

## Heard Island and McDonald Islands (HIMI) Marine Reserve Research and Monitoring Priorities

(Extract from HIMI Marine Reserve Management Plan)

Driver ⇨	Legal or other requirement	Key management issue	Baseline information	Long-term monitoring (SoE)	Management of human pressures
<b>Research or monitoring requirement ⇩</b>					
<b>Research that contributes to increased understanding of the values of the Reserve and that provides for ongoing reporting of the condition of the values of the Reserve, as required under legislation and national and international agreements, such as:</b>					
Continuing population counts and monitoring of threatened species (see Appendix 2) to assist in the implementation of the <i>Sub-antarctic Fur Seal and Southern Elephant Seal Recovery Plan, Recovery Plan for Albatrosses and Giant Petrels</i> and <i>Draft Recovery Plan for 10 Species of Seabird 2004-2009</i>	✓ EPBC, RP, WH, Ramsar, SoP			✓	
Research and monitoring to contribute to the development and implementation of other recovery plans, action plans and threat abatement plans	✓ EPBC, TAP, AP, RP			✓	
Comprehensive surveys of indigenous species to provide baseline information against which to compare human-introduced or otherwise newly colonised terrestrial, freshwater and marine species		✓ CC, AS	✓		✓
Regular surveys to determine the presence and extent of any new species and to monitor the behaviour and further spread of established alien species, such as <i>Poa annua</i>	✓ WH, Ramsar, SoP	✓ AS	✓	✓	✓
Monitoring the spatial extent and character of human disturbance or ‘footprint’ (such as the total area impacted by facilities, debris, historic sites, sampling sites, tracks etc)	✓ WH, Ramsar, SoP			✓	✓
Monitoring the area and extent of newly deglaciated land/decrease in ice-covered land	✓ WH, Ramsar	✓ CC		✓	
Monitoring the colonisation of newly deglaciated land by plants and animals	✓ WH, Ramsar	✓ CC, AS	✓	✓	
Long-term whole-of-Reserve and colony-specific monitoring to provide fundamental data on the distribution, abundance and population trends of seal and seabird species, with particular emphasis on listed threatened species (see Appendix 2)	✓ WH, SoP		✓	✓	
Monitoring the presence or absence of large breeding populations of penguins (such as representative macaroni and other penguin colonies)	✓ WH, Ramsar			✓	
Surveys to increase knowledge of the biodiversity of the Reserve, and its response to current conditions and climate change	✓ WH, Ramsar	✓ CC	✓	✓	
Monitoring changes in composition and extent of vegetation communities		✓ CC, AS	✓	✓	
Long-term climate monitoring		✓ CC		✓	
Monitoring of changes to the coastline, glacial landscape and other and features of the Reserve	✓ WH, Ramsar	✓ CC		✓	
Research into the location, condition and significance of heritage sites and items, including those items that become exposed through natural or human actions	✓ SoP		✓	✓	✓
Hydrographic surveys for producing and updating of marine charts			✓		
Systematic geological mapping			✓		
Monitoring of volcanic activity	✓ WH			✓	
Studies to evaluate the ecological character of wetland areas	✓ SoP, Ramsar			✓	
Quantitative baseline biological studies of coastal marine ecosystems			✓		
Opportunistic monitoring of the distribution of cetaceans during AAD expeditions, fishing vessels, ocean-going yachts, tourist vessels, merchant vessels, spotter aircraft	✓ EPBC, AP		✓	✓	
Research into oceanographic features and processes that strongly influence the distribution of marine species and seabirds		✓ ESD	✓	✓	

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<b>Research or monitoring requirement ↓</b>					
Where practical, remote sensing of vegetation, glacial retreat, benthic communities and habitats and other characteristics	✓ WH, Ramsar, SoP	✓ CC	✓	✓	
<b>Research to determine whether the current Reserve area provides sufficient representation of the marine habitats in the HIMI region and is effective in achieving the purposes for which it was declared, such as:</b>					
Acoustic mapping of the substratum	✓ SoP	✓ ESD	✓		
Stratified random sampling of the benthos, particularly habitat-forming benthos such as sponges and corals, to determine the extent of differences in the assemblages and habitats between the biophysical units used to develop the Reserve	✓ SoP	✓ ESD	✓		
Studies to determine whether the land-based marine predator foraging locations in the Reserve are sufficient for the conservation of those species	✓ SoP	✓ ESD	✓		
Stratified random sampling of benthos within and outside the Reserve, to determine how well the Reserve configuration protects the features it was designed to protect.	✓ SoP	✓ ESD	✓		
Stratified random sampling within and outside the Reserve of target species in the HIMI fishery.	✓ SoP	✓ ESD	✓		
<b>Research and monitoring to further understand of the impacts of human activities in and around the Reserve on the values of the Reserve, and to contribute to developing management strategies that will prevent or minimise those impacts, such as:</b>					
Monitoring of contamination by petroleum hydrocarbons and heavy metals at the Atlas Cove ANARE Station site and sites of more recent contamination.	✓ WH, Ramsar			✓	✓
Site-specific auditing of anchorages, landing sites and main use areas for the presence of alien species	✓ WH, Ramsar, SoP	✓ AS		✓	✓
Identifying the pathways for and consequences of introducing alien species		✓ AS			✓
Research into the impacts of commercial fishing in adjacent waters on the Reserve and/or its key components (e.g. protected species)	✓ WH, Ramsar	✓ ESD		✓	✓
Monitoring changes in the degree to which anthropogenic threats affect threatened animal species (e.g. interactions with fishers, marine pollution, disease outbreaks, direct disturbance)	✓ WH, Ramsar, SoP	✓ AS, ESD		✓	✓
Investigating the cumulative impacts of research programs and other activities on threatened species or species and their habitats that are vulnerable to human disturbance	✓ RP, WH, Ramsar, SoP			✓	✓
<b>Research to contribute to the integrated and ecologically sustainable management of the HIMI region as a whole, such as:</b>					
Studies to allow better understanding of the HIMI food web, such as: <ul style="list-style-type: none"> <li>– quantifying the foraging areas and diet of key land-based marine predators</li> <li>– modelling of the potential interactions (direct and indirect) between marine mammal and seabird predators and HIMI fisheries (trawl fisheries for toothfish and icefish, and long-line fishery for toothfish)</li> </ul>		✓ ESD	✓	✓	✓
Fish stock assessments	✓ CCAMLR	✓ ESD		✓	✓
<b>Research and monitoring that will assist in addressing emerging Reserve management issues consistent with the provisions of this Plan.</b>					

EPBC – Requirement of the EPBC Act; WH – World Heritage reporting requirement; SoP – State of the Parks reporting requirement; TAP – threat abatement plan; AP – action plan; RP – recovery plan; CC – Climate Change effects; AS – Alien Species; ESD – Ecologically Sustainable Development of the HIMI Region