Aviation Task Profile - Aerial Surveys of Wildlife

This plan outlines the identified hazards associated with Aerial Surveys of Wildlife operations by helicopter and fixed wing aircraft. Wildlife here includes pest animals, other wildlife and flora. Failure to utilise the practical controls to those hazards identified in this plan will unnecessarily raise the risk profile of the task.

This plan can be used to develop standards and/or to provide a reference for auditing and assessment by identifying the controls that are in place, assessing the risk and then determining what extra (if any) controls should be utilised.

Compliance with aviation and state WHS regulations, as well as any other applicable regulations, are implied and are to be considered and complied with in addition to the controls identified in this assessment.

Task Profile Name	Aerial Surveys of Wildlife
Objectives of Task	To undertake aerial counts and drop-offs for ground surveys in remote areas of target pest animal, other wildlife and flora (aerial surveys of wildlife) from fixed wing aircraft and helicopters to fulfil contractual research obligations.
Description of task	The task involves planned aerial wildlife and flora counts and aerial insertions into remote areas. Heights and speeds flown need to be commensurate with the ability of observers to identify target species and align with current best practice methods for aerial flora and wildlife surveys of the target species. For waterfowl, the aircraft will be flown along a pre-defined transect at a height of 500ft between waterbodies. When a waterbody is counted, the aircraft will be lowered to 100-150ft and a ground speed of 167-204km.h^{-1} (90-110 knots) for fixed-wing and 40km.h^{-1} (22 knots) for helicopters. For medium-large mammal surveys (e.g. kangaroos, goats, deer, feral pigs), fixed-wing aircraft will be flown along transects at a height of 250ft (76m) and a ground-speed of 185km.h^{-1} (100 knots), helicopters at a height of 150ft (46m) and a ground speed of 93km.h^{-1} (50 knots)
CASA permit/approval	Air Operating Certificate (AOC) endorsed for aerial work with low-level approval/exemption and using pilots with appropriate experience and low level flying permissions. Operations conducted within the parameters permitted by the Civil Aviation Regulations, associated orders and relevant advisory publications.
Aircraft Type	Fixed-wing or helicopters may be used. Fixed-wing aircraft may have either piston or turbine engine(s). Helicopters must be turbine powered. The fixed-wing aircraft shall be high-winged and must be capable of operating normally straight level and manoeuvring safely straight and level at speeds down to 100km.h^{-1} (55 knots). The helicopters are to be certified and equipped with wire strike protection kits. All aircraft operating over water bodies should be equipped with radar altimeters with selectable height audio warning.
Number of engines	single or multi-engine

Task profile (sequence)	• Planning include map reconnaissance for hazards • Briefing including update of hazards as shown on appropriate map, flight following procedures, weather, task objectives, target area, communications and aerial risk assessment. • Fuelling when required • Conduct Crew Brief • Start/Taxi/Takeoff • Transit to area of operation not below 500 feet (ft) Above Obstacles (AO). • Conduct aerial hazard survey and pre-descent brief prior to descent below 500ft AO • Conduct low-level survey at 100-150ft (for waterfowl and helicopter surveys of mammals) or 250ft (for fixed wing aircraft for medium to large mammals) over target area or transect. • Communicate with LCC or Operator (as approved) for flight following and task update. • Land at appropriate area at least every 2-3.5 hours to minimise fatigue. The recommended maximum time if the task is generally low level is 2 hours. • Transit to next survey transect at a safe transit height (> 500ft). • Conduct further hazard reconnaissance and route identification prior to descent to conduct low level operations as above. • Transit to operating base/fuelling area. Conduct pre-landing brief. • Land / Shut Down. • Debrief and report.

Task conditions or technical aspects	The aerial surveys and insertions will be conducted in day visual conditions only in low to medium turbulence at a speed commensurate with safe operations in the environmental conditions being experienced. Helicopters shall operate with a minimum 5% power margin based on Out of Ground Effect power requirements (nil wind). Consideration shall also be made of extreme environmental heat and cold on the safety of aircraft operations and its effect on crewmembers. Maps may be provided to assist aerial inspection crews, but these should not be relied on for the identification of hazards and therefore the reconnaissance of operating areas before descent is essential. The survey will follow a pre-defined transect line, involving the use of GPS units for navigation. Although 500ft has been nominated as the safe level of operations, it should be noted that wires may be strung between hills at higher levels and therefore constant vigilance by pilots and crew is required. Descent below 500ft is essential for completing the task and a pre-descent reconnaissance must be completed. For surveys of waterbodies, the entire area that the aircraft operates below 500ft shall have been fully pre-assessed for hazards. The area should be continually assessed during the descent and operations below 500ft. It should be noted that wires are often strung across bodies of water and therefore the pre-descent survey and ongoing vigilance is essential. Low sun angles or haze over bodies of water are a significant risk and should be avoided. Bird strike is also a high risk, therefore all crew are to wear helmets with clear visors down to protect head and eyes from impact. For over water body operations, all crew shall wear life jackets and should be HUET qualified. Ideally, helicopters should be equipped with floats. Landings by fixed wing aircraft and helicopters should be made to pre-inspected Aircraft Landing Areas and Helicopter Landing Sites respectively. Such landings require prior arrangement with, and area description from the landowner/manager. Ideally the landing areas should conform to CAAP 92 recommendations. In all cases, a complete pre-landing survey is required to ensure that no obstacles may impinge on the safe operation of the fixed wing aircraft or helicopter. Aircraft are not to be operated with any part of the aircraft extending into vegetation (e.g. long grass which may be hiding fences, ant hills or posts).
Time of Year	Operations are year-round
Terrain description	The areas of operations will encompass all types of terrain including paddocks, hills, urban areas and over waterbodies. The high terrain areas can experience low air density, which can adversely affect aircraft performance. Also, the terrain can experience severe downdraughts and turbulence as a result of the strong winds. Cloud can roll in quickly. Lower areas and water bodies can experience extensive areas of fog, mist or smog, which can limit visibility. Low flying over bodies of water is hazardous when there is nil wind due to lack of depth perception. The areas can be extensively wooded and/or populated with domestic structures in close proximity to power lines. Fences may be hidden in long vegetation.

Limitations	The survey is conducted in day visual conditions only in low to medium turbulence at a speed commensurate with safe operations in the environmental conditions being experienced. The survey is preceded by an appropriate risk assessment including aerial aviation hazard identification and assessment, and an assessment of environmental risks. Descent below a safe height (clear of all known and potential obstacles - generally 500 ft AO) is not to be conducted until the pilot confirms a low level of risk factoring in the route and area of operations, aircraft performance, aerial hazard and obstacle survey, environmental conditions and has conducted a low level flying pre-descent brief. This must be conducted for each descent below a safe height. Personnel working for or on behalf of NSW DPI are considered crew. All persons on board aircraft operating on behalf of NSW DPI must have a designated essential role in the performance of the aircraft task. Doors would normally be fitted to the helicopter, but for this task their removal (for the surveyor) is identified as essential to conduct the task and considered in the risk assessment process. When doors are removed, all items of recording equipment (e.g. laptops and keypads) shall be attached to the operators or the aircraft to preclude any objects leaving the aircraft and potentially damaging the aircraft or controls. The greatest threat is loose clothing impacting the tails of aircraft with a consequent loss of control of the aircraft. All loose seat cushions and loose equipment (including any clothing such as jackets not worn) shall be removed from the cabin or placed in on-board lockers. Helicopters require Wire Strike Protection System where it can be installed. Landings at appropriate areas should be planned approximately every 2-3.5 hours to minimise fatigue. The recommended maximum time if the task is generally low level is 2 hours. Sterile Cockpit Procedures shall be implemented when the aircraft is operating below 500ft AO.
Height restrictions	As a general rule, flights are to be conducted at the highest altitudes commensurate with the task objectives. It is recommended that the aircraft be flown at a safe transit height (500ft AO) between target areas. Surveys over the target areas will be undertaken at 100-150ft or 250ft, depending on the survey design protocols, observation requirements for different plants and animals, terrain topography and maximum height of vegetation.
Minimum height above obstacles	500ft is generally accepted as the minimum operating height for safe transit between surveyed areas. This operating height may need to be raised commensurate with the terrain and potential obstacles such as power lines. During waterfowl counts, the aircraft may be flown at 100-150ft. For medium to large mammals, the aircraft may be flown at 150ft (helicopter) or 250ft (fixed-wing).

Operating times	Nominally 2 hours per session with a maximum of four sessions or two sessions (if flying 3.5 hours per session) in any one day and consistent with the Operators' fatigue management plan or CASA industry exemptions (whichever represents the greater restriction). Restricted to daylight hours and due consideration to visibility. If three sessions are undertaken per day, a minimum half day- rest is required after two days of survey, and if two sessions are undertaken per day, a minimum half day- rest is required after three days of survey. Operations over bodies of water should take place when the sun angle is high to avoid glare and loss of depth perception. Additionally, operations of bodies of water may be impacted by early morning fog or mist.
Operating Company Requirements	Company must have: - an AOC and CASA authorisations suitable to the task - a demonstrably functioning Safety Management System - fatigue management, or CASA approved flight and duty time, system - been audited and assessed as being suitable and capable of conducting NSW DPI Aerial Surveillance operations - detailed and documented training system - a minimum 5-year history general operations with no accidents indicating a trend in poor oversight or safety management - proper and detailed maintenance records of the aircraft to be used
Crew composition	4 to 6 - person crew; Pilot and aviation aware air survey officers. Crew numbers, given the hazardous nature of low level operations are to be kept to the absolute minimum required to complete the task.
Qualification / Training of each crew member	**Pilot –** CASA licenced, medically current, appropriate approvals and experience (see EOI), Fly the Wire (mandatory), HUET (highly recommended) **Air Surveillance Officer –** Crew Resource Management, GPS and map reading skills, medically suitable, Work Safety Around Aircraft, Fly the Wire (highly recommended), HUET (highly recommended)
Role of each crew member	**Pilot** – Identify hazards and maintain hazard clearance, operate aircraft, navigation, communication, responsible for safety of the aircraft and crew/passenger, pre-flight and in-flight briefings. **Air Survey Officer** – Assist the pilot in hazard identification and avoidance and communication. Responsible for identifying and recording target species. Advises where to start survey and where to end.
Landing zone details	Landings should be conducted to low risk (CAAP 92-2) Helicopter Landing Site (HLS), Aircraft Landing Areas (ALAs) (CAAP 92-1) or aerodromes. It should be noted that CAR 92(1) puts the responsibility on the pilot to ensure that the place is suitable for use as an aerodrome; and having regard to all conditions of the proposed landing or takeoff (including prevailing weather conditions), that the aircraft can land at, or takeoff from, the place safely. Where ALA information is provided by a person other than the pilot, it is still the pilot's responsibility to ensure that the facility is suitable for the intended aircraft operations.

Communication requirements	The communications requirements for flight following purposes shall be detailed during the pre-flight briefing. It should be noted that the communications management may reside with the Operator but the LCC shall be responsible for ensuring that the flight following is being conducted. Communications need to be maintained at all times between the pilot and the air survey officers in relation to hazard and target identification. Sterile cockpit procedures apply when operating below 1000ft. Communications should also be established and maintained between the aircraft and the ground crew element as appropriate in order to facilitate the communication of operational and hazard related information. Communications are to be established and maintained with other low flying aircraft in the immediate vicinity.
SAR requirements	Flight-following shall be conducted by either the LCC or Operator (as agreed using 30-minute reporting schedules (which may be extended to 60 minutes once the designated operating has been reached) and through the use of satellite-based tracking systems showing real time information with at a minimum location and height reports not exceeding 5 minutes. Planned flight departure and arrival times and any changes shall be communicated to the LCC (which may be communicated via the Operator).
PPE	• Appropriate flying helmet (equipped with clear visor) worn by each helicopter crew member. 'Curly' pigtail communications leads are not to be used. • Donned life jacket when to be worn by each crewmember when operating over water. • Flammable resistant clothing worn by each crew member and passenger • Enclosed leather footwear (hardened toe and supported heel preferred) • Cotton or wool underclothing, socks • Aviation standard gloves (recommended)