

Australia's World Heritage islands: Overview of natural values and threats

Our World Heritage islands

Australia has four island groups listed as World Heritage properties, each with different geology, climate and biological values: Lord Howe Island, K'gari-Fraser Island, Macquarie Island and the Heard and McDonald Island group.

World Heritage properties are areas designated as having Outstanding Universal Value, including for future generations, and the advisory body for their natural heritage is the International Union for Conservation of Nature (IUCN). The World Heritage list contains 1031 properties of Outstanding Universal Value, of which only 17 globally are islands or archipelagos. Several other Australian World Heritage properties, such as the Great Barrier Reef, include islands with significant Outstanding Universal Value.



Fraser Island. Photo: Noam Levin

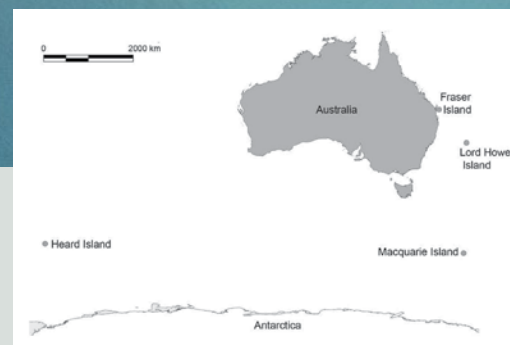
Island features

K'gari-Fraser Island is 122km long and covers 181,851 ha. It has over 250 km of clear sandy beaches with long sweeps of ocean beach, strikingly coloured sand cliffs and spectacular blow-outs.

The Lord Howe Island group is comprised of 1540 ha of land, with spectacular landscapes, including volcanic mountains and species diverse low-lying rainforests, palm forests and grasslands.

Macquarie Island is one of the most isolated islands on Earth. It covers 12,900 ha and is one of the few places on the planet where rocks from the Earth's mantle are exposed above sea-level. It has a dramatic windswept landscape of steep escarpments, lakes and dramatic vegetation changes.

The Heard-McDonald islands are some of the most remote dynamic islands on Earth. They are volcanically active and support shallow fast-



The geographic location of Australia's World Heritage islands including remote sub-Antarctic Macquarie and Heard (and McDonald) Islands in the Southern Ocean.

flowing glaciers. They cover about 37,000 ha, and include Australia's highest peak (Big Ben) at 2745m.

Both Macquarie and Heard-McDonald support high concentrations of wildlife, including penguins and seals.



Macquarie Island.
Photo: Justine Shaw

Native species richness

Long periods of isolation have led to the evolution of endemic species (i.e., species found nowhere else) on Lord Howe Island, Macquarie Island and Heard-McDonald, with Lord Howe having the highest endemism.

K'gari-Fraser Island is a sand island comparatively close to the mainland of eastern Australia, with a history of around 5000 years of human habitation. Its shares many species with the nearby mainland;

consequently, its species are less unique than the isolated open-ocean island groups. It does support unique ecosystems and landforms, however, as a complete sand island. Its proximity to the mainland led to early competition for land use from Europeans, particularly land clearing for pasture and the harvesting of timber. Recent and increasing demand for recreation and tourism has also exposed it to the greatest

degradation of the four World Heritage island groups.

The table below shows the richness in native species on the island groups, particularly in birds, invertebrates and plants. It is typical that remote, isolated islands have low species richness compared to islands that are close to other landmasses, but that many of the species present may be endemic.

Table 1: Native species in the Australian World Heritage island groups (excludes extinct species)

	Mammals	Birds	Invertebrates	Plants
K'gari-Fraser	33	330	No data available	860
Lord Howe	1	15	1600	241
Macquarie	3	24	350	42
Heard-McDonald	2	19	166	11

Extinctions of native species

Known extinctions of native and endemic species have taken place across each of the island groups, with the exception of Heard-McDonald. Macquarie Island has lost two land bird species while Fraser Island has lost an endemic plant to extinction. Lord Howe Island has the highest number of native and endemic species of the four island groups, but has suffered the greatest number and proportion of extinctions. It has lost nine bird species, a mammal, four invertebrates and two plants, predominantly due to invasive species.

Threatened species

Macquarie Island and Heard-McDonald support numerous threatened seabird species (10 and 5 respectively), including albatrosses, petrels, prions, terns and cormorants. Both Macquarie Island and Heard-McDonald support threatened southern elephant seals (*Mirounga*

leonina) and subantarctic fur-seals (*Arctocephalus tropicalis*). Macquarie has several threatened plant species. Lord Howe has nine species of threatened land birds and seabirds, including petrels, shearwaters, terns and several endemic land birds. Fraser Island supports a threatened frog and reptile and four plant species. Fraser is an important site for migratory waders.

Responsible agencies

Macquarie Island is managed as a nature reserve by the Tasmanian Parks and Wildlife Service. Most of the waters out to 200 nautical miles east are within the Macquarie Island Commonwealth Marine Reserve, managed by the Australian Government, in cooperation with the Tasmanian Parks and Wildlife Service. Macquarie Island was inscribed in the World Heritage list in 1997.

K'gari-Fraser Island is managed by the Queensland Government. Most of the land is national park except for a

limited area of private land with small settlements and a resort. All of the marine area within the property lies in the Great Sandy Marine Park. It was inscribed on the World Heritage list in 1992, and added to the National Heritage List in 2007.

Heard-McDonald is the only island group of the four that is managed solely by the Australian Government (through the Australian Antarctic Division). It is managed as a nature reserve. Heard-McDonald were inscribed on the World Heritage list in 1997 and listed on the National Heritage List in 2007. There are significant marine reserves surrounding the islands.

Lord Howe Island is governed by a New South Wales statutory authority established under the Lord Howe Island Act 1953. About 75% of the terrestrial part of the property is managed as a permanent park reserve. It was inscribed on the World Heritage list in 1982 and added to the National Heritage List in 2007.

Current threats

Each of these island groups has unique natural and cultural values; however, the key threats to each island group are similar:

- climate change
- introduced plants and animals
- degradation due to human usage, such as habitation, tourism, scientific research, resource extraction
- inappropriate fire regimes (Fraser Island).

Climate change

Island managers have little control over climate change. The risks posed to these islands by climate change are serious and include rising sea-levels, an increase in the number and severity of storm events, increasing land and sea temperatures, changes in precipitation patterns and ocean acidification. The IUCN has assigned the highest level threat to Fraser Island in particular, with some irreversible changes already apparent. On Macquarie Island, climatic change is associated with an endemic cushion plant becoming Critically Endangered. On Heard Island, glaciers are rapidly retreating due to climatic warming.

Introduced plants and animals

Each of the island groups has been impacted by pest plants and animals, although to differing degrees. The history and level of human usage at each island group strongly influences the number of non-native species on each island group.

Heard-McDonald Islands group

On remote, rarely visited Heard Island, two non-native species have been detected: a grass and an insect (a thrip). So far, no direct on-ground management has been put in place for these species. Heard-McDonald group are the only islands of the four groups not invaded by cats,

rodents and birds. Strict biosecurity measures ensure that risks of invasion associated with the occasional small number of visiting researchers and tourists are minimised.

Macquarie Island

Sealing gangs in the 1800s introduced numerous pests to Macquarie Island. Rabbits, rats and cats have caused the greatest impacts. Numerous domestic animals were introduced over the years (e.g., sheep, goats, pigs, horses) but all were removed by the 1970s. The feral weka or Maori hen (*Gallirallus australis*) was eradicated in the 1970s. In recent years, multimillion-dollar eradication programs have successfully removed rats, mice, rabbits and cats from Macquarie Island. Despite the success of eradication programs, Macquarie Island still has two non-native bird species present – starlings and redpolls. Three common non-native plants, two small herbs and a grass, and numerous non-native invertebrates persist on the island.

Lord Howe Island

Due to the long history of human habitation and movement of people and cargo movement, Lord Howe Island supports 17 non-native vertebrates and 271 non-native

plants. In recent years biosecurity measures have been implemented to reduce invasion risks; however, it is challenging given the high level of visitation and cargo movement. Eradication of some feral pests has been successful, with cats and pigs eradicated in the 1980s, goats in 1999 and myrtle rust in 2018. The eradication of African big-headed ant and multiple weed species is ongoing. A rat eradication program commenced in 2019.

Fraser Island

A total of 24 non-native vertebrates can be found on Fraser Island, along with many non-native plants and several insects. Fraser Island is under particular ecological pressure due to a notable increase in the numbers of visitors and vehicle traffic since the island was listed. Managers of the World Heritage property need to implement innovative, adaptive actions quickly or risk its World Heritage status.

Prevention is best

Control or eradication of pests once established is difficult and costly. Therefore authorities should focus on preventative measures, that is, rigorous biosecurity for each of the island groups.

Heard Island indigenous megaherbs (*Pringlea antiscorbutica*).
Photo: Kate Kiefer





King penguins (*Aptenodytes patagonicus*) on Macquarie Island. Photo: Justine Shaw

Protocols and controls must be enforced at the point of embarking and upon arrival at the island. They must also target the most likely vectors and potential pest species, for example, plants entering as seeds in clothing; pathogens and insects entering on goods and fresh food; and ship-dwelling rodents, other vertebrates and insects.

All cargo and visitors (tourists and expeditioners) pose biosecurity risks to the sub-antarctic ecosystems on Macquarie Island and Heard-McDonald group. As a result, strict quarantine measures are in place; however, several non-native plants and invertebrate have been introduced to Macquarie Island in recent years. Annual cargo supplies are searched pre- and post-departure by rodent detection dogs.

Lord Howe has resident humans and experiences high numbers of visitors and levels of cargo, which presents challenges to biosecurity. However, in recent years there has been increased effort in improving island biosecurity. It is much more difficult to achieve for Fraser due to the size of its resident

populations, very high levels of visitation, high boating activity and receipt of large volumes of cargo. As visitor numbers rise to each of these outstanding places the task of protecting them is more urgent so that future generations may continue to observe the outstanding natural values that are currently present.

Biosecurity must also be accompanied by vigilant pest surveillance, so that any incursions of new pest species that evade existing biosecurity measures can be eradicated before they establish or spread.

Degradation from human usage

The most effective actions centre on mitigating the effects of human behaviour, and minimising impacts from non-native species. Developments such as port and shipping infrastructure, and urban settlements and their associated infrastructure, such as, on Lord Howe Island, the proposed expansion of the airport runway, are threats to the natural values of the islands. Oil spills associated with shipping pose a further threat to all islands.

Fraser Island is an example of the challenges to islands in balancing World Heritage values with socioeconomic pressures, especially the increase in eco-tourism. This increase, which has been significant since the island was listed, has led to corresponding increases in pollution, siltation, wildlife and habitat disturbance and the introduction of new pest species.

Both Macquarie Island and Heard and McDonald Island groups are visited by tourists and expeditioners from the Australian Antarctic program. Tourist visitation is heavily regulated, with an annual cap on visitor numbers, which is outlined in statutory management plans. Tourist numbers to Heard-McDonald is very low and sporadic. No visitors are permitted to land on McDonald Island. The geographical isolation of these two sub-Antarctic islands limits the number of ship visits and visitor numbers.

Demand to visit all these World Heritage islands is likely to continue to rise and result in increased pressure from tourists, developers and researchers on their unique and fragile ecosystems.

Further Reading

Whinam, J., & Shaw, J. D. (2018). "Australia's World Heritage islands". In D. Moro, D. Ball, & S. Bryant (Eds.), *Australian Island Arks: Conservation, Management and Opportunities*. CSIRO Publishing.

Further Information

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Lord Howe Island. Photo: Leonie Valentine