



MAWSON'S HUTS HISTORIC SITE

MANAGEMENT PLAN 2013-2018

ACKNOWLEDGMENTS



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Mawson's Huts Historic Site Management Plan 2013-2018

Australian Antarctic Division

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This management plan draws on the expertise and the work of numerous people who have been involved over several decades in the campaign to 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 (AAD) of the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) prepared this plan to meet its *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) obligations arising from the National and Commonwealth Heritage listings of Mawson's Huts Historic Site. While the Strategies Branch of the AAD is responsible for the contents of the plan, it acknowledges the direct and indirect contributions of the diverse community of interest.

Aspects of this plan are based on the previous management plan prepared in 2007. Much of the technical and contextual information and many of the policy directions used in the 2007 Management Plan were based on the *Mawson's Huts Historic Site Conservation Management Plan 2001*, prepared by Godden Mackay Logan Pty Ltd (under a steering committee of the AAD, Mawson's Huts Foundation and the Australian Heritage Commission). Substantial material that has been incorporated directly from the 2001 conservation management plan has been cited. However, throughout this plan Godden Mackay Logan's work has been a key source. For practical reasons, other documents used in the development of this plan are listed in the bibliography (see Part 4).

The 2007 management plan was subject to an internal and external review of its effectiveness. In March 2011 a request for comments on the previous management plan was circulated to heritage experts and organisations with a known interest in the conservation and management of Mawson's Huts. The AAD was grateful for comments in this phase from the ANARE Club Council, Michelle Berry, Julian Bickersteth, Fiona Tennant, Ian Godfrey, Peter Maxwell, Stirling Smith and Robert Vincent. A public notice seeking comment on the review of the 2007 management plan was also advertised on 15 October 2011, as required under sections 324W and 341X of the EPBC Act. However, no additional comments were received. Following consideration of comments received during the review, a revised plan was prepared and placed on public display, as required under sections 324S and 341S of the EPBC Act. Comments on the revised plan were sought between 21 July 2012 and 24 August 2012. Eight submissions were received which assisted in finalising this plan. Assistance was also provided by Bruce Hull, Environment Officer, Australian Antarctic Division.

The State Library of New South Wales granted permission to use photographs from its AAE collection. Photographs from recent conservation expeditions undertaken by Mawson's Huts Foundations and the AAD also illustrate this plan.



Antarctica occupies a unique place in Australia's national identity and history. No site more fully or vividly evokes that place than Mawson's Huts, which stand today as a testament to the endeavour and endurance that are central to the Australian story and a hallmark of our national Antarctic program.

Amid the drama of the "Heroic Era" of Antarctic exploration, Australian geologist Douglas Mawson set off from Hobart to lead the 1911–1914 Australasian Antarctic Expedition (AAE) in exploring a section of the practically unknown Antarctic coast. This was Australia's first large-scale scientific program after Federation.

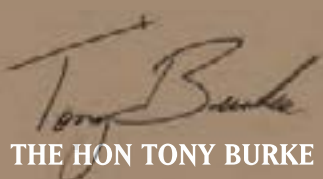
The AAE was groundbreaking in every respect, innovating and introducing such 'new' technology as radio communications and utilising a wingless plane as an air tractor for hauling sledges. Despite the bitter cold and isolation, the AAE expeditioners gathered a wealth of scientific and geographical information and established a proud legacy which stands to this day. This expedition and two subsequent expeditions between 1929 and 1931 laid the foundations for the Australian Antarctic Territory which covers 42% of the continent.

For one hundred years, the AAE huts at Cape Denison have been emblematic of Australia's Antarctic history as the birthplace and forerunner of the work now supported or undertaken by the Australian Antarctic Division (AAD). Their significance has been nationally recognised through the listing of the site as a National Heritage place and a Commonwealth Heritage place.

The isolation and extreme conditions of the Mawson's Huts site make the work of conserving them extremely challenging. Despite this, significant progress in the conservation of the huts has been made under the previous management plan, including stabilisation works to the Transit Hut, ice excavation from the Main Hut and the on-site conservation of many artefacts. Much of this work has been achieved through the combined efforts of the Australian Government and dedicated and hardworking private groups such as the Mawson's Huts Foundation.

One hundred years after the commencement of Mawson's inspirational expedition, this management plan will guide Australian efforts to preserve that moment in time when the AAE abandoned the site to the elements in December 1913. It also allows for an appreciation of what one hundred years of exposure to extreme cold and regular blizzards can do to the fabric of the huts.

The Australian Government remains committed to the careful and strategic management of the Mawson's Huts site and will continue to work closely with interested organisations to protect and manage this most precious and unique example of Australia's Antarctic history. One hundred years on from Douglas Mawson's Australasian Antarctic Expedition, it is my pleasure to reflect on the significance of Mawson's legacy and to recommend this plan and its contents to all Australians.



THE HON TONY BURKE MP

Minister for Sustainability, Environment, Water, Population and Communities

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EXECUTIVE SUMMARY



The Mawson's Huts Historic Site is located at Cape Denison, George V Land, Australian Antarctic Territory, some 3000 km south of Hobart, Australia. The site is on Commonwealth land and the Commonwealth of Australia is the owner of the site, its structures and its objects. The Australian Antarctic Division (AAD) of the Department of Sustainability, Environment, Water, Population and Communities is the agency which manages the site and through which ownership is expressed.

Mawson's Huts Historic Site covers approximately 130 hectares and is the setting of the 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 so-called 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, and since 2004 designated an Antarctic Specially Protected Area within an Antarctic Specially Managed Area under the Protocol on Environmental Protection to the Antarctic Treaty.

National recognition has come from the huts' inclusion on the Register of the National Estate in 1980 (now non-statutory), and the Commonwealth Heritage List (2004) and the National Heritage List (2005) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The EPBC Act requires that a management plan is prepared to provide for the protection and management of the National and Commonwealth Heritage values of a listed place.

Under the guidance of the previous plan, the site underwent some major conservation works with the assistance of the Mawson's Huts Foundation. These works included the over-cladding of the Main Hut, ice removal from the interior, fitting of a frame to help stabilise the Transit Hut, and artefact conservation.

The 2013 plan provides the framework to guide management decisions and on and off site actions to protect and conserve the National Heritage, Commonwealth Heritage and other values of the Mawson's Huts Historic Site. It sets out how the National and Commonwealth Heritage values of the site, as described in the National Heritage List and Commonwealth Heritage List under the EPBC Act, will be managed and protected. It also supports the fulfilment of Australia's obligations under the environmental protocol to the Antarctic Treaty.

The overarching conservation philosophy in managing the Mawson's Huts Historic Site is to protect and conserve the listed heritage values of the site, while allowing the fabric of the site to continue to represent both a moment in time and the passage of time. The passage of time has affected the fabric of the buildings in differing ways depending on their origin and manufacture. As such, this management plan adopts differing approaches towards the conservation of intact structures and standing ruins at the site.

The main pressures on the National and Commonwealth Heritage values associated with the site stem from environmental factors. Wind, humidity, salt, snow/ice and the associated freeze/thaw action have impacted over time on the listed values. During the life of this plan there will be further monitoring and analysis of these key pressures to inform work plans and the development of the next management plan.

Other management actions under this plan will help to ensure that the values of the Mawson's Huts Historic Site are protected, conserved, presented and transmitted to all generations. This plan also provides for a review of the National and Commonwealth Heritage values associated with Mawson's Huts and an assessment of the structural integrity of the buildings.

This plan replaces the *Mawson's Huts Historic Site Management Plan 2007-12* and will be reviewed within five years.

PART I

INTRODUCTION AND CONTEXT



I.1 INTRODUCTION

Situated at Cape Denison, George V Land in the Australian Antarctic Territory, Mawson's Huts have stood for over one hundred years as the cornerstone of Australia's Antarctic history. The Historic Site was the first base associated with Australia's scientific and geographical discovery of Antarctica and consists of buildings, structures and relics from 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 so-called 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.

Mawson's Huts Historic Site is on Commonwealth land and the Commonwealth of Australia is the owner of the site, its structures and its objects. The Australian Antarctic Division (AAD) of the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) 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 AAD as administrator of the Australian Antarctic Territory on behalf of the Australian Government.

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 designated an Antarctic Specially Protected Area (ASPA) No 162 within an Antarctic Specially Managed Area (ASMA) No 3 under the Protocol on Environmental Protection to the Antarctic Treaty.

National recognition has come from the huts' inclusion on the Register of the National Estate in 1980 (now a non-statutory list), and the Commonwealth Heritage List (2004) and the National Heritage List (2005) under the *Environment Protection and Biodiversity Conservation (EPBC) Act 1999*.

The EPBC Act requires the Commonwealth to make a written plan to protect and manage the National and Commonwealth Heritage values of a place it owns or controls. This document is the second such plan for the site. This management plan has been prepared in accordance with the requirements of the EPBC Act and associated regulations. The plan is largely structured in accordance with the guidelines stated within *Working Together: Managing National Heritage Places* (Department of the Environment, Water, Heritage and the Arts, 2008), and *Working Together: Managing Commonwealth Heritage Places* (Department of the Environment, Water, Heritage and the Arts, 2008).

I.1.1 OBJECTIVE OF THE PLAN

The objective of this plan is to guide management decisions and on and off site actions that help identify, protect, conserve, present and transmit the National and Commonwealth Heritage values, and other values, of the Mawson's Huts Historic Site. This is in line with the objective of managing National and Commonwealth Heritage places and is one of the management principles set out in Regulation 10.01E and Schedule 5B and Regulation 10.03D and Schedule 7B of the *Environment Protection and Biodiversity Conservation Act 2000* (EPBC Regulations).

This plan sets out how the National and Commonwealth Heritage values of the site, as described in the National Heritage List and Commonwealth Heritage List under the EPBC Act, will be managed and protected. 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 the values of the Mawson's Huts Historic Site are protected, conserved, presented and transmitted to future generations.

1.1.2 PUBLIC COMMENTS ON THIS MANAGEMENT PLAN

On 15 October 2011 an invitation for the public to comment on the review of the *Mawson's Huts Historic Site Management Plan 2007-12* was advertised, as required under sections 324W and 341X of the EPBC Act. No formal submissions were received during this period. Key stakeholders were consulted in April 2011 during an informal consultation period. Eight submissions on the review of the plan were received.

Under sections 324S and 341S of the EPBC Act, the Environment Minister seeks comment from the public on the replacement of management plans prepared for National and Commonwealth Heritage places, and seeks and considers comments from the Australian Heritage Council about matters raised by the public. A revised draft of the plan was placed on public exhibition and made available for public comment between 21 July 2012 and 24 August 2012. The final version incorporates amendments made in response to the nine submissions received during that period. The draft replacement plan and summary of public submissions were provided to the Australian Heritage Council's December 2012 meeting. The Council made no additional comments and determined that the management plan addresses the matters prescribed by the EPBC Regulations.

1.1.3 OVERARCHING CONSERVATION PHILOSOPHY

The overarching conservation philosophy in managing the Mawson's Huts Historic Site is to protect and conserve the listed heritage values of the site, while allowing the fabric of the site to continue to represent both a moment in time and the passage of time. The passage of time has affected the fabric of the buildings in differing ways depending on their origin and manufacture. As such, this management plan adopts differing approaches towards the conservation of intact structures and standing ruins at the site, as discussed in section 1.1.5. Conservation of the buildings and artefacts should accommodate the original imperfections in design and condition of their elements while demonstrating the effect of decades of exposure to the Antarctic environment.

The design of the huts at Cape Denison is a reflection of the vernacular in Australian domestic architecture of the time. They were never intended to be more than a temporary shelter for a single expedition. Our overall objective is to maintain them in their unperfected state and not reverse or overly interfere with the original condition or structure of the buildings or the associated objects. Future management of the site will be dependent on what is prudent and feasible, taking into consideration the financial and logistical restraints at the time.

1.1.4 OBJECTIVES

The Australian Government's objectives for the site are encapsulated in the conservation principles of this plan, which outline how the National and Commonwealth Heritage values and other values of the Mawson's Huts Historic Site should be identified, protected, conserved, presented and transmitted to all generations. Actions described in the Implementation Plan (Section 3.4) will be measured to assess how these objectives were met when the plan is next reviewed.

At Cape Denison, this involves managing access to and activities at the site, and ensuring that there is an appropriate program of works to conserve, protect and present the heritage values of 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 AAE, particularly during the years of occupation.

1.1.5 CONSERVATION PRINCIPLES

The heritage values of Mawson's Huts Historic Site should be identified, protected, conserved, presented and transmitted to all generations.

Values Identified: The Mawson's Huts Historic Site has been identified as a National and Commonwealth Heritage place under the EPBC Act.

Heritage values of the site meet key criteria associated with entry onto the National and Commonwealth Heritage list. These values represent both tangible and intangible aspects and are discussed in detail in section 2.5.2.

Over time minor changes to the values have occurred and as a result further refining and researching of these values need to take place.

Protected and Conserved: Significant fabric should be conserved in its original context.

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) to show the passage of time and a moment in time, 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 (BANZARE).

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

Interventions at Cape Denison should do as much as is necessary to conserve the site's integrity, but otherwise change as little as possible so that the site's cultural significance is retained.

Objects should be kept in or returned to their documented or likely original context, not arranged for display. Significant objects may be treated to stall deterioration, where possible on site.

Objects in the external scatters should only be removed (either from the site or into a hut) if they are exceptional to interpretation, and removal is the sole practical means of ensuring their survival. No replica objects should be introduced. Objects that are moved should be returned to the site following any conservation works. Where this is not possible or practical, objects should ultimately be placed with a suitable collections agency.

Presented and Transmitted: Research and conservation partnerships will enrich the interpretation and awareness of the site.

Partnerships between the AAD and heritage experts and philanthropic organisations enhance the efficacy of conservation measures and are in keeping with the 1911-14 model of non-government contributions to Antarctic endeavours.

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

1.2 MANAGEMENT FRAMEWORK

Mawson's Huts and Mawson's Huts Historic Site are afforded protection under international treaty obligations, Australian legislation and DSEWPaC's heritage strategy. The AAD'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.

1.2.1 INTERNATIONAL TREATIES, AUSTRALIAN STATUTORY REQUIREMENTS AND CONSERVATION CHARTERS

Antarctic Treaty and Protocol on Environmental Protection to the Antarctic Treaty

Australia, as a party to the Antarctic Treaty (1959) and the Protocol on Environmental Protection to the Antarctic Treaty (1991) (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. Mawson's Huts have been included on this list since its inception.

The Madrid Protocol 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 matters. While no annex applies specifically to historic heritage values, provisions for environmental impact assessment and for area protection and management are relevant.

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 3 and ASPA 162, and approved management plans for both (see Appendices II and III for current plans).

ASPA and ASMA 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.

ASPA and ASMA management plans are reviewed every 5 years as a minimum. The most recently approved versions are available on the Antarctic Treaty Secretariat website, under 'Information – List and status of ASPA and ASMA management plans': http://www.ats.aq/e/ep_protected.htm

Australian Legislation

Antarctic Treaty (Environmental Protection) Act 1980

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 and Australian Government visitors to Cape Denison are subject to the ATEP Act.

The ATEP Act requires that all Australian activities in the Antarctic undergo environmental impact assessment before they commence. The proponent of the activity must provide a preliminary assessment of the likely environmental impacts of their proposed activity, which is used to assess 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 AAD then advises the Minister or delegate of this assessment.

If the Minister (or delegate) considers that the environmental impact is likely to be less than minor or transitory, the Minister grants the proponent a written authorisation to carry on the activity. The Minister may also choose to impose conditions to protect the environment. More detailed assessments 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 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 conditions. The AAD administers the granting of permits by delegation from the Minister.

Environment Protection and Biodiversity Conservation Act 1999

Mawson's Huts Historic Site is listed on Australia's 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 AAD, to make a plan to protect and manage the National and Commonwealth Heritage values of such places that it owns or controls.

Since the site is listed as both a National and Commonwealth Heritage place, sections 324S and 341S of the EPBC Act requires that the Environment Minister make a plan to protect and manage the listed

heritage values of the place. This requirement was first met in 2007 with the making of the *Mawson's Huts Historic Site Management Plan 2007-12*. Such plans are binding on the Commonwealth and Commonwealth agencies (sections 324U and 341V). Sections 324W and 341X require that these plans be reviewed at least once every five years. This current plan is the result of that review.

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 DSEWPac 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 that is likely to have a significant impact should be referred to the Minister and may be subject to an environmental impact assessment. 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 1986* regulates the export of Australia's significant cultural heritage objects (potentially covering artefacts at or associated with Mawson's Huts Historic Site).

Historic Shipwrecks Act 1976

The *Historic Shipwrecks Act 1976* protects historic wrecks and relics in Commonwealth waters, extending from below the low water mark to the edge of the continental shelf.

Conservation Charters

Protection and conservation of the Mawson's Huts Historic Site is also guided by the principles in the following documents:

Venice Charter (The International Charter for the Conservation and Restoration of Monuments and Sites)

Burra Charter, Australia ICOMOS 2004

ICOMOS International Wood Committee: *Principles for Preservation of Historic Timber Structures*

Conservation Plan – A Guide to the Preparation of Conservation Plans for Places of European Cultural Significance (Kerr 2000)

Significance 2.0: a guide to assessing the significance of collections (Russell and Winkworth 2009)

1.2.2 AGENCY MECHANISMS

This management plan contains the primary policies and guidelines for the management of activities at the site. Conservation works at the site for each expedition are subject to individual environmental impact assessments under the ATEP Act. When assessing the impacts of the activities, there is careful consideration of the listed heritage values for the site to ensure their long term conservation and protection.

AAD's Asset Management System

All built assets that are managed by the AAD are part of a centralised asset management system. The system provides details on maintenance and monitoring of assets and any work plans for a given season.

Other Guidelines, Plans and Programs

Mawson's Huts Historic Site has a number of other guidelines, plans and programs that assist in meeting the overall conservation objectives for the site. They include a monitoring and maintenance plan and an interpretation plan and are available through the AAD.

The site is visited by citizens of countries other than Australia. To assist with site conservation and protection, visitor guidelines have been developed by Australia and approved by the Antarctic Treaty Consultative Meeting. The guidelines provide a brief description of the site, maps, landing restrictions and visitor code of conduct. Management plans for the ASPA and ASMA provide greater detail on visitor restrictions and permit conditions (Appendix I and II).

1.2.3 DECISION MAKING PROCESS FOR MANAGEMENT OF THE SITE

The Minister for the Environment 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 AAD Director, the manager of the AAD's Strategies Branch and the manager of the AAD's Territories, Environment and Treaties (TET) Section.

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 AAD Director is responsible for heritage management policy and makes major decisions on the management of the site within the context of the direction provided by protected area and heritage management plans, the DSEWPaC heritage strategy, and with advice from the Heritage and Wildlife Division.

The AAD consults registered stakeholders and the Heritage and Wildlife Division when preparing works plans or reviewing draft works plans that have been submitted for its consideration. The AAD addresses their feedback when recommending 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 and Wildlife Division (should a referral under the EPBC Act be required).

1.2.4 COLLABORATIVE PARTNERSHIPS

The AAD has a long-standing collaborative partnership with the Mawson's Huts Foundation (a non-government organisation) to assist with the conservation and management of the Mawson's Huts Historic Site. Since 1996, the AAD has worked with the Foundation on ten expeditions to Cape Denison to undertake conservation works, environmental monitoring and maintenance. These expeditions have played a major role in communicating, conserving and protecting the listed values of the site. In discharging its responsibility to set work programs and direct future activities at and in relation to the site, the AAD will continue to explore opportunities for further such collaborations.

PART 2

SITE DESCRIPTION AND HERITAGE VALUES



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, Australia.

The boundaries of the site are specified more precisely in the site's entry on the National Heritage List than in the Commonwealth Heritage List entry. In the life of this plan, all boundaries referring to the site should be aligned with the boundaries given in the National Heritage List, namely: 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 north-easterly 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 south-easterly 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 Commonwealth Heritage place boundaries are: a line commencing at the most southerly point of a bay about 120 m northeast of Magnetograph House then running southerly along the ridgeline between Long and Alga Lakes to 40 m ASL, then westerly at that altitude to Land's 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.

The historic site consists of four huts, memorials, plaques and scattered relics. The Main Hut (originally two separate huts) is in the centre of the valley. The Transit Hut is to the northeast and the Magnetograph House and Absolute Magnetic Hut are on the northern end of the eastern ridge. There is also 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

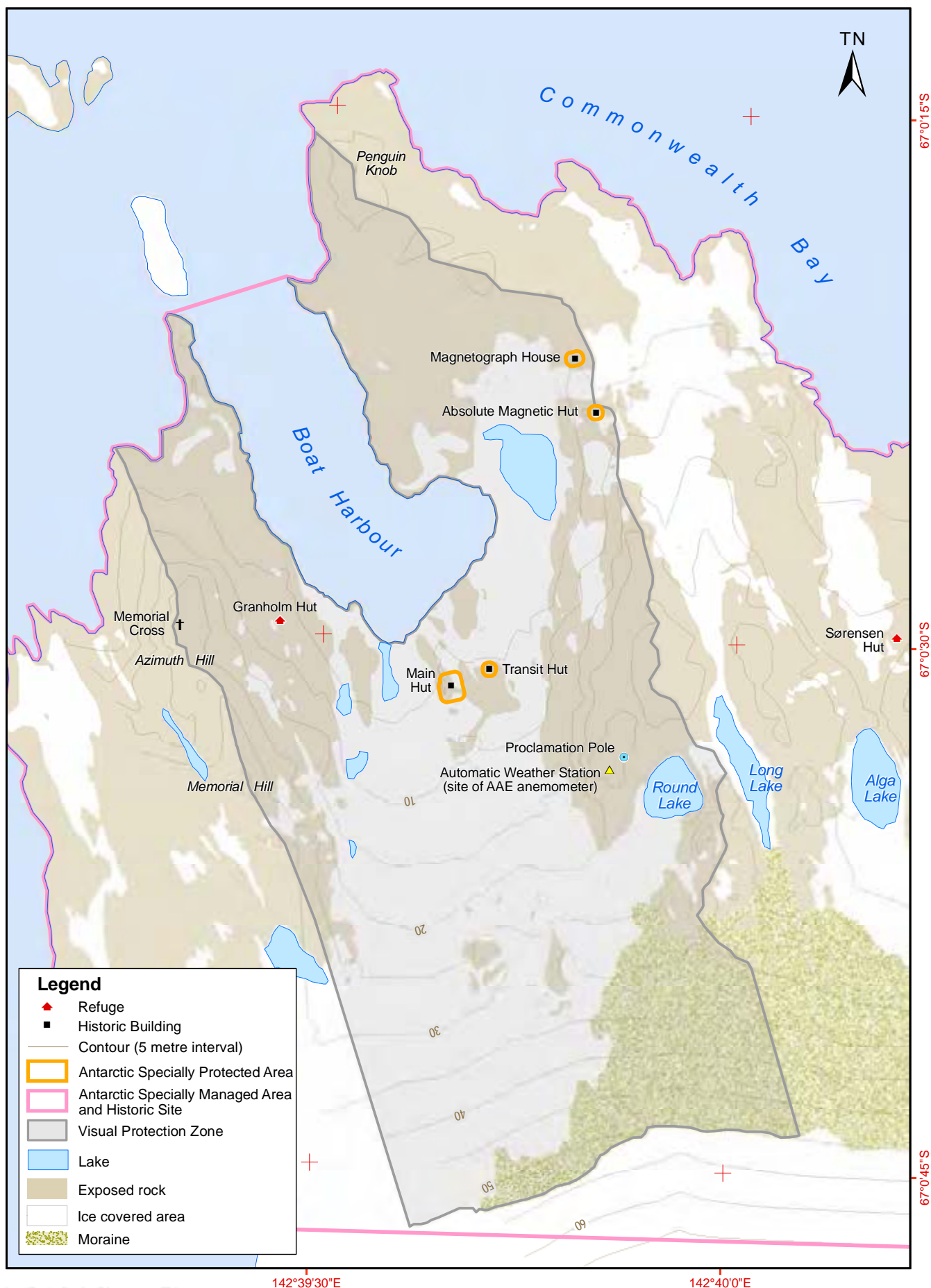
instruments on a rock shelf between the Main Hut and Transit Hut and on the eastern ridge on a knoll known as Proclamation Hill (the site of the proclamation pole and plaque). There are also seal and penguin meat caches and significant artefact scatters within the Historic Site area. From the Main Hut, the Transit Hut ($67^{\circ}00'30''\text{S}$, $142^{\circ}39'42''\text{E}$) is 40 m northeast; the Magnetograph House ($67^{\circ}00'21''\text{S}$, $142^{\circ}39'37''\text{E}$) is approximately 310 m north-northeast; and the Absolute Magnetic Hut ($67^{\circ}00'23''\text{S}$, $142^{\circ}39'48''\text{E}$) 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.

The ASMA management plan establishes a Visual Protection Zone containing the historic structures and designed to exclude new structures to preserve the values of the site.

Mawson's Main Hut ($67^{\circ}00'31''\text{S}$, $142^{\circ}39'39''\text{E}$) was erected as close as was practicable to the landing point for supplies – about 65 m southeast of Boat Harbour.



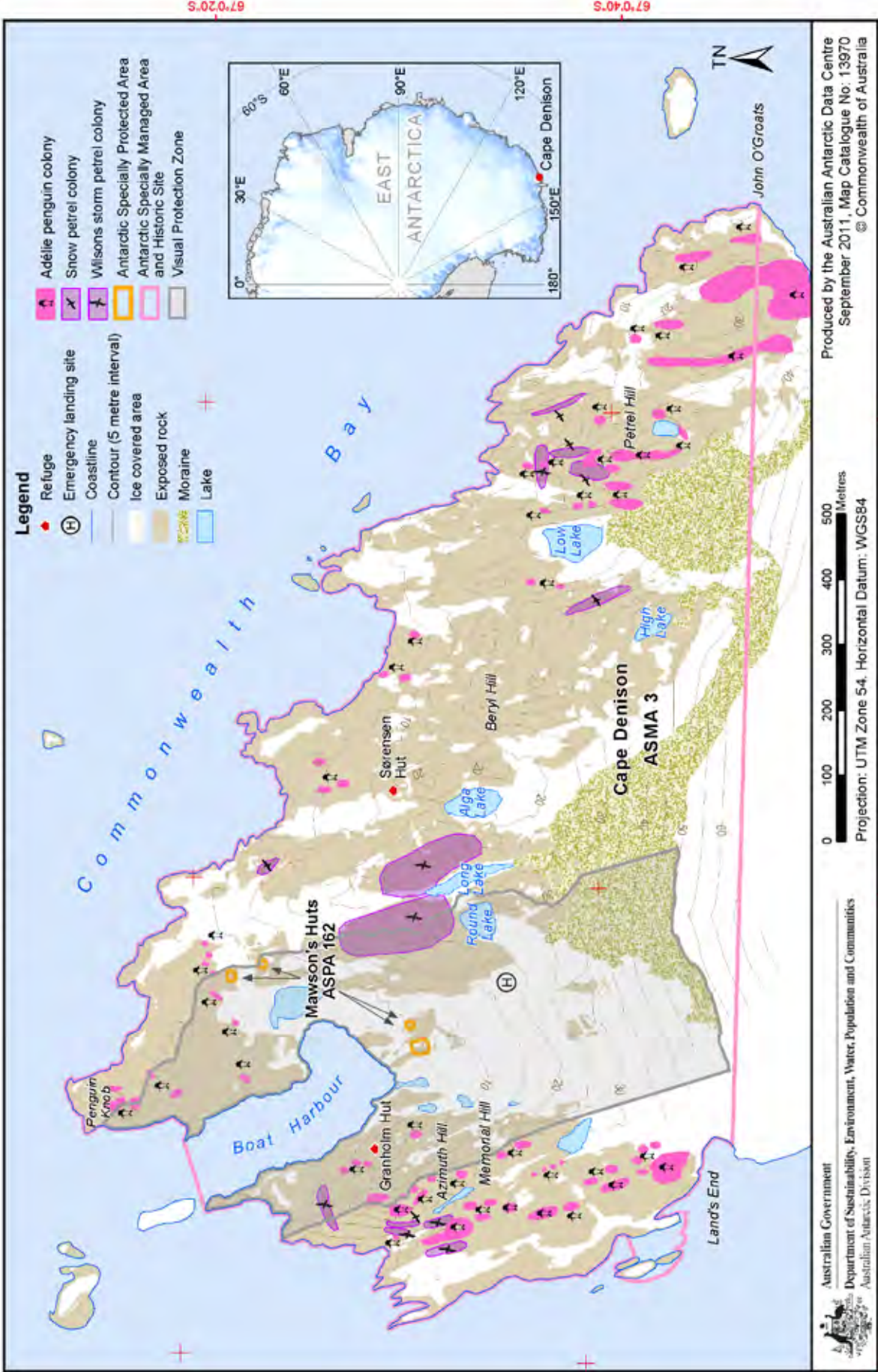
MAWSON'S HUTS, CAPE DENISON VISUAL PROTECTION ZONE



II

PART 2 MAWSON'S HUT MANAGEMENT PLAN 2013-2018

Mawson's Huts, Cape Denison



142°39'E

142°40'E

142°41'E

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 natural features of Cape Denison were first described and recorded by the AAE.

On approach to Cape Denison, the massive Antarctic ice cap clearly dominates the skyline and is visible up and down Commonwealth Bay, terminating in huge ice cliffs. These cliffs can calve into the sea, forming 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. Large boulder fields are coloured with lichen, the only known flora on Cape Denison. There are six melt water lakes associated with glacial action. The site is however renowned for its wind.

Wind is the dominant feature that has shaped occupation of this place, and continues to define the landscape. The wind 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. Frequent blizzards and gusts exceed 100 km per hour: in 1913 the wind was recorded at 143 km per hour for twelve continuous hours (Godden Mackay Logan 2001).

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, and whips the sea into a chop topped with fierce spume only metres from the shore. Surface temperatures, not including the wind chill factor, generally range from -21° and lower in winter, to -3° in summer, with occasional days approaching zero or above.

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. 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 can extend up to 36 m above sea level and is dominated by local rocks. This feature 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 are (with one exception) 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.

2.2.2 CAPE DENISON FLORA AND FAUNA

From November, species breeding at or near the site include over 18 000 pairs of Adélie penguins (*Pygoscelis adeliae*), Wilson's storm petrels (*Oceanites oceanicus*), snow petrels (*Pagodroma nivea*) and the south polar skua (*Catharacta maccormicki*). 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.

2.2.3 CULTURAL FEATURES ON CAPE DENISON

Godden Mackay Logan (2001) reported that Cape Denison provides evidence of human endeavour from all four phases of occupation: the original AAE expedition (January 1912 to 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 planned and prolonged expeditions to the site, primarily for conservation, since 1974.

Known 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
- timber alignment posts for magnetic observations (east and west [below surface]); bench mark 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); eastern mark (30 m east of Magnetograph Hut marking the eastern boundary of the base survey area)
- 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
- scattered artefacts, including remnants of the air tractor and geological sampling sites

BANZARE fabric (1931)

- proclamation flag pole (AAE puff-anemometer mast) and replica 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 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)
- wind scatter test frames 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 west of the BANZARE proclamation area) (1990)
- fabric associated with repair work on and monitoring of the Main Hut (1974–present)
- 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

- over cladding Main Hut roof (2006-07)
- over cladding southwest corner, exterior wall of Main Hut (2009-10)
- stabilisation portal frame added to Transit Hut (2011)
- centenary commemorative plaque and time capsule (below surface) on Anemometer Hill (2012)

2.2.4 FABRIC DESCRIPTION

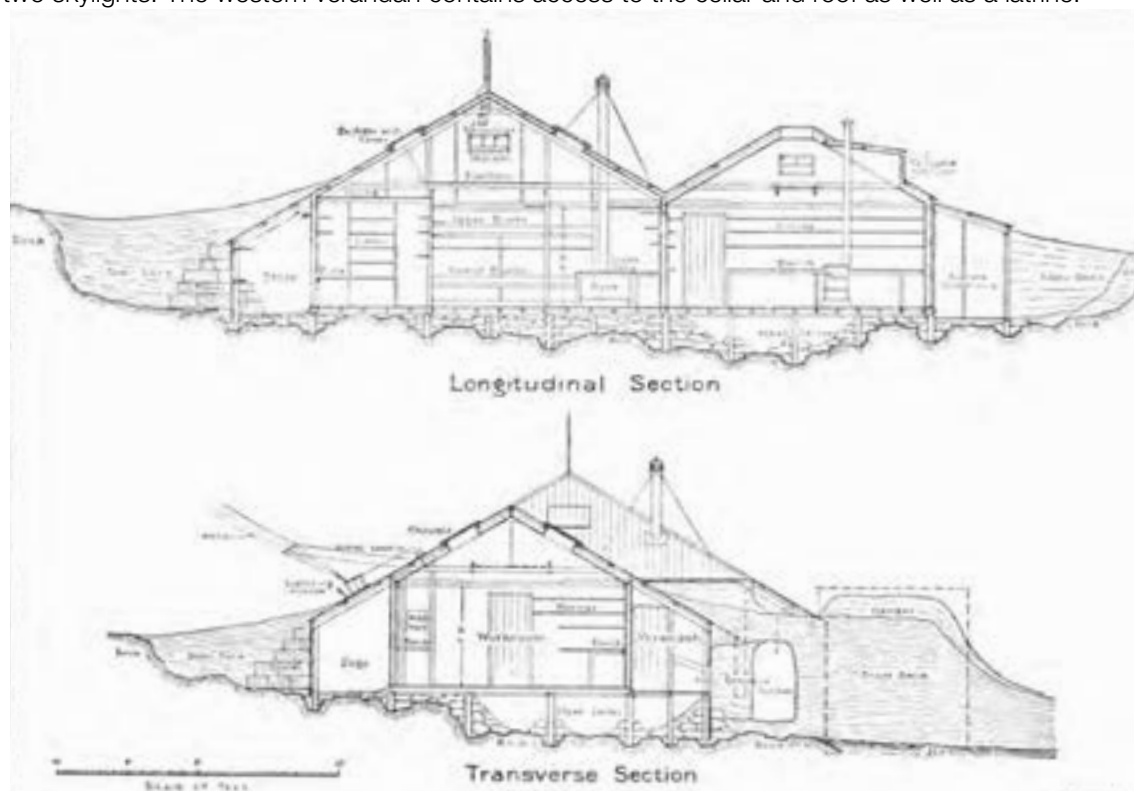
Main Hut

The Main Hut consists of two prefabricated Oregon-framed timber huts with foundations set in 50 t of loose rocks. 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.

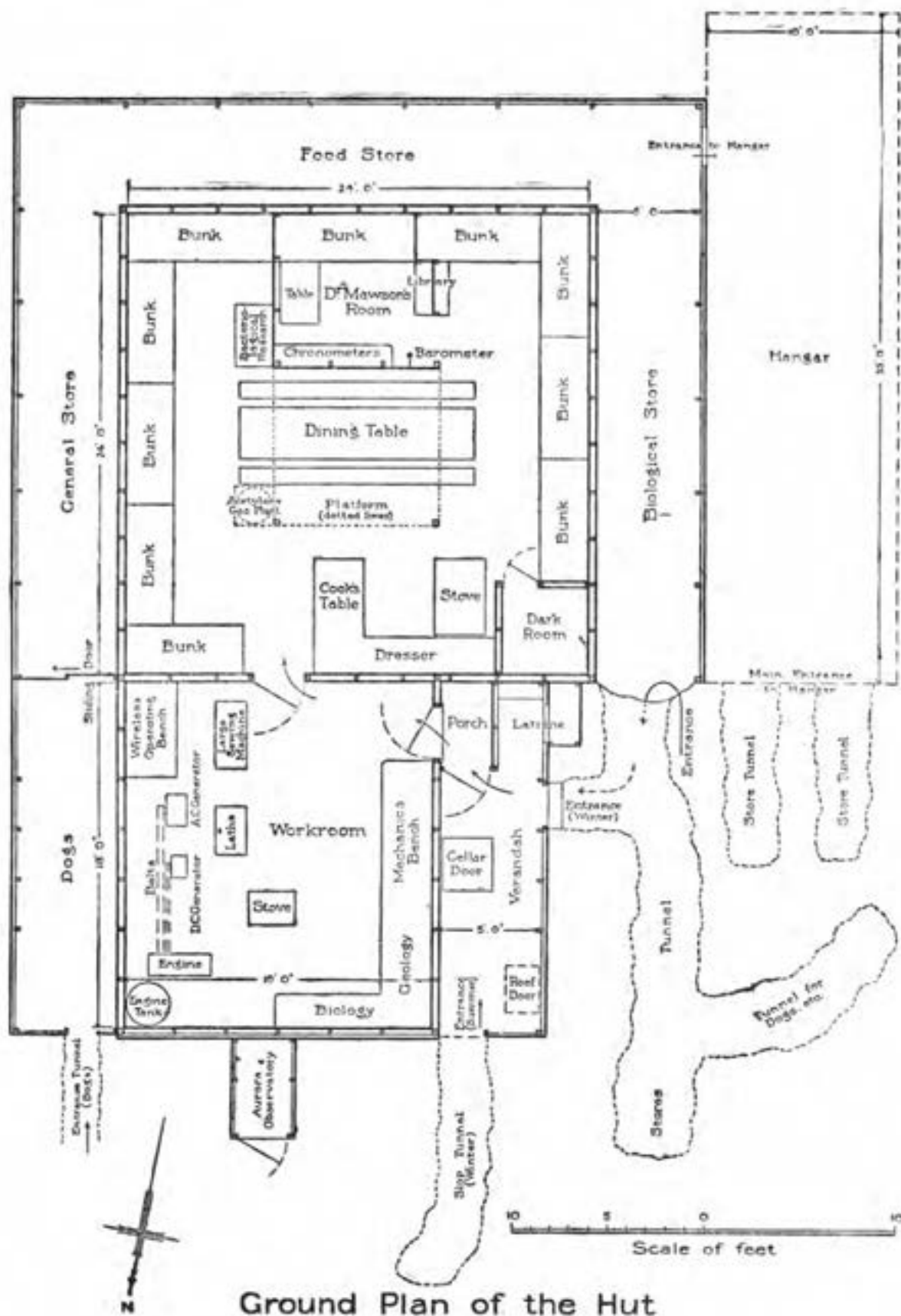


The living section, prefabricated by George Hudson & Son (Sydney), is 7.3 x 7.3 m with a pyramid shaped roof supported in the centre by four 100 mm by 100 mm posts. There are four skylights, all with glass and timber covers which can be opened. Bunks are arranged in two tiers around the walls, leaving a central living space for the stove and dining table. There are two separate rooms: Mawson's cubicle and Hurley's small dark room.

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



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



Allied Hodgkiss's plans of the Main Hut (from Home of the Bizzard)

Living room — Internal Features

Mawson's Cubicle [1]

A small (approximately 2.1 x 2.4 m) room was provided for Mawson centrally on the south side of the hut. The walls were of a single lining on a stud frame, the studs being exposed inside the room. Fittings inside the cubicle include a bunk along the south wall, a series of shelves on the west wall adjacent to the doors, shelves to the north and south walls and a table and chair. Decorative prints left behind by Mawson can also be seen in the cubicle.

Darkroom [2]

An approximately 1.2 x 1.2 m darkroom is located in the northwest corner of the hut. The walls were double lined on a stud frame fitted with a door, 610 mm wide. The room was fitted with a waste disposal chute through the northern wall, a bench along the west wall and numerous shelves. The floor is littered with artefacts amongst detritus which has been worn away near the door entrance. Written on the inside wall on the left, Frank Hurley inscribed 'near enough is not good enough'. Shelves inside the darkroom still carry chemicals used by Hurley.

Bunks [3]

Bunks were erected for the expedition members along the east, south and west walls. Each bunk was generally framed up using posts at each end, plates fixed to the wall, an outer facing board with an inner plate. Boarding spanned from plate to plate. Each bunk had a lower and upper berth. Dividing partitions of boarding fixed to the posts and battens on the wall separated the bunks. The bunks are inscribed with the initials of the expeditioners that occupied them. Herbert Murphy's bunk was removed in 1913 on the northern wall of the living quarters when the radio was moved from the workshop. Several bunks were modified in the second year to create storage areas.

Acetylene Plant [4]

Lighting was provided by an acetylene system consisting of an acetylene carbide plant mounted above a small platform fixed to the northeast queen post above head height.

Shelving and Benches

Numerous shelves were erected throughout the hut. Most shelves appear to consist of tongue and grooved boards and off cuts of timber supported on metal brackets of various sizes and design. Three shelves were erected on the north wall for the storage of cooking and eating utensils and food stuffs. Three shelves erected on the outside of the north wall of Mawson's cubicle were used for the library. A bench constructed from tongue and grooved boarding and framing timber was erected for cooking items adjacent to the stove. These shelves still have a wide variety of artefacts on them. Some shelving has collapsed under the weight of snow and ice.



Mawson's chair. Deb Bourke (A/D)



Mawson's bed. Deb Bourke (A/D)



Mawson's cupboard. Nick Boden (A/D)



Darkroom entrance. Deb Bourke (A/D)



"Not enough is not good enough" Hurley's darkroom. Deb Bourke (A/D)



Charles Laverson's bunk. Deb Bourke (A/D)



Binkie's chest. Deb Bourke (A/D)



Hyde Park Corner. Deb Bourke (A/D)



Acetylene Plant. Deb Bourke (A/D)

Insulation

The only reference to insulation is that recorded by Mawson when he describes the use of 'two courses of tarred paper' in the roof and walls to make them extra wind proof. The extent of the tarred paper is unknown however inspections have confirmed tarred paper visible in the roof through gaps in the boards. The floor ice contains many small fragments of the tarred paper. Straw type insulation (originally used as packing material) has been found adjacent to the door to the living room, and gaps in the boards in combination with strips of tar paper.

Stove and Chimney [5]

A large stove described by Mawson as an anthracite coal cooking range was installed in the northwest corner. The stove was used for cooking and provided warmth for the hut. A chimney of approximately 15 cm diameter penetrated the roof above. The chimney was fitted with a cowl and was supported by three wire stays fixed to the roof. The penetration was over flashed. Asbestos cement sheeting backs the stove along the external wall of the darkroom.

The chimney collapsed between 1977 and 1978. External evidence of the chimney was obscured with the over-cladding of the roof in 2006-07.

Skylights [6]

Skylights were provided in each section of the roof to provide light to the interior of the hut. Each skylight was constructed of appropriate framing, three panels of 2.9 mm glass set into a timber glazing system using putty and glazing pins. Each skylight was then fitted with a hinged cover. Dimensions of each skylight varied. All the original skylights and covers have subsequently been repaired to prevent snow and ice ingress. The glass has been replaced and the covers are a mixture of replica parts and repaired originals.

Doors [7]

There are three doors inside the Main Hut which are part of the original fabric. These include the door into the workshop from the porch, and the door between the workshop and living room and the darkroom door.

Magnetograph House

The Magnetograph House is an Oregon frame timber hut, prefabricated by Risby Brothers (Hobart) and erected in March 1912. Tongue-and-groove Baltic pine boards are used for internal and external cladding, and the walls are reinforced by approximately 30 t of rock. Fastidious steps were taken to make the building impervious to wind. Sheets of tarred builders paper were installed under each timber lining and a final continuous tarred paper covering was placed over the inside wall. The whole of the framework was secured by means of copper spikes and bolts. A shortage of small copper nails necessitated the use of some iron nails to fasten the lining but not within 6' of the instruments. The building was insulated with some twenty sheep skins on the roof and windward side. The plan is rectangular – 5.5 x 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 *Clyde* shipwrecked at Macquarie Island. The internal door is inscribed with a description on how to enter and exit the building.



Stove, Rose Coatside



Swights, Dea Bourke (A.U.)



Door into workshop, Dea Bourke (A.U.)



Magnetograph House, Dea Bourke (A.U.)



Absolute Magnetic Hut [9]

The Absolute Magnetic Hut, erected in February 1912, is a standing ruin consisting of a complete south wall, portions of the east wall, and the framing of the north and west walls. The frame is constructed of leftover Oregon timber with timber boarding and tarred builders' paper lining and is fastened entirely with copper spikes and bolts. 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 [10]

The Transit Hut is a roofless stabilised ruin of what was originally known as the Astronomical Observatory, built on a manually constructed stone platform in May 1913 to house a theodolite to take astronomical observations to determine the latitude and longitude of Cape Denison. These coordinates were painted on the plinth in the centre of the hut.

The Oregon timber frame braced by metal shelf brackets was lined with packing case timber and clad in sheepskin and canvas. There is a partial lining of asbestos cement sheeting. The structure had one door in the northeast corner. A 20" transit telescope loaned to the expedition by the Melbourne Observatory was housed on a 255 mm square wood pillar set into the rocks. The telescope, in conjunction with wireless time signals fixed their longitude very accurately. An inscription on the pillar describes detail of the longitude of the location. The hut incorporates meridional slots in the roof and tops of the north and south walls.

Memorial Cross and Plaque [11]

The memorial cross to Belgrave Ninnis and Xavier Mertz, built by Francis 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 (Godden Mackay Logan 2001).

The crossbar has blown off numerous times. It was re-attached in 1931 by BANZARE, in 1951 by a French overland expedition from Dumont d'Urville, in 1978 by ANARE and a fourth 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 Francis 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 currently in place is a replica. The original was removed to Australia in 1977, returned to the site in 1978, removed again 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 proclamation and replica bronze cylinder in 1978. The original plaque was removed in 1977, returned inside a transparent plastic and metal frame in 1978, removed in 1985 and replaced with a replica in 1986.

Alignment and Survey Marks

The terrestrial magnetism program used five stations and marks to enable observations. Two of the stations, the Absolute Magnetic Hut and the Magnetograph Hut, have been described above. The main azimuth mark (west mark) consists of a 7.6 x 5.1 cm timber, about 1.22 m long, around which a cairn of stones has been constructed. It is located on top of what is now known as Azimuth Ridge, approximately 386 m west of the Absolute Magnetic Hut.

Located about 44 m to the east of the Absolute Magnetic Hut is the dip-circle station. This mark consists of a pointed piece of 7.6 x 5.1 cm timber with a hole bored through it and built around with a stone cairn. The fifth station, in an ice cave approximately 1173 m away, a few degrees east of south of the Absolute Magnetic Hut, no longer exists.

Cultural Heritage Objects [12]

Artefacts, and artefact scatters relating to the AAE, have been observed across Cape Denison and on the plateau. Major concentrations of artefacts occur around the huts, especially the Main Hut. The main concentration of external artefacts at Cape Denison is to the north of the Main Hut. Mawson himself described the plume of discarded items from the AAE domestic quarters that extended to the north of the Hut. The artefact scatter does not appear to represent just a rubbish tip. Homogeneous collections of material, such as wood, suggest that it was used as a source of material for recycling. Other artefacts are present, such as the remains of clothing, food, refuse and numerous portions of seals with cut marks on their bones.

There are a number of other artefact scatters in the Hut Valley area. Seven individual or groups of artefacts have been recorded in the area to the east of Hut Valley, extending as far as John O'Groats. They include seal and penguin meat caches, bamboo poles, pieces of copper wire, survey markers and pieces of wood. Individual artefacts are scattered across the whole of Cape Denison.

More than twenty years of archaeological investigations in the Main Hut have recorded more than 1700 items including food tins and foodstuffs, bottles, photographic plates, reference books, newspapers, novels, notices, pictures, chemicals and developing paper.

Post-BANZARE Fabric [13]

Granholm Hut (67°00'29"S, 142°39'26"E), a temporary shelter and workshop established by the 1978 ANARE party 160 m northwest of the Main Hut, sits within the visual protection zone of the historic site. It has been retained as an emergency refuge and a convenient place to store conservation tools and equipment. The hut has been painted to blend into the rocky landscape to lessen its visual impact on the site.

Sitting outside the visual protection zone 400 m east of the Main Hut, Sørensen Hut (67°00'29"S, 142°40'12"E) is the main temporary shelter for conservation works parties and was built by the AAD in 1986 as a single room with an entry lobby. It was expanded in 1997/98 with the addition of an office section at its southern end and an externally accessed toilet at the northern end. Following a further expansion in 2009/10, the hut now contains a conservation laboratory and sleeping, dining and office facilities.



Adjacent to Sørensen Hut is an expanded 'Apple Hut' which serves as accommodation. It was 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. A nearby wooden platform is used for pitching tents.

Since 1990 an automatic weather station (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 is the property of the University of Wisconsin, Madison, and was replaced in 2011.

In 2007/08, a joint Australian-French project deployed two tide gauges in Boat Harbour to measure the height of the sea. This was the first time the sea level had been properly recorded since 1912. The Australian tide gauge was removed in 2009.

Centenary Time Capsule and Plaque [14]

A time capsule was installed on 16 January 2012 at the base of the proclamation pole to commemorate the centenary of the AAE. It is to be opened in 2112. The capsule contains a message from the Australian Prime Minister and messages from Australian students who offered their vision of Antarctica in another hundred years. A plaque to commemorate this event was laid at the base of the proclamation pole next to the time capsule.



Centenary plaque on Proclamation Hill, Dan Burton (AAP)

Centenary team with time capsule, Dean Lewis

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, Sweden, Scotland and Japan carried out fifteen land-based expeditions – some in quest of the South Geographic and South Magnetic Pole; others to explore, and collect magnetic, meteorological, geological and biological data and samples. 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 – Carsten Borchgrevink's *Southern Cross* hut, Cape Adare (Norway/UK, 1899); Robert Scott's *Discovery* hut, Ross Island (UK, 1901); Otto Nordenskjöld's *Antarctic* hut, Snow Hill (Sweden, 1901); Ernest Shackleton's *Nimrod* Cape Royds hut, Ross Island (UK, 1908); Robert Scott's *Terra Nova* Cape Evans hut, Ross Island (UK, 1911); and Mawson's *Aurora* huts, Cape Denison.

The Australian geologist Douglas Mawson first voyaged to the Antarctic in 1907 as part of 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 quest for the South Pole, he envisaged a locally-planned expedition heavily focused on geology and other sciences.

Mawson intended that his AAE would be a scientific quest. It included magnetic charting for navigational purposes, geological and biological studies, and the establishment of a wireless weather station. It also targeted 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.

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 t 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 young graduates from Australian universities. The average age was approximately twenty-six. Four were New Zealanders, three were British and one was 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). [15]

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 1911 at Macquarie Island (54°30'S, 158°57'E). The five-man party they left behind, led by meteorologist George Ainsworth, was to establish a wireless relay station and scientific base on the island which until then had been largely the domain of sealing gangs and commercial penguin oil harvesters. The station was erected on the northern end 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 on 8 January 1912. On the voyage from Macquarie Island to the continent Mawson abandoned the idea of a third base in the western Ross Sea region following news of Scott's decision to establish a base there. Poor prevailing weather conditions also factored into his decision. 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.

The *Aurora* carried an eight-man party of 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'. 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 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. [16]

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. The Main Hut 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 ceremony 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. [17]



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. [18]

The Magnetograph House was erected in March 1912 on a cleared site approximately 400 m northeast of the Main Hut, where the party had to use explosives to clear and flatten the 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 used by Eric Webb to measure variations in the South Magnetic Pole. [19][20]

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 scraps of 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. [21]

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. [22][23]

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. [24]

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, 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. [25]

19



Magnetograph House with Stuart, Frank Hurley

20



Magnetograph House interior, Frank Hurley

21



Spitz dog portrait, Frank Hurley

25



Midwinter dinner, Frank Hurley

22



Scots inside Living Quarters, Frank Hurley

23



An after dinner coffee in winter quarters, Frank Hurley

24



Madgen attending to the aneroid with pop, Frank Hurley

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 icescape, and other dangers arising from their equipment (one party nearly succumbed to carbon monoxide poisoning while cooking in an unventilated dugout). [26]

There were five major expeditions from the Main Base:

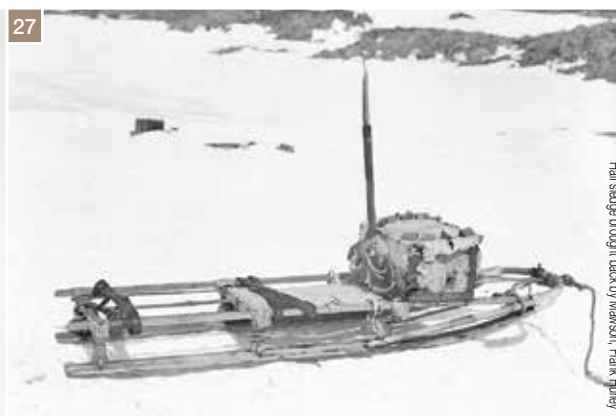
- *Southern Party*: Bage, Webb and Hurley, observing magnetic conditions, appear to have reached within 80 km of the South Magnetic Pole, despite bad weather. They were helped by a southern supporting party (Murphy, Hunter, Laseron).
- *Western Party*: Bickerton, Hodgeman and Whetter investigated the coastal regions to the west of Cape Denison. The team travelled 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 1912 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. The story of his survival elevated Mawson in the public esteem.

On 14 December Ninnis fell into a crevasse and was never seen again. On the return journey Mawson lacked the provisions that had been carried on Ninnis' sledge. The rations ran out, and the 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 while 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. [27]



Photos courtesy of Mitchell Library, State Library of NSW



Wind direction recorder, Frank Hurley

Half sledge brought back by Mawson, Frank Hurley

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 Davis decided to leave Mawson and a six man team – Bickerton, Madigan, Bage, Hodgeman, McLean, and Jeffryes – for another year in Antarctica. The bare essentials accompanying Mawson were a doctor turned biologist, two engineers, a cartographer, magnetician and wireless operator.

There were two major expeditions from the Western Base, leaving just one man (Moyes, the meteorologist) 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 (370 m) and charted the coastline.
- *Eastern Expedition to Denman Glacier*: Wild, Watson, Harrison and Kennedy charted 650 km of coast (Bay of Winds, Delay Point, Redi Glacier, and Cape Gerlache) 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.

Mawson had 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 and 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 was erected to house a twenty-inch transit telescope, and with this, in conjunction with wireless signals from the Melbourne Observatory, Webb and Bage fixed Cape Denison's longitude. [28]



Bage at Astronomic Observatory (Transit Hut), Frank H. Key Mitchell Library, State Library of NSW

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. Shortly after midwinter Jeffryes declared he was resigning his post, his mental illness requiring 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 spent the long winter dealing with difficult personalities, preparing biological specimens, cultivating yeast to make bread, and compiling the expedition account which would become *The Home of the Blizzard*. McLean and Mawson produced the expedition's newspaper, *The Adelie Blizzard*.

The most pressing maintenance task was the wireless. Although two-way communication had been established in February, bad weather in May broke the upper mast. 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. 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, and the disposable 'penny dreadfuls' left behind. [29]

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. Hodgeman inscribed a plaque constructed from part of the kitchen table that was cut in two in 1913. [30]

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

The *Aurora* spent a further two months at sea before returning to a hero's welcome in Adelaide. Publishing the twenty two volumes arising from the outcomes of the expedition was delayed by war, lack of funds and tardy contributors.

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. Hurley 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. His images are a comprehensive visual record of the Antarctic landscape, the expeditioners, their dogs and expedition activities (Godden Mackay Logan 2001).

Hurley's images of the AAE are held by 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, the National Archives of Australia and the AAD.

29



Penny death on book shelf, Chris Henderson (M/F/AA)

30



Memorial Cross for Metz and Vines, Frank Rudy (Michael Library, 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 Australian-based wireless station at the Queen's Domain in Tasmania. The base at Macquarie Island was only established at the 'last minute' when it was realised that Antarctica was too far away to transmit without a relay station. As noted by Godden Mackay Logan (2001): [\[31\]](#)

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 1912, 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 operation of the equipment. The reconstructed apparatus successfully sent messages but was not able to receive them. Two-way communication resumed in February 1913.

In May 1913, following strong gusts that broke the top and middle section of the main wireless mast, Bage and Bickerton made a kite to fly the radio aerial. A Venesta-box kite was used and successfully flew briefly but after several crashes the kite was no longer capable of flying. This may have been the first time a kite was flown in Antarctica. [\[32\]](#)

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. Some fabric remains on Wireless Hill, including remnants of the flying fox. Two generators recovered in the early 1960s are now in custody of the Tasmanian Museum and Art Gallery. The base of one of the wireless masts was removed from the island in 2011 for conservation purposes. The accommodation hut on the isthmus was demolished by ANARE in March 1948 to make way for a new station. Building foundations and remnants and haulage cable, amongst other artefacts, remain on site.

The air tractor

Mawson obtained an REP Monoplane from Messrs Vickers & Co for the expedition. Mawson's specifications of the aircraft to Vickers included the requirement to have the aircraft wings removable so it could be operated as a tractor. Additionally, the packing crate should be designed so that it could be converted to a hangar. 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. However, the aeroplane was damaged during a test flight in Adelaide (with Wild on board), and was taken to Antarctica without the wings. The expeditioners appreciated the irony of using a state-of-the-art aeroplane engine to haul conventional sledges, albeit with limited success:

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. (Godden Mackay Logan 2001)

Some evidence of the air tractor survives at the site. It is believed that the frame of the air tractor is buried under ice between the Main Hut and the harbour. [\[33\]](#)



BANZARE visit

Seventeen years after his original expedition, Mawson – who had been knighted for his AAE achievements – returned. In the summers of 1929-30 and 1930-31 he led 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 a ceremonial declaration and singing 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 oil and petrol cans from the dump behind the Main Hut. They also removed the roof of the Absolute Magnetic Hut in order to gain access and replicate the AAE's magnetic measurements.

Australia became the administrator of the subject land in 1933 when the British Government handed over control. Approximately 42 % 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 Magnetic 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.

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, the first Director of the AAD.

Comparison: Mawson's Huts and other Heroic Era huts

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.

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). As noted by Godden Mackay Logan (2001):

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, or whether a straw-like cellulose material found in parts of the living section wall cavity served this purpose.

As a group, Mawson's Huts probably retain the most intact and diverse range of accommodation and scientific facilities 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 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.

The different countries responsible for these sites are applying various levels of intervention in their management of these places:

- Borchgrevink's Southern Cross Hut; Scott's (Campbell's) Northern Party Hut, 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 stabilisation and repair of the porch section of Scott's ruined Northern Party Hut. Intrusive modern interventions are to be removed, and artefacts prioritised for conservation on the basis of their condition rating, and/or their importance to site interpretation. There is no attempt to return the site to a particular period in time.
- 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 Trust intends to further stabilise the building against snow ingress, and 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, and artefacts prioritised for conservation on the basis of their condition rating, and/or their importance to site interpretation.
- 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 has undertaken some reconstruction (fixing a new roof covering, removing ice from under the building, replacing post 1950s windows and doors with historically accurate versions), restoration (repaired chimney), and reconstruction of decaying stores boxes in the hut environs. Modern interventions to the internal layout have been reversed: the layout now reflects the end of the Nimrod expedition occupancy. 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 including over-cladding the roof) since the late 1950s. New Zealand Antarctic Heritage Trust has undertaken major works to remove snow and ice from under and around the building. The building has been weatherproofed including a breathable barrier layer under the external cladding, barrier dams to prevent meltwater flowing under the hut, and a historically accurate ruberoid cladding on the roof. Modern repairs to doors, windows and walls have been replaced with historically accurate versions. Some reconstruction to support existing chimney flues and acetylene plant fittings has occurred. Modern interventions to the internal layout have been reversed: the layout now reflects the end of the Scott expedition occupancy, with an overlay of Ross Sea Party use. Artefacts requiring conservation have been temporarily removed to a field laboratory and returned to the hut. Campbell's related Cape Adare Hut is regarded as a ruin.
- Nordenskjöld's *Antarctic Hut*, Snow Hill Island: Preservation with stabilisation, and repair (restoration) by Argentina since 1981, with maintenance and archaeological surveys. A related stone hut on Paulet Island is a ruin within a penguin fence. Both areas are subject to Antarctic Treaty site-specific guidelines for visitors.

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Man Hut, Deo Boer (AAN)

2.4 CURRENT USES

The current uses of Mawson's Huts Historic Site are limited to heritage conservation, archaeology, tourism, and meteorological and opportunistic scientific observations. [34]

2.4.1 HERITAGE CONSERVATION

Since the 1970s, site visits have been undertaken specifically for heritage conservation, managed through a combination of private and AAD efforts, including Project Blizzard. 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 about the future of the huts, and these concerns generated debate. 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.

On-site recording and conservation work began in the 1970s, reflecting a growing awareness of the significance of the site, and of historic places in general. These efforts coincided with the growth of the heritage conservation movement and related professions, and reflected changes in the prevailing philosophy of heritage management. The huts were registered on the Register of the National Estate (now non-statutory) 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.

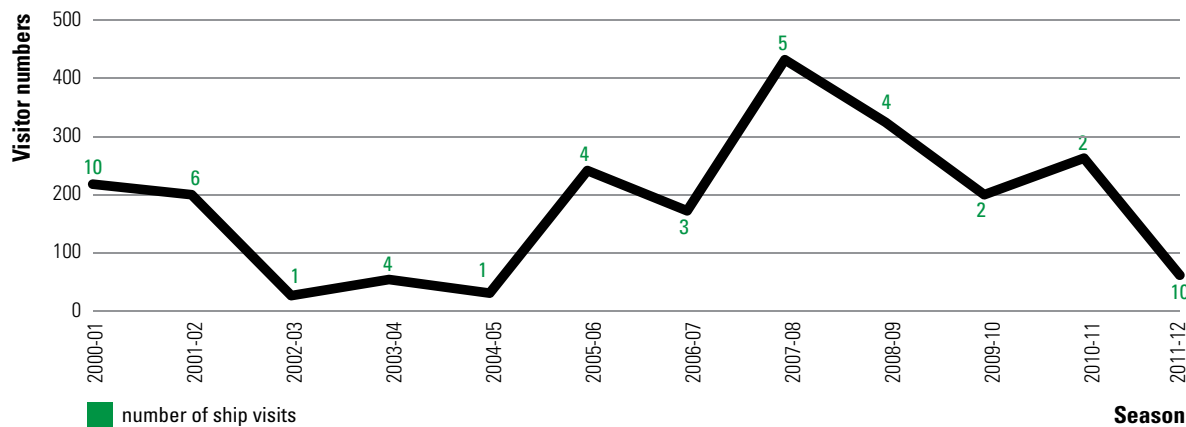
Since 1978, successive Australian governments have endorsed a policy of preserving the huts *in situ*. This policy is consistent with national best practice: Burra Charter Article 9 states that a 'building, work or other component of a place should remain in its historical location', and relocation is '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'. 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.

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 with the assistance of and approval from the AAD. The Mawson's Huts Foundation has mounted expeditions since 1996; undertaking conservation works programs approved by the AAD. A summary of key works to date can be found at Appendix III. [35][36][37]

2.4.2 TOURISM

From 1912 to 1998, two-thirds of the 650 people estimated to have visited the site were tourists. In the time since then, organised tours have been offered regularly as part of voyages to East Antarctica and the Ross Sea region, and more than 2500 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. [38]

According to the International Association of Antarctica Tourism Operators (IAATO), the total number of tourists making landings per season from seaborne and airborne vessels throughout Antarctica is around 26 100 per year over the last ten years. In 2010/11, 19 445 tourists landed in Antarctica; however, 96 % of passengers do not venture beyond the Antarctic Peninsula region, several thousand kilometres west of Cape Denison. In a typical season, there are more than sixty sites on the Antarctic Peninsula, and four sites on the Antarctic continent that receive more tourists than Cape Denison.



A typical tourist visit to Mawson's Huts involves thirty to one hundred people visiting for several hours, under the supervision of the ship's guides who brief their passengers on appropriate protocol.

Visitors may only enter the Main Hut with a permit. Entry for tourists is subject to the condition that they are accompanied by a suitably qualified guide, and only in accordance with other requirements specified in the ASPA management plan (Appendix I). The only interpretive material on-site is a small plaque near the Main Hut which explains in four languages that Mawson's Hut is on the list of Antarctic Historic Sites and Monuments.

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 AAD approval, occupied their own 'Gadget Hut' at Cape Denison throughout 1995. Their hut was used again in 1997 and 1999 and was removed shortly after.

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2.5 HERITAGE VALUES

2.5.1 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 as they were based on the advice of the Australian Heritage Council that the site's values met 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. A summary of the site's natural values, drawing on the assessment that informed the ASPA management plan, has also been included in the listed values for the site.

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 policies for the place are 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 under the EPBC Act.

Previous assessments

Mawson's Huts – the Main Hut, Transit Hut, Magnetograph House, Absolute Magnetic Hut and memorial cross – were assessed as worthy for their historic values for inclusion on the Register of the National Estate (now non-statutory) in 1980. This listing was based on the Australian Heritage Council's assessment that the site met various criteria of national estate significance. The statement of significance says:

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'. 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.

Review of heritage values

As part of the review of the 2007 management plan, a preliminary internal review of the National and Commonwealth Heritage values associated with Mawson's Huts was undertaken. Advice was received from internal and external heritage experts in relation to any changes to the identified values as a result of major conservation works, such as ice removal activities, over-cladding of the Main Hut and the fitting of the portal frame to the Transit Hut. This review was hampered by limited access to the huts during the 2011/12 season. Despite this, the review concluded that while these works impacted somewhat on the

visual aesthetics of the site, overall these activities have led to significant improvements to the longevity of the listed values. However, it was decided that a more comprehensive review should be undertaken during the life of this current plan when more time could likely be spent on site re-assessing the values. This review will take into consideration the need for conservation intervention that will lead to the longevity of the site as well as focusing on the attributes associated with each listed value. Any identified changes to the listed heritage values for the site resulting from the review will need to follow a separate process in accordance with the EPBC Act.

Limitations

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 provide a good assessment of the values for the site, however the listings are not always explicit in identifying the particular fabric associated with the values. As with the 2007 management plan, some interpretation has been required for the purposes of this plan to ensure the values and the fabric are managed in a complementary way. While noting the above limitations, these assessments and statements remain good summaries of the site's significance. Therefore, it has been viewed as unnecessary to undertake a full reassessment of values for this management plan.

2.5.2 DESCRIPTION OF NATIONAL AND COMMONWEALTH HERITAGE VALUES

National and Commonwealth Heritage criteria

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 is of '**outstanding heritage value to the nation**' (see Appendix IV). The site was found to meet criteria A, B, C, D, E, F, G and H (see below).

The site was entered on the Commonwealth Heritage List in June 2004 (Place ID 105435). As a Commonwealth property managed by the AAD, 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 IV). The site was found to meet criteria A, B, C, 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.

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 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 and 1913.

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

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.

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.

B. Rarity

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.

The site has a high level of integrity, retaining the Main Hut, plus the three scientific huts and a large number of artefacts.

The attributes are the same as criterion (A).

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 climatic 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 Antarctic 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.

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.

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.

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.

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.

The attributes are the same as criterion (A).

H. Significant people

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.

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, Laserson, Stillwell and Kennedy). The AAE is significant for the photography of Frank Hurley, including his innovative use of colour images and cinematography.

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.

The attributes are the same as criterion (A).

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 and 1913. The external relationship of buildings and artefacts illustrates the way the AAE organised their activities spatially.

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.

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.

The scientific community, the Antarctic veteran 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.

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.

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.

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.

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.

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.

F. Creative or technical achievement

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.

Attributes:

- All aspects of the huts including their manufacture, design, form, fabric, detail, structure and thermal properties.

G. Social value

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.

Attributes:

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

H. Significant people

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.

Attributes:

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

2.6 NATURAL HERITAGE VALUES

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. Perhaps the most striking natural feature of Cape Denison is the towering height of the Antarctic plateau. This ice cap extends along Commonwealth Bay in the form of huge ice cliffs, which periodically calve into the sea.

The huts, perched on a small rocky peninsula, are 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.

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. Excluding the Antarctic Peninsula, only approximately 0.05 % of coastal 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.

2.7 CONDITION OF FABRIC

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 AAD report on deterioration of the fabric at Cape Denison, the first formal condition report was prepared by Project Blizzard in 1984-86. 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. Recent expeditions working on the site have also reported the condition of the fabric.

Until the 1970s, most elements on the site were gradually deteriorating due to ongoing exposure. Since the expedition that built the structures only needed them to stand for a year or two, the fact that any buildings at all remain 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 interventions.

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.

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 expeditions during 1985-86, 1997-98, 2000-01 and 2002, and annually between 2004-05 and 2010-11. 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 high on account of 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 the roof in order to position recording instruments. The Transit Hut was – even when it was in use – the most ephemeral of the huts. 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. The ruins demonstrate the impacts of exposure of the original timbers to a hundred years of exceptionally harsh weather. The Absolute Magnetic Hut has been subject to only minor intervention for stabilisation, however the Transit Hut has been installed with a portal frame to provide greater stability. The portal frame has been attached to the original hut frame and was designed

in such a way that it would not need to be attached to the original floor, and offers the least interference with the original fabric and the sense of decay over time.

The memorial cross is in good condition. Its condition 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.

2.7.1 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. Both roofs have since 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. [39]



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 original work plan was changed and the new boards were placed over the top of the old boards. This change in methodology meant that the Intergrain™ coating on the new boards lasted longer than expected and impacted on the appearance of the workshop roof until the coating was sanded off in 2011. 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. 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. Weathering should lessen its visual impact. [40]



With the over-cladding in place, the original 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.

In 2009-10, the south-western corner wall of the Main Hut was over-clad as the south verandah wall receives most of the prevailing weather and the wall boards were badly abraded and cover battens were being lost. The over-cladding in some areas helps protect the snow bank that has built up in the verandah which provides a buffer effect for the internal environment of the hut. In other areas over-cladding was not considered to be the best solution, such as the north wall of the workshop where snow ingress was addressed with specific minor internal repairs. This matter will be revisited during the life of this plan.

2.7.2 STRUCTURAL CAPACITY OF THE BUILDINGS

Main Hut

As described in Godden Mackay Logan (2001):

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.

These factors will continue to be monitored during the life of this plan. A review of the structural integrity of the Main Hut will be undertaken during the life of this plan, taking into account the over-cladding and ice removal.

Magnetograph House

The Magnetograph House is substantially intact and the interior is free of ice and snow. The building is thought to be structurally sound and in good condition. This building will also be subject to a structural assessment during the life of this plan.

Transit Hut and Absolute Magnetic Hut – Standing ruins

Following the fitting of the portal frame to the Transit Hut in 2010/11, the structural capacity of the hut has improved considerably. The Absolute Magnetic Hut is in a poor condition and wall cladding is thin and continues to be abraded by the harsh weather conditions. Both huts are managed as standing ruins (see Section 2.9.4). Any future stabilisation works that may be required to either hut will be based on the outcome of a full structural assessment during the life of this plan.

2.7.3 CORROSION OF METAL CONNECTORS

Godden Mackay Logan (2001) notes that:

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 over time. Apart from the loss of cladding, failure of bolts or nails is the event most likely to lead to significant damage to the buildings.

Since 2002 external and internal corrosion rates have been monitored using bimetallic CLIMAT bolts and copper/steel coupons. Its combination with environmental data has allowed conclusions to be drawn regarding corrosion rates in different parts of the Main Hut and the impacts of snow and ice removal and over-cladding the roof of the Main Hut on the internal micro-environments. Corrosion rates are dependent on the types of micro-environments associated with particular areas such as the ice-free darkroom, Mawson's cubicle and more open areas. Preliminary data indicate that corrosion rates may have increased slightly in some areas following the over-cladding of the living quarters. Preliminary data following over-cladding indicates that changes in internal corrosion rates are variable, with slight increases in some areas but concurrent decreases in other areas. Further analysis of corrosion data is required before firm conclusions can be drawn. Additional monitoring, especially in walls and ceiling, is also recommended.

2.7.4 ICE AND ANCHORAGE

The relative contribution to the foundation strength of the Main Hut of 50 t 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, it is assumed that 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 (Godden Mackay Logan 2001).

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, any removal of ice from the floor will be undertaken in stages, and changes to the internal environment monitored. Excavations have left a precautionary ice layer at least 600 mm thick on the floor throughout most of the hut, although this coverage is not uniform and in some places is less than 600 mm. Over time this precautionary ice layer may reduce in thickness through sublimation. Manually lowering this 600 mm precautionary layer may only occur following an engineer's assessment of the structural integrity of the Main Hut and additional monitoring analysis which will be undertaken during the life of this plan.

2.7.5 ARTEFACTS AND FIXTURES

The cultural heritage objects on site are in the process of being documented and mapped. Over 1700 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. 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, detritus congealed on the dark room floor, and tins represented only by rust rings.

Attitudes to the detritus in the dark room have varied markedly since work began to conserve the site. Early works parties, for instance, viewed the undifferentiated mass of material on the floor as 'compost' that should be dug out and discarded, whereas others view the litter as a resource that enriches our understanding of the site's use beyond what the documentary sources provide.

Artefacts outside the huts are in various conditions, with seasonal variations in snow levels limiting the monitoring of some items. Artefact scatter surveys undertaken during 2009/10 and 2010/11 concluded that some objects within the artefact scatter have moved or disappeared. Wind is the most likely cause but wildlife and visitors also move objects.

The interior of the Main Hut has a number of fixtures that were part of the 1911-14 expedition. Situated near the darkroom in the main living area, the stove was used for cooking and heating. The stove has largely been excavated from the ice. The surface of the cast iron stove shows minor surface corrosion. When the hotplate rings were freed of ice, the interior of the stove revealed the remains of coke/wood from previous use. The refractory bricks lining the main oven appeared to be in a stable state. A sheet of metal plate located underneath and in front of the stove appears to have served as a hearth.

Shelving can be found throughout the workshop and living area, many containing a range of artefacts, while others have been damaged by ice and snow. Along the inside walls of the living area, bunk beds can be found with the inscriptions of the expeditioners' initials. Accumulated ice has been removed from the bunks. The bunks are in a relatively good condition except that many planks used to support the mattresses have been removed. The remaining planks were scraps of timber from packing cases and off-cuts of tongue and grooved boards.

The acetylene plant used for lighting is in good condition although chemical by-products from the conversion process remain inside the plant.

2.7.6 UNKNOWN FACTORS

While knowledge of and confidence in many aspects of the site is increasing, there remain unknown factors and areas of limited data in relation to the condition of the huts and how some of their listed values are conserved and protected, including:

- All points of ingress for snow and melt water, including the effect of hoarfrost in walls and ceiling through freeze/thaw actions
- long-term rate of snow and melt water ingress, once all the known ingress points are blocked
- the internal climatic changes that have resulted from over-cladding the roof
- the types of objects located within inaccessible ice-filled verandahs and possible nearby caches
- impacts of climate change on artefacts and the structural integrity of the huts
- building and foundation stability, including deterioration rates of cladding

Since January 1999, monitoring equipment recording relative humidity and temperature has been installed inside the Main Hut. 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. To develop a better understanding of the effect over-cladding has had on the internal climatic environment, additional monitoring and further analysis is needed.

This has been incorporated in the AAD's monitoring and maintenance plan and will help inform actions to conserve and protect the values of the site.

Further analysis is needed of the heritage significance of AAE associated depots and traverse lines, and the wireless stations at Macquarie Island and the Queen's Domain, Tasmania in order to understand their relationship to the Mawson's Huts Historic Site. Such analysis will help better understand the association of these places with the listed National and Commonwealth Heritage values.

In addition, recent changes in fast ice conditions at Cape Denison have affected access to the site and this may affect future expeditions and tourist visits. In 2011/12, a number of visits to the site were unsuccessful or cancelled due to ice conditions. It is unknown how long the current sea-ice conditions might prevail.

2.8 CONDITION AND INTEGRITY OF VALUES — SUMMARY

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, the assessments to date have applied different measures and 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.

The terms used below are consistent with state of the environment guidelines for assessing the condition of heritage places (see Pearson and Marshall 2006). 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, in need minor repairs.
- Poor** Damaged, structurally unstable, erosion, disturbance, walls or floors missing or dilapidated.

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.

The notion of integrity assists in determining the relative significance of a place compared with places of a similar type. Generally a high degree of integrity would be expected for most National Heritage places. For the cultural environment, integrity is the ability of the place to retain and convey key heritage values. The integrity of a place may be affected by internal and external factors.

No.	Value to be assessed (associated criteria under the National and Commonwealth Heritage Lists)	Current condition of the fabric associated with the value/s	Integrity of the fabric and the associated value/s
1.1	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, F, G, H; CHL A, B, C, E, F, G, H).	Fair – Although there are concerns over the Transit Hut and Absolute Magnetic Hut, even as ruins. Minor changes have occurred to the site since the original assessment.	Medium to High – The historic site layout and setting remains intact provided the ruins continue to stand. Therefore while the fabric is managed as a ruin, the values associated with the features are in good condition.
2.1	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).	Workshop: Fair – The original boards beneath the over-clad roof are poor. The over-cladding boards are in good condition.	Medium – Structural integrity has been secured at the cost, in the medium term, of visual integrity, but the new timbers are weathering with the removal of the resin coating from the new boards (2011). The values associated with criteria F remain in good condition as a result of these works.

No.	Value to be assessed (associated criteria under the National and Commonwealth Heritage Lists)	Current condition of the fabric associated with the value/s	Integrity of the fabric and the associated value/s
2.2	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>Living section: various</p> <p>The original roof planes appeared to be structurally 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). The over-cladding of the living quarters roof (2006) continues to protect the boards, battens and fabric remains.</p> <p>Most external walls are in fair condition. The original south wall cladding is poor and has been partially over-clad in the southwest corner to prevent failure of these original boards. Internal walls are in good condition.</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). The replica flagpole installed in 2006 represents this original feature of the hut.</p>	<p>Medium to High–</p> <p>The new timber of the roof over-cladding boards obscures the original roof but allows the AAE fabric to remain in place. External walls have an integrity value of medium and internal walls have high integrity.</p> <p>Medium –</p> <p>While over-cladding of the southwest corner walls obscures the original fabric, most walls retain significant fabric. The values associated with criteria F remain in good condition as a result of these works.</p>

No.	Value to be assessed (associated criteria under the National and Commonwealth Heritage Lists)	Current condition of the fabric associated with the value/s	Integrity of the fabric and the associated value/s
3.1	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>Fair –</p> <p>Some spaces and objects remain obscured by snow and ice, the weight of which has also made some exposed shelving collapse (2002). Repair of some areas of shelving has allowed the reinstatement of artefacts. Further work is required to complete the repairs of the collapsed shelving in the living room and workshop (2010).</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:</p> <p>3 m³ from the south-western and south-eastern corners and 2 m³ from Mawson's cubicle. Significant amounts of ice removal has continued in the Main Hut (2008, 2009, 2010) revealing more of the kitchen and bunks.</p> <p>The over-cladding of the roof of the living quarters has reduced the ingress of snow and ice. The associated impact on the internal environment is yet to be fully understood. Further analysis of corrosion data and additional monitoring are required before firm conclusions can be drawn.</p>	<p>Medium to High –</p> <p>Although there has been damage to collar ties in the workshop, damage to shelving brackets and timbers and some timber losses from the bunks and mezzanine areas, enough significant fabric is retained in the interior spaces for interpretation. The values associated with these criteria remains medium to high.</p>

No.	Value to be assessed (associated criteria under the National and Commonwealth Heritage Lists)	Current condition of the fabric associated with the value/s	Integrity of the fabric and the associated value/s
3.2	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>Fair –</p> <p>Nails from the ceiling, bolts retrieved from the workshop collar ties and the results of corrosion monitoring indicate normal to low corrosion rates, not sufficient to affect their performance, and consistent with bolts from the living section (2002).</p> <p>Low corrosion of flagpole bolts (2007). Corrosion monitoring should be continued as part of the monitoring plan.</p>	High –
3.3	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>Good to Poor –</p> <p>Heritage objects are in various conditions due to exposure in different micro-environments. Photographic and other evidence indicates that some objects have been moved out of context (2002).</p> <p>Some artefacts and fixtures are clearly suffering due to ice ingress and mould (2007). Conservation of artefacts has helped to stabilise deterioration due to environmental conditions.</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>
4.1	The three functionally-specific scientific huts, allowing for research on climatic impact, environmental change and material deterioration and conservation (NHL C)	<p>Magnetograph House: Good –</p> <p>It is substantially intact. The interior is snow and ice free and structurally sound.</p> <p>Magnetograph House walls battered and wind harried.</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>

No.	Value to be assessed (associated criteria under the National and Commonwealth Heritage Lists)	Current condition of the fabric associated with the value/s	Integrity of the fabric and the associated value/s
4.2	The three functionally-specific scientific huts, allowing for research on climatic impact, environmental change and material deterioration and conservation (NHL C)	Absolute Magnetic Hut: Poor – Despite being stabilised in 1997, the remaining wall boards are very thin and are only secured by the ice embedded around the boards.	Medium to Low – Many cladding timbers have been lost and others have been dislodged. Due the nature of managing a standing ruin, there has been a decrease in the level of integrity associated with the Absolute Magnetic Hut since the last management plan.
4.3	The three functionally-specific scientific huts, allowing for research on climatic impact, environmental change and material deterioration and conservation (NHL C)	Transit Hut: Fair – The hut has been stabilised as timber had deteriorated markedly and the structure was on the verge of failure.	Medium to Low– While the overall structure retains its original form, timbers have been lost primarily from the southern and northern faces and the longitude bearing that is painted on the plinth is slowly being lost. The remaining cladding timbers are prone to significant vibration and potential loss during wind events. The non-invasive nature of the portal frame attached to the Transit Hut has a minimal impact of the hut's integrity.
5.1	Memorial cross, associated with heroic endeavours and evoking a sense of isolation (NHL A, E, G; CHL E)	Wind has caused the rotation and blowing-off of the cross arm on numerous occasions, 1931 to 1998. Repaired cross – good – The cross remains in good condition apart from the continued slow loss of timber due to abrasion. No action is necessary. Backing board of the replica plaque: Poor – Has virtually worn away at its extremities – timber loss almost 1 mm per year, 2002 to 2011.	Medium – Modern repairs (stainless steel brackets) have stabilised the cross but lowered its integrity. Replica plaque has been installed.

No.	Value to be assessed (associated criteria under the National and Commonwealth Heritage Lists)	Current condition of the fabric associated with the value/s	Integrity of the fabric and the associated value/s
6.1	The remains associated with the pioneering use of wireless and air tractor (NHL A, F)	Two wireless masts: Poor – Large fragments of the broken wireless masts and cables are mostly obscured by snow and ice.	Low
6.2	The remains associated with the pioneering use of wireless and air tractor (NHL A, F)	Air tractor: Poor – Remains of the air tractor tail were located and returned to Australia for conservation purposes. Portions of tyres found in the artefact scatter to the northwest of the Main Hut (2002). Remains of the third seat were recovered from the rocks on the east of Boat Harbour and are being treated in the on-site laboratory. Other parts of the frame have been located in the workshop and Main Hut during ice excavation (2010).	Low – Search for the air tractor has potentially located the frame left behind in 1913 (2010).
7.1	Original points from which surveying, cartographic, meteorological and magnetic observations were made, which allow for comparative scientific research (NHL C)	Fair – Exposed timber posts from survey markers were inspected and it was determined that no action was necessary (2002). Location and condition of the survey markers should be resurveyed to update condition and GPS location.	High
8.1	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)	Items vary from good to poor – Some of the most sensitive exposed objects, finnesko (reindeer hide) boots and items of clothing were in very good condition (2002). Because of the differential exposure from season to season, it is difficult to accurately assess changes in the condition of the assorted objects in the artefact scatter.	High – No items appear to have been taken recently as souvenirs, and while there appears to be some movement of objects in the artefact scatter, the likelihood of exposed objects being blown into Commonwealth Bay is low.

No.	Value to be assessed (associated criteria under the National and Commonwealth Heritage Lists)	Current condition of the fabric associated with the value/s	Integrity of the fabric and the associated value/s
9.1	The BANZARE proclamation pole, plaque and canister (CHL E)	Good – It is unclear to those viewing the canister that this is a replica.	Medium – Photocopied document and replica plaque and canister.
10.1	The site as a cultural landscape retaining a sense of historic time and place (NHL E, CHL B)	Good – The site remains the least disturbed of the Heroic Era sites.	High – Three non-historic items remain within the Visual Protection Zone: Granholm Hut, which remains in place for storage and as a refuge; a tide gauge installed in 2010/11 by France; and a University of Wisconsin Automatic Weather Station.
11.1	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)	Good to Poor – The Transit Hut and Absolute Magnetic Hut, the artefact scatters and the walls of the Main Hut and Magnetograph House are clear evidence of exposure and time elapsed.	Medium – Over-cladding roof timber protects but obscures the weathered original boards of the Main Hut and the Magnetograph House. This has impacted on the level of integrity for this value.
12	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)	Good – The natural setting is unchanged.	High
13	Accessibility of physical evidence from Cape Denison, now in Australia and elsewhere (NHL C)	Various – A reference collection of building materials has been repatriated to Australia. Artefacts held by AAD are catalogued in the AAD Antarctic Heritage Register. Other artefacts are situated in a range of collection institutions (see Appendix V).	

No.	Value to be assessed (associated criteria under the National and Commonwealth Heritage Lists)	Current condition of the fabric associated with the value/s	Integrity of the fabric and the associated value/s
14	Accessibility of documentary evidence relevant to the site, including the photography of Frank Hurley (NHL C, E, H)	<p>Good –</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> <p>Copies of primary sources (diaries, reports, photographs) are becoming available on the Internet for free public access.</p> <p>Copies of secondary sources (field reports, archaeological reports, recent images of the interiors of the huts) are available online on the AAD Antarctic Heritage Register.</p>	High
15	Associations with heroic endeavours (NHL G) and a model of scientific research and exploration (CHL G)	<p>Good –</p> <p>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.</p>	High

No.	Value to be assessed (associated criteria under the National and Commonwealth Heritage Lists)	Current condition of the fabric associated with the value/s	Integrity of the fabric and the associated value/s
16	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>Good –</p> <p><i>Australian Dictionary of Biography</i> 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 entries emphasise the significance of the AAE experience.</p> <p>Eric N Webb is not in the NZ <i>Dictionary of National Biography</i> – 1975 interview (Lennard Bickel) held by the National Library of Australia.</p>	High

2.9 PRESSURES ON NATIONAL AND COMMONWEALTH HERITAGE VALUES

2.9.1 ENVIRONMENTAL PRESSURES

Wind

Cape Denison is perhaps 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, as well as 'plucking of weathered fibres' on the leeward sides of structures. Abrasion resistance in timber is generally a function of density, but weathering of the surface is probably more significant in determining the loss rate at leeward locations. This is probably the case for the memorial cross where it has been suggested that plucking has removed more timber than corrasion. Further analysis of monitoring data is required to better understand the processes of wind damage in order to develop effective treatments or mitigation measures. [41]



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 compared 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 (Godden Mackay Logan 2001). A similar situation was occurring to the Transit Hut where corrasion had worn down the exposed timber to the point of possible collapse. In 2010 a portal frame was fitted to the inside of the structure to reinforce the structure while still preserving the heritage values of the hut. While the structure itself is now strengthened, the cladding timbers are still subjected to the effects of wind.



Wind is also causing the removal of painted lettering on the Transit Hut plinth that states the latitude and longitude of the site. [42]

Vibration data loggers have been used to determine the effects of ice removal on the stability of the buildings, and timber thickness measurements have been taken to gauge the rate at which timber is being abraded from the cladding and historic wooden structures at the site.

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.

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 and broken shelves and shelving brackets, 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 suppressing daily and seasonal variations in temperature and relative humidity. While obscuring artefacts, the main effect of ice in the verandahs has been to help to stabilise the structure.

Water appears to have no deleterious effect on the structural capacity of timber. Both the bending and compressive strengths of timber are enhanced by low temperature and high moisture content. 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 reduces fungi and does not support insects. While various stain and mould fungi are found at low temperatures, and moulds have been recorded on fabrics, foods, timbers and papers in the Main Hut (the moulds probably arrived with the AAE), they do not cause structural damage. Assorted yeasts including *Rhodotorula* (pink yeast), moulds and occasional mixed fungi were identified from swabs taken from assorted sites in the living quarters of the Main Hut (2009). Fungi that might attack the timber structure, rather than simply surface staining (generally *Basidiomycetes*) exist at 20-30°C, with an optimum range of 23-25°C. There is no evidence of insect attack at the site. Generally, insects such as termites and woodborers require similar temperatures to fungi (Godden Mackay Logan 2001).

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, unless subjected to wetting and drying cycles associated with snow and ice contact. The daily variability of relative humidity is low. However to fully understand the associated risks with high humidity and the lack of air movement within the huts, further analysis of monitoring data would be required. Some metal objects located elsewhere on the site 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. Ice and snow samples collected in 2002 from sites inside and external to the Main Hut were found to have uniformly low chloride contents (1-96 ppm) with only one site, in the workshop verandah (above the meat cellar) showing elevated levels (~1130 ppm). In order to better understand the impact of salt on the timbers and internal artefacts, methods to monitor sulphate concentrations and incorporate into the program will be investigated.

Data loggers have been used to monitor the external Cape Denison environment and micro-environments inside Mawson's Huts since the summer of 1998/99. Temperature and relative humidity data accumulated over this time, supplemented by corrosion studies using bimetallic CLIMAT bolts and copper-steel coupons, has been used to guide conservation decisions regarding ice removal from the interior of the Main Hut and to provide information on the effects of the high humidity environment on the structures and the corrosion of iron fastenings and fittings. These data have also been used to monitor the impacts of snow and ice removal on internal microenvironments of the Main Hut. While this monitoring will continue, additional monitoring of moisture within walls and ceiling will also be undertaken. This information will assist in understanding the climatic impact of the over-cladding of the roof and the potential need for better ventilation. [43]



Fauna impacts

Although Cape Denison contains Adélie penguin colonies, none are located near the buildings. However, the historic fabric has the potential to injure fauna. There is no evidence of fauna damaging huts or artefacts (such as seals rubbing against structures or objects). Adélie penguins have been observed to move small artefacts.

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.

To reduce the risk of fire, the environmental monitoring system installed inside the Main Hut, contains no exposed wires. These stand-alone loggers monitor temperature, relative humidity and vibration levels. Data from loggers are downloaded seasonally (where possible). Smoking or having naked flames in or near the huts is prohibited.

2.9.2 LOGISTICAL CONSTRAINTS

Remoteness

The remoteness of the site from Australia and from Australian Antarctic stations is a major logistical constraint on conservation works. So too is the extreme and variable ice and weather conditions which govern access to the site. Cape Denison is not within the direct shipping routes to Australian stations and therefore requires a dedicated voyage or diversion or opportunistic 'piggy-back' on other vessels that operate in the area from time to time.

Ship-to-shore operations can be difficult, with no known reliably safe anchorage in Commonwealth Bay. Small boat operations are very constrained by the strong offshore winds. Helicopter access from vessels may be an option. The use of twin-engine helicopters within the area should be avoided given the proximity of wildlife.

Resources

The AAD accords the conservation of the heritage values of Mawson's Huts Historic Site a high priority.

The AAD is not specifically resourced to undertake on-site conservation work; to date, the Australian Government has provided funds to the Mawson's Huts Foundation to prepare and mount conservation expeditions on behalf of the AAD. The Mawson's Huts Foundation also raises funding to assist with the conservation of the huts.

2.9.3 RISKS TO STRUCTURAL INTEGRITY

Inappropriate conservation works

Works 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 integrity of the site. Such works programs need to be cautiously designed and assessed prior to their implementation in order to minimise these risks. This does not, however, preclude emergency intervention in the event of unanticipated threats to the structures. No major structural interventions of the scope and scale of the over-cladding of the roof of the workshop of the Main Hut (1998) and of the living section (2006) are however anticipated in the life of this plan.

Snow and melt water ingress into the Main Hut

The over-cladding of the Main Hut roof has largely prevented 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 produced 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. The extent of potential impacts will be determined by continued environmental and corrosion monitoring. The monitoring plan will include the placement of monitoring sensors in high risk/high melt zones, such as walls and ceiling. The use of other sensors, such as gold grid sensors, will be investigated and incorporated into the monitoring plan (if deemed suitable).

Monitoring of snow and ice ingress into the Main Hut will help determine entry points and enable maintenance and internal patching to be undertaken to reduce ingress. In the longer term, careful monitoring is needed to assess the possibility of the build-up of snow and ice, particularly in wall and ceiling cavities, and to determine the effectiveness of internal patching. [44]

The site is regularly affected by diurnal and seasonal freeze and thaw cycles. In winter, the Main Hut is typically buried to the top of the walls by drift snow. During summer seasonal melt cycles, the western and eastern walls often collect melt pools that abut the external timbers, with visible tide marks on the exterior cladding. This may increase the risk of melting of ice in the internal verandah and large melts may cause flooding under and possibly even in the Main Hut. The Oregon timber frame of the Main Hut, where it has been subjected to occasional exposure to water in these pools, shows no signs of damage to date but the potential impact of this activity needs to be monitored over time to identify any changes. In summer, when much of the external snow ablates and melts, melt water pools and streams sometimes form around the Main Hut. During these times, access into the hut may be more difficult for tourists and conservation parties. Melt water is not a straightforward issue since it is difficult to remove, and exposure to air may increase bio-deterioration and corrosion risks more than inundation in water. [45][46]



Snow ingress in workshop, Deb Bourke (A4D)

Melt water near Main Hut, Deb Bourke (A4D)

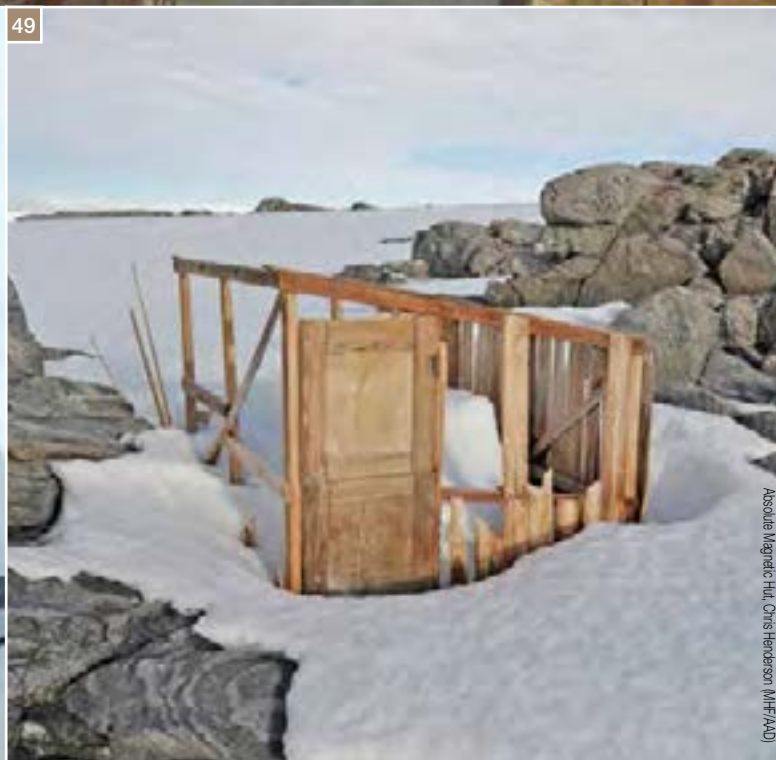
Melt water adjacent to Main Hut, Murray Doyle



Doorway from workshop to living quarters, Deo Bourne (A/D)



Opening the Main Hut, Deo Bourne (A/D)



Absolute Magnetic Hut, Chris Henderson (MH/A/D)

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. [47]

Snow and ice that entered the building due to the failure of cladding and insulation over the years has damaged fittings, increased the corrosion of covered artefacts 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 structure of the hut or its internal environment in such a way that would compromise other heritage values. [48]

Monitoring has shown that the internal environment is not substantially altered by the removal of some of the ice, although further monitoring and analysis are required before conclusions can be reached. Temperature and relative humidity sensors in place since 1999 have found no significant variation since the removal of large volumes of ice in 2002. Additional freeze/thaw monitoring in the walls and ceiling will assist in confirming the suitability of the ice removal policy and may influence the next review of this plan.

Since ice that has formed over and around objects is difficult to remove and increases the risk of damage, further works to remove accumulations of hard snow and ice to reveal the significant fabric, detail and spaces in the hut need to be guided by archaeological and conservation experts as well as recommendations from the analysis of monitoring data.

2.9.4 MANAGEMENT OF STANDING RUINS

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

The Transit Hut and Absolute Magnetic Hut are regarded as standing ruins because of their exceptional *cultural significance* and high degree of *authenticity*, combined with their lack of *integrity* and poor *condition*. They require minimal intervention. The extent of reconstruction necessary to complete these structures would not be consistent with the particular significance of these structures that is partly associated with their physical state, or with heritage practice generally (i.e. Burra Charter). However, it is also recognised that the environment in which they are located will mean some intervention over time will continue to be necessary. [49]

Managing buildings as standing ruins runs the increased risk of loss of fabric, for instance through demolition by a blizzard. Rather than 'standing' ruins, this might leave only foundations and disjointed, failed building materials.

In 2011, a conservation party stabilised the Transit Hut with a portal frame, as the wall boards were so eroded that the whole structure was becoming marginal.

The wall boards on the Absolute Magnetic Hut are reported as being marginally more stable, being affixed to the structure or firmly embedded in ice preventing them from detaching. During the life of this plan, stabilisation works may need to be undertaken on the Absolute Magnetic Hut. Similar to the Transit Hut, works will take careful consideration of the listed values in order to maintain their integrity.

It is recognised that managing the Transit Hut and Absolute Magnetic Hut as standing ruins with no intervention will lead to the loss of condition and integrity. Further analysis of this issue, and possible remedies, will be undertaken during the life of this plan.

2.9.5 MANAGEMENT OF CULTURAL HERITAGE OBJECTS

The Mawson's Huts Historic Site has a large number of moveable cultural heritage objects. To assist with the management of this collection, a collections policy will be prepared during the life of this plan which will address on-site and off-site management of AAD-held artefacts, including loans with collections institutions.

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. 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.

Management and 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 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 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 has been 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 location of artefact scatters on the site is influenced by wind and melt water, and possibly visitor activity, the patterns of placement of these objects could yield information that will contribute to a wider understanding of history.

On occasions, visitors to the site have accidentally or deliberately moved artefacts. Guides provide information to visitors on not moving or touching artefacts. As artefacts become exposed through ice ablation, it may be necessary to remove objects for conservation purposes. Returning the objects to their place of origin may not always be practical or possible, although it is preferred. [50]

The AAD maintains an Antarctic Heritage Register available through the AAD website. Over 1700 artefacts from Cape Denison are recorded in the register. This number will grow as more artefacts are located and assessed.

Management and documentation of objects elsewhere

There are a number of sites associated with the 1911-13 AAE's expedition not within the Historic Site boundary that hold heritage values associated with the site. In the region surrounding the identified site, there are remnants of depots and artefact scatters near to the site and along traverse lines.

The wireless repeater station established on Macquarie Island in 1911 played a critical role in linking wireless communications between Antarctica and Australia. This site is managed by the Tasmanian Government. Pieces of the wireless mast at Macquarie Island were removed in 2011 in a joint operation by the Mawson's Huts Foundation and the Tasmanian Parks and Wildlife Service. The mast pieces have been given to the Tasmanian Museum and Art Gallery for conservation.

The Australian-based wireless station at the Queen's Domain in Tasmania also has potential historic significance associated with the listed site. Being physically separate to the listed place, these associated sites cannot be considered part of the historic values listed under the EPBC Act for the Mawson's Huts site. The station now known as the 'Coastal Wireless Station' is permanently registered on the Tasmanian Heritage Register.

The management of heritage objects found outside the site in Antarctica is addressed in Policy 8 (below). Objects found on Macquarie Island that potentially may be related to the site will be managed by the Tasmanian Government.

Objects, images and papers relating to the AAE and to Sir Douglas Mawson are found throughout Australia. Further information on the location of these artefacts can be found at Appendix V.





PART 3 MANAGEMENT POLICIES AND IMPLEMENTATION

3.1. MANAGEMENT POLICIES

In meeting its international and Australian obligations to conserve the heritage values of Mawson's Huts Historic Site, the AAD aims to manage the site in accordance with the highest conservation standards.

3.1.1 KEY CONSERVATION PRINCIPLES

Policy (i) Site management will uphold key conservation principles

The key principles, developed by meetings of experts during the preparation of the previous management plans, remain relevant and appropriate. These key principles are edited versions of those prepared by Godden Mackay Logan Pty Ltd in *Mawson's Huts Historic Site Conservation Management Plan 2001*.

(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 and listed values.

(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) It is desirable to reveal 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 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 or physical intervention to prevent snow and melt water ingress, and (ii) is sustainable given the maintenance plan feasibly provided over time.

(E) Conservation plans must consider 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 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 and 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 natural heritage values, and cultural heritage objects (both on and off-site) and records.

(G) Decisions must be based on an understanding of cultural significance and 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 a critical 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

Work at the site should be undertaken 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 be applied in conjunction with other relevant guidelines.

(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 needed 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. Identified stakeholders include the Australian Heritage Council, previous expeditioners, conservation practitioners, the Mawson's Huts Foundation, Antarctic tour operators and Antarctic Treaty parties.

(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 at Cape Denison, should be a fundamental aim.

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

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

(N) Records of artefacts and off-site elements should be maintained

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.

3.1.2 GENERAL SITE MANAGEMENT**Policy (2) Site management will work towards long-term goals consistent with the conservation principles**

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.

The following site management principles are edited versions of those prepared by Godden Mackay Logan Pty Ltd in *Mawson's Huts Historic Site Conservation Management Plan 2001*.

(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 structurally stable, clear of internal ice (on the proviso that removal does not negatively affect the internal microclimate), 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 some 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 1912-13 state. Stabilisation frames or other works may be fitted where structural integrity of the hut is poor and on the verge of failure.

(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). 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.

Policy (3) 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 visual 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. Providing for public access for interpretation is a lesser priority.

In light of the achievements and recommendations of conservation works parties, a monitoring and maintenance plan for the site has been prepared. Cyclical maintenance should avoid the need for substantial/emergency interventions.

Policy (4) No development, adaptive reuse or property divestment

No new development is planned for or should occur within the Visual Protection Zone.

Work may be undertaken to maintain or improve existing facilities outside the Visual Protection Zone that support 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 are the property of the Australian Government.

Policy (5) Heritage impact assessments will be undertaken

All activities at the site are subject to an environmental impact assessment under the ATEP Act, and in some instances a referral under the EPBC Act may also be required. The environment impact assessment of all activities will take into account their impact on heritage values and whether the activity is consistent with this management plan. This will apply to:

- any works on the site, other than routine maintenance (as described in the monitoring and maintenance plan) or urgent stabilisation work, which are not specified in this 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 archaeological assessment and recording.

The field/team leader will have overall responsibility for undertaking the work specified in the work plan and according to permits and authorisations.

Policy (6) Recording should precede and follow conservation works

The AAD has obligations under the *Archives Act 1983* 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 AAD will keep records of cultural heritage objects (at the site and for those objects in Australia which are the property of the Commonwealth) using a computer-based information management system.

A list of current datasets can be found at Appendix VI.

Policy (7) Site monitoring should be regular and integrated

Within the limitation imposed by the site's remoteness and extreme weather conditions, the AAD will ensure that the condition of the site and its National and Commonwealth Heritage values are **monitored** and reported upon where possible, in an integrated and regular fashion. The primary aim of the monitoring plan shall be to detect and evaluate any 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.

The AAD will regularly review its monitoring and maintenance plan for the site and adjust conservation and works programs in light of monitoring outcomes.

3.1.3 CONSERVATION AND MANAGEMENT OF ARTEFACTS

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

Movable objects will be prioritised for conservation and interpretation in situ, under the supervision of an archaeologist/conservator, 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 written AAD permission. Objects that are removed should be returned to the site once the conservation work or display for which they were removed is complete, and placed back in the original location, where possible. The return of an artefact to the location from which it was removed is generally preferable unless further damage may result from return. Cultural heritage objects which do not have an association with the site will not be introduced for any purpose.

Any site-associated objects found in Antarctica outside the historic site should be recorded and left in-situ. If removal is deemed necessary, prior approval should be sought from the AAD. If the object is believed to pre-date 1958, it will be managed in accordance with Resolution 4 (2001) of the Antarctic Treaty Consultative Meeting.

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. Failed building material will be kept in non-historic buildings on site or returned to Australia with the approval of the AAD.

3.1.4 ENVIRONMENTAL PROTECTION

Policy (9) 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 Madrid Protocol. Activities at the site will be managed in accordance with the management plans for ASPA No. 162 and ASMA No. 3, endorsed by the ATCM (Appendix I and II). These plans are revised every five years. The latest version can be found on the Antarctic Treaty Secretariat website: http://www.ats.aq/e/ep_protected.htm.

The National and Commonwealth Heritage values of the site will be conserved in accordance with the EPBC Act, particularly the Commonwealth and National Heritage management principles and the *Burra Charter: the Australia ICOMOS Charter for Places of Cultural Significance*.

Under the ATEP Act, all activities within the Antarctic Treaty Area require environmental assessment and approval prior to works being undertaken (see Policy 5).

Policy (10) 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. This policy complies with the Madrid Protocol and is domestically enforced through the ATEP Act.

Threats posed to the natural environment by cultural elements (e.g. AAE explosives or hazardous materials, if any are found) will be removed where possible, and 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, 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 National and Commonwealth Heritage aesthetic values of the site may be addressed by removal or relocation or other means, such as camouflage.

New developments or activities on site which will adversely impact on the National and Commonwealth Heritage values of the site will not be permitted.

To minimise the environmental impact on the historic huts, only existing non-historic infrastructure should be used for accommodation and safety by parties undertaking approved activities.

Policy (11) Certain materials and organisms will not be introduced or removed

No animals, plant material (non-food), micro-organisms or soils shall be deliberately introduced into the site, and all reasonable precautions shall be taken to prevent accidental introductions. Any new timber brought to the site will be treated before shipping. Only dressed timbers will be used to repair fixtures inside the huts and only no other alternatives are viable.

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 stored 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.

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.

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. The AAD must be notified and approval obtained.

Disposal of wastes

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

3.1.5 PLANNING AND MANAGEMENT OF WORKS

Policy (12) Involved personnel will have appropriate expertise

All management decisions which have the potential to affect the Commonwealth or National Heritage values of the site will be founded on expert advice. The AAD will ensure that conservation works plans are reviewed by conservation professionals, who may be required to supervise works on site.

All assessment works shall be carried out by suitably qualified or experienced 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, such as an archaeologist (to supervise and document the exercise) and a conservator (to assess and manage the objects revealed), or by appropriately trained staff.

The AAD shall ensure that all contractors and consultants, and volunteers working on the site are aware of the management plans for the site and have been provided with training and awareness regarding the site's heritage values.

Policy (13) Only works required to conserve heritage values and approved by the AAD will be undertaken

Only activities specified in the works plan or environmental authorisation may be undertaken within the site. Activities must be consistent with the conservation principles of this plan. In accordance with Annex V, Article 8 (4) of the Madrid 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 programme.

The AAD will brief conservation work teams about the policy framework and operational requirements of their project; the team's understanding of the management plan, relevant work plan and associated drawings will be ensured through consultations with AAD staff and the field/team leader.

Emergency works

In the event that emergency works are required, the field/team leader and the AAD shall take all reasonable steps to ensure that these occur expeditiously. Where possible, AAD should be informed as to the nature of the emergency and the proposed actions to be carried out. 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. A full report on the emergency works must be provided to the AAD as soon as practicable.

Policy (14) Discoveries are to be reported to the AAD

AAD decisions on the management of discoveries or unforeseen 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. Where possible, GPS coordinates of discoveries should be provided to the AAD.

As stated in Policy 8, any discoveries of pre-1958 remains outside the site will be managed in accordance with Resolution 4 (2001) of the Antarctic Treaty Consultative Meeting which requires that such discoveries be granted interim protection and assessed for heritage values and associations.

3.2 MANAGEMENT OF HUMAN USES

3.2.1 VISITOR MANAGEMENT

Policy (15) Controlled public access will be permitted

Subject to protection of National and Commonwealth Heritage values and public safety, access to the site will be permitted. Access to within 5 m of the huts and entry to the huts will be subject to a permit and conditions prescribed in the management plan for the ASPA (see Appendix I).

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 or delegate) 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 and/or monitoring work
- educational activities, including tourism, consistent with the aims and objectives of this management plan
- scientific research (using non-historic infrastructure where possible)

Day visits by tourists and educational groups will be permitted. Longer-term visits and overnight stays will be discouraged 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. These 'cultural guides' shall make themselves available to the permitting Party to receive any site training/education that may be deemed necessary prior to and while undertaking the activity;
- 'cultural guide/s' or conservation teams supervise the opening and the closing of the huts following AAD instructions;
- 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, including information on expected behaviour within the site;

- 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 and penguin colonies;
- visitors do not touch the exterior or interior fabric of the buildings or any cultural heritage objects;
- visitors to the site are instructed not to walk over the outside artefact scatter to the north of the Main Hut during times of limited snow cover;
- the maximum number of visitors inside the Main Hut and the Magnetograph House at any one time complies with the ASPA management plan;
- visitors do not touch scientific and conservation management equipment;
- visitors do not wear or carry backpacks in the huts and camera gear is kept to a minimum;
- visitors, including 'cultural guides', do not remove skylights (unless stated in the permit).

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

Non-spiky boot chains may be worn to improve safety within the huts. While they are unlikely to cause damage to the fabric or contents of the buildings, any indication of damage caused by boot chains should be reported to the AAD.

The AAD may pre-approve the use of non-slip matting to aid with visitor safety and protect surface (or near surface) artefacts during hut access. Approval shall be sought prior to use.

Policy (i6) Visitor access will be reported and visitor impacts monitored

As required under permit conditions, each tourism visit to the site will submit a post visit report. Post visit reports should include:

- visitor and guide numbers
- date and duration of visit
- mode of access to the site and description of access to the huts
- visitor impacts, including both physical impacts (such as measurable damage or wear to fabric, and impacts on fauna behaviour) and non-physical impacts (such as amenity)
- measures taken and recommended to minimise visitor impact and protect the site's heritage values

Should visitor monitoring identify adverse impacts, the AAD will identify and implement appropriate management responses which could include altering the activity, temporarily ceasing activities or ceasing some uses altogether.

Visitor surveys may be conducted to improve visitor experience and protect heritage values.

3.2.2 COMMERCIAL AND NON-GOVERNMENT ACTIVITIES

Policy (17) Authorised commercial and non-government activities will be permitted

The following commercial and non-government activities may be undertaken in accordance with an authorisation/permit issued by AAD:

- organised tours;
- conservation expeditions;
- the capture of images (record by artistic representation, or on film, videotape or electronic medium) or recording of sounds; and
- other activities considered by the AAD to be consistent with the management objectives for the site, with this plan, and with the conservation management principles.

Authorisations/permits may only be issued to allowable commercial or other non-government activities if the issuer of the authorisation/permit is reasonably satisfied:

- that the activity will assist in promoting an understanding and appreciation of the cultural resources;
- that the activity does not use natural resources from the area for profit or fundraising unless AAD believes it is in the best interest of preserving or promoting the values of the site;
- that the activity is consistent with the conservation management principles for the site; and
- that all safety and public liability issues can be adequately addressed.

Authorisations/permits relating to allowable commercial and other non-government activities will be managed to:

- avoid undesirable conflict or overlap with other permitted activities;
- avoid disturbance to research and management activities;
- minimise or where possible avoid environmental damage; and
- avoid inappropriate or significant demands on the AAD's resources or equivalent.

3.3 PUBLIC AWARENESS AND SUPPORT

3.3.1 IMPLEMENTATION AND CONSULTATION

Policy (i8) Stakeholders should be encouraged to contribute

The AAD recognises that the participation of stakeholders is essential to ensuring commitment and cooperation in the conservation of the site. Stakeholders will be consulted on changes to the site's management plans, and on other key management decisions which could affect the site and its heritage values.

The AAD will ensure that information about the site is publicly available. It will maintain a register of interested parties and where possible provide opportunities to submit comments on major or unusual proposed activities.

Key stakeholders include:

- international polar bodies – including Antarctic Treaty Consultative Meetings and the International Polar Heritage Scientific Committee of ICOMOS
- Australian heritage organisations, collections agencies, professional groups and individuals
- Australian government agencies
- relatives of AAE members
- the Australian community generally
- tourists and tour operators who have visited the site
- Mawson's Huts Foundation
- people who have worked on or at Mawson's Huts including former AAD staff and ANARE/Australian Antarctic program expeditioners, the ANARE Club, and members of Project Blizzard expeditions
- other Antarctic Treaty parties, especially France, the United States, the United Kingdom and New Zealand, which have logistic operations in the region or similar heritage management responsibilities.

3.3.2 RESEARCH

Policy (i9) Research will be encouraged and coordinated

The AAD will endeavour to:

- support research associated with understanding and protecting the site
- seek to acquire and hold in the AAD Library, copies of research undertaken on the site
- maintain associated databases
- 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

3.3.3 RESOURCES

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

The AAD is responsible for authorising activities at the site, in consultation with the DSEWPac Heritage and Wildlife Division, the Australian Heritage Council and other parties as appropriate. The AAD is also responsible for ensuring the plan is implemented.

The AAD will continually monitor its capacity to provide logistic and other support for conservation works. The AAD will continue to promote cooperation with bodies competent to undertake conservation activities at the site where doing so would further the objectives of this management plan in an efficient way. In previous years this has been achieved through collaboration with the Mawson's Huts Foundation.

3.3.4 INTERPRETATION AND PROMOTION

Policy (21) The AAD will prepare and coordinate interpretive material

In ensuring that the site is interpreted for its cultural significance, the AAD will seek to maximise public access to interpretive information, including through the utilisation of dedicated websites. However, interpretation devices on-site will be limited to signage specifically required under the Antarctic Treaty and information provided by guides before and during visits. The goals for the interpretation of the site include promoting the continued preservation of the site and communicating the significance of the site to visitors and to the wider Australian public. It is recognised that non-government organisations, such as the Mawson's Huts Foundation can assist with interpreting and promoting the values of the site.

No new signs or plaques will be erected within the site, unless approved by the Minister, or delegate.

3.4 IMPLEMENTATION PLAN

Under section 341V(1) of the EPBC Act, this plan shall be given effect to by the Director of the AAD, and no operations shall be undertaken unless they are in accordance with this plan. The environmental impact of works and conservation proposals will 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 adjacent 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, where feasible, within the annual programs of the AAD, and may be supplemented by the contributions of private groups interested in the conservation of the site. The AAD will evaluate season-by-season works programs against the objectives and policies laid out in this plan. The development of work plans will also incorporate reviewing the monitoring and maintenance plan for the site. The extent to which the AAD participates in on site works programs will be determined in the context of strategic planning for the entire Australian Antarctic program, and will be subject to operational factors, the availability of staff and funds, and to any special requirements of the AAD Director or Minister.

The following tables outline the commitments made in this plan in relation to conserving, protecting and presenting the National and Commonwealth Heritage values of the site.

3.4.1 IMPLEMENTATION – CONSERVATION WORKS

Phase	Action	Resources	Plan reference/Comment
(1) Structural Stabilisation	Reassess structural integrity of huts, including an assessment of cladding deterioration.	Government funding including AAD logistical support.	Section 2.7.2, 2.7.4, and 2.9.4 – To be completed during the life of this plan
	Develop detailed guidelines on the conservation of existing fabric and the introduction of new fabric for the on-going conservation of the Absolute Magnetic Hut and the Transit Hut as standing ruin structures.	Architectural and other expertise.	Section 2.7, 2.9.4 and policy 2 – Assess during an expedition early in the life of this plan.
(2) Ice removal	Remove snow and ice in the central rooms of the living and workshop sections of the Main Hut.	Included in an expedition budget.	Section 2.7.4 – Under archaeological/conservator supervision, recording and labelling objects before they are disturbed. Following structural report, reconsider precautionary ice layer at 600 mm taking into consideration monitoring analysis on the impact of freeze/thaw actions in the hut.
(3) Restore broken internal fittings	Repair Main Hut shelves and bunks damaged since 1913 by snow/ice ingress.	Included in an expedition budget.	Section 2.7.5 and 2.9.3 and policy 11- Needs a cautious approach: only to be restored when their original position is clear. Only dressed timber to be introduced. Preference is to use existing timber, where possible.
(4) Clean-up	Continue to remove post-BANZARE structures and objects from the Main Valley.	Included in an expedition budget.	Policy 10 – if/when items are discovered (excluding Granholm Hut).

Phase	Action	Resources	Plan reference/Comment
(5) Monitoring and maintenance plan	Implement a monitoring and maintenance plan. Regularly review the monitoring and maintenance plan. Analyse data collected to assist with future work programs and management plans.	AAD, Strategies Branch.	<p>Sections 2.7.2, 2.7.3, 2.9.1 and 2.9.3 and policy 3 and 7 – To be undertaken annually, when possible. This includes corrosion monitoring, vibration loggers and points of snow and ice ingress. Also includes, checking/repairing fixtures, baffles and skylights, and ensuring that the buildings are secure.</p> <p>Monitoring to assess, amongst other things, the impacts of wind, humidity, salt, airflow, freeze/thaw actions. Investigate the use of other sensors in areas of high melt.</p>
(6) Drainage improvements adjacent to heritage buildings	Investigate drainage issues on the southern and western wall of the Main Hut	Included in an expedition budget.	Section 2.9.3 – When possible, such as during a period of high melt, assess possible structure damage caused by melt pool and investigate ways to improve drainage away from the Main Hut (if required), including through a full risk assessment and seeking engineering advice.
(7) Conservation policy review	Review cladding fabric conservation and the future management of the standing ruins.	AAD, Strategies Branch.	Sections 2.7.1 and 2.9.4.

3.4.2 IMPLEMENTATION – OBJECTS AND COLLECTIONS

Phase	Action	Resources	Plan reference/Comment
1) Mapping	Produce accurate baseline map of artefact scatters.	AAD Data Centre.	Section 2.7.5 – Through scatters studies, continue to add data to existing information.
(2) On-site documentation	Document cultural heritage objects on-site.	Included in an expedition budget.	Section 2.9.5 and Policy 6 and 9 – As objects are identified or exposed, ablation and therefore exposure is likely to increase after ingress stops and the building is sealed.
(3) Induction training	Undertake induction training for conservation staff.	AAD, Strategies Branch.	Policy 12 – Induction/training for all contractors, volunteers and AAD staff working on the site
(4) Collections policy	Develop a collections policy during the life of this plan to address on-site and off-site management of the artefacts, including loans with collection institutions.	AAD, Strategies Branch.	Section 2.9.5

3.4.3 IMPLEMENTATION – INTERPRETATION

Phase	Action	Resources	Plan reference/Comment
(1) Website	Maintain website and canvass other opportunities to tell the story of its national heritage values.	AAD, Strategies Branch.	Policy 21 – Website was established in 2007. Update as required.
(2) Interpretation plan	Implement an interpretation plan for the site.	AAD, Strategies Branch.	Policy 21 – Interpretation is based on the conservation principles in the management plan and aims to promote the heritage values of the site.

3.4.4 IMPLEMENTATION – VISITOR MANAGEMENT

Phase	Action	Resources	Plan reference/Comment
(1) Controlled site access	Maintain ASPA permit system, observe tourist visits when possible.	AAD, Strategies Branch.	Policy 16.
(2) Visitor education	Implement an interpretation plan for visitors, including information on the National and Commonwealth Heritage values of the site.	AAD, Strategies Branch.	Policy 15 – Visitor guidelines were prepared in 2011.
(3) Visitor management	Monitor visitor movement inside huts for possible impact on values/objects.	AAD, Strategies Branch.	Policy 16 – Conservation visits to the site to check for impacts.
	Work closely with tourism companies to ensure correct visitor behaviour information is provided to tourists visiting the site.	AAD, Strategies Branch.	Section 2.9.4.
(4) Visitor surveys	Undertake visitor surveys.	AAD, Strategies Branch.	Policy 16.
(5) Visitor information exchange	Provide visitor information to the Antarctic Treaty Secretariat on an annual basis.	AAD, Strategies Branch.	Policy 16.

3.4.5 IMPLEMENTATION – RESEARCH

Phase	Action	Resources	Plan reference/Comment
(1) Research coordination	Coordinate research undertaken at the site (through the ASPA permits system) and off-site.	AAD, Strategies Branch	Policy 19.
(2) Logistical support to researchers	Provide support for research work at the site.	Determined by AAD resource levels and season-by-season logistical factors.	Policy 19 – Requirements for logistical support are identified through the permit application process.
(3) Review values assessments and statements of significance	Review the 2001 assessments and statements, particularly in light of changes to the site (i.e. over-cladding and other works), consider condition and integrity.	AAD, Strategies Branch.	Section 2.5.1 – To be completed during the life of this plan and incorporated into the next management plan.
(4) Investigate the historic values of depots, traverse routes, and wireless stations at Macquarie Island and Queen's Domain, Hobart	Assess the contribution of other sites to the heritage values of Cape Denison.	Seek external funding and participation.	Section 2.7.6 and 2.9.4.
(5) Boundary alignment	Seek to align the boundaries of the National heritage List and the Commonwealth Heritage List.	AAD, Strategies Branch.	Section 2.1 – low priority.
(6) Survey markers location and condition	Locate and assess the condition of the survey markers and record GPS location. Provide coordinates to AAD Data Centre.	AAD, Strategies Branch.	Section 2.8 – low priority but could be achieved at minimal cost and impact.

3.4.6 IMPLEMENTATION – RECORD MANAGEMENT

Phase	Action	Resources	Plan reference/Comment
(1) GIS data collection	Maintain and where possible further develop GIS data layers.	AAD Data Centre.	Policy 6.
(2) Archival recording	As part of the monitoring plan, undertake archival recording prior to and on completion of any conservation works on the site (incorporating GIS work, where possible).	Included in an expedition budget.	Policy 6 – During each season of conservation works.

3.5 MONITORING OF IMPLEMENTATION

The implementation of the management plan and its effectiveness in conserving National and Commonwealth Heritage values will be managed and assessed by the Strategies Branch of the AAD.

3.6 REVIEW OF MANAGEMENT PLAN

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

1. Assess the effectiveness of the plan in protecting and conserving the National and Commonwealth Heritage values (including a condition assessment of the values).
2. Identify new or changed information from monitoring, community input and/or further research which may require changes to the management plan.
3. 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 and maintenance plan.
4. Recommend ways to improve the protection of values

A sepia-toned photograph of two old glass bottles sitting on a wooden shelf. The bottle on the left is shorter and has a small, circular label with a crest. The bottle on the right is taller and has a large, rectangular label that is mostly torn and missing. A piece of paper with some text is lying on the shelf in front of the taller bottle. The background is a textured, light-colored wall.

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- I. **Antarctic Specially Protected Area No 162 Management Plan (2009)**
- II. **Antarctic Specially Managed Area No 3 Management Plan (2009)**
- III. **Key On-site Conservation Works**
- IV. **Location of Objects, Images and Papers in Australia**
- V. **Current Datasets on Management of the Site**
- VI. **Glossary**

APPENDIX I

ANTARCTIC SPECIALLY PROTECTED AREA NO 162 MANAGEMENT PLAN

Antarctic Specially Protected Area No 162 Management Plan (2009)

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

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

Introduction

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, the Mawson's Huts site was designated under Measure 2 (2004) as Antarctic Specially Protected Area (ASPA) No. 162, to protect the important historical, technical, architectural and aesthetic value of the four Australasian Antarctic Expedition huts. The ASPA also contains part of the site designated under Measure 3 (2004) as Historic Site and Monument No. 77 Cape Denison, Commonwealth Bay, George V Land, and is embedded within Antarctic Specially Managed Area (ASMA) No. 3 Cape Denison, Commonwealth Bay, George V Land, designated under Measure 1 (2004).

1. Description of values to be protected

The ASPA is primarily designated to protect Mawson's Huts which is a site of considerable 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. Mawson's Huts is one of a group of only six sites 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 7.3m x 7.3m, 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 5.5m x 4.9m was adjoined to the living quarters and equipped as a workshop. A 1.5m 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 1.8m x 1.8m 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 5.5m x 2m 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. 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 programmes;
- 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.

3. Management activities

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

- programmes of conservation and archaeological work and environmental monitoring work on Mawson's Huts and any artefacts contained within the huts and an area within five (5) metres 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. Period of designation

This ASPA is designated for an indefinite period.

5. Description of the Area

5(i) Geographical coordinates, boundary markers and natural features

Cape Denison is a 1.5km-wide peninsula projecting into the centre of Commonwealth Bay, a 60km-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 400m long indentation in the coast.

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.

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

The ASPA covers four areas. Each area consists of one hut and an area extending five (5) metres 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 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 not recorded.

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(ii) 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 can be 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 can be made at Boat Harbour and due north of Sørensen Hut (within ASMA 3). 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(iii) Location of structures and other anthropogenic objects within and near to the Area

The ASPA is located within the Cape Denison ASMA No. 3, 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 160m northwest of the Main Hut. It contains building materials, some field equipment and limited provisions.

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 Historic Site and Monument (HSM) No. 77.

5(iv) Location of other protected areas in or near to the Area

ASPA 162 is located within the Cape Denison ASMA No. 3. For further details about ASMA 3, refer to the management plan pertaining to this Area. Cape Denison is also listed as a Historic Site and Monument under the Antarctic Treaty.

6. Zones within the Area

There are no zones within ASPA 162.

7. Maps of the Area

Map A: Cape Denison Management Zones.

The 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 B: Cape Denison Visual Protection Zone.

The 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 C: Cape Denison Flight Paths and Bird Colonies.

The map indicates the approaches, departures and landing site for helicopters, as well as the location of bird colonies in the vicinity.

Specification for all maps:

Projection: UTM Zone 54

Horizontal Datum: WGS84

8. Permit conditions

Annex V of the Protocol on Environmental Protection to the Antarctic Treaty 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 by the same operator. 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(i) 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.

Authorised work parties, when undertaking conservation work on the huts, may use small all-terrain vehicles within the Area to assist with the transport of materials and equipment to and from the buildings.

8(i). 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 programmes are exempt from the provisions of this sub-section.

8(ii) Activities which are or may be conducted within the Area

- Activities related to the regular programme 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(iii) 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 also 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 programme. 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(iv) 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(v) 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(vi) 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(vii) 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(viii) Disposal of wastes

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

8(ix) 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(x) 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).

9. 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 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. Supporting documentation

Australian Antarctic Division 2007. *Mawson's Huts Historic Site Management Plan 2007-2012*. Kingston, Tas.

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

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*.

- Godfrey, I. 2006. *Mawson's Huts Conservation Expedition 2006*. Mawson's Huts Foundation, Sydney
- 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: Australian 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.
- Mawson's Huts Foundation 2005. *Mawson's Huts Conservation Expedition 2005*. Sydney
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- Patterson, D. 2003. *Mawson's Huts Conservation Expedition 2002: Field Leader's Report*.
- Secretariat of the Antarctic Treaty, *Environmental Protection, Protected Areas* http://www.ats.aq/e/ep_protected.htm (Accessed 16 February 2009).

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

Umbilicaiaceae

Umbilicaria decussata (Vill.) Zahlbr.

Lecanoraceae

Rhizoplaca melanophthalma (Ram.) Leuck. & Poelt

Lecanora expectans Darb.

Pleopsidium chlorophanum (Wahlenb.) Zopf

Parmeliaceae

Physcia caesia (Hoffm.) Th. Fr.

Usnaeaceae

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

Buelliaaceae

Buellia frigida Darb.

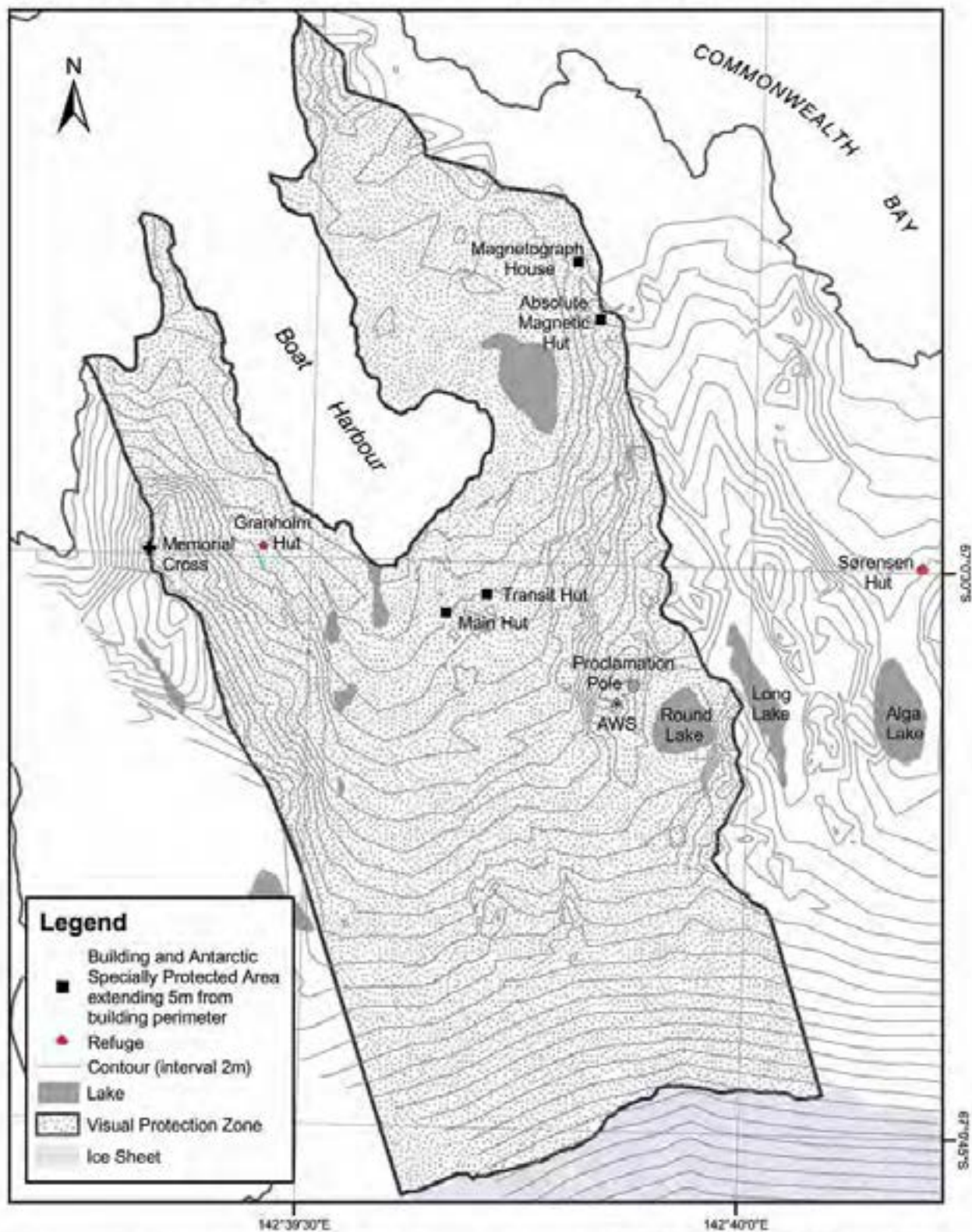
BRYOPHYTES

No bryophytes evident at Cape Denison.

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

[illegible]

Map B Cape Denison Visual Protection Zone



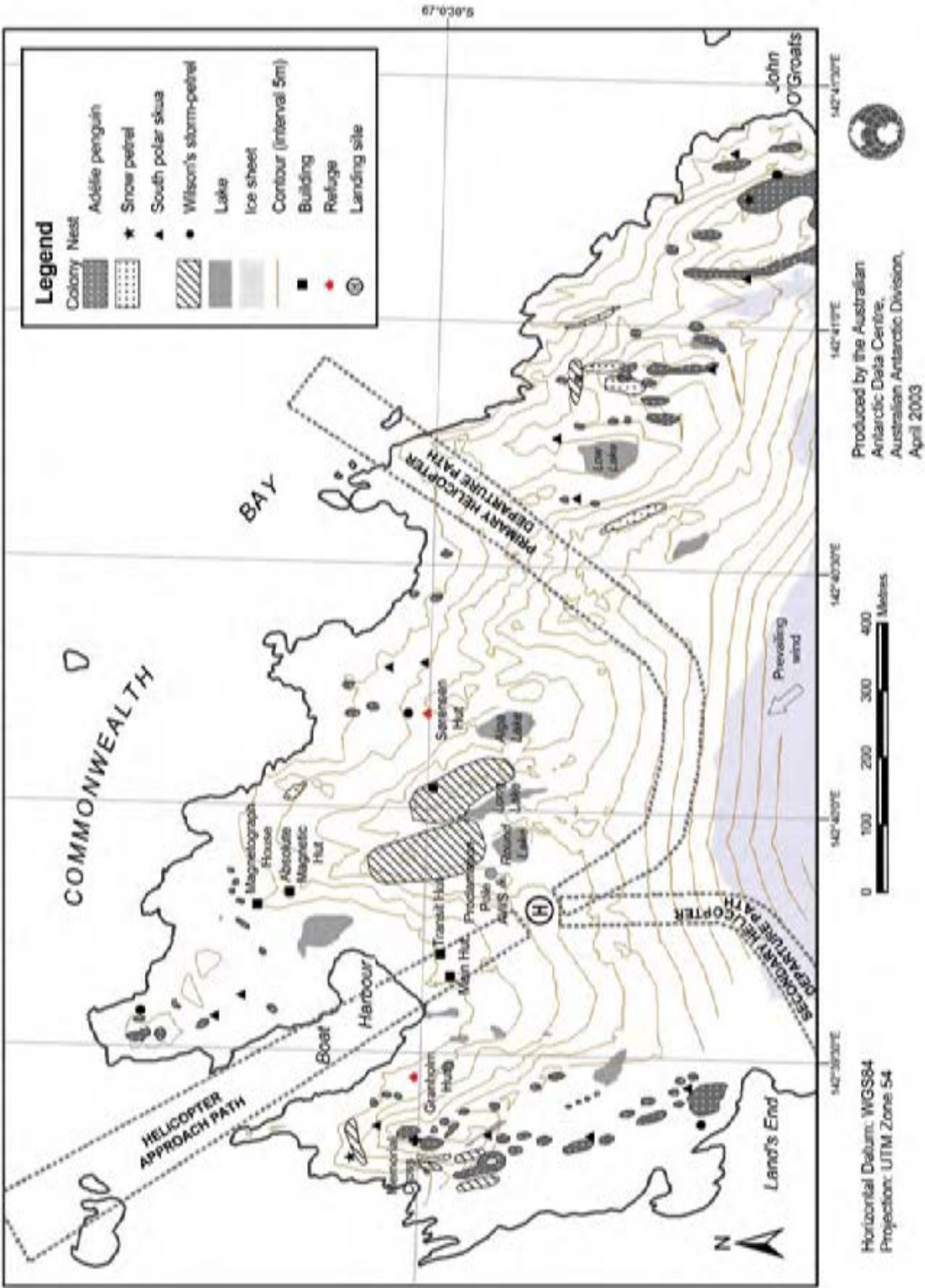
Horizontal Datum: WGS84
Projection: UTM Zone 54



Produced by the Australian
Antarctic Data Centre,
Australian Antarctic Division,
April 2003



Map C Cape Denison Flight Paths and Bird Colonies



APPENDIX II

ANTARCTIC SPECIALLY MANAGED AREA NO 3 MANAGEMENT PLAN

**Historic Site and Monument No. 72 and
Antarctic Specially Managed Area No. 3 Management Plan (2009)**

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 its considerable historical, cultural and scientific significance, Cape Denison is designated under Measure 1 (2004) as Antarctic Specially Managed Area (ASMA) No. 3, 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 under Measure 3 (2004) as Historic Site and Monument No. 77, in accordance with 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 four Australasian Antarctic Expedition historic huts and their immediate surrounds are designated under Measure 2 (2004) as Antarctic Specially Protected Area (ASPA) No. 162 Mawson's Huts.

1 Description of Values to be Protected

1.1 Primary values

The ASMA is established because 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.

Mawson's prime focus 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

The 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. 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 demonstrates 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 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 No. 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 similar or greater size to Cape Denison are approximately 20 km to the east of Cape Denison (from the centre of the ASMA), and approximately 60 km to the west. 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 A to the management plan for ASPA 162. 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. 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. 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;
- installation of signage to indicate the boundaries of the HSM and ASMA;

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*.

- 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. Period of designation

The ASMA is designated for an indefinite period.

5. Description of the Area

5.1 Geographical coordinates, boundary markers and natural features

Cape Denison (67° 00' 13" S—67° 00' 0.50" 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.

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 No. 162. The basement rock 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 B(ii).

The only flora evident at Cape Denison is lichens, for which a list of species is included at Appendix A to the management plan for ASPA 162, 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 can be 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 can 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).

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).

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 Antarctic 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.

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', 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 No. 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 and Monument No. 77 under the Antarctic Treaty.

There are no other ASPAs or ASMAs within 50 km of Cape Denison.

6. Zones within the Area

All activities within the Area are to comply with the provisions of the Protocol on Environmental Protection to the Antarctic Treaty, the Code of Conduct contained in this management plan (see Section 8), and any other applicable instruments adopted by the Antarctic Treaty Consultative Meeting. 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 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 B(i) and B(ii); twin-engine helicopter operations should be avoided during weeks that birds are hatching eggs or raising chicks (late October to early March).

7. 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 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, and the site of the BANZARE proclamation pole.

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.

Specification for all maps

Projection: UTM Zone 54

Horizontal Datum: WGS84

8. 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.
- 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 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 Antarctic 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 Antarctic 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 Antarctic program of their intentions as far in advance of a visit as is practicable.

The details of all field activities should be accurately recorded for transfer to the management database of the Australian Antarctic program. See Section 9 below.

9. 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). Parties should maintain a record of such activities including 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 of this information in a publicly accessible archive 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. Supporting Documentation

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APPENDIX A

Fauna recorded at Cape Denison, Commonwealth Bay: Breeding populations (pairs) of seabirds at Cape Denison

Common name	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 *Pachyptila desolata* (indeterminate breeding status)

? Cape petrel *Daption capense* (indeterminate breeding status)

Other seabirds sighted at Cape Denison

Common name	Species
Antarctic petrel	<i>Thalassoica antarctica</i>
Southern giant petrel	<i>Macronectes giganteus</i>
Sing 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

Common name	Species
Weddell seal	<i>Leptonychotes weddellii</i>
Leopard seal	<i>Hydrurga leptonyx</i>
Southern elephant seal	<i>Mirounga leonina</i>

APPENDIX B(I)**Helicopter operations: Breeding cycles of nesting seabirds at Cape Denison, Commonwealth Bay**

Species	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 adults and chicks

APPENDIX B(II)**Helicopter operations: Seals breeding at Cape Denison, Commonwealth Bay**

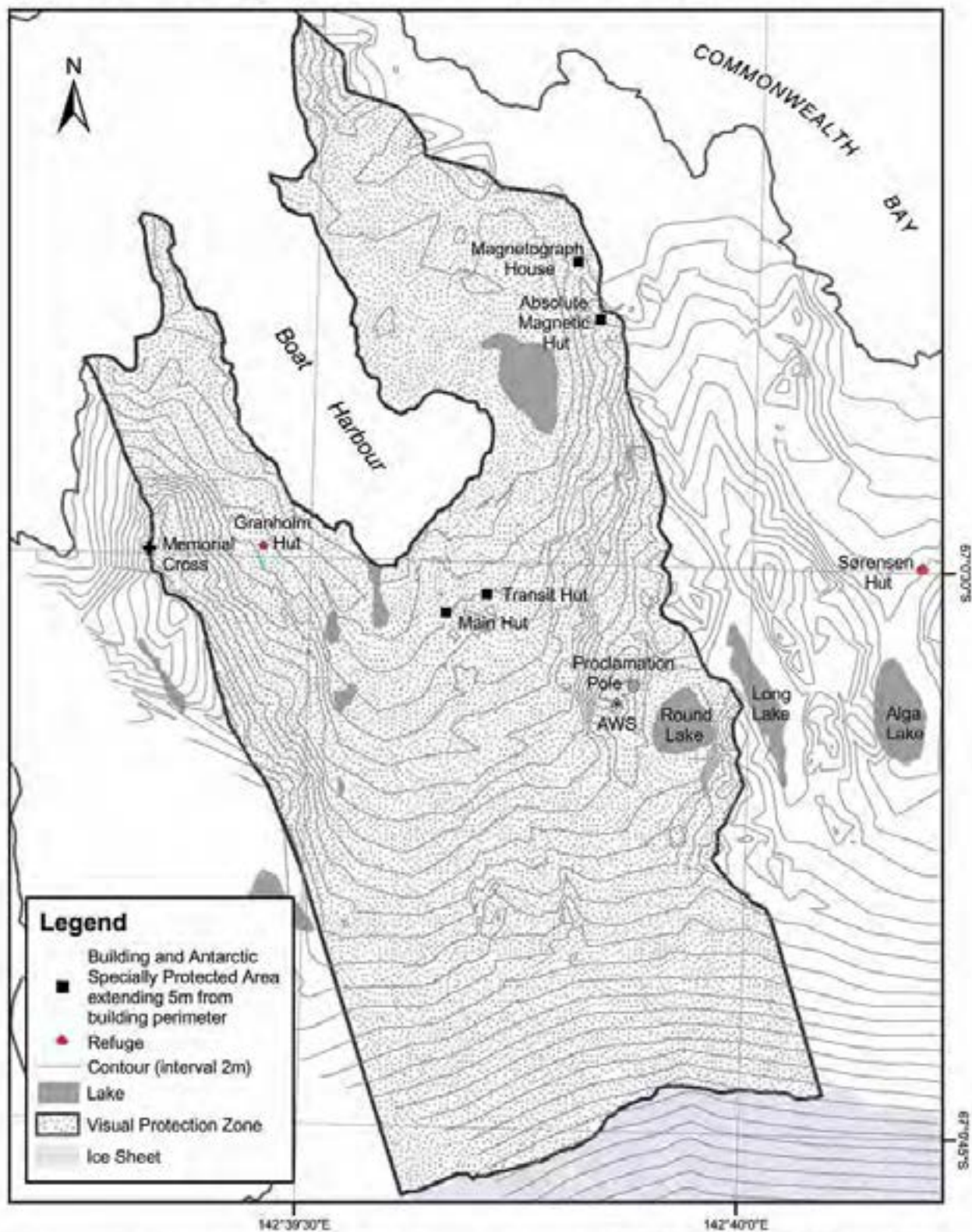
Species	Number	Summer breeding cycle
Weddell seal (<i>Leptonychotes weddellii</i>)	Exact number not known, no established colonies	Before November: no seals; between mid-November to end December, approx. 24 adults per day
Southern elephant seal (<i>Mirounga leonina</i>)	Exact number not known, no established colonies	Approx. 2 or adults per day in December

Legend

- Antarctic Specially Managed Area and Historic Site boundary
- Visual Protection Zone
- Lake
- Ice Sheet
- Contour (interval 5m)
- Building and Antarctic Specially Protected Area extending 5m from building perimeter
- Refuge

Map Labels: COMMONWEALTH, Boad Harbour, Siple's Hut, John O'Groats, Land's End, N, 142°30'E, 142°40'E, 142°50'E, 0, 100, 200, 300, 400, Metres, Horizontal Datum: WGS84, Projection: UTM Zone 54, Produced by the Australian Antarctic Data Centre, Australian Antarctic Division, April 2003.

Map B Cape Denison Visual Protection Zone



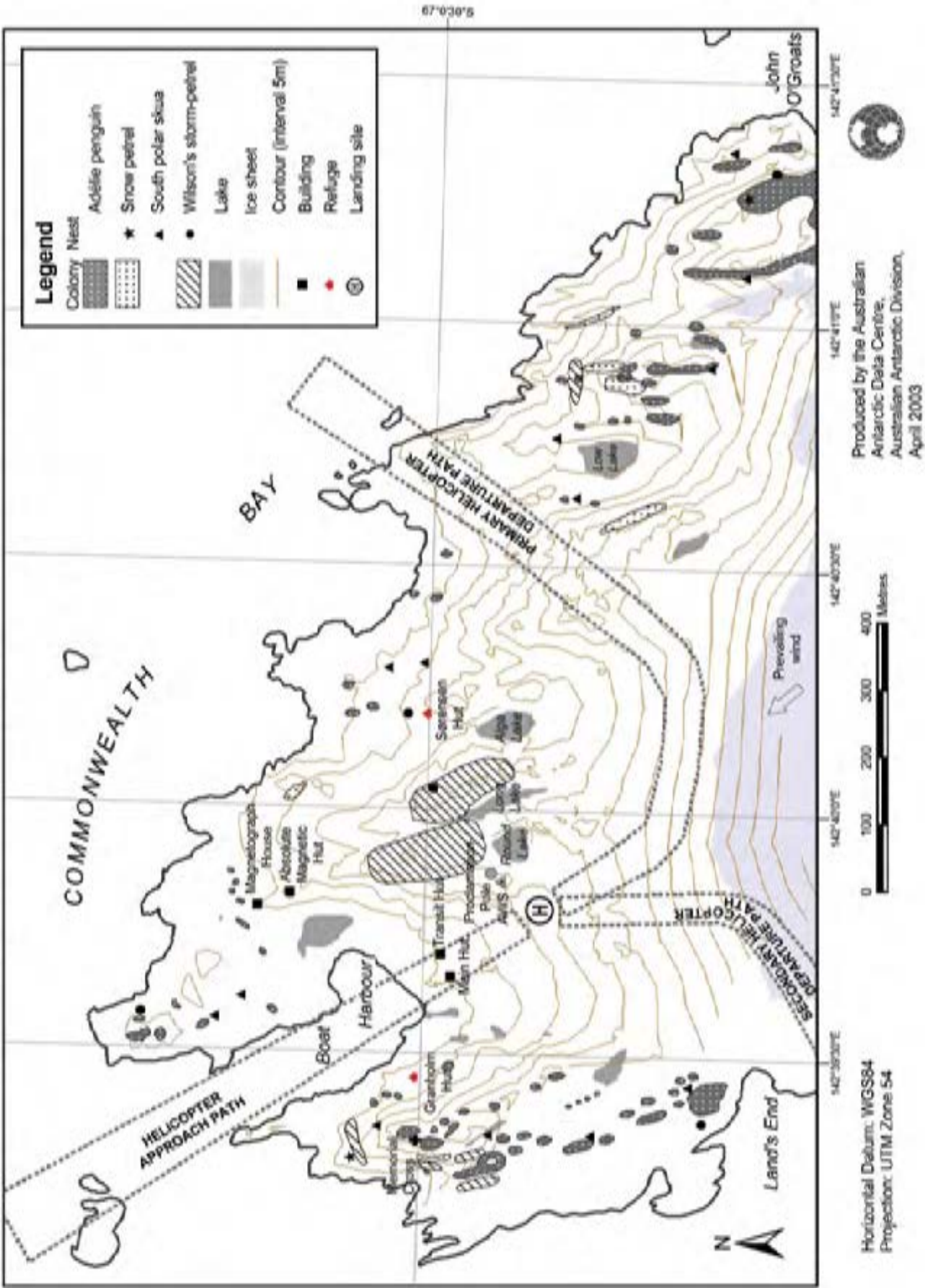
Horizontal Datum: WGS84
Projection: UTM Zone 54

0 50 100 150 200 metres

Produced by the Australian
Antarctic Data Centre,
Australian Antarctic Division,
April 2003



Map C Cape Denison Flight Paths and Bird Colonies



APPENDIX III

KEY ON-SITE CONSERVATION WORKS

Year	Works party and main on-site conservation works
1931	BANZARE Memorial cross crossbar reattached
1951	Expédition qui hiverna en 1951 (French) Memorial crossbar re-attached
1974	Antarctic Division (ANARE) Memorial cross repaired
1977	Antarctic Division (ANARE) Main Hut skylight covers repaired Repatriation: memorial cross plaque, BANZARE proclamation, sledge, wheel, pipe, spanners and dividers returned to Australia
1978	Antarctic Division (ANARE) Memorial cross crossbar reattached and replica plaque installed Main Hut workshop roof patched, ice removed, some interior lining replaced, artefacts recorded and stored Main Hut living section artefacts extensively recorded
1981	Antarctic Division (ANARE) Retrieval of artefacts for display in Australia, and film-making for a documentary
1982	Oceanic Research Foundation (private expedition) Main Hut minor roof repairs
1984-86	Project Blizzard (private expedition) 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 Condition assessments Memorial and proclamation plaques removed and replaced with replicas Experimental work for future conservation of materials on the site
1996	AAP Mawson's Huts Foundation Survey visit to gather information for a works plan

Year	Works party and main on-site conservation works
1997-98	AAP Mawson's Huts Foundation Main Hut skylights, ridge capping, gutters and flashings repaired and ice removed Main Hut workshop roof over-clad Main Hut living section central platform restored Magnetograph House roof re-clad, door and tar-paper lining repaired Absolute Magnetic Hut excavated from ice and original building fabric restored Transit Hut structure restored – loose boards re-fixed Memorial cross crossbar reattached with stainless steel brackets Internal environmental monitoring equipment installed Archaeological site survey; artefacts documented; ice cores taken
2000-01	AAP Mawson's Huts Foundation Main Hut battens added to cover gaps on southern roof plane Archaeological site survey; artefacts documented
2002-03	AAD Main Hut structural investigations and workshop roof structure repaired Site Geographic Information System (GIS) framework and artefacts inventory established Living section and workshop artefacts catalogued Artefact scatters around Main Hut, Penguin Knob and the two seal caches documented Environmental sensors and data loggers reinstalled Archaeological site survey; artefacts documented
2005-06	AAP Mawson's Huts Foundation Main Hut parts affected by snow and melt water ingress repaired/monitored Main Hut living section roof battens secured and ice removed Workshop skylight covers replaced
2006-07	Mawson's Huts Foundation Main Hut living section roof encapsulated (over-clad with fabric membrane and Baltic pine) Vibration sensors installed Main Hut living section snow and ice removed Main Hut flagpole returned to Australia; replica installed
2007-08	Mawson's Huts Foundation Construction of laboratory for artefact conservation treatment Archaeological survey of artefact scatter Continued snow and ice excavation inside Main Hut

Year	Works party and main on-site conservation works
2008-09	Mawson's Huts Foundation Removal of snow and ice from Main Hut Reinstating and fixing of timbers to the Transit Hut Completion of new laboratory to treat artefacts Documentation of condition of buildings Conservation treatment of 88 artefacts Documentation and removal of snow and ice from Main Hut
2009-10	Mawson's Huts Foundation Platform timber in Main Hut reinstated Excavation of ice in several locations inside the Main Hut Over cladding of the outside southwest corner of the Main Hut Magnetograph House opened and internal condition recorded Photography, cataloguing and treatment of 156 artefacts Survey and map of the internal fitting and artefacts inside Main Hut and workshop completed Air tractor fragments recovered and returned to Australia for treatment Archaeological survey completed and exposed artefacts mapped using kite aerial photography
2010-11	Mawson's Huts Foundation Timber portal frame installed to stabilise Transit Hut Packing and removal of air tractor tail for conservation treatment Archaeological survey of an artefact scatter north of Main Hut
2012	AAD Centenary Expedition Minor maintenance and condition report

APPENDIX IV 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 V

LOCATION OF OBJECTS, IMAGES AND PAPERS IN AUSTRALIA

- Objects, images and papers relating to the AAE and to Sir Douglas Mawson are found throughout Australia:
- Australian Antarctic Division (papers, failed building materials, debris, sledging and other equipment, specimens)
- Australian Museum (objects and scientific specimens)
- Powerhouse Museum (Australian Museum objects and Laserson 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, air tractor tail, flag pole, juvenile emperor penguin stuffed by Dr McLean)
- Museum of Victoria (duplicates of AAE bird, mammal and marine specimens)
- Tasmanian Museum and Art Gallery (Harrisson objects from Western Base), two generators and mast sections from Macquarie Island
- 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)
- University of Sydney Library (van der Graf paintings)
- Privately held records (eg Madigans' diaries, Harrisson paintings)

APPENDIX VI

CURRENT DATASETS ON MANAGEMENT OF THE SITE

Type of Record	Location	Comment
Approvals issued for works	AAD – individual project files, filed by project number	More detailed information on project approvals and outcomes could be posted on the AAD website to improve public access
Description of work undertaken, including progress & final reports	Australian Antarctic Division – individual project files	
Monitoring programs/plans implemented	AAD – individual project files, AADC AAS Projects and metadata	
Building plans	Conservation management plan	The AAD needs to acquire electronic copies or original plans
Files	AAD file system	Not linked to other data sets
Maps	AADC map catalogue	Publicly available via the AAD website
Aerial photographs	AADC metadata	
Satellite images	AADC metadata	
Design specification and other documentation	AAD – individual project files AADC Antarctic program publications; scientific bibliographies; library monographs	
Conservation works program schedules	AAD – individual project files	
Cultural heritage objects	AADC Antarctic artefacts – includes some images.	Covers more than 1700 in situ objects. Publicly available via the AAD website
Images	AAD – iMAGEAntarctica (some not yet catalogued)	Publicly available via the AAD website.
Locations of standing buildings, cultural features, landscape features and historic structures, works and paths	AADC Metadata	
Archaeological information, artefact scatters	Survey data held by AAD in the Antarctic Heritage Register	Artefact scatters partly mapped An accurate survey of the site, ideally with aerial or kite aerial photography, is required
Areas which have been cleaned up, including a history of works	AAD – individual project files, conservation works reports	
Data from monitoring programs/plans	AADC AAS projects and metadata	

APPENDIX VII

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 this plan are provided below.

Antarctic Specially Managed Area (ASMA) is an area set aside under Annex V of the Madrid Protocol to preserve 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, to minimise environmental impacts. Under article 4(2) of Annex V, an ASMA may include 'sites or monuments of recognised historic value'.

Antarctic Specially Protected Area (ASPA) is an area set aside under Annex V of the Madrid Protocol to protect 'outstanding environmental, scientific, historic, aesthetic or wilderness values, any combination of those values, or ongoing or planned scientific research.' An ASPA protects values within its boundaries by requiring permits for entry and applying a management plan to control activities in the area.

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. 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 legislation that gives effect to the Protocol on Environmental Protection to the Antarctic Treaty 1991 (Madrid Protocol).

Australian Antarctic Data Centre (AADC) was established in 1995 as a repository for scientific data resulting from the Australian Antarctic program. Data resulting from the Australian Antarctic Division's science program 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 Division (AAD) was established in 1948 and is now a division of the Australian Government Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC). It is charged with achieving Australia's policy, operational and scientific goals relating to Antarctica and has legislative responsibility for the conservation and management of Mawson's Huts.

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.

Australian National Antarctic Research Expeditions (ANARE) referred to the field operations of the Australian 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, 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.

Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) is a Commonwealth government department which develops and implements national policy, programs 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 Water Resources, (ii) the Department of the Environment and Heritage, and (iii) 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.

Geographical Information System (GIS) is a computer based program 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.

Mawson's Huts Foundation was established by the Australian Associated Press (AAP) in 1995, and is now an independent charity. 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'.

Plucking of weathered fibres is the removal of wood fibres by wind in the lee of the wind, rather than by impact of snow/ice particles.

Territories Environment and Treaties (TET) Section, within the Strategies Branch of the AAD, coordinates Australia's contributions to international conventions covering the Antarctic and develops environmental policies and management measures for the protection of the Antarctic environment.

NOTES



Australian Government