



National
Operational
Guidance

Hazard

**Inappropriate or uncontrolled use of
aircraft**



NFCC
National Fire
Chiefs Council

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Hazard - Inappropriate or uncontrolled use of aircraft

Hazard Knowledge

At many wildfire incidents aircraft can provide important tactical support to ground teams and the incident commander. However, the inappropriate or uncontrolled use of aircraft at a wildfire incident can present significant hazards to firefighters, personnel from other agencies, members of the public, the environment and any other leisure, commercial or military aircraft that may be flying nearby. For example:

- Aircraft and unmanned aircraft flown by members of the public who are not involved in suppressing the fire may inadvertently or deliberately fly over or near to the wildfire, presenting a hazard to both aerial and ground operations
- Aircraft deployed at the incident may drop water or retardant onto or near to people on the ground, which may represent a significant life and health risk
- Aircraft deployed at the incident may drop water or retardant onto or near to sensitive areas, potentially causing environmental damage (for further information refer to hazard ['Environmental impact'](#))
- Helicopters deployed at the incident may create downwash, which can cause flying debris and increase the rate of firespread

For the purpose of this guidance, aircraft include:

- Fixed-wing aircraft - refer to [National Operational Guidance: Transport](#) for further information
- Helicopters - refer to [National Operational Guidance: Transport](#) for further information
- Unmanned aircraft

Aircraft may be used beneficially for a number of different purposes, including:

- Aerial reconnaissance of the incident
- Dropping water or retardant onto, or in front of, the fire
- Moving personnel and equipment to, or around, the incident ground

Aircraft can also be used effectively to provide access to remote and otherwise inaccessible areas. At some wildfire incidents, the early deployment of aircraft may prevent a small wildfire from developing into a much larger, more costly, and more destructive fire.

While deploying aircraft may bring many benefits, fire and rescue services should also be aware

that a number of factors will limit the effectiveness of aircraft at wildfire incidents and/or can present significant hazards to the aircraft, and to personnel on the ground, such as:

- The terrain - steep slopes and mountainous areas make low-flying operations more complex and hazardous
- Man-made structures - such as power lines and communication masts, can make flying conditions and water/retardant dropping hazardous
- Weather conditions - high winds may make flying conditions dangerous and/or may influence the accuracy of water and retardant drops
- Smoke and darkness - may have an impact on or restrict aerial operations
- Vegetation - vegetation may prevent water or retardant drops from reaching the intended location on the ground or fire
- Turnaround times for refilling aircraft with water/retardant and fuel may be lengthy
- Delayed attendance times of requested aircraft may lead to an escalation of the incident, or other changes in the situation before their arrival at the incident
- Animal behaviour - the presence of aircraft may affect animal behaviour



Control measure - Notify the appropriate authorities about potential hazards to aircraft

Control measure knowledge

Wildfires can produce significant smoke plumes, which can reduce visibility for pilots. Wildfires can also produce strong thermal updrafts that may be hazardous to flight. This means wildfires may present a significant hazard to a variety of aircraft, including aircraft deployed at the incident, and aircraft that may be present in the area for other reasons (for example, commercial aircraft or Ministry of Defence aircraft).

In addition, aircraft flown by other agencies, or by members of the public who are not involved in suppressing the fire, may inadvertently or deliberately fly over or near to the wildfire. This presents a hazard to personnel involved in both aerial and ground operations.

Fire and rescue services need to consider that commercial aircraft and unmanned aircraft that are not involved in suppression operations may be flown at, or near, a wildfire incident. They may, for example, be used to record media footage of the incident or to inspect national infrastructure such as power lines or pipelines. These aircraft may fly near to aerial or ground resources, increasing the likelihood of an air-to-air or air-to-ground collision.



It is important that fire and rescue services notify air traffic control as soon as possible if there is a possibility that the wildfire may represent a hazard to aircraft in the area. Air traffic control can then issue warnings and instructions to aircraft in the vicinity of the fire. If required, the police can request that air traffic control create an air exclusion zone around a fire, to prevent unauthorised aircraft or unmanned aircraft from flying over, or near, the incident.

Strategic actions

Fire and rescue services should:

- Identifying and compiling contact details for all National Air Traffic Control and all air traffic control units within their area
- Identifying the areas covered by individual air traffic controls within their area

Tactical actions

Incident commanders should:

- Requesting that the fire control room notifies air traffic control if a wildfire incident is likely to present a hazard to aircraft
- Contacting the police to request an air exclusion zone around the wildfire to assist in maintaining the safety of the aerial and ground resources deployed
- Consider suspending aerial operations if unauthorised aircraft are present and pose a risk



Control measure - Consider deploying fixed-wing aircraft or helicopters

Control measure knowledge

Fixed-wing aircraft and helicopters can be deployed to perform a number of tactical support roles at a wildfire incident, including:

- Direct aerial attack by dropping water or fire retardants onto the burning area
- Indirect aerial attack by dropping water or fire retardants in front of the burning area to form control lines or to strengthen existing control lines
- Airlifting water to, and around, the incident ground
- Airlifting personnel and equipment to, and around, the incident ground
- Aerial reconnaissance and information gathering

It is crucial that fire and rescue services request aircraft that have the correct capability for the tasks that they need to perform. Large commercial and military helicopters, and those used by the new Search and Rescue Service, can often create too much downdraft for effective direct aerial attack.

However, if available, large helicopters can be used very effectively to move personnel and equipment around the incident ground and to and from more remote locations. Smaller helicopters operated by experienced pilots can be used very effectively for dropping water and retardant.

Refer to the National Operational Guidance: [Transport](#) for information on working with and near aircraft, including guidance on how to safely board and disembark helicopters and fixed-wing aircraft.

When requesting aerial resources the incident commander should accurately describe their requirements. The aerial resource provider has a responsibility to provide an appropriate aircraft and pilot.

Strategic actions

Fire and rescue services should:

- Complete local pre-planning to obtain an awareness of potential aircraft providers, and the capabilities and limitations of individual aircraft and providers
- Complete local pre-planning to identify how communications between aircraft and ground resources will be established and maintained at wildfire incidents, including identifying radio channels that can be used by available aircraft
- Complete local pre-planning to identify potential areas that may be communication 'blackspots' and may affect communication between ground resources and aircraft at wildfire incidents
- Consider establishing memoranda of understanding (MoUs) with local or regional providers of fixed-wing aircraft or helicopters
- Consider improving and maintaining interoperability between aircraft providers or pilots, and fire and rescue personnel by organising co-operative training and joint multi-agency exercises
- Consider appointing personnel to perform the role of aerial observer

Tactical actions

Incident commanders should:

- Consider the challenges of establishing and maintaining communications between personnel on the ground and aircraft



- Consider the challenges of managing the safety of multiple fixed-wing aircraft, helicopters and unmanned aircraft at the incident
- Consider deploying an appropriate member of personnel to accompany pilots as an aerial observer
- Provide briefings and/or inform ground personnel and other aircraft and unmanned aircraft of the presence of fixed-wing aircraft and/or helicopters, and provide details concerning the area in which they will be operating, the tasks they will perform, and the likely duration of those tasks
- Provide briefings and/or inform the pilots of fixed-wing aircraft and helicopters, of any known hazards present at the incident and the locations of personnel on the ground
- Consider the potential impact that the fire, weather conditions and topography may have on the flight and performance of fixed-wing aircraft and helicopters
- Consider the medium and long-term weather forecasts to assess the potential impact of the weather on the safety and effectiveness of fixed-wing aircraft and helicopters deployed at the incident
- Consider the support required for fixed-wing aircraft and helicopters, including:
 - Suitably located water supplies
 - Take-off and landing areas
 - Refuelling areas
- Brief all responders regarding the areas, tasks and duration of aircraft and/or helicopter operations
- Consider requesting appropriate fixed-wing aircraft, helicopters and unmanned aircraft based on need



Control measure - Consider deploying unmanned aircraft

Control measure knowledge

Unmanned aircraft can be used at wildfires to provide an overhead view of the incident. They can be used for a variety of purposes, such as:

- Information gathering



- Monitoring fire behaviour and firespread
- Monitoring the location of personnel on the incident ground
- Spotting potential water sources that may not be visible or apparent from the ground
- Inspection of access, egress and escape routes
- Spotting hotspots from above, particularly if equipped with a thermal imaging camera (refer to control measure 'Consider using thermal imaging cameras')

Unmanned aircraft can be used to assist in developing tactical plans for wildfires and in implementing a safe system of work. Unlike fixed-wing aircraft and helicopters, unmanned aircraft may be able to work well during the hours of darkness if they are equipped with thermal imaging cameras.

The Civil Aviation Authority has produced specific guidance for unmanned aircraft ([CAP 722 - Unmanned Aircraft System Operations in UK Airspace - Guidance](#)). The guidance is intended to assist those who are involved in all aspects of developing unmanned aircraft systems, to identify the route to certification, outline the methods by which permission for aerial work may be obtained, and ensure that all requirements are met by the unmanned aircraft system industry. The document highlights the safety requirements that have to be met before an unmanned aircraft system is allowed to operate in the UK.

Strategic actions

Fire and rescue services should:

- Consider pre-planning activity to obtain an awareness of potential unmanned aircraft providers, and the capabilities and limitations of individual unmanned aircraft and providers
- Consider improving and maintaining interoperability between unmanned aircraft providers/operators and fire and rescue personnel by organising co-operative training and joint multi-agency exercises

Tactical actions

Incident commanders should:

- Consider the challenges of establishing and maintaining communications between personnel on the ground, unmanned aircraft operator(s) and any other aircraft that may be deployed at the incident
- Provide briefings and/or inform ground personnel and other aircraft (i.e. fixed-wing aircraft and helicopters) of the presence of an unmanned aircraft, and provide details about the area the unmanned aircraft will be operating in
- Provide briefings and/or inform unmanned aircraft operators of any known hazards present at the incident and the locations of personnel on the ground



- Consider the support required for the unmanned aircraft, including identifying suitable take-off and landing areas
- Consider the limitations of the unmanned aircraft and its operator
- Consider the potential impact that the fire, weather conditions and topography may have on the flight and performance of an unmanned aircraft
- Consider the medium and long-term weather forecasts to assess the potential impact of the weather on the safety and effectiveness of unmanned aircraft deployed at the incident
- Consider if there is a need to suspend unmanned aircraft operations at the incident while other aerial or ground operations are taking place



Control measure - Establish communications with aircraft

Control measure knowledge

Monitoring ground vehicles and aircraft at the incident ground is an essential part of the safe system of work used by the fire and rescue service. When deploying aircraft at a wildfire incident, fire and rescue services must establish effective air-to-ground and air-to-air communications to maintain the safety of all personnel and resources deployed. The success and safety of deploying aircraft at wildfire incidents will largely depend on the support provided by ground resources.

For further information about the effective organisation of the incident ground, refer to National Operational Guidance: [Incident command](#). For further information about pre-planning for using aircraft at wildfire incidents, refer to the Scottish Government's [Wildfire Operational Guidance](#).

If military aircraft are requested and deployed at a wildfire incident, the incident commander or aerial sector commander should establish and maintain effective communications with military liaison personnel.

Strategic actions

Fire and rescue services should:

- Establish the tactical limitations of any aircraft available
- Complete pre-planning activities to establish air-to-ground and air-to-air communications
- Undertake local pre-planning activity to identify radio channels that can be used for ground-to-air communications at wildfire incidents
- Consider pre-planning activity to identify suitable water sources for use with fixed-wing

aircraft and helicopters

Tactical actions

Incident commanders should:

- Establish and maintain communications between personnel on the ground and aircraft
- Brief pilots and aircraft operators of their task or mission, objectives, and any hazards identified
- Brief the pilots of all aircraft regarding incident hazards and the locations of personnel
- Consider deploying a tactical lookout to accompany the operator of any aircraft as an aerial observer
- Create an aerial sector and appoint an aerial sector commander when aircraft are in use
- Appointing an aerial sector commander
- Providing ground support to the aerial sector
- Liaise with the aerial resource provider to confirm the fire and rescue service requirements
- Provide regular briefings and relay appropriate information to or from:
 - The incident commander
 - All pilots and operators of aircraft and unmanned aircraft
 - All ground resources providing support to aircraft and unmanned aircraft
 - All ground resources from the fire and rescue service and other agencies/organisations present at the incident
- Liaise with the police to ensure that any unauthorised aircraft or unmanned aircraft are removed from the incident, and request an air exclusion zone at the incident if required
- Identify suitable take-off and landing areas in liaison with pilots and operators of unmanned aircraft
- Ensure all personnel are aware of the intended locations of any water, retardant or equipment drops
- Brief pilots on where and when to complete their drops of water and/or retardant - water or retardant is normally dropped into the wind if possible, and drops should start from a strong anchor point
- Ensure ground resources and personnel are deployed to support direct attack by aircraft
- Observe effect of aerial water and retardant drops and communicate to the aerial sector commander
- Consider deploying aircraft to observe water or retardant drops from the air, to assess and

communicate the relative effectiveness of water and retardant drops to pilots

- Relay any observations of water and retardant drops to pilots in a timely manner, so that they can adjust the positioning of their aircraft for subsequent drops as necessary



Control measure - Manage the safety and security of take-off and landing areas for aircraft

Control measure knowledge

Suitable landing areas provide aircraft and unmanned aircraft with a safe and convenient base from which aerial operations can be provided and supported. If aerial assets are requested, it is useful if the incident commander and/or aerial sector commander can assist pilots of aircraft and unmanned aircraft in identifying potentially suitable take-off and landing areas. While the ultimate responsibility for selecting a suitable take-off and landing area will be with the pilot, the responsibility for managing the safety and security of take-off and landing areas will be with the incident commander and/or aerial sector commander.

Helicopters and other aircraft often attract onlookers who may inadvertently put themselves and/or the aircraft in danger. It is essential that the incident commander or aerial sector commander considers how members of the public and other personnel will be controlled and prevented from entering the landing area. Cones and tape are not appropriate for creating a cordon, so the safest and most effective means of control may be deploying personnel to prevent unauthorised people accessing the landing area.

If military aircraft are being deployed, the task of identifying an appropriate landing area will be the responsibility of the military liaison officer. The incident commander and/or aerial sector commander should ensure there is close co-operation and information sharing between the fire and rescue service and the military liaison officer.

Ideally take-off and landing areas should:

- Be large enough to accommodate all aircraft that may need to use it
- Be on level ground that is dry and firm
- Have a compact surface - sandy and gritty soil types should be avoided
- Wherever possible, have an approach that is free of flight hazards such as high vegetation, overhead pylons and/or other man-made structures
- Consider that helicopter pilots prefer to land into the wind
- Be located near to a road or track as this will assist in the provision of fuel and other supplies



- Be close to a water supply that can be used to replenish the aircraft's firefighting systems
- Have their location provided in the form of a grid reference to pilots and other personnel

Strategic actions

Tactical actions

Incident commanders should:

- Clear all debris from the surrounding area, to reduce the likelihood of flying debris that may cause injury or damage
- Ensure vehicles are parked a sufficient distance away from the take-off and landing area
- Ensure that firefighting equipment is made ready but kept outside of the take-off and landing area
- Ensure that cones and tape are not used to mark or cordon off the take-off and landing area, as these can represent a significant hazard to aircraft
- Clear debris from landing areas and avoid the use of cones and tape to mark cordons