Procedure

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Aerial control of locusts

Authorised by (DPI)	Deputy Director General Biosecurity & Food Safety	**Authorised date (DPI)**	16/07/2015
Authorised by (LLS)	Senior Executive Team	**Authorised date (LLS)**	01/06/2015
Authorisation period		**Effective date**	27/07/2015

1. Application / Scope

- Aviation resources are used in locust operations for surveillance and control purposes, for example aerial spraying.
- Aviation operations must be conducted in a safe and efficient manner and in accordance with the NSW Department of Primary Industries (NSW DPI) policies and procedures.
- Aviation control of locusts is to be considered after ground control options have been exhausted and where strict criteria have been met.

2. Abbreviations / Definitions

- GPS: global positioning system
- NSW DPI: NSW Department of Primary Industries

3. Resources / Equipment

- Air operators, aircraft and crew that meet NSW DPI task profiles – available through NSW Rural Fire Service (NSW RFS) State Air Desk
- Photo identification cards for authorised Air Surveillance Officers
- Resources to record surveillance data – camera, video, global positioning system (GPS), record sheet, electronic tablet, maps

4. Warnings

- Expectations of use of aviation resources must be managed to ensure cost effective control programs are implemented and land managers fulfil their responsibilities.
- Community members may be averse to aerial spraying requiring effective community engagement strategies to be implemented.
- Risks for each of the aviation tasks are detailed in the task risk assessments.
- Risks associated with the use of insecticides and associated impact on the environment and personnel have been identified in the *Insecticide application for locust control* risk assessments.

5. Procedure

5.1. Aviation tasks

Aviation tasks in locust operations are aerial surveillance, spraying and spotting. Refer to the task profiles for further information.

5.1.1. Aerial Surveillance

The objective of the Aerial Surveillance task is to identify and record the extent of locust activity. No aerial surveillance for Spur Throated Locusts nymphs will be conducted as they do not band and cannot be seen from the air. Aerial surveillance for Spur Throated Locusts adults only occurs after ground reports verify the presence of swarms in the area.

5.1.2. Aerial Spotting

The objectives of the Aerial Spotting task are:

a. to provide information to assist with the correct application of spray and guidance onto identified targets in support of emergency management operations
b. to monitor spray aircraft in order to initiate emergency procedures and monitor emergency responses if required in the case of an accident
c. to act as a flight following/communications link where required for spray aircraft.

5.1.3. Aerial Spraying

The objective of Aerial Spraying is to correctly, effectively and efficiently apply spray to control locusts. Spotter aircraft may be used to support spray aircraft.

Supporting information on spray application for pilots is available from the APLC - *Information to pilots*.

5.2. Identifying Targets

Aerial targets may be identified by either ground or aerial surveillance. Aerial spraying will only be considered when the target meets the criteria in Table 1.

Aerial surveillance

- Complete an *Aerial Observation Report – Locusts* form for all bands and swarms. Potential aerial spray targets should be identified on the form.
- Complete a *Plague Locust Report* for each aerial observation report.

Processing aerial surveillance information

- Coordinate an on-ground assessment to:
  - confirm the presence of targets that meet the criteria (Table 1)
  - confirm and complete data on the *Plague Locust Report*
  - determine viable control options – ground or aerial, including spray widths, rates and vegetation density
  - conduct a risk assessment for hazards where aerial spraying is proposed. Refer to potential risks on *Landholder Consultation Record* and *Task Description and Risk Assessment* form. Consider the minimum buffers and withholding periods in accordance with the insecticide label. Refer to *Surveillance and Reporting of Locusts* procedure.
- Obtain permission to spray from the land owner/occupier (on *Landholder Consultation Record*) prior to any spraying. The owner/occupier of the land must be contacted a maximum of 24 hours prior to spraying as the situation may have changed since permission was previously given. If contact cannot be made, spraying will be postponed.

Table 1: Minimum target criteria for aerial spraying

Age	Activity	Minimum Density	Minimum Area (hectares)
Nymphs	Banding - clearly defined & visible	80+ per m^2	100 ha or 3x35 ha (or similar) adjacent or in close proximity
Adults	Swarms – clearly visible	11-50+ per m^2	100 ha or 3x35 ha (or similar) adjacent or in close proximity

5.3. Criteria for Prioritising Targets

In the likely event that multiple targets develop, targets should be prioritised for treatment. Factors to consider during the Risk Assessment are listed below.

- **Aircraft operators' considerations.** The aircraft pilot will have the final say on the ability to spray a target.
- **Biological state of the locusts**
  - Field personnel should assess locust status by catching insects, dissecting them and checking for fat or egg reserves. Adults full of eggs/fat (yellow in colour) pose the threat of laying (further generations) or migration to other areas.

    - Fattened locusts looking to lay will generally fly during the heat of the day (10am – 4pm) at heights up to 300m (too high for control). There may be opportunities to control these in the cool of the day (morning and evening) when roosting. Roosting adults can be sprayed from the ground in late afternoon or early morning to reduce the need for aircraft.
    - Locusts with no fat generally fly low during the heat of the day seeking feed and may be potential targets.
    - Consider the instar stage of the band. Fifth instar nymphs will be close to dispersing, fledging and flying.
    - Controlling a target before it moves to an area where control will not be feasible or has not been previously infested or will impact on urban areas (public parks, bowling greens, schools, golf courses, gardens etc) that will generate a public reaction.
- **Size and density of the target** - the greater the size and density, the greater potential for crop/pasture damage and egg laying potential. Targets must meet the minimum criteria for size and density. Spraying of bands will be much more effective and efficient than spraying of swarms.
- **Height of the swarm** - once swarms are above 10 metres in height they will become difficult to spray. Label requirements for aerial control must be adhered to. As the height increases so does the potential for spray drift.
- **Environmental hazards** may restrict the ability to aerial spray including but not limited to threatened species (see Appendix 1), forage range of bees, biological control sites (see appendix 2), organic farms (see Appendix 3) and water bodies.
- **Access to target** - be mindful of the terrain and hazards including but not limited to telephone lines, urban areas, power lines, bird strike, locust swarms etc.
- Forecast and current weather conditions.

5.4. Aerial Spraying of Targets

Aerial spraying of targets requires:

- Forward Command Post to complete the *Task Request* and *Task Description and Risk Assessment* which is then processed and approved according to the *Management of Aviation Operations* procedure
- Land owner/manager to give permission to spray
- Land owner/manager/occupiers to be advised of the day of spraying
- Pilot to be fully briefed on the task (from Aviation Task Operations Plan).

Post aerial spraying requires the following.

- Cross reference the spray/air log supplied by air operator with the original GPS coordinates (from *Plague Locust Report* form) to confirm the designated target was sprayed.
- Checking of spray effectiveness of the target area adhering to re-entry intervals. At this stage, mortality should be evident (except *Metarhizium*). Refer to the *Surveillance and Reporting for Locust* procedure.
- Spray records must be forwarded to the land manager by the contractor or by agreement with the Local Land Services.

5.5. Permission to Spray

- Aerial application of insecticides must have the signed permission of the land owner/ manager of the land.
- *Landholder Consultation Record* must be completed prior to spraying. The form will indicate the dates for which it is current and applicable.
- The land owner/occupier must be must be notified prior to each spray event.

5.6. Enter, Survey and/or Spray Without Permission

- In situations where the owner/manager of the land cannot be found or refuses to give approval to enter, survey and/or carry out treatment for the control locusts, refer to information in the *Surveillance and Reporting for Locust* procedure.

6. References

Policies

- TI-O-113 Emergency Management – Use of Aviation

Procedures

- Insecticide management for locusts
- Surveillance and reporting of locusts
- Management of aviation operations

Risk Assessments

- Insecticide application for locust control

Legislation

- *Local Land Services Act 2013*
- *Pesticides Act 1999*

Information

- Australian Plague Locust, Landholder Control Strategies for NSW
- Plague locusts, wingless grasshoppers and livestock residues

Forms

- Aerial Observation Report - Locusts
- Aerial Spray Record
- Aircraft Task Operations Plan
- Landholder Consultation Record
- Plague Locust report form
- Post Control Check
- Task Description and Risk Assessment

Task Profiles

- Aerial Spotting
- Aerial Spraying
- Aerial Surveillance

Task Risk Assessments

- Aerial Spotting
- Aerial Spraying
- Aerial Surveillance

7. Revision History

Version	Date	Section	Details
1	14 Nov 2008		For approval
2	18 Aug 2009	All	Update NSW DPI to I&I NSW, DSCC to DECCW; photo identification; correction to CAS Regulation – DG clause; remove excess risk management explanation; change to Aircraft Task form; include brief/debrief; aerial spotting permitted; refer enter/treat without permission & post control check to Surveillance procedure
3	16 Aug 2010	5.12, 5.13 5.3, 6	Replace swarm with target, instar stage (in 5.13 c) Update references
4	14 May 15	All	Reformat and review – remove aviation information and refer to Management of aviation operations

Contact Officer: State Emergency Coordinator

8. Appendices

Appendix 1: Threated species and habitats (e.g. Plains-wanderer, Bush Stone-curlew, Ibis)

In consultation with the Office of Environment and Heritage (OEH) agreed buffers have been established for aerial and ground control in areas where threatened species or threatened species habitats have been recorded.

- Refer to the maps available through BioMap showing:
    - Bush Stone-curlew point location with 2km habitat range buffer
    - Plains-wanderer primary and secondary habitats
    - Ibis historical/potential breeding sites
    - Examples of minimum spray buffer distances for Bush Stone-curlew and Plains Wanderer – only upwind spray buffers are relevant and distances may be greater (refer to insecticide label)
- Minimum spray buffers for insecticides other than *Metarhizium* for mapped Plains-wanderer habitat areas and Bush Stone-curlew habitat range are:
    - 300m upwind ground spray buffer; and
    - 1.5 km upwind aerial spraying buffer.
- Note 1: Spray buffers are additional to mapped habitat ranges for Bush Stone-curlew and mapped primary/secondary habitats for Plains-wanderer (see example in Appendix 2).
- Note 2: Check the insecticide label requirements – minimum spray buffers may need to be increased to comply with the label.
- When using control agents other than *Metarhizium* around mapped Ibis breeding sites, consult with OEH prior to control to confirm if breeding site is active. If the breeding site is active, undertake a risk assessment with OEH based on activity of site, stage of breeding and feeding range at site to determine appropriate exclusion zone. Spray buffers are to be consistent with insecticide label requirements.
- In circumstances where it is clear that the habitat is no longer suitable to the threatened species an application may be made to OEH for re-classification.

Appendix 2: Biological control sites

When planning locust control in or near identified biological control sites adhere to the following requirements:

- No insecticide application should occur (excluding *Metarhizium*) in the high value and very high value critical biological control nursery sites as mapped in BioMap. Mapped sites include the biological control release point and a minimum spray buffer (see details below).
- Use of *Metarhizium* is permitted within mapped nursery sites buffer areas.
- Comply with insecticide label requirements, particularly upwind spray buffers for sensitive sites. Distances should be measured from the mapped release point with the spray buffer (detailed below) the minimum requirement.
- Consult with NSW DPI, local government and landholders regarding site locations.

The minimum spray buffers around the release point that are mapped in BioMap are:

- High value sites - 300m ground spray buffer and 1km (1000m) aerial spray buffer
- Very high value sites – 1km (1000m) ground spray buffer and 1.5km (1500m) aerial spray buffer

Appendix 3: Organic farms

It is important to complete the *Landholder Consultation Form* prior to issuing any insecticide or when conducting a pre-spraying risk assessment. *Metarhizium* is a biological control agent of choice for these situations. Refer to:

- Section 5.4.3 of the *Insecticide management for locusts* procedure
- Primefact - Spraying locusts with Metarhizium

When a contractor is required to spray on a registered organic property, the contractor will need to undertake a thorough APPROVED decontamination procedure. Refer to Primefact *Spraying locusts with Metarhizium* for the decontamination procedure.

The contractor (or LLS on behalf of the contractor) must supply a copy of the records (spray application and decontamination) including batch numbers and expiry dates of *Metarhizium* to the land manager.