



Considerations for IAATO Operators carrying authorized/permitted scientists during high risk of Highly Pathogenic Avian Influenza outbreaks in Antarctica and the sub-Antarctic

Introduction:

There is a high risk of Highly Pathogenic Avian Influenza (HPAI) arriving in Antarctica during the 2023-24 and the 2024-25 seasons¹. To better understand its impact and spread, scientists are planning ways to conduct surveillance in Antarctica, including sample collection. IAATO works closely with the SCAR Antarctic Health Wildlife Network (AHWN) and understands that some researchers are reaching out to IAATO Operators to assist them in the field.

This document contains important information and guidance for IAATO Operators to consider before carrying scientists into the field who intend to work near wildlife, including for HPAI sample collection.

Pre-season considerations for scientists and operators

HPAI is a class 3 pathogen. It is known to [transmit to humans](#) under special conditions (e.g., those working closely with infected poultry).

There are several considerations for scientists when it comes to conducting HPAI research and infectious disease surveillance in Antarctica. These considerations include:

- Appropriate permitting/authorization by a National Competent Authority for science conducted in Antarctica/sub-Antarctic;
- Any additional permits for collection, export and import. Note that regulations/restrictions of handling a class 3 pathogen will differ from country to country;
- Appropriately trained personnel;
- Appropriate biosecurity procedures;
- Appropriate PPE including training in its use and removal;
- Use and handling of sampling kits;



- Use, handling and storage of samples and waste, including for onward transport to final destinations;
- Appropriate facilities for testing;
- Capacity and willingness of state/national laboratories to analyse collected samples;

Non-allowable activities

Operators and scientists are **not allowed** to:

- Sample at sites suspected or identified as having HPAI;
- Test samples in Antarctica or the sub-Antarctic from sites suspected or identified as having HPAI;
- Collect samples from dead wildlife or animals showing symptoms

An exception is if appropriate permits/authorizations have issued by a relevant national Competent Authority. This includes permits for export and import of samples.

IAATO Operators are **not allowed** to fly RPAS over or near concentrations of wildlife under any circumstances (see *IAATO Statement on the use of Remotely Piloted Aircraft Systems. IAATO Field Operations Manual, section 07*).

Under special conditions, scientists may be allowed to fly RPAS over or near concentrations of wildlife for the surveillance, detection and monitoring of HPAI with appropriate permission/authorization from a national competent authority (See Appendix I - *Antarctic Wildlife Health Network Guidelines for use of Remotely Piloted Aircraft Systems for Scientific Surveying During Wildlife Disease Outbreaks in Antarctica and sub-Antarctic regions*).

Further considerations for Operators

If you are an Operator carrying scientists into the field to collect samples for reasons that are unrelated to HPAI (e.g. guano samples for diet or microplastic analysis), you should assume that the samples **could be contaminated with HPAI** and take **account of the considerations given below**.

Standard Operating Procedures (SOP) should be created by any operator carrying scientists who are working with HPAI or may come into contact with it (e.g., working close to wildlife, collecting guano samples). Staff, crew and scientists should be appropriately informed regarding these SOPs.

If you are an Operator considering carrying scientists into the field to **sample for HPAI**:



- Ensure the correct permits/authorizations are obtained by the scientists for all activities related to the scientific activity, such as sampling, waste disposal and use of RPAS.
- Check the details of any permits/authorisations carefully. The EL, AEL and field staff must be familiar with these details to check that all activities are consistent with the provisions laid out in the permits/authorizations.
- For samples, check scientists have export permits from gateway cities to get samples from, for example, ship to aircraft. Questions to consider include:
 - Do they have import permits and required licenses for sending a class 3 pathogen across borders?
 - Do the scientists have agreement from a certified laboratory for testing of samples at the final destination?
- It is strongly recommended that Operators interview scientists intending to travel with them about their activities, response plans, SOPs and skills etc:
 - Is their academic background and experience relevant to the intended activity (e.g. microbiology/virology, molecular sciences, biological sciences)?
 - Do they have relevant training and **experience?** Consider all proposed activities, e.g. use of RPAS; wearing and removal of PPE; sampling etc. While the risk of HPAI remains high, it is not recommended to invite scientists on to your program who are doing the activity in Antarctica for the first time;
 - Do they have appropriate SOPs if necessary?
 - If sampling involves handling of wildlife, do they have appropriate ethics approval?
- On PPE and collection of samples:
 - Will scientists have and provide appropriate PPE?¹
 - Does your vessel/facility have storage for contaminated PPE and waste, away from people and food areas (i.e. restricted access)?
 - Do you have appropriate equipment and procedures for handling and storing contaminated waste (e.g. biohazard bags sealed in clearly labelled barrels/bins)?
 - Consider how and when PPE will be removed in the field.
How will the waste be managed at gateway ports?
- Ensure you, the Operator, and your staff, understand any SOPs and Risk Assessments being used by the scientists being supported, such as for sampling or use and removal of PPE. Consider performing drills as part of your scenario planning;



- Ensure you and your team, including the EL and AEL, fully understands what type of sampling will be done and the risks involved. Consider carefully how you and the research team will communicate the activity to your crew and guests.
- It is recommended to have a clear communications policy in place for scientists, staff and crew should HPAI be suspected in the field. In most cases, behavioral symptoms and unusual mortality will alert people to the suspected presence of the disease; it will not be possible to confirm the presence of HPAI. **Therefore, HPAI should only be referred to as 'suspected' when communicating why landings have been cancelled or aborted.**

Additionally, the EL and scientist should coordinate communications channels that follow established protocols found in the IAATO 2023-24 Biosecurity Instructions (FOM, Section 02) and Procedures Upon the Discovery of a High or Unusual Mortality Event (FOM, Section 07).

- Discuss all shared intentions with your National Competent Authority.
- Ensure you have protocols in place for managing a situation where humans contract HPAI. It is important this possibility is discussed with your medical team and appropriate SOPs are in place.
- If you, the Operator, or your teams are **not comfortable** about any part of the research, including sampling techniques or the person conducting the sampling collection, even if they have a permit/authorization, **you should say no.**
- Inform IAATO that you are supporting the activity.

References:

1. SCAR Antarctic Wildlife Health Network (2023). Biological Risk Assessment of Highly Pathogenic Avian Influenza in the Southern Ocean. <https://www.scar.org/library/science-4/life-sciences/antarctic-wildlife-health-network-awhn/5973-risk-assessment-avian-influenza/file/>
2. IAATO Statement on the use of Remotely Piloted Aircraft Systems. IAATO Field Operations Manual, section 07.
3. Hart, T., Dewar, M.L., Humphries, G. (2023). Antarctic Wildlife Health Network Guidelines for use of Remotely Piloted Aircraft Systems for Scientific Surveying During Wildlife Disease Outbreaks in Antarctica and sub-Antarctic regions.



ANNEX I

IAATO and Antarctic Wildlife Health Network Guidelines for use of Remotely Piloted Aircraft Systems for Scientific Surveys During Disease Outbreaks in Antarctica and sub-Antarctic regions

Tom Hart^{1,5}, Meagan Dewar^{2,5}, Grant Humphries^{3,4}

1. Department of Biological and Medical Sciences, Oxford Brookes University, UK
2. Future Regions Research Centre, Federation University Australia.
3. Oceanites Inc. Washington, DC, USA.
4. Black Bawks Data Science Ltd. Invergarry, UK
5. SCAR Antarctic Wildlife Health Network.

The following guidelines have been created in response to IAATO queries and specifically for scientists using Remotely Piloted Aircraft Systems (RPAS) in Antarctica and the sub-Antarctic during wildlife disease outbreaks and on IAATO vessels.

Remotely Piloted Aircraft Systems (RPAS) offer an exceptional opportunity to remotely and minimally-invasively survey populations with suspected disease outbreaks such as Highly Pathogenic Avian Influenza (HPAI). Guidelines for use and permitting conditions are available via the Antarctic Treaty System, but here we summarise them and add considerations for RPAS use during disease outbreaks including HPAI and to provide clarity, especially to IAATO Operators.

Scientists are able to remotely survey for and monitor active HPAI outbreaks without direct contact with infected animals thus reducing exposure of humans to a possible zoonotic pathogen and limiting the potential spread. Videos are especially useful for the identification of behaviours, monitoring of disease outbreaks and assessing its impact and should be shared with national permitting bodies. Other benefits include less disturbance to the animals as this is a less invasive approach, it is a faster and less expensive method to survey the area and can be conducted even if conditions are unsuitable to land at a site.

We recommend the use of RPAS for early surveillance and detection of HPAI, monitoring of active outbreaks and gathering of important evidence in relation to the spread and movement of HPAI within a colony and the overall impacts HPAI has had on a colony.



However, any use of RPAS must be appropriately permitted/authorised by a relevant competent authority following risk and Environmental Impact Assessments that consider the below guidelines, as well as detailed information about other non-disease related risks to wildlife (e.g., noise disturbance, collisions, environmental waste).

RPAS activities must only be undertaken by trained pilots with experience of flying over wildlife.

Flying or landing in a manner that disturbs concentrations of birds and wildlife is prohibited in Antarctica except in accordance with a permit issued by an appropriate authority under the Madrid Protocol (ATCM Resolution 4 (2018) Annex). In the context of activities that are permitted for HPAI surveillance, detection and monitoring, disturbing concentrations of wildlife is not recommended.

Minimum Qualifications for RPAS pilots performing scientific surveys

The AWHN suggests that local experience is vital for a safe flight and avoiding disturbance. In the context of HPAI, flights need extra safety margins given that in the event of a crash, it may not be possible to recover the RPAS.

- Commercial RPAS Pilot Licence from a relevant competent authority. For example, Fed 107 issued by the FAA in the USA, or A2CofC issued by the CAA in the UK;
- Minimum of 10 hours of experience flying the RPAS listed on the relevant permit 90 days prior to deployment;
- At least five flights over wildlife (in Antarctica or elsewhere). If not, then the RPAS pilot must have an additional 10 hours of flight time in the six month period before deployment, and must have their first five flights over wildlife supervised by an experienced Antarctic RPAS pilot who can take control of the aircraft if necessary (i.e., standing in close proximity to the pilot);
- Previous experience working in the Antarctic, and at least five flights supervised by an experienced Antarctic wildlife RPAS pilot;
- An experienced observer looking for signs of behavioural change in the target wildlife due to presence of the RPAS;
- Permitted for RPAS flying with all pilots listed from a relevant permitting authority and must include flying over wildlife.

Suitable Aircraft

We refrain from listing suitable aircraft as the market is constantly changing, but due to the conditions experienced around the Southern Ocean and in Antarctica, aircraft should have:

- 25+ kt wind max tolerance;
- Minimum operating temperature of -10 degrees Celsius;
- Approximately 20 minute flight time at 0 degrees Celsius;



- GPS navigation;
- Dedicated control pad (i.e., not controlled by a smart-phone).

We highly recommend aircraft have visibility markings (e.g., reflective tape). Floatation devices are optional as they affect the aircraft's flight characteristics. Far more important is the pilot's approach to flying well within the capacity of the aircraft given the conditions and not to fly if the flight becomes less likely to be completed safely.

Suitable flying conditions

The RPAS pilot and observer must have a flight plan in place before leaving the operator's vessel that considers weather conditions and other possible risks to the survey. The following conditions are considered suitable and if they should worsen in any of these three categories, the flight should be aborted:

- Wind speeds < 20 kts (monitored by communication with the operator's vessel);
- Good visibility (> 200m);
- Minimal precipitation - stop flights if precipitation decreases visibility to < 200m.





Flying over colonies

Flight teams on land or water (i.e., boat-based) launches must include an observer to monitor wildlife for changes in behaviour due to presence of the RPAS, and watch for flying seabirds that might interact with the RPAS. The observer should be standing close enough to the pilot to be able to communicate instantaneously without raising their voices. Pilots should take off at least 50 m from birds or highways. Automated flight paths are often preferable for data collection, but pilots must be able to take manual control in the event of a flying seabird interacting with the RPAS.

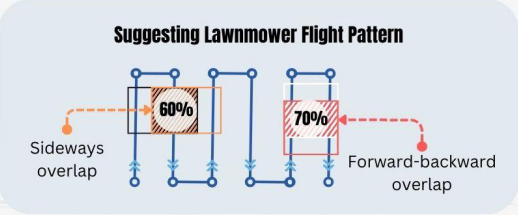
Biosecurity

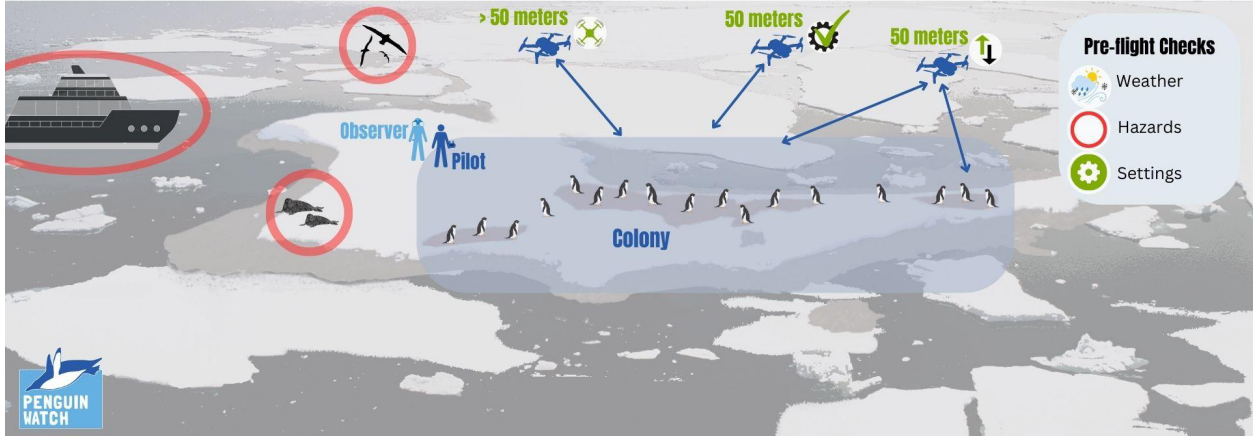
Upon completion of flights, all gear should be disinfected with biocide wipes or soap and bleach prior to being used at another site. This includes removing any solid material on either the drone or carrying cases. For ease, a landing pad for the RPAS should be used which can be easily biosecured.

Minimise Risk of Disturbances

-  Adjust flights to environmental conditions and the presence of flying birds
-  Taking off and landing 50 meters away
-  Flying >50 meters above a colony
-  Keep surveys short when possible. Most sites can be flown in ≈20 minutes.

Suggesting Lawnmower Flight Pattern





Unplanned forced landing or loss of aircraft

In the case of a crash landing near wildlife, the RPAS should not be recovered if HPAI is suspected, unless permits include sampling of known HPAI and with appropriate PPE (please see Dewar et al 2023 for guidance). If HPAI is not suspected, the RPAS may be retrieved but with HPAI PPE precautions. The impetus should be on avoiding flights if they cannot be completed successfully. If the RPAS is lost, the National Competent Authority (NCA) and IAATO should be informed upon return to the vessel.

Detection of HPAI

If HPAI is suspected, RPAS flights may still take place, but from a vessel (e.g., a small boat such as a zodiac, RIB, or the deck of the ship (pending permission from the Captain of the vessel and the deck being within 500m of the colony)). If HPAI is detected during a land-based flight operation (e.g. HPAI was not detected via pre-landing surveys), the RPAS must be aborted and all personnel must return to the landing site immediately for evacuation of the landing. Once onboard the ship, all personnel and equipment must be decontaminated. After decontamination, if possible and with the Captains permission, a flight to assess the extent of the outbreak can be conducted from a vessel.

Deep field operations

Deep field operations that have scientists who are permitted to fly drones over Emperor penguins must adhere to the land-based guidelines as laid out in this



document. However, we recommend that the distance to Emperors be increased to 70m as per Rümmler et al. (2021).

Working with tourist operators

Ultimately, operators will be responsible for determining if RPAS activity can take place. For example, if inclement weather is incoming, the operator can cancel operations and pilots will have to return to the RPAS home point (i.e., point of launch or control pad) immediately and leave the landing site. In the case of HPAI, if the operator is uncomfortable with any RPAS operations (i.e., oncoming weather, high swell oc, too many dead or dying birds), they have the authority to cancel RPAS operations or prevent them from taking place.

References

Dewar, M., Vanstreels, RET, Boulinie, T., Cary, C., Clessin, A., Gamble, A., Gray, R., Grimaldi, W., Hart, T., Morandini, V., Leonard1, S., Uhart, M., Younger, J., Wille, M. 2023. Biological Risk Assessment of Highly Pathogenic Avian Influenza in the Southern Ocean. Scientific Committee on Antarctic Research, Cambridge UK. <https://www.scar.org/library/science-4/life-sciences/antarctic-wildlife-health-network-awhn/5973-risk-assessment-avian-influenza/file/>

Environmental Guidelines for operation of Remotely Piloted Aircraft Systems (RPAS) in Antarctica (v 1.1). Antarctic Treaty Consultative meeting Resolution 4 (2018) Annex (https://documents.ats.aq/recatt/att645_e.pdf)

IAATO Statement on the use of Remotely Piloted Aircraft Systems (RPAS)

Rümmler, M.C., Esefeld, J., Pfeifer, C. and Mustafa, O., 2021. Effects of UAV overflight height, UAV type, and season on the behaviour of emperor penguin adults and chicks. *Remote Sensing Applications: Society and Environment*, 23, p.100558.