



# Environmental Policy on operating Remotely Piloted Aircraft in Antarctica and the Territory of Heard Island and McDonald Islands



Figure 1: Remotely Piloted Aircraft flying at Casey Station (Claire Elliott, 2022).

## Contents

<b>1</b>	<b>Introduction</b> .....	<b>2</b>
<b>2</b>	<b>Purpose of this document</b> .....	<b>2</b>
2.1	<b>Matters not covered in this policy</b> .....	<b>2</b>
2.2	<b>Additional requirements</b> .....	<b>2</b>
2.3	<b>Planning to reduce environmental impacts and other considerations</b> .....	<b>3</b>
2.4	<b>Wildlife disturbance</b> .....	<b>4</b>
2.5	<b>Other considerations</b> .....	<b>4</b>
2.6	<b>Territory of Heard Island and McDonald Islands (HIMI)</b> .....	<b>5</b>
<b>3</b>	<b>Part A: Standard RPA Operations</b> .....	<b>5</b>
3.1	<b>Standard conditions</b> .....	<b>5</b>
<b>4</b>	<b>Part B: Advanced RPA Operations</b> .....	<b>6</b>
4.1	<b>Beyond Visual Line of Site and Extended Visual Line of Site</b> .....	<b>7</b>
	<b>More Information</b> .....	<b>7</b>
	<b>Appendix 1 - Environmental and controllable factors that can influence an animal's response to RPA flights</b> .....	<b>8</b>

## 1 Introduction

Antarctica, the Southern Ocean and sub-Antarctic islands are unique and fragile environments. The Antarctic Treaty establishes Antarctica as a natural reserve devoted to peace and science. Australia is strongly committed to protecting the Antarctic environment and the Australian Antarctic Division (AAD) is responsible for fulfilling that commitment, including through the application of environmental laws.

Remotely Piloted Aircraft are operated in Antarctica for a range of purposes within and external to the Australian Antarctic Program, including for:

- Research, data collection, mapping, remote sensing.
- Professional media and film
- Operations (crevasse detection, vessel navigation)

For clarity, within this document the term Remotely Piloted Aircraft (RPA) refers to an uncrewed aircraft, which is piloted from a remote pilot station, either within, extended, or beyond visual line of site.

All activities, including the operation of RPA, in the Antarctic Treaty area (south of 60°S) and the Territory of Heard Island and McDonald Islands (HIMI) must seek and receive environmental approval prior to commencing the activity. More information about the application processes are available via the following links:

- [ATEP approval](#) (Antarctic Treaty Area)
- [HIMI approval](#)

## 2 Purpose of this document

This policy outlines the requirements for operating RPA in a manner that minimises environmental impacts in the Antarctic Treaty area (including all land, water and ice shelves), and the Territory of Heard Island and McDonald Islands.

### 2.1 Matters not covered in this policy

- This policy does not consider uncrewed land or marine (surface or underwater) vehicles.
- This policy is not intended to provide guidance for Macquarie Island, which is part of the State of Tasmania and is administered by the Tasmanian Parks and Wildlife Service.
- This policy does not provide guidance on the operation of RPA in the vicinity of cetaceans (whales and dolphins) in Antarctica. Information on using RPA near cetaceans can be found here: [www.dcceew.gov.au/environment/marine/publications/australian-national-guidelines-whale-and-dolphin-watching-2017](http://www.dcceew.gov.au/environment/marine/publications/australian-national-guidelines-whale-and-dolphin-watching-2017)

### 2.2 Additional requirements

In addition to seeking environmental approval (as discussed above), it is the responsibility of the RPA pilot to be aware of and adhere to other operational or licencing requirements, including for example:

- For all AAP RPA operations, this policy should be read in conjunction with the *AAD Standard Operating Procedure, Operations Manual, Volume 5 – UAS Standard Operating Procedures*.
- For all non-AAP RPA operations, it is the responsibility of the RPA operator, to be aware of any *Australian Civil Aviation Safety Authority (CASA)* requirements, including licences that may apply.

- If you are flying as part of a science project, or undertaking close approaches to wildlife, you may require approval from an Animal Ethics Committee.

### 2.3 Planning to reduce environmental impacts and other considerations

There are a range of factors that might influence the risk of environmental impacts of operating RPA in Antarctica. Being aware of these factors will not only assist when planning to operate RPA, but will also help when preparing to submit an environmental approval application to undertake an activity in Antarctica that includes RPA operations. Relevant factors include:

#### *RPA operator*

- level of training and experience appropriate for the location and activity
- site knowledge – an understanding of the geographic features, climate and environmental values that are likely to occur at the site (some examples listed below)

#### *RPA characteristics*

- types including rotary, fixed wing and hybrid flight mode
- size, weight, colour, shape and noise output
- powered by electricity (battery) liquid fuel (combustion), hybrid, other

#### *RPA operations*

- horizontal or vertical angle flight approach
- grid, circular, linear or random flight patterns
- spatial and temporal characteristics:
  - flight duration, time of year or day, frequency
  - flight speed and altitude

#### *Site values and characteristics*

- wildlife, including birds (flying and flightless) and mammals (seals)
- sensitive terrestrial areas including vegetation, geology and water bodies
- wind, temperature and visibility
- topography
- marine environments
- marine vessel characteristics
- heritage and historical sites
- protected areas
- aesthetic and wilderness values

#### *Navigation*

- Navigation or stabilisation systems in some RPA can be affected by high magnetic declination and inclination experienced near the magnetic poles.
- RPA navigation and communication systems can be affected by increased solar activity (i.e. solar 'storms'), which disproportionately affects areas near the magnetic poles.
- RPA communication systems may affect or be affected by ship and research station operations such as VHF radio or other communications.

#### *Pre-flight preparation*

Pre-flight planning will help to avoid disturbance or direct interactions with wildlife. Planning may include:

- Desktop assessment.

- Reviewing maps to identify protected areas, key fauna and flora locations and terrain features where wildlife may occur such as cliffs.
- Design flight plans that incorporate appropriate vertical and horizontal separation distances from wildlife concentrations.
- Flight protocols to avoid anticipated problems.
- Site reconnaissance.
- Identifying potential hazards that impact the ability of the operator to avoid wildlife disturbance or to safely abort a flight.

## 2.4 Wildlife disturbance

Understanding the factors that influence wildlife disturbance during RPA operations is important when planning to fly RPA in locations where wildlife is known or likely to occur. RPA flights should be planned to avoid disturbing, modifying behaviour or colliding with wildlife.

Environmental factors that influence an animal's response to RPA flights should be considered during flight planning and may include (but not limited to): subject taxa, aspects of a species life cycle (such as breeding status), ambient noise, meteorological conditions, habitat variables, and an animals' level of exposure to anthropogenic settings.

Controllable factors that may influence an animal's response include: RPA approach distance, noise emissions, speed, type and flight pattern.

Operating RPA in a manner that addresses these factors will decrease the chance of wildlife disturbance. A detailed list of environmental and controllable factors is provided at **Appendix 1**.

Wildlife disturbance may be observed as follows:

- Penguins: crest raised, craning, alert, wings out.
- Seals: alert, sitting up, open mouth, moving towards waterholes.
- Flying seabirds: opening their beaks and swaying their heads, taking to the air, moving to their nesting cavities.

Evidence suggests that sudden changes in RPA noise intensity due to automatic compensation for wind gusts, making sudden movements, and vertical altitude changes (such as taking off and landing) are more likely to elicit an animal response. This should be taken into consideration when increasing the RPA distance for the purpose of avoiding wildlife disturbance, and during take-off and landings.

Some animals may show signs of aggression or attraction to RPA. Birds on the wing, such as Skua (*Stercorarius sp.*), have been observed flying from a distance to investigate RPA and have also been known to attack RPA. Evidence suggests that a fast climb evasive move is the safest option to avoid contact with an attacking skua. Ending a flight may also encourage wildlife to move away from RPA.

## 2.5 Other considerations

Approval or clearance from a relevant person may also be required in certain locations or situations prior to undertaking RPA flights.

For AAP activities:

- Seek approval from a station or deputy station leader prior to operating on or close to Australian research stations.
- Be aware of requirements and restrictions near aviation facilities and operations.

- Operating RPA from a ship may represent a range of potential risks. Always ensure you receive clearance from the ship's captain or other relevant person prior to operations.

For non-AAP activities:

- Be aware of any CASA rules that may apply, including flying in a manner that reduces risks to people, buildings and other aircrafts.
- Be aware of IAATO guidelines that may apply to the use of RPAs from tourism vessels.
- Do not operate near research stations, facilities or field activities operated by a national competent authority without permission.

## 2.6 Territory of Heard Island and McDonald Islands (HIMI)

Extreme and rapidly changing weather conditions can be expected at HIMI, including strong winds that may prevent RPA from being launched, or resulting in it becoming lost during operation. HIMI is also home to high concentrations of wildlife and a greater diversity of species than Antarctica. This diversity can result in an extended breeding period for wildlife in general, and some species being present year-round.

As such, a particularly precautionary approach to the assessment and approval of RPA can be expected.

## 3 Part A: Standard RPA Operations

Standard RPA operations are generally considered acceptable and consistent with relevant laws in the following situations.

Standard operations generally include:

- Use of rotary type RPA
- Use of battery powered RPA
- RPA that weighs no more than 7kg
- Operating RPA within visual line of site (VLOS)

Required skills, training and experience:

- Remote pilots must have a minimum of 10 hours on the type of RPA they propose to operate, and in the case of flights from a ship at sea, a minimum of 10 hours in manual mode.

### 3.1 Standard conditions

Your ATEP Act authorisation will include conditions for your RPA activity. Conditions that pertain to wildlife interactions are based on the most recent information and data, but also reflect a degree of precaution to ensure unnecessary impacts are avoided. A precautionary approach also acknowledges that many studies (regarding impacts of RPA on wildlife) are limited to visual observations and do not consider changes to individual species' heart rate, respiratory rates and stress hormones. These are all possible aspects of wildlife disturbance and can be difficult to detect.

The following conditions are likely to be applied to standard RPA operations in Antarctica. Their purpose is to not only prevent direct impacts to Antarctic values, but also to reduce the risk of RPA failure.

### RPA Operations

- All RPA flights must have a pilot and observer in attendance (the observer must be in close proximity of the pilot).
- The RPA pilot or observer (in close proximity of the pilot) must maintain continuous visual line of sight with the RPA while in flight.
- RPA operations must not occur in temperatures lower than specified by the manufacturer.
- RPA operations must not occur in wind speeds greater than specified by the manufacturer.
- RPA operations must not occur in low light conditions.
- RPA operations must not occur over areas that do not allow for the retrieval of the RPA, in case it crashes or fails.
- RPA must not be left in the field or marine environment if crashes or fails.

*Note: Unless retrieval poses safety risks, a Station/Field Leader or Ship's Master considers it unreasonable or impracticable to retrieve, or if the impact of retrieval is likely to be greater than the impact of RPA not being retrieved.*

### Wildlife

- RPA must not operate (including landing or taking off) closer than 200 m (laterally) of static wildlife concentrations.

*Note: The AAD may apply conditions with increased distances in situations where a species, wildlife colony or other factor suggests an increased separation distance is required to avoid wildlife disturbance.*

- RPA operations must stop immediately if wildlife is exhibiting signs of disturbance.
- RPA operations must be aborted if dynamic wildlife, particularly birds on the wing, present a significant risk of collision (e.g. Skua attacking RPA).

### Sensitive terrestrial areas

- In the event of RPA failure, extreme care must be used to avoid foot traffic over sensitive areas, including fragile vegetation (moss and lichen) or soils.
- Operating RPA over lakes, tarns, and other terrestrial water bodies should be avoided, unless specifically required and authorised.

### Antarctic Specially Protected Areas

- RPA operations must not occur over or within 100m horizontal distance of an Antarctic Specially Protected Area (ASPA) boundary.

## 4 Part B: Advanced RPA Operations

Operating RPA outside of Standard RPA Operations (described in Part A), will be considered on a case by case basis where risks are justifiable, and the operator's skills, experience and environmental knowledge are appropriate, or where the purpose of activity is consistent with management plans for protected areas.

Advanced operations may include:

- use of RPA weighing greater than 7kg
- closer approaches to wildlife and sensitive areas for the purpose scientific research or data collection
- operating within or over an Antarctic Specially Protected Area.
- operation higher than 120m above ground or sea level.

- operating an RPA Beyond Visual Line of Site (BVLOS) or Extended Visual Line of Site (EVLOS).

Required skills, training and experience may include:

- demonstrated experience in operating at closer distances to fauna and sensitive sites.
- a high level of knowledge or expertise of the environmental values of Antarctica, relevant to the proposed operating location.
- training and experience in BVLOS and EVLOS operations.

Pre-flight planning

- The proponent or operator should demonstrate a high level of environmental risk assessment and contingency planning.

#### 4.1 Beyond Visual Line of Site and Extended Visual Line of Site

BVLOS and EVLOS flights will be considered on a case by case basis where risks are understood and it can be demonstrated that RPA will be operated in a manner that avoids impacts to Antarctic values, without direct human observation.

To undertake BVLOS and EVLOS operations, RPA pilots must hold relevant approvals in accordance with *Chapter 5 of the CASR Part 101 Manual of Standards* (Australia).

#### More Information

For more information, please contact the Antarctic and Environmental Regulation Section, Australian Antarctic Division at [eia@aad.gov.au](mailto:eia@aad.gov.au).

<p><b>File reference:</b> 978223</p> <p><b>Record number:</b> D22/46745</p>	<p><b>Responsible area:</b> Antarctic and Environmental Regulation (AER) Section</p> <p><b>Authorised by:</b> Manager, AER Section</p> <p><b>Contact email:</b> <a href="mailto:eia@aad.gov.au">eia@aad.gov.au</a></p>	<p><b>Authorisation date:</b> 25 September 2023</p> <p><b>Review date:</b> September 2025</p>
<p><b>Location of points of use:</b> <a href="https://blizzline.antarctica.gov.au/environment/environmental-policies-guidelines-codes/">https://blizzline.antarctica.gov.au/environment/environmental-policies-guidelines-codes/</a></p>		

## Appendix 1 - Environmental and controllable factors that can influence an animal's response to RPA flights

<b>Controllable factors</b>	Approach distance – Wildlife disturbance decreases with increasing RPA approach distance.
	Noise emissions – Avoid sudden changes in noise intensity (e.g. caused by rapid changes in flight angle, rapid ascents).
	Airspeed (including ground speed, flight speed, cruising speed).
	RPA type and characteristics (e.g. shape, size, colour, lights).
	Take-off distance – Launching outside animal's field-of-view and at a greater approach distance than that used during flights may reduce an animal's awareness of RPA.
	Flight pattern – Sweeping horizontal flight patterns, altitudinal movements (vertical descends or ascents), diagonal movements towards animals (altitudinal changes during horizontal approach).
	Timing of flights – Time of day (adults departing nest), time of year (breeding season).
	Habituation – Frequently disturbed wildlife may show fewer signs of reactions to RPA flights than more isolated conspecifics.
<b>Environmental factors</b>	Taxa – Different visual and auditory acuity between taxa.
	Biological state – Breeding, moulting etc
	Ambient noise – Noise emissions from RPA masked by ambient noise if ambient noise is louder.
	Weather – Wind, sea state, cloud cover.
	Behavioural state of the animal(s) – Resting animal versus active animal.
	Presence of predators – Disturbance may increase when birds of prey are present.
	Age of animals – Different responses between adult and younger age classes.
	Sex of animals – Linked to breeding activity.
	Animal condition – Injured/sick, hormone and stress levels.