (1997) <i>The Spy Who Loved Children: the Enigma of Herbert Dyce Murphy 1879-1971.</i></p> <p>Rossiter, H (2004). <i>Lady Spy, Gentleman Explorer: the life of Herbert Dyce Murphy.</i></p>
Walter Henry Hannam	26, Australian (Sydney)	Wireless operator Mechanic	<p><i>Joined the Expedition in charge of the arrangements for a wireless telegraphic system. He was in the Antarctic ... for two summers and a winter, and was successful in transmitting wireless messages for a short time during 1912 through Macquarie Island to Australia. Assistant magnetician for a time.</i></p> <p>Earned polar medal for his AAE contribution, and served in the Australian Motor Transport Corps in the War. Died 1965.</p>

Name	Age & origin	Positions	Biographical information (Mawson, 1915) & sources
Main Base party			
John Henry Collinson Close	40, Australian (Sydney)	Assistant collector	<i>During the South African War he saw active service in Rhodesia, and at the time of the Expedition's departure was a teacher of physical culture at Sydney. A member of ... several sledging parties, he spent two summers and one winter in the Antarctic.</i>
Dr Leslie H Whetter	29, New Zealander	Surgeon	<i>Graduated at Otago University, New Zealand, and joined the Expedition as Surgeon ... He accompanied a sledging party which explored to the westward of Winter Quarters.</i> Member of the Royal Society of New Zealand.
Sidney N. Jeffryes	27, Australian (Toowoomba)	Wireless Operator (1913)	<i>A qualified operator of the Australasian Wireless Company. During the second year (1913) he took W. H. Hannam's place in charge of the wireless plant.</i> Committed to a mental institution on his return, and later reported to have recovered.

Name	Age & origin	Positions	Biographical information (<i>Mawson, 1915</i>) & sources
Western Base party			
(John Robert) Frank Wild	38, British	Leader	<p>Joined the Merchant Service in 1889 and the Navy in 1900, served on an extended sledge journey during the National Antarctic Expedition (Capt. R. F. Scott) of 1901-1904, and was one of the Southern Party of Sir Ernest Shackleton's Expedition from 1907-1909. During the Australasian Expedition he opened up a new tract of country—Queen Mary Land.</p> <p>Returned to England, served with the navy in Russia during the war, and was twice second-in-command to Shackleton: leading the stranded and famously rescued Elephant Island party in the 1914-17 <i>Endurance</i> (Imperial Trans-Antarctic) Expedition; took over command and aborted Shackleton's 1921-1922 <i>Quest</i> expedition. Farmed in South Africa and suffered a broken marriage, financial failure and alcoholism until his death in 1939.</p> <p>Mills, L (1999) <i>Frank Wild</i>.</p>
Andrew Dougald Watson	24, Australian (Sydney)	Geologist	<p>Took part in several sledging journeys, accompanying F. Wild in his main eastern trip during the summer of 1912-1913.</p> <p>On return he lectured in geology at (Mawson's) University of Adelaide and then became a school teacher in New South Wales and the ACT. Died 1962.</p> <p>Price, B (2005) 'Watson, Andrew Dougald (1885–1962)', <i>ADB Supplementary Volume</i>: 398. Available on-line.</p>

Name	Age & origin	Positions	Biographical information (<i>Mawson, 1915</i>) & sources
Western Base party			
Dr Sydney Evan Jones	24, Australian (Sydney)	Medical Officer	<p><i>Took part in several sledging journeys during 1912 and was leader of the party who explored westward to Gaussberg.</i></p> <p>Returned to New South Wales to serve at mental hospitals, and became one of the first Australian practitioners of psychotherapy: a founding member of the Australasian Association of Psychiatrists. Superintendent of the Broughton Hall institution until his death in 1948.</p> <p>Jones diaries held by the National Library of Australia.</p>
Charles Turnbull Harrison	43, Australian (Hobart)	Biologist	<p><i>For many years previous to joining the Expedition he had done illustrative and artistic work and had been engaged on a survey and in botanical and other scientific observations on the west coast of Tasmania. ... acted as Biologist and Artist, accompanying F. Wild on his main eastern journey and several other sledging parties.</i></p> <p>Lost with all hands aboard the fisheries research vessel <i>Endeavour</i> in December 1914 on its return journey from resupplying Macquarie Island.</p>

Name	Age & origin	Positions	Biographical information (<i>Mawson, 1915</i>) & sources
Western Base party			
Morton Henry Moyes	25, Australian (Koolunga)	Meteorologist	<p><i>Took part in several sledging journeys in the autumn and spring of 1912. During the summer of 1912-1913, through an unavoidable accident, he was left to carry on work alone at Winter Quarters for a period of nine weeks.</i></p> <p>Returned to teach mathematics and navigation at the Royal Australian Naval College. Navigating officer of the <i>Aurora</i> in 1916-17 for its rescue of marooned members of Shackleton's Trans-Antarctic Expedition; seconded to the BANZARE expedition; continued naval service. Long retirement until his death in 1981.</p> <p>Fairfax, D (1986). 'Moyes, Morton Henry (1886–1981)', <i>ADB</i> Vol 10: 602-604. Available on-line.</p> <p>Moyes, JL (1994). <i>Antarctica: ice, aloneness, ice</i>.</p>
Alexander Lorimer Kennedy	22, Australian (Adelaide)	Magnetician	<p><i>Receiving special tuition, he acted as Magnetician at the Western Base ... was a member of several sledging parties and accompanied F. Wild on his main eastern journey as Cartographer.</i></p> <p>Returned to complete his engineering degree at the University of Adelaide, and served with the AIF tunnelling corps in the World War. Worked at observatories and then as a mining engineer in WA. Died 1972.</p> <p>Home, RW and Needham, PJ (1995). 'Kennedy, Alexander Lorimer' in <i>Physics in Australia to 1945</i> by R.W. Home.</p>

Name	Age & origin	Positions	Biographical information (<i>Mawson, 1915</i>) & sources
Western Base party			
Charles Archibald Hoadley	24, Australian (Melbourne)	Geologist	<p><i>Graduate in Mining Engineering of Melbourne University ... took part in several sledging journeys and was Geologist of the party who explored westwards to Gaussberg.</i></p> <p>Returned to teach geology and other skills at technical colleges, and was involved in the Boy Scout movement until his death in 1947.</p> <p>Lack, J (1983). 'Hoadley, Charles Archibald Brookes (1887–1947)', <i>ADB Vol 9</i>: 312-313. Available on-line.</p>
George Harris Sarjeant Dovers	21, Australian (Sydney)	Cartographer	<p><i>In the Antarctic for two summers and one winter ... A member of several sledging parties, he acted as Cartographer to the party which reached Gaussberg.</i></p> <p>Attempted cotton enterprise in Africa. Died 1971. Son Robert Dovers served with ANARE on Heard Island, and led the first winter party at Mawson Station.</p>

Name	Age & origin	Positions	Biographical information (<i>Mawson, 1915</i>) & sources
Macquarie Island party			
George Frederick Ainsworth	33, Australian (Sydney), from Commonwealth Meteorological Bureau	Leader Meteorologist	<p><i>For a period of two years he acted as leader of the Macquarie Island Party, carrying out the duties of Meteorologist.</i></p> <p>Enlisted in the AIF in 1915 and worked on counter-espionage, and in 1918 became inspector in charge of Commonwealth police in Queensland. Headed the foreign section of the Prime Minister's Department, and was the Australian delegate to some key international negotiations, 1921-25. Entered industry, managing car and rubber firms in Australia and New Zealand, and then became state organiser of the United Australia Party, one part of the conservation coalition. Died 1950.</p> <p>Gibbney, HJ (1979). 'Ainsworth, George Frederick (1878-1950)', <i>ADB Vol 7</i>: 21-22. Available on-line.</p>
Leslie Russell Blake	21, Australian (Queensland)	Geologist Cartographer	<p><i>From the Geological Survey Department, Brisbane ... He visited the Antarctic during the final cruise of the 'Aurora' in the summer of 1913-1914.</i></p> <p>Received a Polar Medal for his mapping work. Enlisted as a gunner with the AIF and awarded the Military Cross for courage during the great Somme offensive, promoted to Captain and photographed by Frank Hurley in the Ypres salient in August 1917. In October 1918 he was killed in action, near the Somme.</p> <p>Blake diary held by the National Library of Australia.</p> <p>Gorman, ML (2005). 'Captain Leslie Russell Blake and Aberdeen University's penguin egg', <i>Current Biology</i> 15: 11: 402-405.</p>

Name	Age & origin	Positions	Biographical information (<i>Mawson, 1915</i>) & sources
Macquarie Island party			
Harold Hamilton	26, New Zealander	Biologist	<p><i>Besides being employed on the New Zealand Geological Survey, he acted as Entomological Collector to the Dominion Museum at Wellington. ... Biologist for two years.</i></p> <p>Joined the Dominion Museum in Wellington, discovered a rare frog species, and came to specialise in Maori arts. Died in 1937.</p>
Charles A. Sandell	25, British	Wireless operator Mechanic	<p><i>Studied electrical engineering for some years and then came to Australia in 1909 and entered the Commonwealth Branch of Telephony. Having a practical knowledge of wireless telegraphy he joined the Expedition as a Wireless Operator and Mechanic and was stationed with the Macquarie Island Party for two years. After the departure of A. J. Sawyer in August 1913, he was in complete charge of the wireless station.</i></p> <p>Apparently fought in and survived the War.</p>
Arthur J. Sawyer	26, New Zealander	Wireless operator	<p><i>Having had considerable experience in wireless telegraphy, he joined the Expedition as an operator from the Australasian Wireless Company. At the Macquarie Island Station he was chief wireless until August 1913, when on account of illness he returned to New Zealand.</i></p> <p>Appears to have enlisted for war service and spent time in the South Pacific.</p>

Name	Age & origin	Positions	Biographical information (<i>Mawson, 1915</i>) & sources
Ships' officers			
John King Davis	28, British (England)	Master of <i>S. Y. Aurora</i> Second-in-command of the expedition	<p><i>Served his apprenticeship on the Liverpool-owned sailing-ship, 'Celtic Chief', obtaining his certificate as second mate before joining the barque 'Westland' trading between England and New Zealand. His next post was that of second officer on the training ship 'Port Jackson', following which he joined Sir Ernest Shackleton's Expedition (1907-1909) as chief officer of the 'Nimrod', acting subsequently as master. All five AAE cruises.</i></p> <p>Received the Murchison Award (Royal Geographical Society) for his AAE navigation. Interrupted his war service (based in Sydney) in 1916 to lead the Ross Sea Relief Expedition for Shackleton. Twice invested with the polar medal. Commonwealth director of navigation, 1920-1949. Skipped <i>Discovery</i> for the first BANZARE voyage, but Mawson did not seek his services for the second. Joined Mawson on the government's Antarctic Planning Committee in 1949. Australia's second continental station named for him in 1957. Died 1967.</p> <p>Béchervaise, J (1981). 'Davis, John King (1884–1967)', <i>ADB Vol 8</i>: 238-239. Available on-line.</p> <p>The State Library of Victoria holds the J. K. Davis papers.</p>
John H. Blair	24, British (Scotland)	First officer (later stages of expedition)	<p><i>For five years he served with the Loch Line of Glasgow as apprentice and third mate. As second mate he joined A. Currie and Company, of Melbourne, in the Australian-Indian trade, reaching the rank of first mate, in which capacity he acted during the final AAE cruise.</i></p> <p>Served with the British Navy in the War.</p>

Name	Age & origin	Positions	Biographical information (<i>Mawson, 1915</i>) & sources
Ships' officers			
Percival Gray	22, British (England)	Second officer	<i>Served on the 'Worcester' as cadet captain for eighteen months and as apprentice on the 'Archibald Russell', of Glasgow, and in the New Zealand Shipping Company. In 1909 he entered the Peninsula and Oriental Company and reached the rank of third officer, joining the AAE as second officer. All five AAE cruises.</i>
Clarence Peterson de la Motte	19, Australian (Bullii)	Third Officer	<i>Had early training at sea on the barque 'Northern Chief' of New Zealand, obtaining his certificate as second mate in March 1911. During the eight months prior to joining the Expedition he served as fourth officer on the S.S. 'Warrimoo' of the Union Steamship Company of New Zealand. All five AAE cruises.</i> <i>Joined the Ross Sea Relief Expedition for Shackleton.</i>
F.J. Gillies	35, British (Wales)	Chief Engineer	<i>Served his apprenticeship as an engineer on the steamers of John Shearman and Company and P. Baker and Company of Cardiff. For six years previous to joining the Expedition he was in the Indian trade. All five AAE cruises.</i>

12. Appendices

Appendix I Compliance with Legislation

Compliance with *Environment Protection and Biodiversity Conservation Regulations 2000* (amended 2003): Schedule 5A, Management plans for National Heritage places, and Schedule 7A, Management Plans for Commonwealth Heritage places:

Schedules 5A and 7A: The management plan must:	This plan
(a) Establish objectives for the identification, protection, conservation, presentation and transmission of the National and Commonwealth Heritage values of the place	Section 1
(b) Provide a management framework that includes reference to any statutory requirements and agency mechanisms for the protection of the National and Commonwealth Heritage Values of the place	Sections 5, 7 and 8
(c) Provide a comprehensive description of the place, including information about its location, physical features, condition, historical context and current uses	Section 2
(d) Provide a description of the National and Commonwealth Heritage Values and any other heritage values of the place	Section 3
(e) Describe the condition of the National and Commonwealth Heritage Values of the place	Section 4
(f) Describe the method used to assess the National and Commonwealth Heritage Values of the place	Section 3
(g) Describe the current management requirements and goals including proposals for change and any potential pressures on the National and Commonwealth Heritage Values of the place	Section 6
(h) Have policies to manage the National and Commonwealth Heritage Values of a place, and include in those policies, guidance in relation to the following: <ul style="list-style-type: none"> i) the management and conservation processes to be used; ii) the access and security arrangements, including access to the area for indigenous people to maintain cultural traditions; 	Section 7

- iii) the stakeholder and community consultation and liaison arrangements;
- iv) the policies and protocols to ensure that indigenous people participate in the management process;
- v) the protocols for the management of sensitive information;
- vi) the planning and management of works, development, adaptive reuse and property divestment proposals;
- vii) how unforeseen discoveries or disturbances of heritage are to be managed;
- viii) how, and under what circumstances, heritage advice is to be obtained;
- ix) how the condition of Commonwealth and National Heritage values is to be monitored and reported;
- x) how records of intervention and maintenance of a heritage places register are kept;
- xi) the research, training and resources needed to improve management;
- xii) how heritage values are to be interpreted and promoted

(i)	Include an implementation plan	Section 8
(j)	Show how the implementation of policies will be monitored	Section 9
(k)	Show how the management plan will be reviewed.	Section 10

Compliance with *Environment Protection and Biodiversity Conservation Regulations 2000* (amended 2003): Schedule 5B, National Heritage management principles, and Schedule 7B, Commonwealth Heritage management principles:

	Schedules 5B and 7B	This plan
1	The objective in managing Commonwealth and National Heritage places is to identify, protect, conserve, present and transmit, to all generations, their National and Commonwealth Heritage Values.	Section 1
2	The management of Commonwealth and National Heritage places should use the best available knowledge, skills and standards for those places, and include ongoing technical and community input to decisions and actions that may have a significant impact on their National and Commonwealth Heritage Values.	Section 7

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3	The management of Commonwealth and National Heritage places should respect all heritage values of the place and seek to integrate, where appropriate, any Commonwealth, State, Territory and local government responsibilities for those places.	Section 5
4	The management of Commonwealth and National Heritage places should ensure that their use and presentation is consistent with the conservation of their National and Commonwealth Heritage Values.	Sections 1 & 7
5	The management of Commonwealth and National Heritage places should make timely and appropriate provisions for community involvement, especially by people who: a) have a particular interest in, or associations with, the place; and b) may be affected by the management of the place.	Section 7
6	Indigenous people are the primary source of information on the value of their heritage and that the active participation of indigenous people in identification, assessment and management is integral to the effective protection of indigenous heritage values.	Not applicable
7	The management of Commonwealth and National Heritage places should provide for regular monitoring, review and reporting on the conservation of National and Commonwealth Heritage Values.	Sections 7 & 10

Appendix II
Schedules 5A, 5B, 7A and 7B of the EPBC Regulations

Schedule 5A Environment Protection and Biodiversity Conservation Regulations
Management Plans for National Heritage places (Regulation 10.01C)

A management plan must:

- (a) establish objectives for the identification, protection, conservation, presentation and transmission of the National Heritage values of the place; and
- (b) provide a management framework that includes reference to any statutory requirements and agency mechanisms for the protection of the National Heritage values of the place; and
- (c) provide a comprehensive description of the place, including information about its location, physical features, condition, historical context and current uses; and
- (d) provide a description of the National Heritage values and any other heritage values of the place; and
- (e) describe the condition of the National Heritage values of the place; and
- (f) describe the method used to assess the National Heritage values of the place; and
- (g) describe the current management requirements and goals, including proposals for change and any potential pressures on the National Heritage values of the place; and
- (h) have policies to manage the National Heritage values of a place, and include, in those policies, guidance in relation to the following:
 - (i) the management and conservation processes to be used;
 - (ii) the access and security arrangements, including access to the area for indigenous people to maintain cultural traditions;
 - (iii) the stakeholder and community consultation and liaison arrangements;
 - (iv) the policies and protocols to ensure that indigenous people participate in the management process;
 - (v) the protocols for the management of sensitive information;
 - (vi) the planning and management of works, development, adaptive reuse and property divestment proposals;
 - (vii) how unforeseen discoveries or disturbance of heritage are to be managed;
 - (viii) how, and under what circumstances, heritage advice is to be obtained;

- (ix) how the condition of National Heritage values is to be monitored and reported;
 - (x) how records of intervention and maintenance of a heritage places register are kept;
 - (xi) the research, training and resources needed to improve management;
 - (xii) how heritage values are to be interpreted and promoted; and
- (i) include an implementation plan; and
 - (j) show how the implementation of policies will be monitored; and
 - (k) show how the management plan will be reviewed.

**Schedule 5B Environment Protection and Biodiversity Conservation Regulations
National Heritage management principles (Regulation 10.01E)**

- 1 The objective in managing National Heritage places is to identify, protect, conserve, present and transmit, to all generations, their National Heritage values.
- 2 The management of National Heritage places should use the best available knowledge, skills and standards for those places, and include ongoing technical and community input to decisions and actions that may have a significant impact on their National Heritage values.
- 3 The management of National Heritage places should respect all heritage values of the place and seek to integrate, where appropriate, any Commonwealth, State, Territory and local government responsibilities for those places.
- 4 The management of National Heritage places should ensure that their use and presentation is consistent with the conservation of their National Heritage values.
- 5 The management of National Heritage places should make timely and appropriate provision for community involvement, especially by people who:
 - (a) have a particular interest in, or association with, the place; and
 - (b) may be affected by the management of the place.
- 6 Indigenous people are the primary source of information on the value of their heritage and the active participation of indigenous people in identification, assessment and management is integral to the effective protection of indigenous heritage values.
- 7 The management of National Heritage places should provide for regular monitoring, review and reporting on the conservation of National Heritage values.

**Schedule 5B Environment Protection and Biodiversity Conservation Regulations
Management plans for Commonwealth Heritage places (Regulation 10.03B)**

A management plan must:

- (a) establish objectives for the identification, protection, conservation, presentation and transmission of the Commonwealth Heritage values of the place; and
- (b) provide a management framework that includes reference to any statutory requirements and agency mechanisms for the protection of the Commonwealth Heritage values of the place; and
- (c) provide a comprehensive description of the place, including information about its location, physical features, condition, historical context and current uses; and
- (d) provide a description of the Commonwealth Heritage values and any other heritage values of the place; and
- (e) describe the condition of the Commonwealth Heritage values of the place; and
- (f) describe the method used to assess the Commonwealth Heritage values of the place; and
- (g) describe the current management requirements and goals, including proposals for change and any potential pressures on the Commonwealth Heritage values of the place; and
- (h) have policies to manage the Commonwealth Heritage values of a place, and include in those policies, guidance in relation to the following:
 - (i) the management and conservation processes to be used;
 - (ii) the access and security arrangements, including access to the area for indigenous people to maintain cultural traditions;
 - (iii) the stakeholder and community consultation and liaison arrangements;
 - (iv) the policies and protocols to ensure that indigenous people participate in the management process;
 - (v) the protocols for the management of sensitive information;
 - (vi) the planning and management of works, development, adaptive reuse and property divestment proposals;
 - (vii) how unforeseen discoveries or disturbance of heritage are to be managed;
 - (viii) how, and under what circumstances, heritage advice is to be obtained;
 - (ix) how the condition of Commonwealth Heritage values is to be monitored and reported;
 - (x) how records of intervention and maintenance of a heritage places register are kept;

- (xi) the research, training and resources needed to improve management;
- (xii) how heritage values are to be interpreted and promoted; and
- (i) include an implementation plan; and
- (j) show how the implementation of policies will be monitored; and
- (k) show how the management plan will be reviewed.

**Schedule 7B Environment Protection and Biodiversity Conservation Regulations
Commonwealth Heritage management principles (Regulation 10.03D)**

- 1 The objective in managing Commonwealth Heritage places is to identify, protect, conserve, present and transmit, to all generations, their Commonwealth Heritage values.
- 2 The management of Commonwealth Heritage places should use the best available knowledge, skills and standards for those places, and include ongoing technical and community input to decisions and actions that may have a significant impact on their Commonwealth Heritage values.
- 3 The management of Commonwealth Heritage places should respect all heritage values of the place and seek to integrate, where appropriate, any Commonwealth, State, Territory and local government responsibilities for those places.
- 4 The management of Commonwealth Heritage places should ensure that their use and presentation is consistent with the conservation of their Commonwealth Heritage values.
- 5 The management of Commonwealth Heritage places should make timely and appropriate provision for community involvement, especially by people who:
 - (a) have a particular interest in, or associations with, the place; and
 - (b) may be affected by the management of the place;
- 6 Indigenous people are the primary source of information on the value of their heritage and that the active participation of indigenous people in identification, assessment and management is integral to the effective protection of indigenous heritage values.
- 7 The management of Commonwealth Heritage places should provide for regular monitoring, review and reporting on the conservation of Commonwealth Heritage values.

Appendix III National Heritage List and Commonwealth Heritage List Criteria

- 10.01A Environment Protection and Biodiversity Conservation Regulations
National Heritage criteria (EPBC Act s 324D)
- (1) For section 324D of the Act, subregulation (2) prescribes the National Heritage criteria for the following:
- (a) natural heritage values of places;
 - (b) indigenous heritage values of places;
 - (c) historic heritage values of places.
- (2) The National Heritage criteria for a place are any or all of the following:
- (a) the place has outstanding heritage value to the nation because of the place's importance in the course, or pattern, of Australia's natural or cultural history;
 - (b) the place has outstanding heritage value to the nation because of the place's possession of uncommon, rare or endangered aspects of Australia's natural or cultural history;
 - (c) the place has outstanding heritage value to the nation because of the place's potential to yield information that will contribute to an understanding of Australia's natural or cultural history;
 - (d) the place has outstanding heritage value to the nation because of the place's importance in demonstrating the principal characteristics of:
 - (i) a class of Australia's natural or cultural places; or
 - (ii) a class of Australia's natural or cultural environments;
 - (e) the place has outstanding heritage value to the nation because of the place's importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
 - (f) the place has outstanding heritage value to the nation because of the place's importance in demonstrating a high degree of creative or technical achievement at a particular period;
 - (g) the place has outstanding heritage value to the nation because of the place's strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;

- (h) the place has outstanding heritage value to the nation because of the place's special association with the life or works of a person, or group of persons, of importance in Australia's natural or cultural history;
 - (i) the place has outstanding heritage value to the nation because of the place's importance as part of indigenous tradition.
- (3) For subregulation (2), the **cultural** aspect of a criterion means the indigenous cultural aspect, the non-indigenous cultural aspect, or both.

**10.03A Environment Protection and Biodiversity Conservation Regulations
Commonwealth Heritage criteria (EPBC Act s 341D)**

- (1) For section 341D of the Act, subregulation (2) prescribes the Commonwealth Heritage criteria for the following:
- (a) natural heritage values of places;
 - (b) indigenous heritage values of places;
 - (c) historic heritage values of places.
- (2) The Commonwealth Heritage criteria for a place are any or all of the following:
- (a) the place has significant heritage value because of the place's importance in the course, or pattern, of Australia's natural or cultural history;
 - (b) the place has significant heritage value because of the place's possession of uncommon, rare or endangered aspects of Australia's natural or cultural history;
 - (c) the place has significant heritage value because of the place's potential to yield information that will contribute to an understanding of Australia's natural or cultural history;
 - (d) the place has significant heritage value because of the place's importance in demonstrating the principal characteristics of:
 - (i) a class of Australia's natural or cultural places; or
 - (ii) a class of Australia's natural or cultural environments;
 - (e) the place has significant heritage value because of the place's importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
 - (f) the place has significant heritage value because of the place's importance in demonstrating a high degree of creative or technical achievement at a particular period;
 - (g) the place has significant heritage value because of the place's strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;

-
- (h) the place has significant heritage value because of the place's special association with the life or works of a person, or group of persons, of importance in Australia's natural or cultural history;
 - (i) the place has significant heritage value because of the place's importance as part of indigenous tradition.
- (3) For subregulation (2), the **cultural** aspect of a criterion means the indigenous cultural aspect, the non-indigenous cultural aspect, or both.

Appendix IV Antarctic Specially Protected Area Management Plan

Management Plan for Antarctic Specially Protected Area No. 162

MAWSON'S HUTS
CAPE DENISON, COMMONWEALTH BAY,
GEORGE V LAND, EAST ANTARCTICA

Latitude 67° 00' 30" S, Longitude 142° 39' 40" E

Mawson's Huts are four timber huts that served as the winter base of the Australasian Antarctic Expedition of 1911–14 organised and led by geologist Dr Douglas Mawson. An important symbol of the so-called 'heroic age' of Antarctic exploration (1895-1917), the huts at Cape Denison are the least disturbed and altered of those structures remaining from the era. The achievements of the Mawson expedition include some of the earliest and most comprehensive studies of Antarctic geology, glaciology, oceanography, geography, terrestrial magnetism, astronomy, meteorology, biology, zoology and botany.

In recognition of the rarity and richness of this social, cultural and scientific resource, including the important technical, architectural and aesthetic value of the huts, all four Australasian Antarctic Expedition huts are designated as an ASPA, embedded within the Cape Denison ASMA 03.

1.0 Description of Values to be Protected

This ASPA is proposed on the grounds that Mawson's Huts are a site of historic, archaeological, technical, social and aesthetic values.

Historic value

Mawson's Huts at Cape Denison, Commonwealth Bay was the main base of the Australasian Antarctic Expedition (AAE) of 1911–14, led by Dr Douglas Mawson. It is one of only six hut sites in Antarctica remaining from the 'heroic age'.

Mawson's Huts is one of a group of 'heroic age' huts where pragmatic consideration of the need to provide permanent shelter in the Antarctic environment resulted in an expedition hut form suitable for polar regions.

Mawson's Huts were built in January, February and March 1912 and May 1913. In their surviving form and setting the huts illustrate the isolation and harsh environment of Cape Denison.

They also demonstrate the cramped internal conditions endured by expedition members. The living quarters in the Main Hut, for example, a single space measuring 7.3 m x 7.3 m, provided sleeping and kitchen facilities for 18 men.

The external form and internal structure of the largest hut, the Main Hut, are a simple but strong architectural concept: a square base topped by a pyramid roof (to prevent damage by blizzards), with skylights to provide natural lighting. Following the decision to combine two expedition bases into one, a hip-roofed accommodation hut measuring 5.5 m x 4.9 m was adjoined to the living quarters and equipped as a workshop. A 1.5 m wide verandah surrounded the structure on three sides, under the same roof. The verandah was used as a storage space that also assisted in insulating the hut from the weather.

The two huts that form the Main Hut were built of Oregon timber frames clad with Baltic pine tongue-and-groove boards. They were prefabricated in Australia, and on-site construction was assisted by a branded letter code on framing members and coded colours painted on board ends. (None of the expedition party had any previous construction experience.) The survival of the Main Hut at one of the windiest sites on Earth is testimony to the strength of its design and care of its construction.

Mawson's Huts contain numerous significant and relatively untouched artefacts from the 'heroic age', which form a rich resource of material available for research and interpretation, and potentially yielding information about aspects of expeditioner life not included in official written accounts.

The three other AAE huts are:

The Absolute Magnetic Hut, constructed during February 1912. It measured 1.8 m x 1.8 m in plan with a skillion roof and had an Oregon timber frame to which boards of remnant timber were fixed. The hut was used in association with, and as a reference point for, observations made in the Magnetograph House. Today it is considered to be a standing ruin.

The Magnetograph House was erected in March 1912 to house equipment used to measure variations in the South Magnetic Pole. It measures 5.5 m x 2 m with a shallow pitched skillion roof and no windows. After the first building attempt was demolished by high winds, large rocks were heaped against the new hut to provide a wind barrier. Sheepskin and hessian attached to the roof also assisted in keeping the internal temperature constant and in minimising the ingress of drift snow. These innovations may have contributed to the relatively intact condition of the hut today.

Construction of the Transit Hut commenced in May 1913, with packing case timbers being affixed to an Oregon frame. The structure was also clad in sheepskin and canvas. Originally known as the Astronomical Observatory, the hut housed the theodolite used to take star sights to determine the exact longitude of Cape Denison. It is now considered to be a standing ruin.

Aesthetic values

Mawson's Huts are of aesthetic value; the building form of the huts themselves shows the functional and efficient planning that was undertaken in response to the site position and the elements endured by the expedition members. The weathering of the huts and the decay of the remains gives a feeling of time elapsed and exposure to the elements.

2.0 Aims and Objectives

The aim of the management plan is to provide protection for the huts so that their values can be preserved. Management of the Area aims to:

- avoid degradation of, or substantial risk to, the values of the Area;
- maintain the historic values of the Area through planned conservation¹ and archaeological work programs;
- allow management activities which support the protection of the values and features of the Area;
- allow scientific research; and
- prevent unnecessary human disturbance to the Area, its features and artefacts by means of managed access to the four Australasian Antarctic Expedition huts.

¹ In the context of this Management Plan the term *conservation* "means all the processes of looking after a place so as to retain its cultural significance", as defined in Article 1.4, of *The Burra Charter: The Australian ICOMOS Burra Charter, 1999*.

3.0 Management Activities

The following management activities may be undertaken to protect the values of the Area:

- programs of conservation and archaeological work and environmental monitoring work on Mawson's Huts and any artefacts contained within the huts and the five (5) metre buffer zone around the huts;
- visits made as necessary for management purposes;
- review of the Management Plan at least once every five (5) years, and update as required;
- consultation among national Antarctic programs operating in the region, or those with an interest or experience in Antarctic historic site management, with a view to ensuring the above provisions are implemented effectively; and
- installation of signage to indicate the boundaries of the ASPA.

4.0 Period of Designation

This ASPA is designated for an indefinite period.

5.0 Description of the Area

5.1 Geographical coordinates, boundary markers and natural features

Cape Denison is a 1.5 km-wide peninsula projecting into the centre of Commonwealth Bay, a 60 km-wide stretch of coast in George V Land, east Antarctica. The topography of Cape Denison is defined by a series of four rocky ridges, running south-southeast to north-northwest, and three valleys filled with ice, snow, and glacial moraine. The largest, most westerly of these valleys contain the four Australasian Antarctic Expedition huts. At the seaward end of this valley is Boat Harbour, a 400 m long indent in the coast.

Map A indicates that Mawson's Main Hut is located about 65 m from the harbour. The Transit Hut is located 40 m northeast of the Main Hut; the Magnetograph House is approximately 310 m north-northeast of the Main Hut; and the Absolute Magnetic Hut is about 275 m northeast of the Main Hut.

The ASPA covers four areas. Each area consists of one hut and a five (5) metre buffer zone extending from the perimeter of the hut. The huts are located at:

- Main Hut: 67° 00' 31" S, 142° 39' 39" E;
- Transit Hut: 67° 00' 30" S, 142° 39' 42" E;
- Absolute Magnetic Hut: 67° 00' 23" S, 142° 39' 48" E; and
- Magnetograph House: 67° 00' 21" S, 142° 39' 37" E.

Cape Denison is the summer habitat for breeding Adélie penguins, Wilson's storm-petrels, snow petrels and south polar skuas. Several colonies are located close to the proposed ASPA, and the ASPA areas may from time to time be traversed by penguins returning to their nests. Weddell seals, southern elephant seals and leopard seals have been recorded hauling out and, in the case of elephant seals, moulting at Cape Denison. However, the presence of seals within the immediate ASPA boundaries is unknown.

The only flora evident near the huts are lichens and non-marine algae. Although the non-marine algae have yet to be studied, a list of lichen species is included at Appendix A.

5.2 Access to the Area

Sea, land and air access to Mawson's Huts is difficult due to the rugged topography and climate of the area. Sea ice extent and uncharted bathymetry may constrain ship access to approximately 3nm from the coastline. Access is then gained either by small watercraft or by helicopter, although attempts to land are frequently hampered by heavy seas and prevailing north-westerly or katabatic winds. Boat landings may be made at Boat Harbour and due north of Sørensen Hut (within ASMA 03). The helicopter landing site and approach and departure flight paths are indicated on Map C.

Onshore access to and within the ASPA is on foot. With the exception of a short boardwalk close to the Main Hut, there are no roads or other transportation infrastructure on shore. The boardwalk is frequently covered by snow and therefore unusable for all but a few weeks of the year.

5.3 Location of structures and other anthropogenic objects within and near to the Area

The ASPA is located within the Cape Denison ASMA, which features several other structures from this expedition, including survey markers and the mast atop Anemometer Hill; and six non-historic structures, including temporary field shelters. The non-historic structure located closest to the ASPA is Granholm Hut, situated some 160 m northwest of the Main Hut. It contains numerous building materials, some field equipment and limited provisions. More building materials are stored beneath the hut. To the east of Granholm Hut is a stack of timbers for use in conservation work on the Main Hut. This stack is secured with galvanised wires attached to rock bolts. A similar timber stack is located on rocks some 100 m southeast of the Main Hut.

Objects left by the Australasian Antarctic Expedition are strewn within the Area. Of particular note is the artefact scatter located immediately north of the Main Hut. Due to their significant cultural heritage value, these artefacts have been included within the Cape Denison ASMA and HSM No. 77.

5.4 Location of other protected areas in or near to the Area

ASPA 162 is located within the Cape Denison ASMA. For further details about ASMA 03, refer to the separate document pertaining to this Area. Cape Denison is simultaneously listed as a Historic Site under the Antarctic Treaty.

6.0 Zones within the Area

There are no zones within ASPA 162.

7.0 Maps of the Area

Map A: Cape Denison Management Zones. This map shows the boundaries of the ASMA, the Historic Site, the Visual Protection Zone, ASPA No. 162, and significant topographic features of the Area. The inset map indicates the location in relation to the Antarctic continent.

Map Specifications:

- Projection: UTM Zone 54
- Horizontal Datum: WGS84

Map B: Cape Denison Visual Protection Zone. This map shows the boundaries of the Visual Protection Zone and indicates the position of significant historic artefacts, including the four Australasian Antarctic Expedition huts, the Memorial Cross, and Anemometer Hill, the site of the BANZARE Proclamation Pole.

Map Specifications:

- Projection: UTM Zone 5
- Horizontal Datum: WGS84

Map C: Cape Denison Flight Paths and Bird Colonies. This map indicates the approaches, departures and landing site for helicopters, as well as the location of bird colonies in the vicinity.

Map Specifications:

- Projection: UTM Zone 54
- Horizontal Datum: WGS84

8.0 Permit Conditions

Annex V of the Protocol on Environmental Protection to the Antarctic Treaty (Madrid Protocol) prohibits entry into an ASPA except in accordance with a Permit. Permits shall only be issued by appropriate national authorities and may contain general and specific conditions. A Permit may be issued by a national authority to cover a number of visits in a season. Parties operating in the Commonwealth Bay area shall consult together and with non-government operators interested in visiting the Area to ensure that visitors are managed appropriately.

General conditions for issuing a Permit to enter the ASPA may include:

- activities related to conservation, inspection, maintenance, research and/or monitoring purposes;
- management activities consistent with and/or in support of the management objectives of the ASPA Management Plan objectives; and

- educational purposes and activities, including tourism, consistent with the aims and objectives of this Management Plan.

The Permit should be issued for a stated period and shall be carried within the Area. A visit report must be supplied to the authority named in the Permit within three (3) months of the expiry date of the Permit.

8.1 Access to and movement within or over the Area

Onshore access to and within the huts is on foot. Depending on snow conditions, a short boardwalk close to the Main Hut may be accessible and should be used whenever practicable so as to avoid potential impact on the artefact scatter to the north of the Main Hut.

8.1.1 Visitor management

Day visits to Mawson's Huts may be permitted, provided that:

- each group is accompanied by a person with cultural heritage skills (to the satisfaction of the permitting Party) who remains in the Area for the duration of the visit;
- briefings on this management plan and the values of the ASPA are conducted prior to visits and adequate site interpretation materials are made available to each visitor;
- visitors accessing the Area avoid sensitive historic artefacts, such as the artefacts scatter to the immediate north of the Main Hut, and other sensitive areas, such as lichen communities; and
- visitors do not touch the exterior fabric of the buildings or any artefacts.
- Visitors may enter the Main Hut and Magnetograph House provided that:
 - a person who has approved cultural heritage skills accompanies all visitors inside the huts;
 - visitation of the interior of the huts is limited to up to four (4) persons (including the guide) at any one time inside the Main Hut, and up to three (3) persons (including the guide) in the Magnetograph House; and
 - artefacts, scientific and related conservation management equipment and the interior building fabric are not touched.

Authorised work parties undertaking approved conservation and/or archaeological work programs are exempt from the provisions of this sub-section.

8.2 Activities which are or may be conducted within the Area

- Activities related to the regular program of conservation work, and activities for inspection, maintenance, research and/or monitoring purposes;
- scientific research;
- visitation for educational purposes, including tourism; and
- visitation to assess the effectiveness of the management plan and management activities.

8.3 The installation, modification, or removal of structures

Other than to preserve the values of Mawson's Huts, no new structures or equipment should be installed.

No alteration to Mawson's Huts shall be made, or structures installed, except for those required for the conservation, research, monitoring or maintenance activities specified above.

Cape Denison is simultaneously designated as a Historic Site. In accordance with Annex V, Article 8 (4) of the Protocol, no historic structure or other artefact at Cape Denison (including Mawson's Huts) should be damaged, removed or destroyed except in accordance with an approved conservation and/or archaeological work program. A historic artefact may only be removed from the Area for the purposes of conservation and/or preservation and then only in accordance with a Permit issued by a national authority.

The repatriation of the artefact to its original location at Cape Denison is generally preferable unless further damage or deterioration may result from repatriation.

8.4 The location of field camps

Camping is not allowed within the Area.

Use of Mawson's Huts for accommodation is not permitted.

Existing non-historic infrastructure within the ASMA should be used by Parties undertaking activities in accordance with this management plan, in preference to establishing new infrastructure.

Tents should be pitched on the wooden platform adjacent to Sørensen Hut.

8.5 Restrictions on materials and organisms that may be brought into the Area

No living animals, plant material, micro-organisms or soils shall be deliberately introduced into the Area, and all reasonable precautions shall be taken to prevent accidental introductions.

No poultry or poultry products, with the exception of sterilised egg powder, may be brought into the Area.

No polystyrene packaging materials may be brought into the Area.

No pesticides or herbicides may be brought into the Area, except those used for the purposes of conservation or preservation of historic structures or artefacts, which shall be allowed into the Area in accordance with a Permit, and then removed from the Area at or before the conclusion of the activity for which the Permit was granted.

Fuel, food and other materials are not to be deposited in the Area, unless required for essential purposes connected with the activity for which the Permit has been granted.

Use of combustion-type lanterns is not permitted inside the Area under any circumstances.

Smoking in the Area is not permitted.

8.6 Taking or harmful interference with native flora or fauna

Taking or harmful interference with native flora and fauna is prohibited, except in accordance with a separate Permit issued under Article 3 of Annex II (of the Protocol on Environmental Protection to the Antarctic Treaty) by the appropriate national authority specifically for that purpose.

8.7 The collection or removal of anything not brought into the Area by the Permit holder

No historic structure or other artefact in the Area may be handled, disturbed or removed from the Area unless for conservation, preservation or protection purposes, or for scientific reasons, and then only in accordance with a Permit issued by an appropriate national authority.

The repatriation of the artefact to the location at Cape Denison from which it was removed is generally preferable unless further damage or deterioration may result from repatriation.

If an artefact is to be removed, the Australian national program should be informed so that documentation regarding that program's archaeological research at Mawson's Huts may be amended accordingly.

Material of human origin that is likely to compromise the values of the Area, and which was not brought into the Area by the Permit holder or otherwise authorised, may be removed unless the impact of removal is likely to be greater than leaving the material in situ. If material is to be removed, the appropriate Authority must be notified and approval obtained.

8.8 Disposal of wastes

All wastes, including human wastes, should be removed from the Area.

8.9 Measures that may be necessary to ensure aims and objectives of the Plan can continue to be met

The provision of information for tourists and other visitors to the Area:

- including a briefing video and interpretative literature;
- a post-visit survey to assist in the formal monitoring of visitor impact (with primary regard to conservation requirements, rather than visitor access);
- off-site interpretation of the Area that maximises the use of available media, including the Internet; and
- the development of skills and resources, particularly those related to the excavation of artefacts from ice, to assist in the protection of the Area's values.

8.10 Reports to be made to the appropriate authority regarding visits to the Area

To enhance cooperation and the coordination of activities in the Area, to allow for effective site monitoring and management, to facilitate the consideration of cumulative impacts, and to fulfil the aims and objectives of this Management Plan, Parties should ensure that the principal holder for each Permit issued submits a report describing the activities undertaken. Such reports should include, as appropriate, the information identified in the Visit Report Form contained in Appendix 4 of Resolution 2 (1998)(CEP 1).

9.0 Exchange of Information

Parties should maintain a record of activities approved for this ASPA and, in the Annual Exchange of Information, should provide summary descriptions of activities conducted by persons subject to their jurisdiction, which should be in sufficient detail to allow evaluation of the effectiveness of this Management Plan. Parties should, wherever possible, deposit originals or copies in a publicly accessible archive (such as the dedicated Mawson's Huts website at http://www.aad.gov.au/mawsons_huts) to maintain a record of visitation of the Area, to be used both in any review of this Management Plan and in organising further visitation and/or use of the Area.

10.0 Supporting Documentation

Angela Bender, mapping officer, Antarctic Division, pers. comm. 9 April 2003; 16 April 2003.

Dodge, C.W. 1948. BANZARE Reports, Series B, Vol. VII. British Australia New Zealand Antarctic Expedition.

Foreign & Commonwealth Office London/British Antarctic Survey 1997. List of Protected Areas in Antarctica.

Godden Mackay Logan 2001. Mawson's Huts Historic Site, Cape Denison Commonwealth Bay Antarctica: Conservation Management Plan 2001. Sydney: Godden Mackay Logan: 36, 41–43, 110, 146, 147, *passim*.

Hayes, J. Gordon 1928. Antarctica: a treatise on the southern continent. London: The Richards Press Ltd.: 212.

McIntyre, D, and M. McIntyre 1996. 'Weddell seal survey in Boat Harbour'. In: Antarctic Division 1997. Initial Environmental Evaluation: AAP Mawson's Huts Foundation Conservation Program 1997–98: Attachment D.

Mawson, D. 1996 (reprint). The Home of the Blizzard. Adelaide: Wakefield Press: 53, 54, 62, 68.

Patterson, D. 2003. Mawson's Huts Conservation Expedition 2002: Field Leader's Report.

Professor Rod Seppelt, botanist, Antarctic Division, pers. comm. 19 February 2003.

Appendix A

Flora recorded at Cape Denison, Commonwealth Bay

The following taxa were recorded at Cape Denison by the Australasian Antarctic Expedition (AAE) of 1911–14 and the British Australian New Zealand Antarctic Research Expedition (BANZARE) in 1929–31 and published by Carroll W. Dodge in *BANZARE Reports, Series B, Vol. VII*, July 1948.

LICHENS

Lecideaceae

Lecidea cancriformis Dodge & Baker
Toninia johnstoni Dodge

Umbilicariaceae

Umbilicaria decussata (Vill.) Zahlbr.

Lecanoraceae

Rhizoplaca melanophthalma (Ram.) Leuck. & Poelt
Lecanora expectans Darb.
Pleopsidium chlorophanum (Wahlenb.) Zopf

Parmeliaceae

Physcia caesia (Hoffm.) Th. Fr.

Usneaceae

Pseudephebe minuscula (Nyl. ex Arnold) Brodo & D. Hawksw.
Usnea antarctica Du Rietz

Blasteniaceae

Candelariella flava (C.W. Dodge & Baker) Castello & Nimis
Xanthoria elegans (Link) Th. Fr.
Xanthoria Mawsonii Dodge

Buelliaceae

Buellia frigida Darb.

BRYOPHYTES

No bryophytes evident at Cape Denison.

There are numerous non-marine algae; however, no surveys have been undertaken.

Appendix V Antarctic Specially Managed Area Management Plan

Management Plan for Historic Site and Monument 72 and
Antarctic Specially Managed Area No. 3

CAPE DENISON, COMMONWEALTH BAY,
GEORGE V LAND, EAST ANTARCTICA

Latitude 67° 00' 13" S–67° 00' 50" S
Longitude 142° 40' 00.1" E–142° 41' 27" E

Introduction

Cape Denison, Commonwealth Bay is one of the principal sites of early human activity in Antarctica. It is the location of the base of the Australasian Antarctic Expedition of 1911-14 organised and led by Dr (later Sir) Douglas Mawson. An important symbol of the 'heroic age' of Antarctic exploration (1895-1917), it is one of only six hut sites remaining from this period. Cape Denison hosted some of the earliest comprehensive studies of Antarctic geology, geography, terrestrial magnetism, astronomy, meteorology, glaciology, oceanography, biology, zoology and botany. It was also the base of numerous explorations inland and features artefacts associated with these sledging parties, including food caches and equipment. Due to the considerable historical, cultural and scientific significance of Cape Denison, the entire area is designated as an Antarctic Specially Managed Area (ASMA) consistent with Articles 2, 4, 5 and 6 of Annex V of the Protocol on Environmental Protection to the Antarctic Treaty. It is also listed as a Historic Site and Monument in accordance with Article IX(1) of the Antarctic Treaty and Article 8(2) of Annex V of the Protocol.

Cape Denison is characterised by four valleys aligned northwest/southeast. The majority of Australasian Antarctic Expedition artefacts, including buildings ('Mawson's Huts') and other structures, are concentrated in the westernmost valley and on the ridges on either side of the valley. The historic huts and their immediate surrounds constitute Antarctic Specially Protected Area (ASPA) No. 162.

1.0 Description of Values to be Protected

1.1 Primary values

This ASMA is proposed on the grounds that Cape Denison is a site of historic, archaeological, social and aesthetic values.

Historic value

Antarctica's 'heroic age' was a period of great human adventure and discovery. Cape Denison, Commonwealth Bay provides the setting for the buildings, structures and relics of the Main Base of the Australasian Antarctic Expedition (AAE) of 1911–14, led by Dr Douglas Mawson.

The prime focus of Mawson's was scientific research. Nevertheless, the expedition also had an exploratory agenda, with the aim of charting the entire Antarctic coastline immediately south of Australia. For this purpose at least five sledging expeditions were undertaken from Cape Denison from spring 1912, including the infamous Far-Eastern Sledging Party during which expeditioners Belgrave Ninnis and Xavier Mertz perished and Mawson himself barely survived. Overall, more than 6,500 km of coastline and hinterland was explored by sledging parties of the Expedition.

Cape Denison contains numerous relics relating to the work of Mawson's expedition, including Mawson's Huts and other significant and relatively untouched artefacts from the 'heroic age'. While the majority is concentrated in the westernmost valley and its immediate surrounds, the historical boundaries of the Main Base extend further. Artefacts and other evidence of occupation, such as food caches, extend across the entire Cape, forming a rich resource of material available for research and interpretation, and potentially yielding scientific data and information about aspects of expeditioner life not included in official written accounts.

Aesthetic values

This ASMA is designated to preserve not only the artefacts remaining *in situ* but also the cultural landscape of Cape Denison in which Mawson and his men lived and worked. Cape Denison is characterised by its almost incessant blizzard conditions, which severely limit access to the region and activities at the site. System and katabatic winds pour down the plateau and funnel through the Cape's valleys; blasting the hut with gusts that in May 1912 reached 322 km/h. (The average wind speed for the month was 98 km/h). Cape Denison is not only the windiest place in Antarctica, but also the windiest place on Earth at sea level. The site thus provides the physical and symbolic context of the extreme isolation and harsh conditions endured by the expedition members and, by association, all other 'heroic age' researchers and explorers. In designating the entire area as

mawson's huts

HISTORIC SITE

an ASMA, Cape Denison's unique 'sense of place' is protected, with Mawson's Huts and Boat Harbour as the focus of the visual catchment. Mawson's Huts themselves are provided with additional protection in ASPA 162.

Educational values

Cape Denison's wildlife and undisturbed artefacts, framed against the dramatic backdrop of the Antarctic Plateau, represent significant educational values. The Area's isolation and extreme weather provide visitors with a unique insight into the conditions endured by 'heroic age' researchers and explorers, and a chance to form a deeper appreciation of their achievements.

Environmental values

The paucity of relatively ice-free areas in the immediate region means that Cape Denison represents an important assemblage of life forms (Appendices A and C). The closest ice-free areas of equal or greater size to Cape Denison are approximately 20 km to the east of Cape Denison (from the centroid of the ASMA), and approximately 60 km to the west respectively. A haul-out site for Weddell, leopard and elephant seals, the Cape is also an important breeding area for Adélie penguins, Wilson's storm-petrels, snow petrels and south polar skuas.

Flora at Cape Denison is represented by 13 lichen species distributed on boulders and other moraines throughout the peninsula. These species are listed at Appendix C. No bryophytes are evident. The lichens' distribution on rocks, which are subject to different patterns of snow ablation, makes them vulnerable to trampling and other interference by visitors, however infrequent visitation may be.

Cape Denison has 13 small lakes. These are associated with glacial action, are a permanent feature, and are frozen over for most of the year. Since such lakes are also susceptible to physical, chemical and biological modification within their catchment boundaries, a catchment-based approach to the management of human activities is required.

Scientific values

Mawson, a geologist, planned his expedition in order to examine the theories about continental connection and the processes of glaciation and climate. He also sought to study the South Magnetic Pole and magnetic charting for navigational purposes; to conduct biological studies, including the identification of new species; and to establish a weather station.

Cape Denison provides opportunities to repeat Mawson's experiments and conduct further research into magnetism, meteorology, biology, and other sciences. For example, although Antarctic lakes are generally recognised as valuable due to their relatively simple natural ecosystems, the lakes at Cape Denison have neither been sampled nor their biota studied. There are also numerous non-marine algae present; however, no surveys have been undertaken.

The records from Mawson's expedition provide a dataset against which the results of modern research may be compared, and the site's isolation lends it considerable value for future use as a reference site for other areas that experience a greater level of human activities.

2.0 Aims and Objectives

Management of the Area aims to assist in planning and co-ordinating current and future activities in the Area, to avoid possible conflicts, and to improve co-operation between Parties in order to avoid degradation of, or substantial risk to, the values of the Area. Management objectives are:

- to prevent degradation of the Area, its features, artefacts, and values;
- to maintain the heritage values of the Area through planned conservation² and archaeological work programs; and
- to provide for management activities which support the protection of the values and features of the Area.

3.0 Management Activities

The following management activities may be undertaken to protect the values of the Area:

- research and other activities essential or desirable for understanding, protecting and maintaining the values of the Area;
- the removal of objects not related to the AAE of 1911–14 and/or the British Australian New Zealand Antarctic Research Expeditions (BANZARE) of 1929–31 and that compromise the historic and aesthetic values of the Area, provided that removal does not adversely impact on the values of the Area, and that the objects are appropriately documented prior to removal. Priority should be given to the removal of field infrastructure from the Visual Protection Zone, giving consideration to the needs (including those of safety) of conservation workers and the program of conservation works;
- essential maintenance of other objects and infrastructure, including the Automatic Weather Station;

² In the context of this Management Plan the term *conservation* "means all the processes of looking after a place so as to retain its cultural significance", as defined in Article 1.4, of *The Burra Charter: The Australian ICOMOS Burra Charter, 1999*.

- installation of signage to indicate the boundaries of the HSM and ASMA;
- visitation of the Area as necessary to assess whether it continues to serve the purposes for which it was designated and to ensure that management activities are adequate; and
- consultation with other national Antarctic programs operating in the region, or those with an interest or experience in Antarctic historic site management, with a view to ensuring the above provisions are implemented effectively.

4.0 Period of designation

This ASMA is designated for an indefinite period.

5.0 Description of the Area

5.1 Geographical coordinates, boundary markers and natural features

Cape Denison (67° 00' 13" S-67° 00' 050" S; 142° 39' 02" E-142° 41' 28" E) is located in the centre of Commonwealth Bay, a 60 km-wide stretch of coast in George V Land some 3,000 km south of Hobart, Australia. The Cape itself is a rugged, 1.5 km-wide tongue of ice, snow, rock and moraine projecting into Commonwealth Bay from the steeply rising wall of the ice cap of continental Antarctica. On the western side of the Cape is Boat Harbour, a 400m-long indentation in the coast.

The designated ASMA (Map A) extends from Land's End (67° 00' 46" S, 142° 39' 24" E) in the west, along the coastline to the northern tip of the western shore of Boat Harbour (67° 00' 24" S, 142° 39' 28" E), across the mouth of Boat Harbour (in a straight north-easterly diagonal) to the northern tip of Penguin Knob (67° 00' 17" S, 142° 39' 31" E) on the eastern shore of Boat Harbour, and then along the coastline in a south-easterly direction down to John O'Groats (67° 00' 47" S, 142° 41' 27" E). The southern boundary extends in a straight line from Land's End to John O'Groats along latitude 67° 00' 47" S. With the exception of the boundary across the mouth of Boat Harbour, the northern coastal boundary extends to that land above the lowest tide.

The shoreline and the ice cliffs at both ends of the Cape (Land's End and John O'Groats) form a clearly defined boundary; as such, no boundary markers have been installed because the coast is a clearly defined boundary. Signs will be installed at the eastern (John O'Groats) and western (Land's End) limits of the southern boundary.

Natural features: Topography and geomorphology

The topography of Cape Denison is defined by a series of four rocky ridges, running south-southeast to north-northwest, and three valleys. The largest, most westerly of these valleys contains the AAE buildings, which are protected within ASPA 162. The basement of the Cape Denison area consists of partially migmatized, massive felsic orthogneiss intruded about 2350 million years ago (Ma) into an older metamorphosed sequence. Above the basement the area features a lower zone of relatively polished rock and a higher zone of relatively unpolished rock; the former being especially prominent below 12 metres above sea level and indicative of more recent uplift and exposure than the upper zone. An upper and lower moraine are apparent, with the upper moraine, closer to the edge of plateau, containing a diversity of angular boulders. The lower moraine is dominated by local rocks sorted into bands, perhaps the result of an 'ice push' from the sea rather than being genuine glacial moraine.

Water bodies

Cape Denison contains 13 small glacial lakes, which are generally oriented parallel to the foliation of the basement rocks. At the height of summer Cape Denison also features numerous melt streams which flow into Commonwealth Bay. It is not known whether the streams flow down established courses, or whether the streams are a feature of the regular freeze/thaw cycle.

Biological features

Cape Denison is the summer habitat for breeding Adélie penguins, Wilson's storm-petrels, snow petrels and the south polar skua (Map C). Other species sighted in the area include the Cape petrel, Antarctic petrel, southern giant petrel and emperor penguin. A full list of species and number of breeding pairs (where available) is attached as Appendix A.

Weddell seals, southern elephant seals and leopard seals have been recorded as hauling out and, in the case of elephant seals, moulting at Cape Denison. However, the sporadic nature of visits to the Area means that monitoring has been inconsistent and the exact extent of the seal population uncertain. Some data is presented in Appendix Bii.

The only flora evident at Cape Denison is lichens, for which a list of species is included at Appendix C, and non-marine algae, which have yet to be studied.

5.2 Access to the Area

Sea, land and air access to Cape Denison is difficult due to the rugged topography and climate of the area. Sea ice extent and uncharted bathymetry may constrain ship access to approximately 3nm from the coastline. Access is then gained either by small watercraft or by helicopter, although attempts to land are frequently hampered by heavy seas and prevailing north-westerly or katabatic winds. Boat landings may be made at Boat Harbour and due north of Sørensen Hut. The helicopter landing site and approach and departure flight paths are indicated on Map C.

There are no roads or other transport infrastructure on shore. Land vehicles should only be used in accordance with the Code of Conduct (see Section 8.0).

Pedestrian access within the Area is unrestricted except in places where AAE buildings, artefacts, or bird or lichen colonies are present, and should be conducted in accordance with the Code of Conduct (see Section 8.0).

5.3 Location of structures and other anthropogenic objects within and near to the Area

Cape Denison is notable for being the location of four historic buildings and a Memorial Cross constructed by the AAE of 1911-1914. The buildings and their immediate environs are protected by ASPA 162.

Within the ASMA there are several AAE structures, including survey markers and the mast on top of Anemometer Hill, about 150 m east of Mawson's Main Hut. On 5 January 1931 members of the BANZARE party (including Douglas Mawson) visited Cape Denison to claim formal possession of George V Land on behalf of Great Britain, and used the mast to support the proclamation flag and canister containing the proclamation itself. A small timber plaque and proclamation, still attached to the mast, are the only 'formal' artefacts of that visit remaining *in situ* today.

Cape Denison additionally features six other structures: an automatic weather station (AWS); a field shelter known as Sørensen Hut; a red fibreglass 'Apple' hut; a wooden platform on which tents may be pitched; a field shelter known as Granholm Hut, and a plaque near Mawson's Main Hut indicating that the hut is a Historic Monument.

The AWS is located at 67° 00' 33" S; 142° 39' 51" E on a rise near Round Lake and approximately 150 m southeast of Mawson's Main Hut. It has been operating since 1990 as part of the Antarctic Automatic Weather Project of the University of Wisconsin-Madison, and is the property of that institution.

Sørensen Hut is located about 400m east of Mawson's Main Hut at 67° 00' 29" S; 142° 40' 12" E. It was constructed by the Australian national program in 1986 to provide temporary shelter for parties conducting conservation works on Mawson's Huts and contains some provisions and field equipment. Numerous items are also stored underneath and immediately adjacent to Sørensen Hut, and in the adjacent Apple hut.

Granholm Hut is situated at 67° 00' 29" S; 142° 39' 26" E, some 160 m northwest of Mawson's Main Hut. It was constructed in 1978 to provide a temporary shelter and workshop for parties working on Mawson's Huts. It contains numerous building materials, some field equipment and limited provisions. Additional building materials are stored beneath the hut.

To the east of Granholm Hut is a stack of Oregon and Baltic pine timbers for use in conservation work on the Main Hut. This stack is secured with galvanised cables attached to rock bolts. A similar timber stack is located on rocks some 100 m southeast of the Main Hut and 10 m east of the designated helicopter landing site.

The HSM marker currently situated adjacent to the Main Hut will be replaced by appropriate signage to indicate that the whole of Cape Denison has been designated as a Historic Site. The signage will be in the English, French, Spanish and Russian languages, and will indicate the protection status of the site and its contents under the Antarctic Treaty.

Objects left by Mawson's expedition are scattered throughout the Area, and appear from year to year depending on snow cover. These include cairns; cached seal and penguin carcasses; timbers; and a large collection of disassembled penguin skeletons. It is believed that a significant number of artefacts exist under the snow and have yet to be uncovered. It is additionally possible that artefacts from the ice cave known as 'Aladdin's Cave', a sledging depot excavated by Mawson's expedition in 1912, may also be present in the vicinity of the ASMA, if not within the ASMA itself. The cave was originally located on the plateau at 67° 05' S, 142° 38' E, some 8 km south of Mawson's Main Hut, but it may have been relocated (via the movement of ice) up to 4.5 km down-slope from the original 1912 location. Its exact location has yet to be determined.

5.4 Location of other protected areas in or near to the Area

ASPA 162, encompassing the four AAE huts, is located within the Cape Denison ASMA, and exists to protect their historic and social values.

The Cape Denison ASMA is to be simultaneously listed as Historic Site No. 72 under the Antarctic Treaty.

There are no other ASPAs or ASMAs within 50 km of Cape Denison.

6.0 Zones within the Area

All activities within the Area are to comply with the provisions of the Madrid Protocol and the Code of Conduct contained in this management plan (see Section 8.0). In addition to these general guidelines, three zones are defined in which restrictions on certain activities are deemed necessary in order to meet the management objectives for the Area.

6.1 ASPA 162

ASPA 162 (Mawson's Huts) is located within the ASMA. This ASPA encompasses the four Australasian Antarctic Expedition huts in order to protect their historic and social values. Entry to the ASPA and activities within it require a permit and must be carried out in accordance with the ASPA Management Plan.

6.2 Visual Protection Zone

The visual catchment of Mawson's Huts and the Memorial Cross is of particular importance within the Cape Denison cultural landscape. In order to protect the landscape setting and 'sense of place' of Mawson's Huts, a Visual Protection Zone is defined within the proposed ASMA. To preserve these values, no new structures should be built within the Visual Protection Zone.

The Visual Protection Zone is illustrated on Maps A and B and is generally defined as the area enclosed by the western and eastern ridge lines of the valley containing the historic structures. The boundary extends from the coastline (67° 00' 24.9" S, 142° 39' 14.3" E) and runs southeast along the western side of the westernmost ridge to the ice plateau (67° 00' 46.8" S, 142° 39' 37.2" E); northeast along the edge of the ice plateau to 67° 00' 43.9" S, 142° 40' 5.6" E; north-northwest between Round Lake and Long Lake to 67° 00' 33.7" S, 142° 39' 59.8" E; then as far as Magnetograph House (67° 00' 20.3" S, 142° 39' 46.6" E); and then northwest along the eastern side of the eastern ridge line to the sea (67° 00' 15.7" S, 142° 39' 28.2" E).

6.3 Helicopter Zone

Helicopter operations have the potential to disturb breeding and moulting wildlife. To minimise disturbance to seals and nesting birds at Cape Denison during the summer months, helicopters should only land at the site indicated on Map C and approach and depart in accordance with the flight paths indicated on the map. Departure paths have been selected to avoid wildlife concentrations as much as possible. Use of a single-engined helicopter is preferable; however twin-engined helicopters may be used with due regard for the potentially greater disturbance to wildlife. The presence of seals and the breeding cycle of birds nesting in the Area are charted at Appendices Bi and Bii; twin-engine helicopter operations should be avoided during weeks that birds are hatching eggs or raising chicks (late October to early March).

7.0 Maps of the Area

Map A: Cape Denison Management Zones. This map shows the boundaries of the ASMA, the Historic Site, the Visual Protection Zone, ASPA No. 162, and significant topographic features of the Area. The inset map indicates the location in relation to the Antarctic continent.

Map Specifications:

- Projection: UTM Zone 54
- Horizontal Datum: WGS84

Map B: Cape Denison Visual Protection Zone. This map shows the boundaries of the Visual Protection Zone and indicates the position of significant historic artefacts, including the four Australasian Antarctic Expedition huts, the Memorial Cross, and Anemometer Hill, the site of the BANZARE Proclamation Pole.

Map Specifications:

- Projection: UTM Zone 54
- Horizontal Datum: WGS84

Map C: Cape Denison Flight Paths and Bird Colonies. This map indicates the approaches, departures and landing site for helicopters, as well as the location of bird colonies in the vicinity.

Map Specifications:

- Projection: UTM Zone 54
- Horizontal Datum: WGS84

8.0 Code of Conduct

The actions of individuals contribute significantly to protecting the Antarctic environment. This Code of Conduct is intended to provide general guidelines to help minimise environmental impacts at Cape Denison, but it cannot be expected to cover every situation. All visitors, including national program personnel and tourists, should consider their responsibilities and seek to minimise their impact on all aspects of the environment and most particularly the values described.

8.1 Access to and movement within or over the Area

All land vehicles are prohibited within the Area, with the exception of small all-terrain vehicles which, due to the colonisation of rocky areas by lichens and seabirds, should be used on snow and ice surfaces only and with due consideration of the location of historic artefacts.

Pedestrian access within the Area is unrestricted but artefact-rich areas (such as the scatter immediately to the north of the Main Hut), bird or lichen colonies, and penguin 'highways' (the established route of birds moving between their nest and the sea) should be avoided.

8.2 Activities which are or may be conducted within the Area

- Historic conservation and archaeological work.
- Research, including scientific research.
- Visitation for the purposes of education or recreation, including tourism in line with Recommendation XVIII-1.
- Essential maintenance of non-historic infrastructure, including the Automatic Weather Station, and removal of non-historic objects that compromise the historic and aesthetic values of the Area. These activities should be conducted by authorised personnel only.

8.3 The installation, modification, or removal of structures

- To preserve the historic, archaeological, social, aesthetic and environmental values of the ASMA, no new structures should be constructed, nor additional scientific equipment installed in the Area, except for the conservation, research or maintenance activities specified in Section 3.0 above.
- All equipment and infrastructure left in the Area should be periodically reviewed for maintenance and potential removal.

8.4 The location of field camps

- Existing non-historic infrastructure should be used by Parties undertaking activities in accordance with this management plan, in preference to establishing new infrastructure.
- Tents should be pitched on the wooden platform adjacent to Sørensen Hut. Use of the huts and any supplies should be reported to the Australian national program as soon as practicable to ensure the safety of other people who may be reliant upon known stores.

8.5 The taking of or harmful interference with native flora and fauna

- Approach distances to wildlife should be consistent with those agreed within the Committee for Environmental Protection. Until guidelines are adopted by the Committee, Table 1 below provides guidance.
- Visitors should not wash, swim or dive in the lakes. These activities could contaminate the water body and disturb the water column, microbial communities, and sediments.

Table 1: Minimum distances to maintain when approaching wildlife on foot

Species	Phase of life	On foot (m)
Snow petrels	Nesting	15
Wilson's storm-petrels	Nesting	15
South polar skuas	Nesting	15
Adélie penguins	Summer: on ice or away from colony	5
	Summer: breeding birds in colonies	15
Breeding Weddell seals and pups (includes weaners)	All times	15
Mature seals on their own (all species)	All times	5

8.6 The collection or removal of anything not brought into the Area by the visitor

Cape Denison is listed as a Historic Site under the Antarctic Treaty. In accordance with Annex V, Article 8 (4) of the Protocol, no historic structure or other artefact at Cape Denison should be damaged, destroyed or removed, unless removal of an artefact is essential for conservation purposes. Any artefacts may only be removed by authorised and appropriately trained personnel. The repatriation of the artefact to the location at Cape Denison from which it was removed is generally preferable unless further damage or deterioration may result from repatriation.

If an artefact is to be removed, the Australian national program should be informed so that documentation regarding that program's archaeological research at Cape Denison may be amended accordingly.

8.7 The disposal of waste

All wastes, including human wastes, should be removed from the Area .

Refuelling of vehicles, generators and other essential equipment should be conducted with due care for the surrounding environment. Refuelling activities should not be conducted in the catchment areas of lakes or melt streams, at the ice edge, or in other sensitive areas.

8.8 Reports to be made to the appropriate authority regarding visits to the Area

To enhance cooperation and the coordination of activities in the Area, to allow for effective site monitoring and management, to facilitate the consideration of cumulative impacts, and to fulfil the aims and objectives of this Management Plan:

- National program personnel, tourists and other non-government personnel proposing to visit, land, and/or conduct activities in the Area should inform the Australian national program of their intentions as soon as is practicable.
- The details of all field activities should be accurately recorded for transfer to the management database of the Australian national program. See Section 9.0 below.

9.0 Information exchange

Parties with active programs in the Area and non-government operators should exchange information obtained during visits to the Area that may have a bearing on the operation of this Management Plan. For example, the expedition or tour leader should submit to the appropriate authority a report describing the activities undertaken in the Area. Such reports should include, as appropriate, the information identified in the Visit Report form contained in Appendix 4 of Resolution 2 (1998)(CEP 1). Parties should maintain a record of such activities and, in the Annual Exchange of Information, should provide summary descriptions of activities conducted by persons subject to their jurisdiction, which should be in sufficient detail to allow evaluation of the effectiveness of this Management Plan.

Parties should, wherever possible, deposit originals or copies in a publicly accessible archive (such as the dedicated Mawson's Huts website at http://www.aad.gov.au/mawsons_huts) to maintain a record of visitation or usage of the site, to be used both in any review of this Management Plan and to assist in organising the use of the Area.

10.0 Supporting Documentation

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Appendix A

Fauna recorded at Cape Denison, Commonwealth Bay

Breeding populations (pairs) of seabirds at Cape Denison

Species	No. pairs, December 2002
Adélie penguin <i>Pygoscelis adeliae</i>	18,737
Wilson's storm-petrel <i>Oceanites oceanicus</i>	38
Snow petrel <i>Pagodroma nivea</i>	30
South polar skua <i>Catharacta maccormicki</i>	8
Antarctic prion <i>Pachyptila desolata</i> (indeterminate breeding status)	
Cape petrel <i>Daption capense</i> (indeterminate breeding status)	

Other seabirds sighted at Cape Denison

Species
Antarctic petrel <i>Thalassoica antarctica</i>
Southern giant petrel <i>Macronectes giganteus</i>
King penguin <i>Aptenodytes patagonica</i>
Royal penguin (carcase) <i>Eudyptes schlegeli</i>
Chinstrap penguin <i>Pygoscelis Antarctica</i>
Emperor penguin <i>Aptenodytes forsteri</i>

Seals recorded at Cape Denison

Species
Weddell seal <i>Leptonychotes weddellii</i>
Leopard seal <i>Hydrurga leptonyx</i>
Southern elephant seal <i>Mirounga leonina</i>

Appendix B

Helicopter operations: Breeding cycles of nesting seabirds at Cape Denison, Commonwealth Bay

Species breeding at Cape Denison	Number	Summer breeding cycle
Wilson's storm-petrel (<i>Oceanites oceanicus</i>)	Approximately 38 pairs; three small colonies	Before mid-December: adults; after mid-December: adults, eggs and chicks
Snow petrel (<i>Pagodroma nivea</i>)	Approximately 30; one small colony	Before late November: adults; after late November: adults, eggs and chicks
Adélie penguin (<i>Pygoscelis adeliae</i>)	Approximately 18,800 pairs, numerous colonies	Before November: adults; after November: adults, eggs and chicks
South polar skua (<i>Catharacta maccormicki</i>)	Approximately 8 pairs, scattered nests on fringes of penguin colonies	Before mid-December: adults; after mid-December: adults and eggs; after late December: adults and chicks

Appendix Bii

Helicopter operations: Seals at Cape Denison, Commonwealth Bay

Species	Number	Summer breeding cycle
Weddell seal (<i>Leptonychotes weddellii</i>)	Exact number not known, no established colonies	Before November: no seals; between mid-November to end December, approx. 24 adults per day
Southern elephant seal (<i>Mirounga leonina</i>)	Exact number not known, no established colonies	Approx. 2 or adults per day in December

Appendix C

Flora recorded at Cape Denison, Commonwealth Bay

The following taxa were recorded at Cape Denison by the Australasian Antarctic Expedition (AAE) of 1911–14 and the British Australian New Zealand Antarctic Research Expedition (BANZARE) in 1929–31 and published by Carroll W. Dodge in *BANZARE Reports, Series B, Vol. VII*, July 1948.

LICHENS

Lecideaceae

Lecidea cancriformis Dodge & Baker
Toninia johnstoni Dodge

Umbilicaceae

Umbilicaria decussata (Vill.) Zahlbr.

Lecanoraceae

Rhizoplaca melanophthalma (Ram.) Leuck. & Poelt
Lecanora expectans Darb.
Pleopsidium chlorophanum (Wahlenb.) Zopf

Parmeliaceae

Physcia caesia (Hoffm.) Th. Fr.

Usneaceae

Pseudephebe minuscula (Nyl. ex Arnold) Brodo & D. Hawksw.
Usnea antarctica Du Rietz

Blasteniaceae

Candelariella flava (C.W. Dodge & Baker) Castello & Nimis
Xanthoria elegans (Link) Th. Fr.
Xanthoria Mawsonii Dodge

Buelliaceae

Buellia frigida Darb.

BRYOPHYTES

No bryophytes evident at Cape Denison.

There are numerous non-marine algae; however, no surveys have been undertaken.

Appendix VI - Glossary

Heritage conservation terms are used in this report in accordance with the definitions adopted in The Burra Charter (*The Australia ICOMOS Charter for places of cultural significance*: www.icomos.org/australia). The Burra Charter is the standard for cultural conservation acknowledged by government heritage agencies around Australia.

Definitions that are specific to the Antarctic context are provided below.

Antarctic Division was established in 1948 and is now a division of the Australian Government Department of the Environment and Water Resources. It is charged with achieving Australia's policy, operational and scientific goals relating to Antarctica. Now the 'Australian Antarctic Division', it has legislative responsibility for the conservation and management of Mawson's Huts.

Antarctic Specially Managed Area (ASMA) is an area set aside under Annex V of the Madrid Protocol to preserve its unique natural systems or to reduce the risk of interference to areas of exceptional scientific interest. An ASMA is used to help plan and coordinate activities, or minimise environmental impacts. Under article 4(2) of Annex V, an ASMA may include 'sites or monuments of recognised historic value'. The management plan for the area may establish zones to restrict activities or require permits, and a code of conduct governing activities within the area.

Antarctic Specially Protected Area (ASP) is an area set aside under Annex V of the Madrid Protocol to protect what article 3(1) of Annex V describes as 'outstanding environmental, scientific, historic, aesthetic or wilderness values, any combination of those values, or ongoing or planned scientific research.' An ASP protects values within its boundaries by requiring permits for entry and applying a management plan to control activities in the area.

Antarctic Territories Environment and Policy Section (ATEPS), within the Policy Coordination Branch of the Antarctic Division, coordinates Australia's contributions to international conventions covering the Antarctic, develops environmental policies and management measures for the protection of the Antarctic environment and manages the environmental audit programme.

Antarctic Treaty came into force in 1961 and established an international framework for the governance of the continent, which set aside differences of opinion over the status of individual territorial claims in Antarctica. The Treaty reserved Antarctica as a demilitarised zone, setting aside the continent for peace and science. Forty-six countries have become Parties to the Antarctic Treaty. Of these twelve are original signatories (seven of whom had pre-existing claims to territory in Antarctica), and a further sixteen became Consultative Parties after the Treaty came into force. Under the Treaty, provisions have been made to conserve the natural environment of Antarctica, and to protect historic sites and monuments.

Antarctic Treaty (Environment Protection) Act 1980 (ATEP) is the Australian enabling legislation that gives effect to the Protocol on Environmental Protection to the Antarctic Treaty 1991 (Madrid Protocol), which sets out environmental protection obligations for parties to the Antarctic Treaty.

Australasian Antarctic Expedition (AAE) 1911-1914 was a private expedition to Antarctica, supported by the Australian Association for the Advancement of Science. It was organised and led by Douglas Mawson and funded by donations from private sponsors, scientific organisations and government. The expedition's aims were exploratory and scientific, with a focus on George V Land. The expedition included the deployment of a base at Macquarie Island, the Main Base at Cape Denison, the Western Base on the Shackleton Ice Shelf, and two oceanographic voyages by the *Aurora*.

Australian Antarctic Data Centre (AADC) was established in 1995 as a repository for scientific data resulting from the Australian Antarctic programme. Data resulting from the Antarctic Division's science programme is the property of the Australian Government. However, in the spirit of the Antarctic Treaty's article 3.1.c, Australia makes these data publicly available two years after the date of collection. All data within the AADC is discoverable and described through a metadata system.

Australian Antarctic Territory (AAT) comprises all the islands and territories, other than Adélie Land (136° 11'E to 142° 04'E), situated south of 60° S and lying between 160° E and 45° E, as defined by the *Australian Antarctic Territory Acceptance Act 1933*.

Australian Heritage Council (AHC) is the heritage advisory body to the federal minister responsible for heritage matters. In 2003 the Council replaced the Australian Heritage Commission, which had provided advice to government departments, including the Antarctic Division.

Australian National Antarctic Research Expeditions (ANARE) referred to the field operations of the Antarctic Division. Established in 1947, Sir Douglas Mawson was a member of the Planning Committee, which advised the government on Antarctic policy. Three expeditions were organised in 1947, two of which successfully established ANARE research stations on Heard and Macquarie Islands.

British, Australian and New Zealand Antarctic Research Expedition (BANZARE) 1929-1931 was financially supported by the Australian, British and New Zealand governments financially, and private funds. The expedition was organised and led by Sir Douglas Mawson and its aims were political, economic and scientific. Its primary aim was to claim the land covered by the AAE, together with any additional lands possible. The expedition was conducted almost totally aboard ship, with five land proclamations made, including one at Cape Denison.

Burra Charter refers to The Australia ICOMOS (International Council on Monuments and Sites) *Charter for the Conservation of Places of Cultural Significance* 1979, in its amended version adopted in 1999. It is also available as *The Illustrated Burra Charter (Good Practice for Heritage Places)* 2004. The Charter sets a standard of practice for those who provide advice, make decisions about, or undertake works to places of cultural significance, and is widely accepted as a national statement of best practice by heritage agencies and governments.

Committee for Environmental Protection (CEP) is the committee established in 1998 by the Madrid Protocol to provide advice and formulate recommendations to the Antarctic Treaty parties in connection with the implementation of the environmental protocol and its annexes, for consideration at Antarctic Treaty Consultative Meetings.

Department of Environment and Water Resources (DEW) is a Commonwealth government department which develops and implements national policy, programmes and legislation to protect and conserve Australia's natural environment and cultural heritage. The department administers environment and heritage laws, including the *Environment Protection and Biodiversity Conservation Act 1999*. Formerly known as (i) the Department of the Environment and Heritage and (ii) Environment Australia.

Environment Protection and Biodiversity Conservation (EPBC) Act is Commonwealth legislation which protects the environment, particularly matters of National Environmental Significance. It streamlines national environmental assessment and approvals process, protects Australian biodiversity and integrates management of important natural and cultural places.

Fibre Saturation Point As soon as the timber is cut, the wood starts to lose moisture. The initial reduction in moisture content is a result of free water loss. This usually occurs without any significant dimensional changes to the timber as the loss of moisture represents the drainage of voids or vessels in the timber. If the environmental conditions are favourable, the moisture loss continues until all the free water is released to the atmosphere. This point is known as the fibre saturation point (fsp). The fibre saturation point varies a little with each piece of timber, but it is generally taken to be at a moisture content of between 25% and 30%.

Geographical Information System (GIS) is a computer based programme that provides an efficient way to manage, analyse and display spatial data. A GIS allows for data from a variety of different sources to be rapidly overlaid for viewing and analysing.

Madrid Protocol is the Protocol on Environmental Protection to the Antarctic Treaty, adopted by the Antarctic Treaty parties in 1991, and in force since 1998. Its annexes address environmental impact assessment, conservation of fauna and flora, waste, marine pollution, area protection and management and liability. Provisions for the protection of cultural heritage are in Annex V, article 8. Sites or monuments of recognised historic value can be designated as Antarctic Specially Protected Areas or Antarctic Specially Managed Areas, and are listed as Historic Sites and Monuments, to prevent them being damaged, removed or destroyed.

Mawson's Huts Foundation was established by the Australian Associated Press (AAP) in 1995, and is now an independent charitable organisation. Its mission is to 'conserve in perpetuity for the Australian people, the historic buildings erected at Cape Denison by the 1911-14 Australasian Antarctic Expedition, now known as "Mawson's Huts"'.

mawson's huts

HISTORIC SITE

