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Procedure – Surveillance of plague locusts

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1. Application / Scope

This procedure is issued with the concurrence of the Director-General of Industry & Investment NSW (I&I NSW) under Clause 6.2 of the Memorandum of Understanding between the Director-General of I&I NSW and State Management Council of the Livestock Health and Pest Authorities (LHPAs).

This procedure assists I&I NSW and LHPA personnel and associated agencies to prepare for a locust outbreak including resourcing, training, review of policies/procedures, and early surveillance and treatment.

The most successful control response to plague locust outbreaks lies with a rapid and coordinated response. A planned coordinated response by land managers, control agencies and other stakeholders will provide the most effective and efficient plague locust control response.

2. Abbreviations / Definitions

APLC	Australian Plague Locust Commission
APO	Agricultural Protection Officers
APVMA	Australian Pesticides and Veterinary Medicines Authority
Band	An aggregation of migrating hoppers or nymphs
DLC	Deputy Locust Commissioner
FCP	Forward Command Post
GPS	Global Positioning System
Instar	Developmental stage of immature Plague Locust
LCC	Local Coordination Centre
LHPA	Livestock Health and Pest Authority (formerly Rural Lands Protection Board)
MSDS	Material Safety Data Sheets
I&I NSW	Industry & Investment NSW (formerly NSW Department of Primary Industries)
Nymphs	Immature stages of locust development before insect reaches adulthood
OHS	Occupational Health and Safety
Outbreak	Population that reaches band (hoppers) and then swarm (adults) density <i>but</i> the locusts fail to reproduce
PDO	Program Development Officers
PIDF	Pest Insect Destruction Fund
Plague	A situation in which swarms propagate themselves, i.e. high population densities persist for many generations of locusts
Population	Group of interbreeding individuals at a particular time and location
PPE	Personal Protective Equipment
SCC	State Coordination Centre
Swarm	An aggregation of migrating adults (typically used to describe flying locusts)

3. Resources / Equipment

A range of equipment and resources is required to undertake surveillance for Plague Locusts including

- Locust information and insecticide use information sheets;
- Communication protocols regarding reporting plague locust activity to and amongst control agencies and stakeholders;
- Global Positioning Systems (GPS) equipment to accurately determine and communicate the position of plague locust activity; and
- Maps of areas affected by plague locusts including locations of previous egg beds.

4. Warnings

- Refer to the following safe work method statements for Occupational Health & Safety (OHS) issues:
 - [driving vehicles](#)
 - [property visits](#)
- Visiting properties may involve biosecurity restrictions particularly for organic or specialised enterprises. Refer to the risk assessment - [Maintaining biosecurity entering and exiting properties](#).
- Collection of plague locusts in the field may involve OHS risks – refer to the risk assessment - [Collection and examination of locusts](#)
- Personnel performing ground surveillance may operate in remote and/or isolated locations requiring a risk assessment approach to tracking their location. Refer to the procedure [Monitoring location of field personnel](#).

5. Procedure

Planning and coordinating a successful plague locust control program involves early detection of insect activity. Responsibility for the control of plague locusts is outlined in the Responsibilities in Plague Locust Campaigns policy.

5.1 LHPA Preparations for the Locust Season

LHPA and I&I NSW personnel required to identify locusts must be trained, initially participating in a two day course with a one day refresher as required.

LHPA rangers and I&I NSW personnel are required to maintain an inventory of spray equipment and supplies (purchased by the PIDF and listed below) and supply it to I&I NSW when requested.

- Insecticide related equipment including Personnel Protective Equipment (PPE), insecticide boom sprays, insecticide application equipment, spray nozzles, wind meters, GPS units to ensure requirements are adequate to control locust activity.
- Supplies of the leaflet '[The Australian Plague Locust, Landholder Control Strategies for NSW](#)'
- The SAFEMEAT brochure '[Plague locusts, wingless grasshoppers and livestock residues](#)' and the revised supplementary SAFEMEAT brochure 'Plague locust control – supplementary advice'.

LHPA Rangers should ensure that all equipment used by the LHPA or loaned to landholders for locust control activities is serviced and in good working order. Landholders must also be instructed or trained in the safe use of such equipment. The Landholder Consultation Record should be signed by people borrowing equipment stating they have been instructed in its safe and correct use.

5.2 Preparing Landholders

- LHPA Rangers and I&I NSW field personnel should ensure that all landholders are aware of the threat posed by locusts in their area by way of information meetings, field days, community meetings, local media and letters to landholders.
- LHPA Rangers should ensure that landholders in their area are familiar with the identification of all stages of plague locusts.
- LHPA Rangers should ensure that all landholders identify, mark (with a physical marker such as a painted peg or flagging) and monitor locust egg-beds on their property and report locust activity to the LHPA.
- LHPA Rangers should ensure the issue of the relevant information to all landholders under threat of locusts and that they are aware of the dangers of insecticides, including environmental, public health and OHS aspects. Landholders must also be made aware of the threat to agricultural industries from insecticide residues; they must know how to calibrate spray equipment correctly to ensure the correct amount of insecticide is applied.
- LHPA Rangers should ensure landholders are aware of the insecticide withholding periods by supplying the SAFEMEAT brochure '[Plague locusts, wingless grasshoppers and livestock residues](#)' when supplying plague locust insecticide.
- Insecticide users have an obligation to read and comply with insecticide labels and permits and to comply with legislation ensuring only qualified people apply insecticide. This is the responsibility of the landholder.

5.3 I&I NSW Preparations

During the period before an expected locust outbreak I&I NSW will:

- Issue a joint letter with LHPAs to targeted landholders advising that authorised officers may enter their land to inspect for the presence of plague locusts under section 191 of the [Rural Lands Protection Act 1998](#).
- Determine the forecast for the upcoming locust season, in consultation with the Australian Plague Locust Commission (APLC) and via APPLC locust bulletins.
- Ensure that LHPA rangers are aware of the plague locust forecasts for their district.
- Provide copies of the leaflet '[Australian Plague Locust, Landholder Control Strategies for NSW](#)' and the revised SAFEMEAT brochure '[Plague locusts, wingless grasshoppers and livestock residues](#)' and the supplementary SAFEMEAT brochure 'Plague locust control – Supplementary Advice'.
- Arrange the purchase of insecticide with funds from the Pest Insect Destruction Fund (PIDF) (this account is funded by landholder levy). LHPAs make a contribution to the Minister for Primary Industries for the control of pest insects, which is then used by I&I NSW to purchase and distribute insecticides to landholders via LHPAs. The insecticides are supplied to LHPA for use on LHPA land and for issue to landholders.
- Source insecticide from other regions if required and have it moved throughout the region so that it is available where it is most needed. Priority should be given to using insecticides closer to their expiry date.
- If required, organise for tests on insecticide stocks to determine their efficacy. State-wide information on the location and age of insecticides can be obtained from the Deputy Locust Commissioner (DLC).
- Revise the plague locust control policies, procedures and associated documents.
- Prepare and distribute appropriate media and educational material to ensure landholders are equipped to prepare for the forecast plague locust outbreak, in cooperation with LHPAs and the APPLC.
- Organise appropriate training for LHPA and I&I NSW personnel in cooperation with the APPLC to ensure that all personnel fully understand the program strategy, recommended locust control methods and related environmental, health and safety issues.
- Provide specific emergency management training to personnel allocated to emergency management roles in the plague locust control campaign.
- Ensure LHPA personnel have current information on insecticides and the methods to be used for control of the plague locust.
- Ensure all authorities have appropriate equipment serviced and ready for the plague locust campaign.
- The DLC should consider whether aerial surveys or spraying or both may be required during the coming season. If this appears to be the case, tenders should be called by the State Logistics Manager and a contract initiated with aviation companies for the use of suitably equipped survey and spray aircraft. This should be done in collaboration with the DLC. Aircraft operators contracted to I&I NSW should be reviewed for currency.
- LHPA personnel are to ensure that sufficient quantities of appropriate insecticide at LHPA depots will be available for use during the expected campaign. Batch numbers and expiry dates should be checked and recorded in the Insecticide storage inventory and order form.

5.4 Training

Training is essential for all personnel involved in locust control. Trained, competent and authorised personnel will be allocated to specific roles related to their training, skills and experience.

5.4.1 LHPA Rangers and other field personnel

LHPAs should nominate personnel for training in locust control and liaise with APOs/PDOs regarding the timing and content of training.

LHPA rangers are primarily responsible for locust management in their district. Other personnel such as field assistants and administrative personnel may also be required to play a role. When a new ranger begins working for an LHPA, they should be provided with the following locust training:

- The LHPA ranger must attend the first available locust information workshop(s) provided by I&I NSW and the APLC.
- The ranger should be given the opportunity to spend time in the field in their own LHPA district or another LHPA district if locust activities are being undertaken. These activities may be directed by the LHPA, the APLC, or I&I NSW. The field experience should take place during the first locust season after the ranger commences employment.

When any other personnel commence working for an LHPA, they should be:

- informed as part of their training of the importance of locusts as a priority duty;
- told of the availability of the locust SOPs and where a copy is accessible; and
- given the opportunity to attend the first available locust course provided by I&I NSW and the APLC.

5.4.2 Agricultural Protection Officers / Program Development Officers

APOs and PDOs are available to assist in locust control activities in their region of responsibility which will include numerous LHPA districts when needed. When a new APO/PDO commences duty with I&I NSW, they must be provided with the following locust training:

- APOs/PDOs must attend the first available locust course provided by I&I NSW and the APLC.
- APOs/PDOs must spend time in the field where locust activity is being undertaken. These activities may be undertaken by the LHPA, the APLC or I&I NSW. This should take place during the first locust season after the APO/PDO commences employment.

5.4.3 Training Other Personnel

I&I NSW will train other Government department personnel in locust biology and control and in emergency management procedures to equip them to participate in any plague locust outbreak.

5.5 LHPA Identification, Reporting and Monitoring of Egg-beds

If adult locusts are observed in dense numbers on the ground, they may be laying eggs. Under the [Rural Lands Protection Act 1998](#), landholders must report the presence of locusts, including laying locusts, to their LHPA.

Rangers should inspect all reports of suspected egg-laying to determine whether eggs are present. Digging the ground (to a minimum depth of 10 cm) for signs of eggs should be carried out as soon as possible. If no eggs are present, the locusts may have been 'test-drilling' the area. This area may still be important as egg laying may have occurred nearby.

Mark laying areas with a physical marker such as a painted peg or flagging and record the latitude and longitude (Lat/Long) coordinates preferably using a GPS. Obtain sufficiently detailed directions to allow someone unfamiliar with the area to locate the site in the future if necessary. Rangers should record all the information regarding the report on the Plague Locust Report form and fax it to I&I NSW. Latitudes and longitudes must be recorded clearly and consistently as degrees and decimal minutes (e.g. -33°17.156' 149°6.334'). Alternatively, decimal degrees may be used but must be clearly defined (e.g.-33.28593° 149.10557°).

Rangers should refer to the APLC for a likely time of hatching from plague locust laying sites and monitor the area for signs of locust hatching.

5.6 LHPA Reports of Locust Nymphs and Adults

Record keeping is an essential component of locust management as it allows a history of an area or a location to be constructed.

- It is a landholder's legal responsibility under Part 11, Section 143 of the *Rural Lands Protection Act 1998* and the associated current Pest Control Order to immediately report and control pest insects on their land. Reports are to be sent to the local LHPA.
- Rangers should monitor all known or suspected egg-beds, and other areas where previous activity of locusts has occurred when soil temperature and moisture levels rise to initiate hatching.
- LHPA Rangers must investigate, on-site wherever possible, all initial reports of egg-beds, hatchings, nymphs and adult locusts prior to issue of insecticides. This will ensure that accurate information is available to help determine the scope and timing of the outbreak.
- LHPA Rangers should also investigate on-site any subsequent reports in new areas.
- During times of high activity, not all reports may be inspected prior to insecticide issue. Refer to procedure Insecticide Management for Plague Locusts - section 5.4.2.

LHPAs must appoint a contact between the LHPA and I&I NSW. This contact person will also be responsible for submitting reports for all rangers and divisions of the LHPA.

- For LHPAs the contact person should ensure that the Plague Locust Report form is completed as reports are received or when insecticide is issued.
- Reports must include information on the hatching or presence of nymphs or adult locusts, including those on Travelling Stock Routes, National parks and State Forests.

5.7 Plague Locust Surveys

In the first instance landholders are responsible for locating nymphs on their properties. If the locust event becomes large enough LHPA and I&I NSW personnel may be required to participate in a plague locust survey.

For effective control of locusts, fast and accurate survey methods must be used. LHPA and I&I NSW personnel may be requested to assist the APLC/I&I NSW with surveys.

5.7.1 Ground Survey for Nymphs

- Ground surveillance conducted by LHPA/I&I NSW personnel should be targeted, planned and pro-active by:
 - recording landholder reports
 - contacting by phone neighbours of affected landholders and other landholders in the general area to check for activity (if not already reported)
 - recording negative findings
 - determining systematically the status of areas with no reports, preferably by phone survey to landholders
- Ground surveys should start in areas where egg-beds or hatchings have been reported.
- The extent of nymph populations should be identified by walking or driving across the area and taking GPS waypoints or noting structural or geographic features at the extremities.
- Maps or GPS data should be used to record the location size, density and stage of nymph populations.
- Ground surveys and searches should also be undertaken to confirm aerial investigations.

5.7.2 Aerial Survey

- APLC and I&I NSW are responsible for aerial surveys for plague locusts.
- LHPA personnel should assess the locust situation and request aerial support if required. Aircraft contractors and aircraft will be assigned according to the Activation of Aerial Control policy.
- Only approved and competent LHPA/I&I NSW personnel are permitted to work in and around aircraft.
- Ground surveys and searches of suspected areas should also be undertaken to confirm aerial investigations.

5.7.3 Post Control Check

- Systematic post control checks will allow an evaluation of the effectiveness of the spraying technique (particularly of contractors) and assessment of any off-target impacts, particularly important for aerial control. Post control checks are used to investigate any complaints regarding insecticide efficacy and environmental affects.
- Rangers and/or surveillance officers should check the effectiveness of the aerial and ground spraying approximately 72 hours after the target area is sprayed. At this stage, mortality should be evident (except Metarhizium). Adult locusts may move away from an area after being sprayed so the effectiveness of the spraying can be difficult to determine.
- Checks should be done by driving through the treated area (allowing for the trajectory of the swarm/band) and sensitive areas. Record observations on Post Control Check form. Non-target mortalities should be recorded and samples collected for testing for residues.
- If problems are identified the LCC must be informed immediately. A Technical Specialist must immediately review application techniques. The calibration of the spray unit/aircraft, the age and condition of the insecticide and all other factors must be checked. Until the problem is rectified, no other spraying should take place.

5.8 Treatment of locusts on private land

5.8.1 Entering land to survey and treat locusts

It is important that locust control is achieved in the quickest time possible to minimise the impact of locusts on agriculture and the environment.

Approval of the occupier is preferred when undertaking locust control.

Before an authorised officer can enter land, section 191 of the Act must be complied with.

Every reasonable endeavour should be made to obtain approval of **all** occupiers of the land **prior** to entering the land and controlling locusts.

Obtaining occupier approval is the responsibility of the LHPAs and they may obtain approval to enter land to spray to control locusts up to 3 months prior to an anticipated locust problem.

Approval of the occupier is required for the control of locust nymphs on the ground and swarms by air or ground methods.

5.8.2 Procedure where approval is not obtained

In situations where the occupier of the land cannot be found or refuses to give approval, entry, inspection and treatment may occur, but only with the prior authorisation of the LHPA and State Controller. Refer to *Rural Lands Protection Act 1998* (Section 182 for authority to enter and Section 169 for authority to carry out control). Note that notice can be given in all the ways set out in section 240 of the Act.

Under the provisions of the *Rural Lands Protection Act 1998* authorised officers may enter the land and inspect after first giving notice of entry to the occupier under section 191. Note that section 191(2) **does not allow the notice of entry and the entry to occur on the same day.**

- Entry and spraying upon occupier refusal should only occur in exceptional cases and with the approval of the State Controller.
- It is preferred that an Individual Eradication Order be issued in these instances. Refer to the Plague Locust Compliance/Enforcement policy.
- The State Coordination Centre (SCC) should be advised by the LCC of any proposals to treat locusts without occupier approval.
- Where a landholder has provided oral or written objections to the entry or to the treatment, those objections must be considered by the SCC and accommodated if it is possible to do so without compromising the overall success of the control program.
- Treatment, without notice to or without approval by the occupier, should only proceed in situations where the treatment of the locusts is crucial to the overall success of the control program. The reasons for a decision to treat in the absence of consent must be documented by the SCC.

5.8.3 Procedures prior to entry to premises

Entry to survey and treat premises where approval of the occupier has not been given can only occur in the presence of an authorised officer under the *Rural Lands Protection Act 1998*. This includes spraying from the air to control locusts on the property. It may be necessary to authorise additional officers such as spray pilots to meet this requirement. An Individual Eradication Order may need to be issued.

An Order has been issued under the *Plant Diseases Act 1924* authorising entry onto land to conduct plague locust survey work by APLC staff only. In this Order: survey work means any one or a combination of the following tasks:

- visually survey any lands by vehicle or foot
- take locust specimens
- identify egg beds with labelled pegs
- take samples of locust egg beds using a spade, shovel, mattock or similar instrument
- monitor known locust egg beds and known locust populations

5.8.4 Environmentally sensitive areas

Before treatment is undertaken all reasonable care should be taken to identify environmentally sensitive areas. It is recognised that it may not be possible to identify all environmentally sensitive areas as they may not be obvious. Caution should be exercised near feeding areas of native bird species such as Ibis which are highly mobile. The identification of environmentally sensitive areas must be provided to the operators undertaking the control work. Potential off-site impacts should be considered when deciding when and where to undertake control. Refer to the Environmental Considerations in a Plague Locust Response policy.

5.8.5 Spraying pesticides

Under the *Pesticides Act 1999* all pesticide users, including spray pilots, in NSW are required to use only pesticides registered or permitted by the Australian Pesticides and Veterinary Medicines Authority that are approved for the intended situation of use. Refer to the Use of Insecticides for Plague Locust Control policy.

5.8.6 Procedures upon completion of control work

A notice should be placed on the property gate stating that the property has been entered and treated for locusts. The information on the notice should state the areas treated and the control agent used and its withholding period; it should also state that an invoice may be forthcoming for the cost of control, and give a phone number that the owner or occupier can contact if they require further information.

The occupier may be charged for the cost of controlling locusts on their property under *Rural Lands Protection Act 1998*, Section 171 (1b).

6. References

Policy

- [Activation of Aerial Control](#)
- [Environmental Considerations in a Plague Locust Response](#)
- [Plague Locust Compliance/Enforcement](#)
- [Responsibilities in Plague Locust Campaigns](#)
- [Use of Insecticides for Plague Locust Control](#)

Procedures

- [Insecticide Management for Plague Locusts](#)
- [Monitoring location of field personnel](#)

Forms

- [Plague Locust Report form](#)
- [Insecticide storage inventory and order form](#)
- [Landholder Consultation Record](#)

Safe Work Method Statements

- [Driving vehicles](#)
- [Property visits](#)

Risk assessment

- [Collection and examination of locusts](#)
- [Maintaining biosecurity entering and exiting properties](#)

Information

- [Australian Plague Locust, Landholder Control Strategies for NSW](#)
- [Plague locusts, wingless grasshoppers and livestock residues](#)
- [Australian Plague Locust, *Chortoicetes terminifera*](#)

Legislative Acts and Regulations

- [Occupational Health and Safety Act 2000](#)
- [Pesticides Act 1999](#)
- [Plant Diseases Act 1924](#)
- [Rural Lands Protection Act 1998](#)

7. Appendices