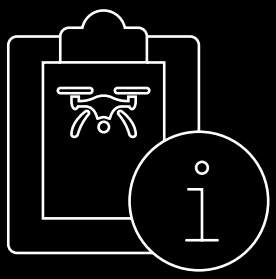


CHAPTER 3: BEFORE EVERY FLIGHT

Before every flight

Before every flight, you should identify the areas where permission is required to operate and seek that permission if you wish to fly there. Conduct all your operations with caution.

Take extra care in areas where low-level crewed flight occurs. For example, in the vicinity of beaches (helicopters on shark patrol or search and rescue operations) and scenic areas and local flight training areas.

Maintain a constant watch for low-flying aircraft at all times. Even noisy aircraft may not be heard due to such things as wind, RPA motors and other noises.

Be aware of 'cognitive tunnelling'. This is where you are so focused on the task at hand that you don't perceive extraneous events and noises until it's too late to take corrective action.

How to identify no-fly zones

Drone safety apps

CASA-verified drone safety applications are the easiest way to find information about no-fly zones and restricted airspace. The drone safety apps and web applications provide customised location-based information with easy to use maps about where you can and cannot fly your drone in accordance with aviation legislation.

While drone safety apps show all controlled aerodromes and most non-controlled aerodromes, some uncertified aerodromes in Australia may not be captured in these apps.

Drone safety apps are useful for identifying areas where you must not fly. However, they are not an official source of air navigation information and should be supplemented by using official sources of information when planning an operation.

Official sources of information

It remains your responsibility not to operate in a no-fly zone. While drone safety apps provide guidance, CASA recommends you refer to official publications in the Aeronautical Information Package, such as the En Route Supplement Australia (ERSA), Visual Terminal Charts (VTCs), Visual Navigation Charts (VNCs), NOTAMs and the Aeronautical Information Publication (AIP) (see Appendix A).

Other

You may also need to check with your local or state government for local rules or regulations before you fly (e.g. in national parks or marine parks).

Prescribed areas – no-fly zones around aerodromes

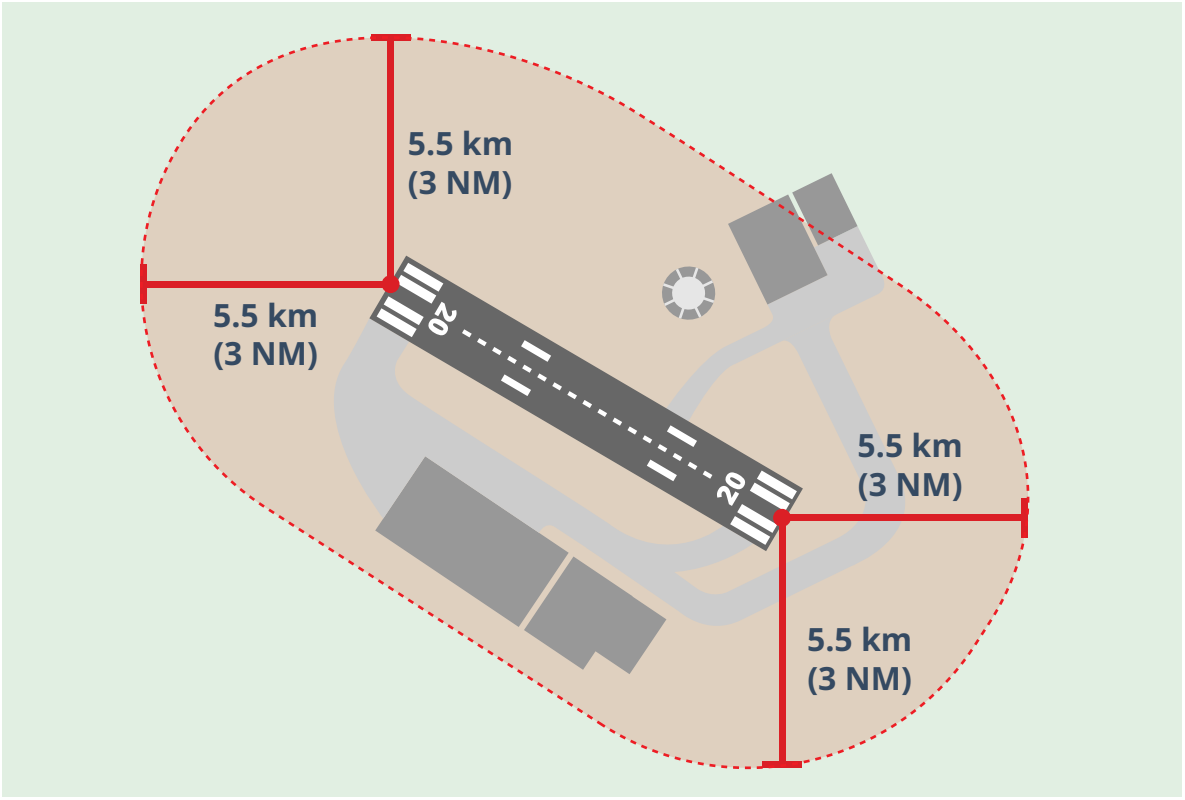
(CASR 101.075, Part 101 MOS Ch.4 & 9)

An aerodrome can range in size from a small dirt airstrip on an outback cattle station to a large airport in a capital city. An aerodrome (which includes helicopter landing sites) can be found just about anywhere – even a helideck on a cruise liner could be an aerodrome. No-fly zone refers to the area around a controlled or non-controlled aerodrome.

Measurement point

The measurement point is any point on the actual or notional centreline of a runway between the 2 threshold centrepoints. The threshold is the beginning of the portion of the runway usable for landing, and the threshold centrepoint is where the centreline and the threshold intersect.

Figure 2: View of the area within 5.5 km (3 NM) from the measurement point



Controlled aerodromes

A controlled aerodrome generally has an air traffic control tower. At a controlled aerodrome, there is increased air traffic and strict rules about where you can and cannot fly. You must not fly an excluded RPA:

- over an approach or departure path (where crewed aircraft approach or depart the aerodrome)
- over the movement area (runways, taxiways, manoeuvring areas and aprons)
- within 5.5 km (3 NM) of the measurement point of the runway of a controlled aerodrome.

Micro RPA are permitted to be flown within 5.5 km (3 NM) of the movement area of a controlled aerodrome provided they are:

- *not operated over the movement area*
- *not operated over or in the departure or approach path*
- *not operated inside the boundary of the aerodrome*
- *not creating a collision hazard to other aircraft taking off or landing.*

Figure 4 is a snapshot taken from a CASA-verified drone safety app. It illustrates the no-fly zone near the Alice Springs controlled airport including the approach and departure paths, and the 5.5. km (3 NM) boundary from the measurement point of the runway.

Figure 4: No-fly zone for Alice Springs airport

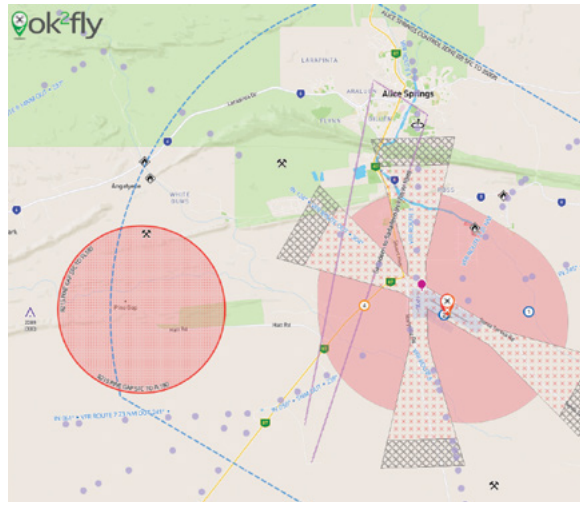
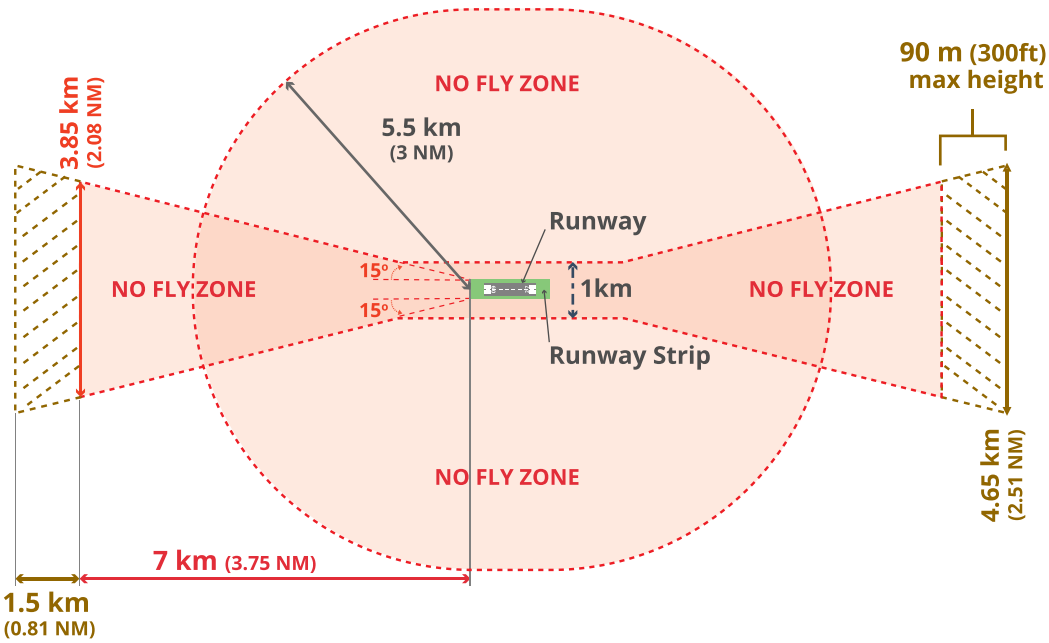


Image | **Ok2Fly** | AvSoft Australia

Figure 3: No-fly zone around controlled aerodromes



Non-controlled aerodromes

Many aerodromes in Australia are non-controlled. A non-controlled aerodrome does not have an air traffic control service and generally does not have a control tower. To maintain separation and to sequence landing and take-off, crewed aircraft communicate via radio.

Near a non-controlled aerodrome when **crewed aircraft are operating**, you must not fly an excluded RPA:

- over an approach or departure path (where crewed aircraft approach or depart the aerodrome)
- over the movement area (runways, taxiways, manoeuvring areas and aprons)
- within 5.5 km (3 NM) of the measurement point of the runway of the aerodrome.

Operation of crewed aircraft includes aircraft on approach or take-off (departure), taxiing or anywhere on the movement area of the aerodrome.

Near a non-controlled aerodrome when **no crewed aircraft are operating**, you may fly an excluded RPA within 5.5 km (3 NM) of the measurement point of the runway of the aerodrome. However, you must land your RPA and keep it on the ground:

- from the moment a crewed aircraft begins to taxi for departure and until it has departed the area
- at any time you become aware of the arrival of a crewed aircraft.

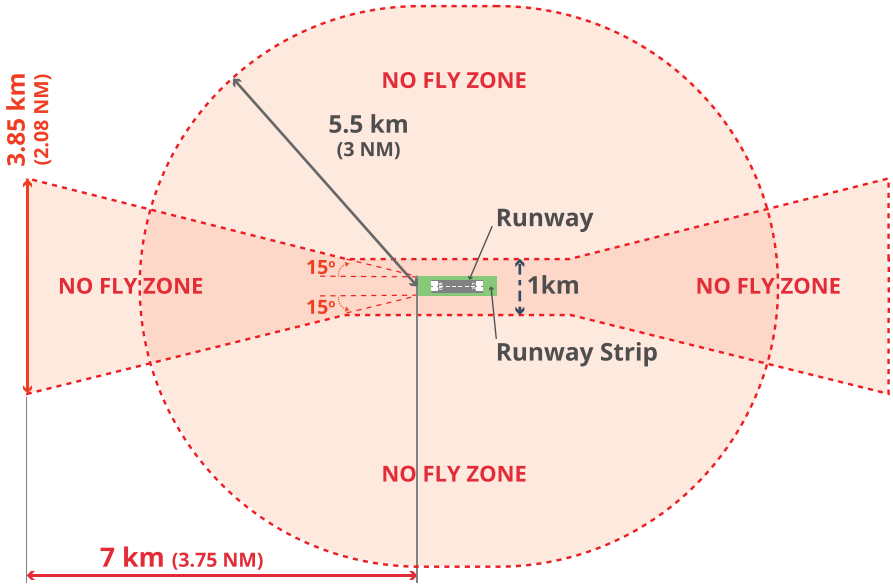
Aircraft may come and go from unexpected angles, particularly where there are helicopter, agricultural, ultralight or sports operations.

Aircraft flying under 'instrument flight rules' may also appear suddenly from low cloud, unaligned with a runway, when conducting a 'non-precision circling approach'.

You or an observer will normally become aware of a crewed aircraft by hearing or seeing it.

If you are unsure whether there is an aerodrome in the area you plan to operate, it is good practice to check a CASA-verified drone safety app. If you are in a more remote location, check with local aviation operators (e.g. aero clubs, flying schools, agricultural and aerial work operators).

Figure 5: **No-fly zone around non-controlled aerodromes when crewed aircraft are operating**



RPA observers and other remote crew

You may appoint a person as an observer. This is not a requirement but it may assist in reducing hazards.

Observers should be trained and thoroughly briefed on how they will alert you to situations when hazards arise.

Before flying, discuss and agree:

› the role of everyone involved in the flight

› the actions everyone will take

› what procedures and expressions you will use.

Examples of expressions are:

› land immediately at the RPA's current location

› return to home (the location of the remote pilot) now.

The use of an observer does not relieve remote pilots from their primary responsibility to ensure safe flight of the RPA and to maintain visual line of sight of the RPA at all times.

Figure 6 is a snapshot from a CASA-verified drone safety app. It illustrates the no-fly zone for the Towrang gliding aerodrome when a crewed aircraft is in the area. The image does not show the departure and approach paths for this aerodrome; it only shows the no-fly zone as a circle with a 5.5 km (3 NM) radius from the centre of the aerodrome.

Figure 6: No-fly zone for a non-controlled aerodrome

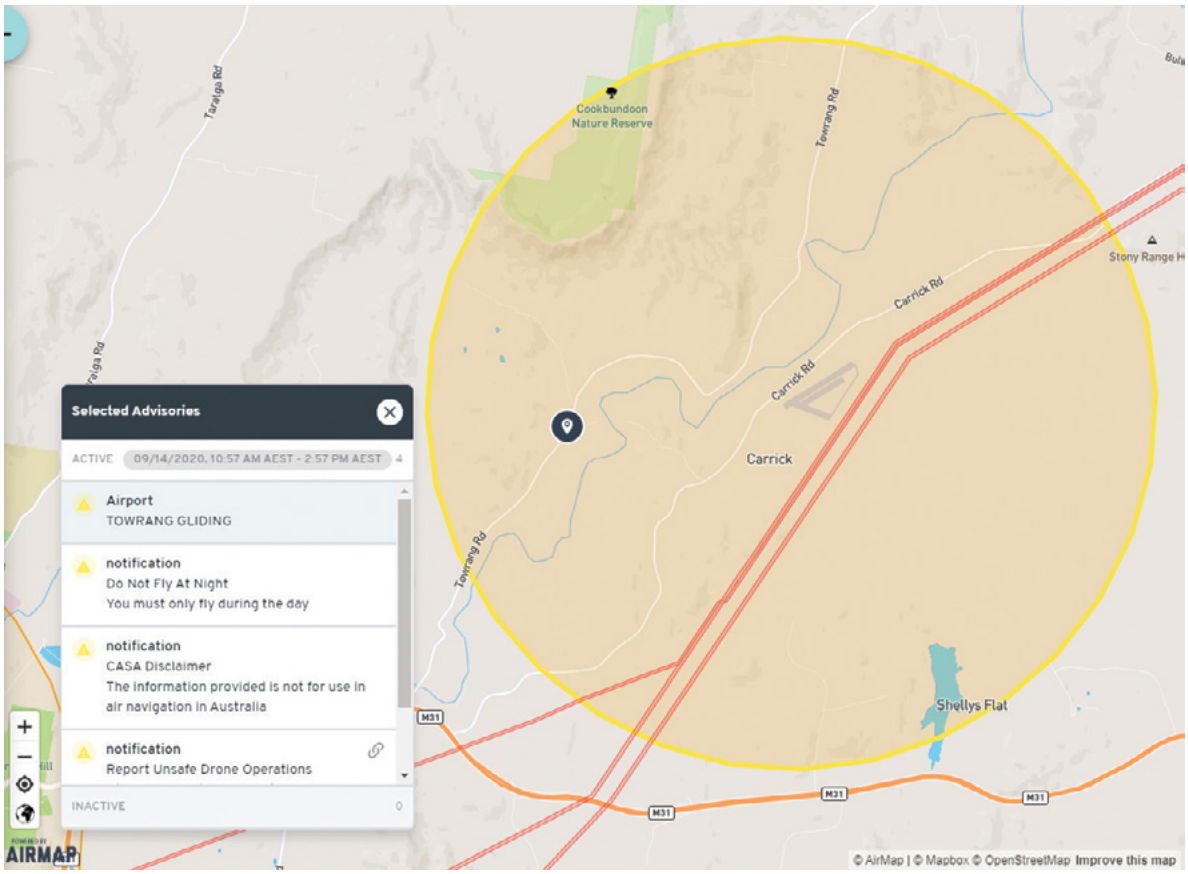


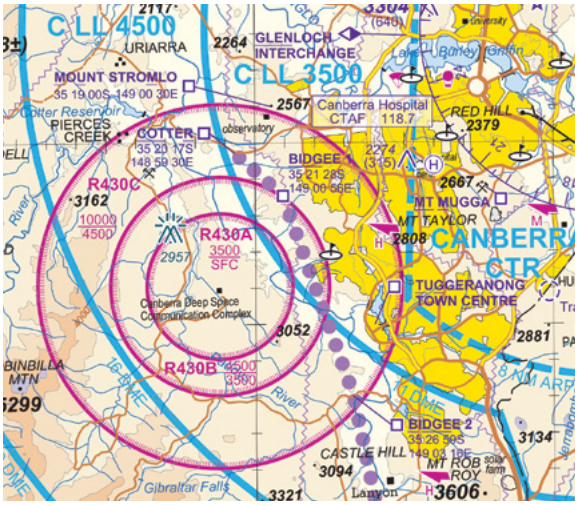
Image | **AirMap** | AirMap Inc

Restricted areas (CASR 101.065)

No-fly areas associated with restricted areas

Restricted areas are quite common in Australia. An RPA is not permitted to be flown when the restricted area is active. Restricted areas are often (but not always) associated with military flight or weapons training, but can be established for many reasons. Radio or optical telescopes, for example, may be the reason why the area is classified as a restricted area.

The visual navigation chart (VNC) extract shows the restricted area around the Tidbinbilla Deep Space Tracking Station, west of Canberra.



It is the controller's responsibility to check if an area is restricted before commencing operations.

Image | © Canberra Deep Space Communication Complex

The CASA-verified drone safety apps show the locations of most restricted areas, and some also show their activation times (see Figure 7). These apps would also show prohibited areas should any be declared.

Figure 7: Drone safety app depiction of restricted area with activation times

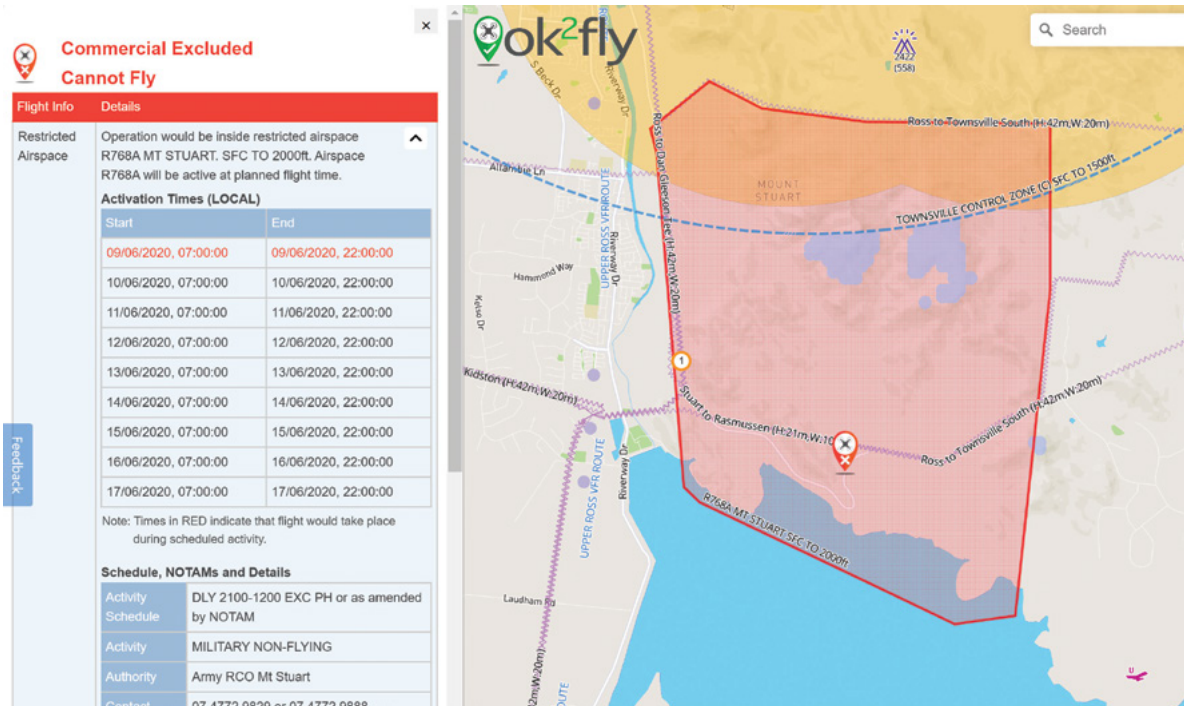


Image | **ok2fly** | AvSoft Australia

Airservices Australia also publishes the activation times for some prohibited, restricted and danger areas in the AIP ERSA: airservicesaustralia.com/aip/aip.asp. Activation times may vary and become active with very little notice. Activation times may also be published via NOTAM (please see the next section).

NOTAM

A NOTAM is a notice to airmen, which is advice to pilots that contains information immediately relevant to flight operations. It is normally published electronically and can be issued at short notice.

Instead of fixed activation times, some restricted areas are activated as needed, for example, when the Australian Defence Force is conducting training activities in the area. The times for these areas are published in a NOTAM.

Where a restricted area can be activated by NOTAM, the visual terminal chart (VTC) or visual navigation chart (VNC) illustrating the restricted area will bear an annotation – NOTAM (see the extract as shown here).

NOTAMs are freely available through Airservices Australia's online National Aeronautical Information Processing System. Alternatively, some CASA-verified drone safety apps show NOTAM information (see Figure 8).

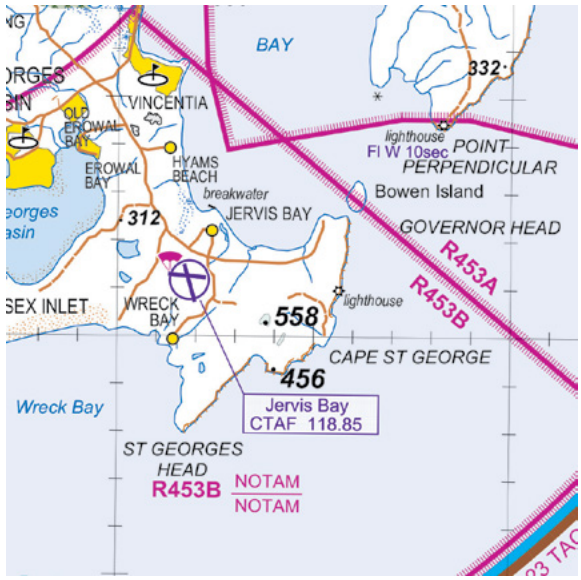


Figure 8: Drone safety app depiction of restricted area activation time by NOTAM

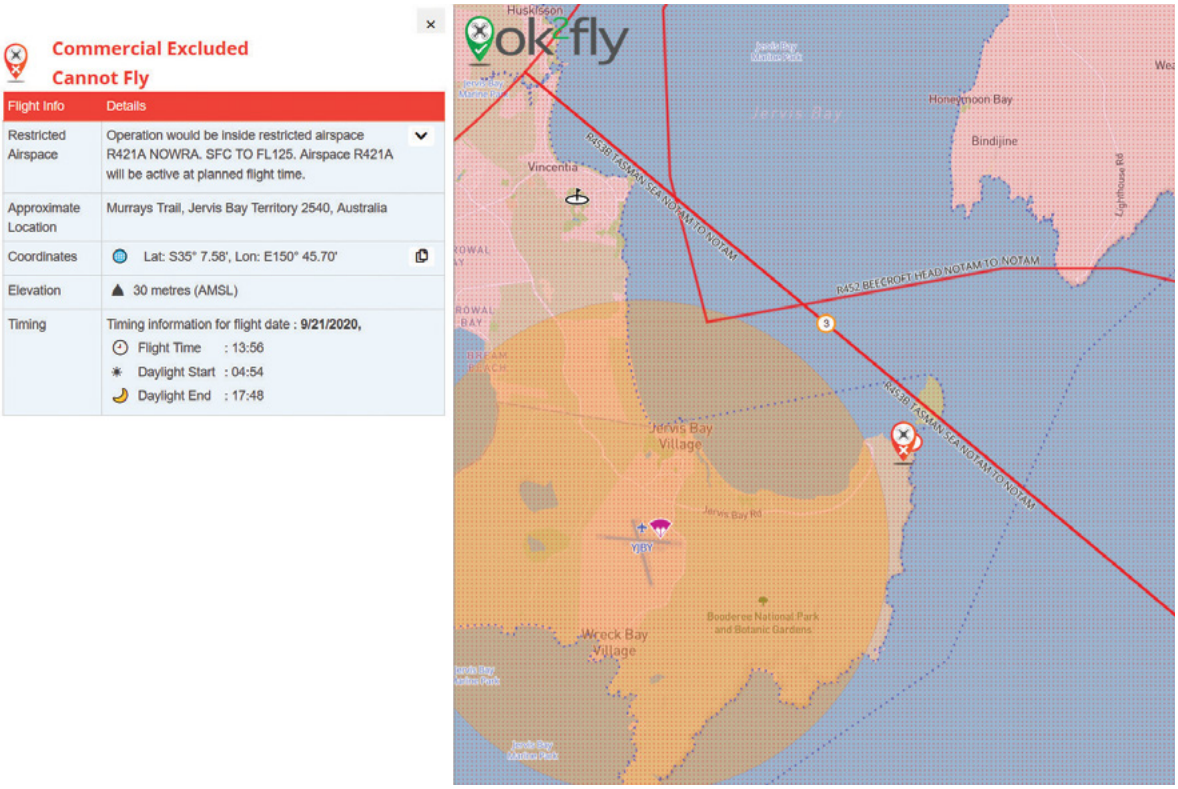


Image | **ok2fly** | AvSoft Australia

Operating micro and excluded RPA in restricted airspace

Under the standard operating conditions, micro and excluded RPA are not permitted to operate in restricted areas without the approval of the controlling authority for the area.

The ERSA lists restricted area categories in the Prohibited Restricted Danger (PRD) section:

airservicesaustralia.com/aip/aip.asp.

Local councils may also have restrictions in place, so it is a good idea to check before you fly.

CASA-verified drone safety apps display information about restricted areas. See Figure 9 in relation to an area of Sydney, NSW.

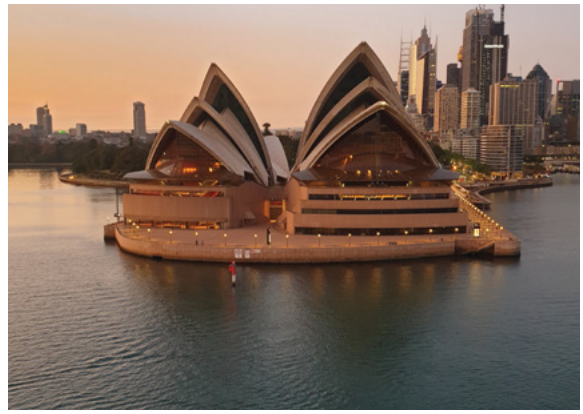


Image | **Nico Smit** | unsplash.com

Sydney Harbour has large areas of restricted airspace. CASA approval is required to fly any drones, RPA or model aircraft in this area.

Figure 9: Drone safety app depiction of Sydney Harbour restricted area

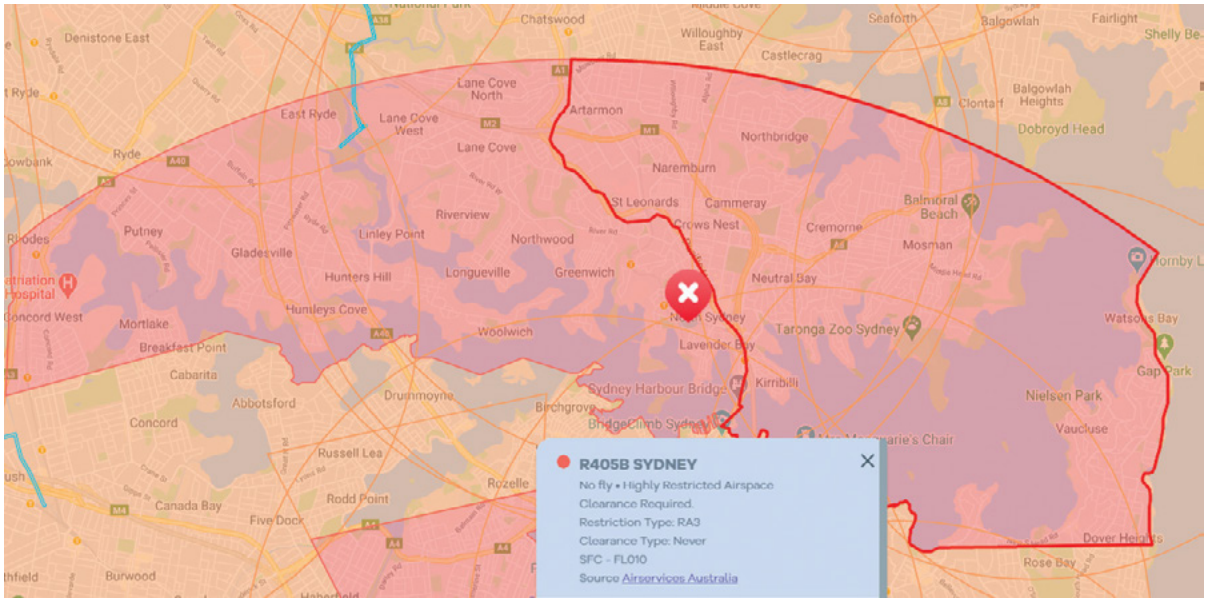


Image | **OpenSky** | Wing Aviation

Danger areas (AIP-ENR 1.4–12)

Danger areas exist where there is activity taking place that may pose an increased risk to aviation safety. These danger areas include activities such as flying training, parachuting, blasting, rifle ranges, firing ranges, high-velocity exhaust plumes, gliding and visual flight rule transit lanes. Uncrewed aerial vehicle testing areas may also be classified as danger areas.

A micro or excluded RPA is permitted to operate in a danger area; however, the controller should be aware of the activity and evaluate the risk before a flight.

All CASA-verified drone safety apps display the location of danger areas, and some also detail the reason and the hours of activity.

Figure 10: Drone safety app depiction of danger area associated with parachuting

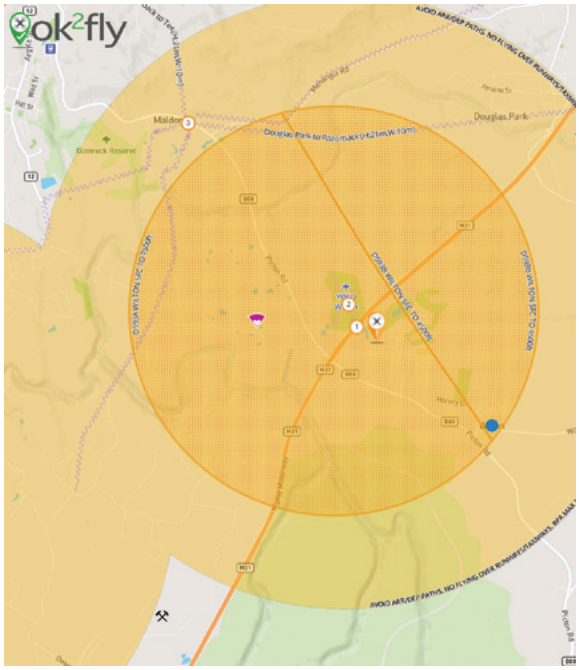


Image | **ok2fly** | AvSoft Australia

Aviation charts (such as VNCs) also show danger areas. Details of the activity in the danger area can also be found in ERSA, see airservicesaustralia.com/aip/aip.asp.

Emergency procedures

RPA flown under a ReOC are required to detail the procedures to be followed in the event of an emergency. There is no regulatory requirement on micro and excluded RPA used commercially to detail the procedures. However, it would be good practice to consider what you would do in the case of:

- an engine or propeller failure
- loss of the data link
- loss of control
- failure of navigation equipment
- airframe damage.

Emergency procedures may include the use of recovery or fail-safe devices, such as parachutes, that help to mitigate the risk of injury to people or damage to property. CASA encourages the use of such recovery devices when they are available for the RPA type.

Note: Where an RPA is fitted with a recovery device such as a ballistic parachute system including a pyrotechnic charge, it must be compliant with dangerous goods regulations (Part 99). The relevant area or panel on the RPA should be clearly marked to warn crew of the potential danger.

A mission plan should be prepared for each flight of an RPA. The plan should include information about the local area and any hazards. It should also contain procedures about planned emergency flight profiles in the event of a lost data link. Depending on system capabilities, these profiles should include either:

- an RPA automated transit to a pre-designated recovery area, followed by an automated recovery, or
- an RPA automated transit to a pre-designated recovery area, followed by activation of a flight termination system.

The RPAS data link should be continuously and automatically monitored while the RPA is in flight, and a real-time warning should be displayed to the remote pilot in the case of failure.

Checklist 3 – Before every flight

STEP 1

Is your flight planned in a no-fly zone near non-controlled airspace?

- ☐ **Yes** – do not operate
- ☐ **No** – go to **Step 2**

STEP 2

Is your flight planned in a no-fly zone near a controlled aerodrome?

- ☐ **Yes** – you cannot fly your RPA unless it is a micro RPA and is not operated over the departure and approach paths and within 500 m either side of the runway centreline
- ☐ **No** – go to **Step 3**

STEP 3

Is your flight planned in a no-fly zone near a non-controlled aerodrome?

- ☐ **Yes** – are there any crewed aircraft operating in the no-fly zone?
  - › **No** – go to **Step 4**
  - › **Yes** – are you operating wholly indoors?
    - » **No** – do not launch or, if already airborne, land
    - » **Yes** – go to **Step 4**
- ☐ **No** – go to **Step 4**

STEP 4

Is your flight planned in a prohibited or restricted area?

- ☐ **Yes** – is the prohibited or restricted area active?
  - › **Yes** – you must not fly your RPA unless permission is obtained from the area's controlling authority
  - › **No** – go to **Step 5**
- ☐ **No** – go to **Step 5**

STEP 5

Is your flight planned in a danger area?

- ☐ **Yes** – you can fly your RPA provided you mitigate the risk. See Chapter 4
- ☐ **No** – you can fly your RPA. Follow the drone safety rules. See Chapter 4