St Helena Government

Biosecurity Major Incident Plan

Summary	**Biosecurity emergency response plans**
Purpose	**Plans in response to the introduction of a new pest, weed or disease**
Status	**Published**
Version Control	**V2**
Date Created	**November 2016**
Date of Issue	**March 2016**
Date of Review	**November 2017**

Prepared by	Jill Key Pest Control and Biosecurity Officer Joe Hollins Senior Veterinary Officer
Reviewed by	Julie Balchin
Issued by	Darren Duncan

Version	Date	Status	Author
V1	March 2016	Initial issue of plan	Jill Key, Joe Hollins
V2	November 2016	Revised to include: the emergency response plan for predatory invertebrates; and all plans for Phytosanitary risks revised following the exercise held on 18/10/16	Jill Key, Mike Jervois

Exercising, Validation and Activation

Date	Type	Update
18/10/16	Exercise and validation	Phytosanitary risks Appendix B ERAP for New Tephritid Fly validated and exercised.

Table of Contents

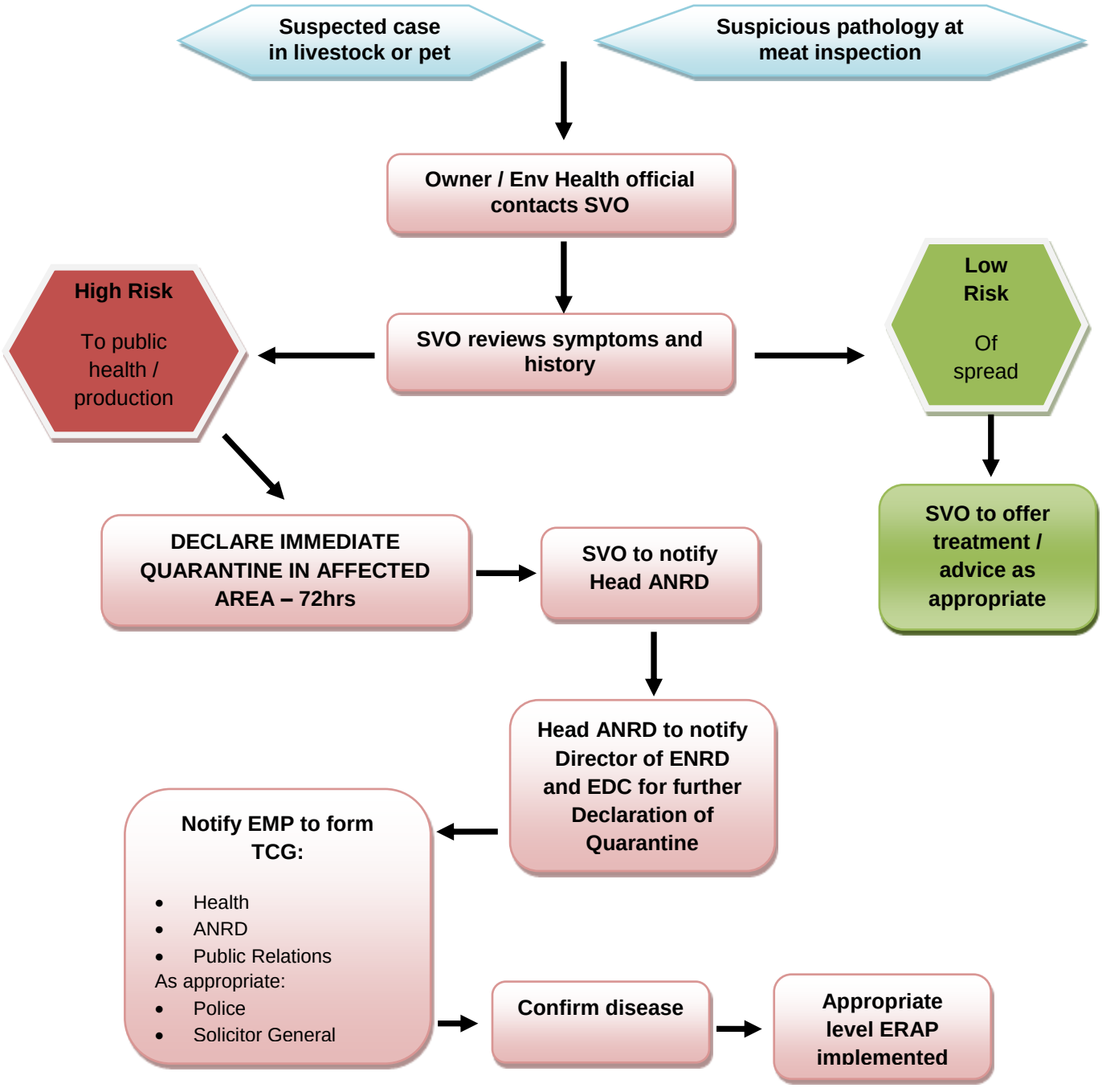
1. Zoosanitary Risks – Animal Diseases

Speed sheets for use in respect of a high risk case being identified by the Veterinary Team & Process for unplanned yacht arrivals

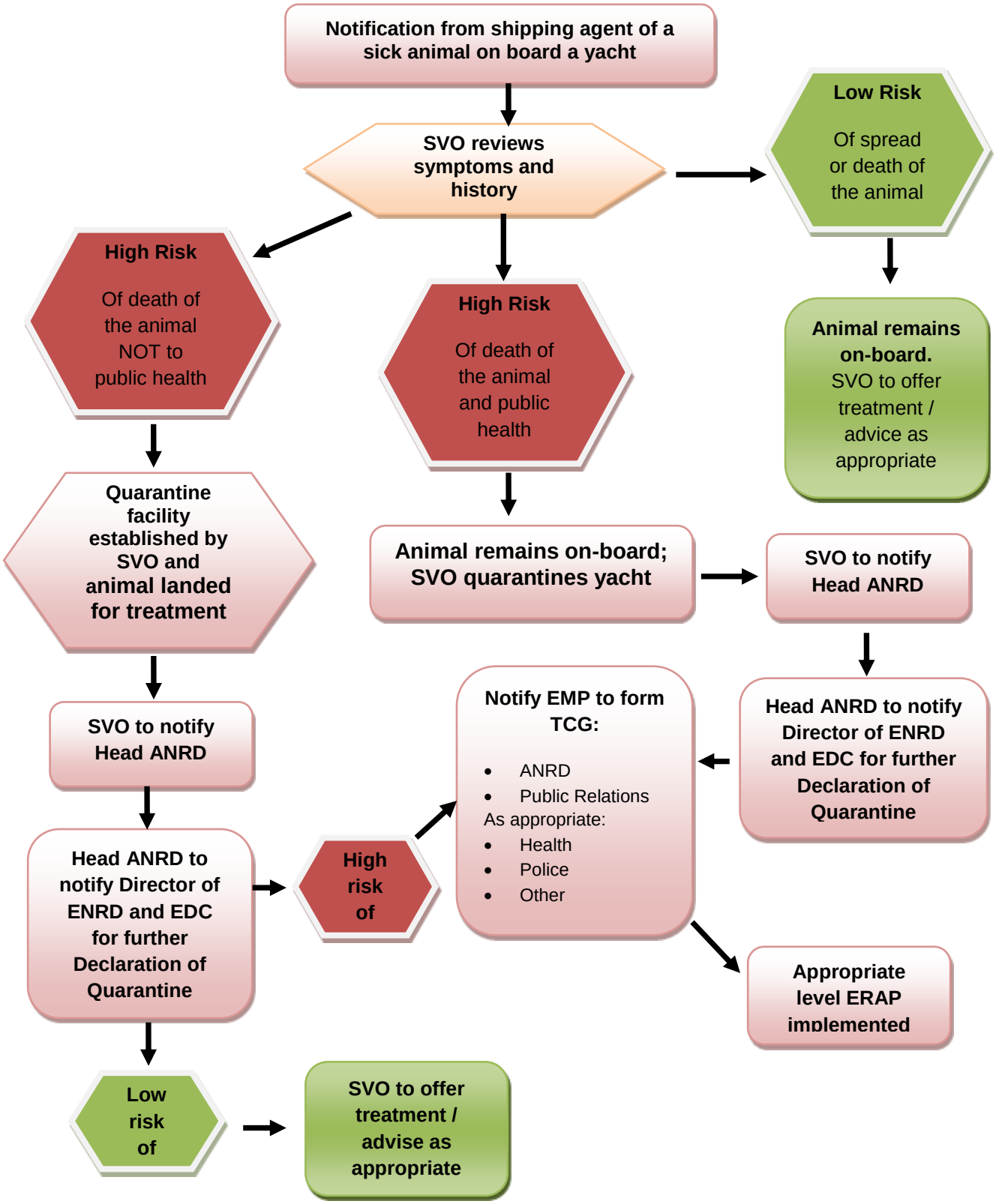
1. **Suspected case of new animal disease on the island**
2. **Process in the event of an unplanned arrival of a sick animal on a yacht**
3. **Veterinary team actions speed sheet**

Follow the process as per the sheet then refer to the main plan for further information.

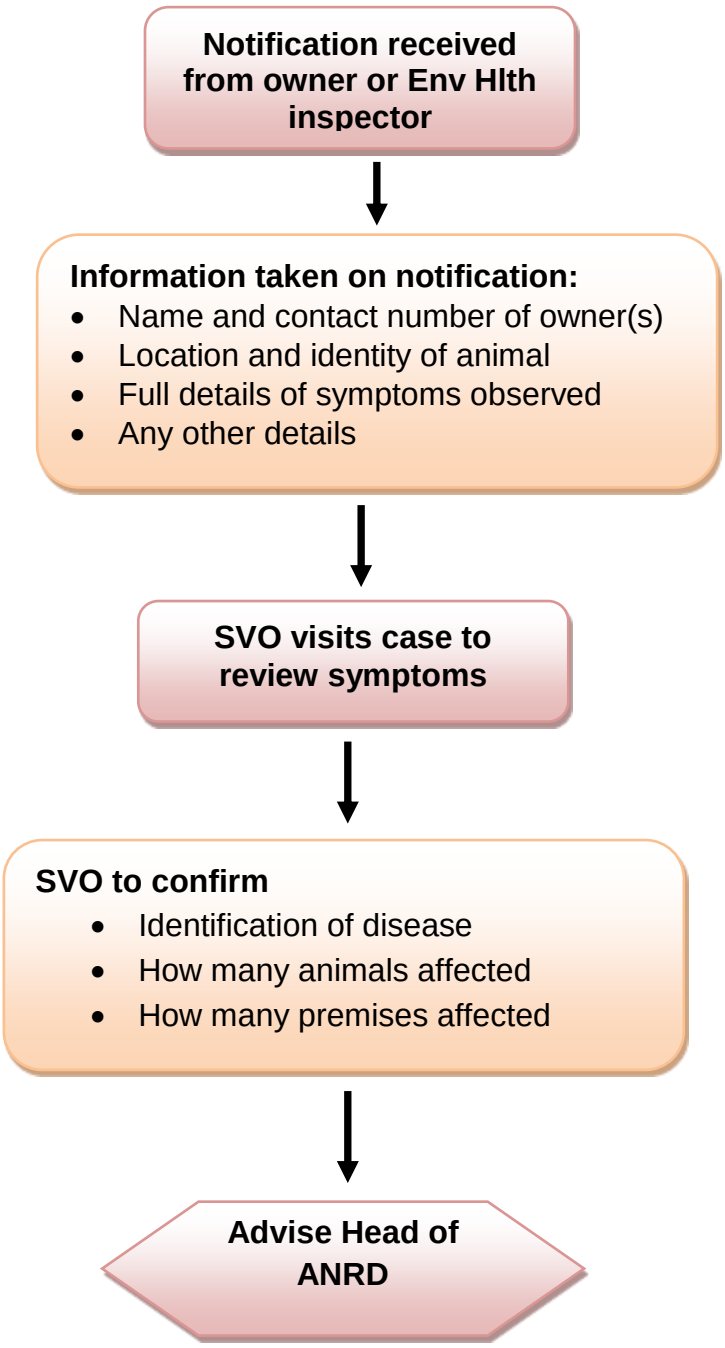
1. SUSPECTED CASE OF A NEW ANIMAL DISEASE



2. PROCESS FOR UNPLANNED ARRIVAL OF A SICK ANIMAL ON A YACHT



3. VETERINARY TEAM ACTIONS SPEED SHEET



Information

The introduction of a new animal disease to the island is potentially very harmful both to other animals and to public health. Some diseases are very specific and only affect one species while others can affect a range of species. Impacts can be felt at different levels: from relatively mild and localised (for example the introduction of dog mange), to devastating to agricultural production (for example the introduction of Foot and Mouth disease of cattle or Newcastle disease of poultry), and to devastating for public health (for example the introduction of rabies). In all cases it only requires a single animal to become infected to initiate an outbreak. Pathways of introduction include both natural pathways such as via seabirds or migratory birds, and human mediated pathways such as via infected meat products or a sick animal on-board a yacht.

This plan seeks to mitigate risk by early identification of cases which are considered to be high risk. Intervention points have been identified at notification of a suspected case in order to minimise risk to the wider population.

.

Intention

Working with multi agency partners, utilising a risk based approach St Helena Government (SHG) will seek to:

- Protect life
- Protect the agricultural economy of the island
- Undertake measures to minimise the risk of spread of a contagious animal disease outbreak
- Warn and inform the public as to the risk providing reassurance to maintain confidence in the SHG response
- Ensure the restoration of normality as soon as possible

Method

Routine inspections are made by Environmental Health officers of all slaughtered carcasses and report any suspicious pathology to the Senior Veterinary Officer (SVO). Pet and livestock owners also normally contact the SVO in the event of sick animals, allowing new outbreaks to be identified.

Levels of Response:

Three trigger levels have been identified which determine the action and response, to help assess the risk to St Helena and inform action that may be required.

Dependent on the nature of the developing outbreak it may be necessary to start the response at any one of the trigger points so a degree of flexibility will need to be applied.

Suggested actions are listed against each trigger point for guidance purposes. The response will need to fully take account of the developing threat and risk so as to ensure actions are proportionate and effective and be compatible with broader SHG strategic intentions.

Level 1

Disease has the potential to become a problem; affects one species or related species group such as poultry. Example: Newcastle disease, Fowl cholera	
Suggested Actions	**Further Considerations**

• Containment of affected premises / area
• Implementation of specific plan and any associated protocols
• Raise awareness with key stakeholders
  o Farmers Association
  o Other as appropriate
• Continued horizon and environmental scanning
• Review information and intelligence updates daily
• Implement additional border control procedures, as appropriate
• Public reassurance / warning and informing
	• Risk of spread within St Helena
	• Command Structure
	• Review membership of the Tactical Coordination Group (TCG)
	• Pre deployment of Personal Protective Equipment (PPE) to affected area
	• Review supplies of PPE and reorder as necessary
	• Restrictions on movement of animals
	• Requests for international assistance

Level 2

Disease has the potential to become a problem; affects a wide range of species. Example: Foot and Mouth Disease	
Suggested Actions	**Further Considerations**

• Containment of affected premises / area
• Activate Command Structure
• Hold Tactical Coordination Meeting
• Implementation of specific plan and any associated protocols
• Raise awareness with key stakeholders
  o Police
  o Farmers Association
  o Bee Keepers Association
  o Other as appropriate
• Continued horizon and environmental scanning
• Review information and intelligence
	• Risk of spread within St Helena
	• Review membership of the TCG
	• Requirement to establish a Tactical Coordination Centre
	• Need to establish Strategic Coordination Group and Incident Executive Group (IEG)
	• Pre deployment of PPE to affected area
	• Review supplies of PPE and reorder as necessary
	• Restrictions on movement of animals
	• Requests for international assistance

updates daily • Implement additional border control procedures, as appropriate • Public reassurance / warning and informing • Public reassurance / warning and informing	

Level 3

Disease has the potential to become a problem for public health Example: Rabies	
Suggested Actions	**Further Considerations**
• Continue horizon and environmental scanning • Activate Major Incident Plan • Hold IEG, Strategic and Tactical Coordination Meetings • Deployment of PPE staff engaged in high risk activity • Implementation of specific plan and any associated protocols • Public reassurance / warning and informing	• Risk of spread within St Helena • Review membership of the TCG • Requirement to establish a Tactical Coordination Centre • Need to establish Strategic Coordination Group and IEG • Pre deployment of PPE to affected area • Review supplies of PPE and reorder as necessary • Restriction on movement of animals • Evacuation of affected area • Requests for international assistance

Emergency response action plans

Specific emergency response action plans (ERAPs) provide the general requirements for diseases at each level, 1 to 3:

- Appendix A. ERAP for Level 1 disease: Newcastle disease
- Appendix B. ERAP for Level 2 disease: Foot and Mouth disease
- Appendix C. ERAP for Level 3 disease: Rabies

Administration

This plan will be administered by the Emergency Planning Manager. This will include review and updates as the situation develops.

Command and Control

A command and control structure will be implemented to support this plan

Gold: Chief Secretary

Silver: Chair TCG: Chief of Police

Tactical Coordination Group Membership:
Agriculture: Head of ANRD, Director of Environment and Natural Resources Directorate (ENRD), Senior Veterinary Officer, Biosecurity Officer (BSO)
Communications: Chief Public Relations Officer
Health: Director of Health, Senior Medical officer, Environmental Health
Police: Chief of Police
Port Authority: Harbour Master / Head of Customs
Shipping Agents: Solomons General Manager (Agencies)
Emergency Planning Manager (EPM)

The Tactical Coordination Group (TCG) will meet on an ad hoc basis until such point as the increase in risk rises. At this point consideration should be given to membership of the TCG and as to whether a Tactical Coordination Centre should be established. Consideration should also be given, based on the risk as to whether a Strategic Coordination Group meeting should be held and if necessary extended to include an Incident Executive Group.

Business Continuity Management
The level at which public services will operate will be a strategic decision made by Gold. Critical business activity will need to be identified in advance of an escalation of threat and consideration given as to how these services will be maintained.

Personal Protective Equipment (PPE)
Any decision to deploy PPE will be made by the SVO and is detailed in the ERAPs; based on an appropriate risk assessment to the threat posed. This may include the pre deployment of 'go boxes' to strategic locations as a result of an increase in the threat and subsequent change to the response level. Veterinary equipment and PPE held at Agricultural and Natural Resources Division (ANRD) is given in Appendix D.

Waste Management
The safe and effective disposal of waste resulting from contact with infected animals or materials is vital to prevent further spread of infectious organisms and thus to safeguard operators, members of the public, and other animals. Guidance to be followed can be found in the ERAPs, with further information for important zoonoses to be found on the World Health Organisation website.

Communications

Communications will utilise various media channels including online, radio, newspaper and TV and will look to build upon previous good practice including daily media briefings, if the situation escalates.

Contingencies

The St Helena Major Incident Response Plan is available via the Emergency Planning Manager.

A decision will be made by Silver in relation to whether the Major Incident Plan should be activated and its timing.

Appendix A. Emergency Response Action Plan for Level 1 Disease

Level 1: the disease has the potential to become a problem; affects one species or related species group such as poultry. Example used: Newcastle disease.

Legal provisions

- Animal Disease Ordinance Cap. 96, 2001 (as amended).
    - Emergency powers as the Agricultural Authority for infected area, quarantine area declaration and others.
    - Declaration of Quarantine Area and Infected Area by Agricultural Authority for up to 72 hours, and subsequently by Economic Development Committee (EDC) for period as determined necessary.
- Customs Ordinance (Import and Export Control Regulations) Cap. 145.
    - Control on movement of live poultry, meat and eggs.

Financial provisions

- All operational costs fall to ANRD budget.
- Costs of coop improvements and disinfecting materials fall to private individuals.
- No legal provision for compensation for loss of stock.

Chain of command

- ANRD is the lead agency, the Agricultural Authority is Head, ANRD.
    - SVO is the recognised Expert, leading and informing the Technical Group coordinating the operational plan.
    - Technical Group members include: Biosecurity Officer (BSO), Agricultural Development Officer (ADO), Livestock Officer (LSO).
    - The Field team work under the guidance of the Technical Group, and include: two Veterinary and Livestock Assistants (VLA) and a Senior Field Worker.

Operational Plan

Key facts:

- Newcastle Disease is a highly contagious disease of poultry, otherwise known as Fowl Plague.
- Disease may not always be apparent; the incubation period is 2 to 14 days.
- Transmission can be by cloths, boots, vehicles, movement of chickens, poultry meat, and wild birds. Avoid moving chickens around.
- There are no serious human health issues.

Health and Safety

- All chickens in affected premises should be considered potentially infected and handled with due caution; see Annexes A to E.

- The appropriate Personal Protective Equipment must be worn before entering any infected or suspected infected premises; see Annexes A to E.

Control strategy – immediate action on suspicion

- On suspicion of an exotic notifiable disease, quarantine of affected premises is immediately declared by the Agricultural Authority
- Infected area also declared and chickens in the affected premises are culled and samples collected.
- All movements on and off the premises of people, goods and animals controlled and subject to permits issued by the Agricultural Authority.
- Signs declaring quarantine with legal basis and warning tape applied to appropriate areas, especially entry points, to warn the general public.
- Area of potential infection is identified (neighbouring premises, pathways of infection, etc).
- Samples sent to a diagnostic laboratory, such as the AHLVA, UK.
- Export of live chickens, eggs and chicken meat to Ascension is prohibited.
- Notification of SILVER.

Control strategy – action on confirmation

<u>Main strategy</u>

- Containment programme initiated in outbreak area.
    - Visits to promote chicken housing improvements to prevent wild bird access, and raise awareness of symptoms and preventing spread.
    - Where suspicion is raised of a possible outbreak, visits made to check premises and flocks.
    - Wild chickens in target areas to be culled, as far as possible.
- Island wide ANRD-led participatory vaccination programme initiated, starting with ring vaccination around the priority Districts of outbreaks.
    - Vaccine collection points to be established in each District, both in working hours and after hours.
    - Poultry keepers (as determined from most recent animal census) to be targeted, if they fail to collect from the distribution points.
    - Expected implementation period: 4 weeks from receipt of vaccine.

<u>Contingency plan: in the event of further outbreaks in other districts</u>

- Declare quarantine with immediate effect:
    - In the entire premises, not just the affected coop.
    - A buffer zone will be established at a suitable radius as advised by the Technical Group.
- Reaction will be proportionate to the level of risk identified.

- District-wide culling will be considered, if necessary, with advice from SVO and Defra, and Executive Council approval for legislative change to the Animal Diseases Ordinance.

Biosecurity

- Procedures are outlined in the Annexes as follows:
  - Annex A. Procedures for the Management of Poultry and Premises to Prevent Infection.
  - Annex B. Procedure for Site Visit on Suspicion of Newcastle Disease.
  - Annex C. Procedure for Establishing Infected Area and Quarantine Area.
  - Annex D. Procedure for Culling and Disposal of Infected Chickens.
  - Annex E. Procedures for Disinfection of Premises and Coops.
  - Annex F. General Biosecurity Measures to be Followed.

Communication

- Inform TCG
- Updating Council Committee on a fortnightly basis and when need for formal quarantine is required.
- Updating Director of ENRD as and when necessary on the progress of the programme.
- Updating the Chief Secretary as and when necessary on the progress of the programme.
- Press releases issued:
  - Precautionary press release: Simple measures to prevent the spread and a list of symptoms developed and included in all press releases henceforth.
  - Confirmation of Newcastle Disease (ND) press release.
  - Update press releases
- Radio interviews held to accompany press releases.

Equipment and Resources

- See resources required under the Plan's Procedures in Annex A to F.

Annex A. Procedure for Management of Poultry and Premises to Prevent Infection

This procedure is for all chicken owners.

- Set up a footbath such as a bucket or washing up bowl filled with disinfectant or bleach at the entrance to the coop. Dip your feet on the way in and on the way out to create a barrier to germs.
- Wherever practical, keep your chickens inside the coop. Even if your set-up means you are unable to do this, keep all feed and water inside the coop.
- Do your best to exclude wild birds by blocking holes and using netting, and remove any spilled feed that could attract wild birds.
- Have a dedicated set of boots and overalls for your chicken coop which never leaves your property.
- Wash your hands after visiting the chickens.
- Discourage visitors to your coop and avoid visiting chickens at other premises.
- Report any unusual deaths or symptoms to the Veterinary Section at ANRD on 24724. Symptoms affect multiple chickens and may include all or some of these:
    - Open mouth breathing
    - Coughing and sneezing
    - Discharge from the eyes and nostrils
    - Blackening combs and wattles
    - Ruffled wings and drooping wings
    - Sudden egg drop combined with pale paper-thin egg shells
    - Severe watery yellow diarrhoea
    - High death rate

Annex B. Procedure for Site Visit on Suspicion of Newcastle Disease

This procedure is for authorised ANRD staff.

- ANRD receives notification of sick chickens and suspected ND.
- ANRD vehicle is parked off the premises.
- PPE to be employed before entering premises:
    - Wetsuits, sprayed with a recommended disinfectant (eg Sorgene or Virkon) once on.
    - Rubber boots
    - Gloves: 2 layers of latex examination gloves
    - Dust mask
    - Safety glasses
- Foot bath containing recommended disinfectant (eg Sorgene or Virkon) placed and used by all staff entering premises.
- Owner of the chickens may be present during the visit and is required to use the footbath, but not to put on PPE.
- Visual examination of the flock for symptoms; chickens are not handled.
- If ND is confirmed, the Procedure for Culling and Disposal of Infected Chickens (Annex D) is implemented.
- If ND is not confirmed, disinfection routine is followed, as outlined in the following 3 points.
- Before leaving premises:
    - Paper suits and other disposable PPE are removed and bagged for incineration. The bag is sealed and sprayed with a recommended disinfectant externally, then placed in the back of the vehicle for incineration
    - Wetsuits are sprayed with a recommended disinfectant (eg Sorgene or Virkon) before taking them off.
    - All equipment is sprayed with a recommended disinfectant (eg Sorgene or Virkon).
- On leaving premises all staff must pass through the footbath. Rubber boots are not removed until they have passed through the foot bath. The tread of each boot should be picked clean of mud and debris before entering the footbath. A brush may be employed to further scrub the surfaces.
- All other protective clothing is removed and placed in the back of the vehicle before leaving the site, and washed in the ANRD washing machine immediately on arrival at ANRD.

Annex C. Procedure for Establishing Infected Area and Quarantine Area.

This procedure is for authorised ANRD staff once ND has been confirmed in premises.

- SVO or a designated member of the Technical Group decides whether a Quarantine Area and/or Infected Area is to be declared.
- Both Quarantine and Infected Area designation applies for up to 72 hours as decided necessary by the Agricultural Authority.
- Beyond 72 hours both Quarantine Area and Infected Area designation requires formal approval by EDC and public gazetting, and is for any specified period as determined by Committee on advice of the Agricultural Authority.
- The procedure is the same for both:
    - ANRD vehicle is parked off the premises.
    - The coop or the poultry premises are taped off using “Biosecurity” tape and appropriate signage.
    - Signage states: Infected Area or Quarantine Area; NO ENTRY UNTIL FURTHER NOTICE, legal basis, contact details, and date of enforcement, authority under which it is declared.
    - Coops will be locked by ANRD.
- Gazette notice is posted for public information on a Quarantine Area declaration only.

Annex D. Procedure for Culling and Disposal of Infected Chickens.

This procedure is for authorised ANRD staff in quarantined premises.

- All culling is to be carried out by authorised ANRD staff.
- ANRD vehicle is parked off the premises.
- The recommended disinfectant is for example Sorgene or Virkon.
- PPE to be employed before entering premises:
    - Disposable paper suits to be used as an external protective layer
    - Wetsuits underneath, lightly sprayed with a recommended disinfectant once on.
    - Rubber boots
    - Gloves: 2 layers of latex examination gloves
    - Dust mask
    - Safety glasses
- Foot bath containing recommended disinfectant to be in place and used by all staff entering premises to precoat their boots.
- Ensure chickens to be culled are confined in a coop or trap.
- Culling to be done by an approved method, for example, use of a Burdizzo neck clamp.
- Dead chickens are placed in a double clinical waste bag, 5 bodies to a bag.
- Bags are knotted and sprayed with disinfectant before leaving the premises.
- Disinfected bags, including disposable PPE, are placed in the vehicle and taken to the incinerator for immediate incineration.
- The vehicle is disinfected with a recommended disinfectant once all bags have been removed.
- Before leaving premises:
    - Paper suits and other disposable PPE are removed and bagged for incineration. The bag is sealed and sprayed with a recommended disinfectant externally, then placed in the back of the vehicle for incineration
    - Wetsuits are sprayed with a recommended disinfectant (eg Sorgene or Virkon) before taking them off.
    - All equipment is sprayed with a recommended disinfectant (eg Sorgene or Virkon).
- On leaving premises all staff must pass through the footbath. Rubber boots are not removed until they have passed through the foot bath. The tread of each boot should be picked clean of mud and debris before entering the footbath. A brush may be employed to further scrub the surfaces.

- All other protective clothing is removed and placed in the back of the vehicle before leaving the site, and washed in the ANRD washing machine immediately on arrival at ANRD.

Annex E. Procedure for Disinfection of Poultry Coop/Premises

This procedure is for all chicken owners following culling.

- Once all chickens are culled and disposed of (see Annex D) the coop and immediate outside area is sprayed with a recommended disinfectant (eg Sorgene or Virkon).
    - The immediate outside area depends on the site, and can vary from 2m buffer zone to the entire site, up to around 8m, and any other areas of potential contamination such as feed sheds or nesting areas.
- Drinking bowls, feeding troughs and any other husbandry equipment is sprayed with a recommended disinfectant.
- The entire site is quarantined for 2 months, during which only ANRD authorised personnel are allowed to enter.
- The coop should be secured against wild birds as a potential source of further infection.
- Once quarantine is lifted, the owners should thoroughly clean the coop:
    - All faeces, nesting material and other debris should be burned on-site. Where this is not possible, ANRD will collect the material for disposal by incineration.
    - Bowls and feeding troughs to be sprayed with a recommended disinfectant, following which they should be thoroughly washed in clean water.
- Owners are recommended to re-stock with vaccinated chickens, ANRD can provide details on recommended sources.

Annex F. General Biosecurity measures to be followed.

This procedure is for all chicken owners.

- Livestock vehicles, cars or trailers must be parked outside the premises, wherever possible, on hard standing away from farm animals and must be visibly free of animal excreta, slurry etc.

- It is recommended that either clean non-disposable protective clothing or waterproof protective clothing and waterproof boots are worn.

- Discourage visitors, especially if they also have chickens which might be infected.

- Suitable protective clothing and footwear must be worn on all premises where visits include entering areas where chickens are present or to which they normally have access. The purpose of the protective clothing and footwear is to prevent any contamination being carried from premises to premises. Protective clothing and footwear may be disposable or re-usable. The following are *examples* of types of protective clothing:
    - Disposable boiler type suits. These can be used once and should be discarded at the end of the visit to the premises. They can be left on the premises with the owner's agreement or bagged and suitably disposed of later, as can disposable overshoes for footwear.
    - Non-disposable protective clothing (e.g. cotton boiler suits or cotton coats). These may be used once and should be laundered before being re-used on any other livestock premises.
    - Waterproof protective clothing and waterproof boots. These should be cleansed and disinfected before entering the premises and again at the end of the visit just before leaving the premises.

- All equipment used must be clean on arrival and on departure. Great care must be taken when cleaning electrical apparatus or tools. Where possible equipment should be protected from contamination e.g. using plastic bags. **Health and Safety rules must be observed.** Where equipment can be cleansed and disinfected this must be done before entry to the premises and again on departure.

- Sufficient water, disinfectant and disinfecting equipment should be taken on the visit, even if facilities for disinfecting clothes, footwear, equipment or vehicles are thought to be available on the premises.

Annex G. Factsheet on Newcastle Disease

http://archive.defra.gov.uk/foodfarm/farmanimal/diseases/atoz/newcastle/disease-factsheet.htm

Description

Newcastle disease is a highly contagious disease of birds caused by pathogenic strains of Avian Paramyxovirus type 1 (APMV-1). Occasionally virulent strains of Paramyxovirus of pigeon (APMV1) can infect poultry causing Newcastle disease. Birds affected by this disease include fowls, turkeys, geese, ducks, pheasants, guinea fowl and other wild and captive birds, including ratites such ostriches, emus and rhea. For further information see the OIE website.

Most recent GB outbreaks

In Great Britain, isolated cases of this disease were first reported in the 1930s. From 1947, outbreaks occurred here over the next 30 years and there were further isolated cases in 1984, 1996-7, 2005 and 2006. This disease does however remain a problem world-wide.

Clinical signs

The clinical signs in affected birds can be very variable. The disease can be present in a very acute form with sudden onset and high mortality or as a mild disease with respiratory distress or a drop in egg production as the only detectable clinical signs. A sub-clinical (asymptomatic) form of Newcastle disease and many intermediate forms of the disease can also occur. The clinical signs include depression, lack of appetite, respiratory distress with beak gaping, coughing, sneezing, gurgling and rattling, yellowish green diarrhoea and nervous signs. In laying flocks a sudden drop in egg production with a high proportion of eggs laid with abnormal (soft) shells is often an early sign of disease. Young birds are particularly susceptible and mortality can be heavy, with survivors often exhibiting permanent nervous signs. When lesions are present they may include haemorrhages (minute blood spots) in the lining of the glandular stomach, gizzard, intestines, heart, inner surface of the chest wall, some skeletal muscles and air sacculitis/pericarditis.

Transmission

- Wild birds may be implicated in the introduction of the disease to domestic poultry.
- Direct contact with secretions from infected birds, especially faces.
- Contaminated vehicles, equipment, personnel, clothing, water or feed.

Appendix B. Emergency Response Action Plan for Level 2 Disease

Level 2: disease has strong potential to spread amongst pets or livestock with possible severe economic consequences. Example used: Foot & Mouth Disease (FMD).

Legal provisions

- Animal Disease Ordinance Cap. 96, 2001 (as amended).
    - Emergency powers as the Agricultural Authority for infected area, quarantine area declaration and others.
    - Declaration of Quarantine Area and Infected Area by Agricultural Authority for up to 72 hours, and subsequently by EDC for period as determined necessary.
    - 6 - The Agricultural Authority and an Inspector shall have, for the purposes of this Ordinance, all the powers which a policeman has under this Ordinance.
    - 4 - Members of the Police Force and Inspectors appointed under this Ordinance shall, subject to the general directions of the Agricultural Authority, enforce the provisions of this Ordinance and of every regulation made thereunder.
- Customs Ordinance (Import and Export Control Regulations) Cap. 145.
    - Control on movement of imports and exports of animals and food of animal origin.

Financial provisions

- Operational costs shared by relevant services: ANRD, police.
- Costs of C&D (cleansing and disinfection) of premises falls to government.
- Extra contingency costs will have to be met by central government.
- No legal provision for compensation for loss of stock.

Chain of command

- ANRD is the lead agency, the Agricultural Authority is Head, ANRD.
    - SVO is the recognised Expert, leading and informing the Technical Group coordinating the operational plan.
    - Technical Group members include: BSO, ADO, LSO.
    - The Field team work under the guidance of the Technical Group, and include: two VLAs and a Senior Field Worker.
    - Agricultural Authority to appoint additional ‘Inspectors’ as defined under the Animal (Diseases) Ordinance to carry out the provisions of the ordinance with regard to quarantine controls, removal and/or disposal of infective materials including carcasses, cleansing & disinfection, surveillance of livestock, and arrests if necessary, depending on scale and extent of outbreak.

- The scale of and extent of spread may involve the training and recruitment of additional technical staff on advice from the Technical Group.
- ANRD to advise and enrol police to enforce quarantine restrictions such as road blocks to control movements of vehicles and people, and to make arrests if necessary.

Operational Plan

Key facts:

- Foot & Mouth is a highly contagious disease of cloven hoofed animals (pigs, cattle, sheep and goats). There are 7 strains: O, A, C, Asia1, Sat 1, 2, 3. This is important to know if a vaccination policy is employed. Some strains are spread aerially, others are spread by contact.
- Disease may be easily overlooked in sheep and goats, often seen as a fever with inappetance and lameness lasting just a few days with no lasting side effects, but they may then carry and excrete the virus for 9 months, infecting other species.
- Cattle are badly affected, with blistering of the hooves and mouth, especially the tongue. Although mortality is only 5-10%, damage from the disease often makes them uneconomic to keep. Recovered cattle will carry and re-excrete the virus for 24 months.
- Pigs are also badly affected and are great excretors and multipliers of the virus. Pig houses with roof vents create air-borne viral plumes.
- Transmission can be by clothes, boots, vehicles, movement of livestock, meat, vermin and wild birds, or with certain strains, by air. All livestock movements should cease. Infected premises should be sealed off.
- There are no serious human health issues. This is an economic disease.

Health and Safety

- All cloven hoofed livestock on the island, whether symptomatic or not, should be considered potentially infected and precautions taken to prevent further spread; see Annexes A to E.
- The appropriate Personal Protective Equipment must be worn before entering any livestock premises so that the operative can disinfect his/her person before leaving the premises; see Annexes A to E.
- Suitable precautions and restraints should always be taken when handling and inspecting livestock.

Control strategy – immediate action on suspicion

- On suspicion of an exotic notifiable disease, quarantine of affected premises is immediately declared by the Agricultural Authority. This is valid for 72 hours, after

which quarantine can be extended by the EDC for a period as determined necessary.

- Signs declaring quarantine with legal basis and warning tape applied to appropriate areas, especially entry points, to warn the general public.
- It is possible for humans to carry the virus for up to 2 weeks in the upper respiratory tract. Hence inspectors (as defined) to be designated as 'clean' or 'dirty'.
    - Dirty inspectors are those that have encountered the disease, and must not be used to examine healthy livestock or enter uninfected premises. This may include isolation form their own stock at home. They are used for all actions on infected premises.
    - Clean inspectors must not enter infected premises, and are used for the handling and surveillance of uninfected livestock, until such time as they encounter the disease when they become redesignated as dirty.
- Infected area also declared by the EDC, as defined in the Animal (Diseases) Ordinance. For a disease of high transmissibility, and in view of the island's small size, it is recommended that the whole island is declared an infected area to activate legal controls.
- All movements on and off the infected premises of people, goods and animals controlled and subject to permits issued by the Agricultural Authority.
- All livestock lands to be closed to the general public such as walkers, picnickers, conservationists, etc.
- Convene TCG without delay to consider which strategy to use. Choice of strategy depends on location of outbreak and degree of containment, species affected, whether leeward or windward side of island (regarding likely spread over following weeks), likely costs versus benefits, strain and availability of vaccine (once identified) and resource availability. Options are as follows:
    - No slaughter policy with no vaccination. This may be considered if the whole island is already affected, which with virulent strains in favourable conditions could occur within days. The pattern of outbreaks will permit predictions for this scenario beyond the symptomless incubation period. It provides for maximum conservation of livestock, and slaughter can be confined to seriously affected animals, but for welfare reasons.
        - This works on the basis that there are no meat export markets to protect, and there is low mortality.
        - But it accepts that FMD becomes endemic on the island, because of its prolonged carrier status.
        - The sheep, goat production will be little affected (mortality rate virtually 0% in adults). Cattle and pigs mortality approx. 5% but production may be badly affected.
        - Could lead on to long term vaccination policies for control.

- No slaughter policy but with vaccination (see below). This may be considered in the short term to inhibit spread if the area affected is contained but likely to escape and spread in time. It is also a long term policy.
    - Slaughter only as with 1. above (welfare).
    - Vaccination as with 4. below (ring and/or island wide vaccination).
    - Conserves maximum amount of stock, minimises costs and losses, and protects all other stock from infection. Infected premises however would have to remain under strict controls indefinitely, or until proven clear of carriers by sequential blood testing.
- Slaughter policy with no vaccination: slaughter of infected premises +/- adjacent premises. This may be considered if it is the known primary case and it is well contained. Lack of vaccine availability, and delay in strain identification may force this policy. As an island wide policy, although it would be the default option for the European Union (EU), the following needs strong consideration:
    - Consider cost and practical consideration such as disposal of carcasses
    - Consider loss of domestic production potential and genetics with difficulty to replace stock
    - Consider need. Is there a need? Slaughter without vaccination is to protect export markets and prevent interference with laboratory surveillance tests.
    - In addition the slaughter of sheep and goats is to protect the infection of cattle and pigs by carriers. Consider relative merit of protecting cattle and pigs over sheep, when sheep and goats are barely affected
    - Consider also that small size of island means difficult containment of the disease, so that the policy of slaughter once adopted may start to extend island wide, resulting in heavy costs and losses, and ultimately loss of home production, loss of local income, loss of genetics, and increased expenditure on meat imports.
- Slaughter policy with vaccination: slaughter of infected premises +/- adjacent premises, bolstered by ring vaccination and whole island vaccination. This may be considered if the strain is slow and patchy to spread, possibly dependent on renewed outbreaks from carriers, but is dependent in the short term on laboratory identification of strain and vaccine availability.
    - Sourcing of vaccine to be researched immediately. This may be strain dependent, and therefore dependent on laboratory confirmation, but sources can be prepped.

        - Ring vaccination – the vaccination of adjacent premises – is unlikely to be adequate considering the nature of the terrain and the prevalence of wild birds etc, except as the most immediate measure for containment. However vaccination does not get ahead of the incubation period, or prevent infection once it has begun to incubate. Therefore whole island vaccination is recommended.

(For guide on vaccination see Appendix H: Vaccination Data)

- Other areas of potential infection to be identified and monitored over the subsequent incubation period. This to include all adjacent livestock carrying premises and all 'dangerous contacts' (premises of visitors to infected premises, moved vehicles, machinery and equipment etc). Even if a vaccination policy is chosen, there will be considerable delay before the vaccine is deployed to protect other livestock.
- FAO reference laboratory to be contacted in first instance for advice on sample taking, and arrangements made for confirmation of diagnosis through sampling. Meanwhile if presumptive diagnosis is made on symptoms, then full precautionary measures should be taken despite lack of scientific corroboration (Note: this is the practical approach as laboratory confirmation will always be too slow to come).
- Export of meat to Ascension prohibited.
- Notification of SILVER.

Control strategy

Main strategy

- Containment programme initiated in outbreak area.
- Strategy for containment to be decided in first instance by TCG, with options and pros/cons as itemised above.
    - No slaughter with no vaccination.
    - No slaughter with vaccination.
    - Slaughter with no vaccination.
    - Slaughter with vaccination.
        - Ring vaccination.
        - Island wide vaccination.
- All inspectors deployed on infected premises designated as 'dirty'.
- Where suspicion is raised of a possible outbreak – a 'report case' - visits made by 'clean' inspectors. If disease presence confirmed on the basis of symptoms, clean inspectors redesignated as dirty inspectors.
- Island wide surveillance of stock, prioritising adjacent premises and dangerous contacts.

- Where island wide vaccination decided upon, start with ring vaccination around the primary and subsequent outbreaks as the most susceptible to infection.
    - Targeted implementation period: 2 weeks from receipt of vaccine. Speed is of the essence hence recruitment of extra vaccination teams in advance of receipt of vaccine.

Biosecurity

- Procedures are outlined in the Annexes as follows:
    - Annex A. Procedure for Management of Livestock Premises to Prevent Infection.
    - Annex B. Procedure for Site Visit on Suspicion of FMD (a 'report case')
    - Annex C. Procedure for Establishing Infected Area and Quarantine Area.
    - Annex D. Procedure for Treatment and Control of Infected Livestock.
    - Annex E. Procedure for Disinfection of Livestock Premises.
    - Annex F. Procedure to be followed by ANRD personnel if vaccination strategy employed.
    - Annex G. General Biosecurity Measures to be Followed.
    - Annex H. Vaccination Data.

Communication

- Inform TCG
- Updating Council Committee on a weekly basis and when extension of quarantine is required.
- Updating Director of ENRD as and when necessary on the progress of the programme.
- Updating the Chief Secretary as and when necessary on the progress of the programme.
- Press releases issued:
    - Precautionary press release: Simple measures to prevent the spread with a list of symptoms included in all press releases henceforth.
    - Confirmation of FMD press release.
    - Update press releases
- Radio interviews held to accompany press releases.
- SVO to log onto and advise OIE.
- SVO to advise Defra.

Equipment and Resources

- See resources required under the Plan's Procedures in Annex A to H.

Annex A. Procedure for Management of Livestock Premises to Prevent Infection.

This procedure is for all livestock owners.

- Set up a footbath such as a bucket or washing up bowl filled with disinfectant at all entry points into premises. Check that disinfectant is appropriate for the destruction of the microorganism. Dip your feet on the way in and on the way out to create a barrier to germs. Ideally spray vehicle wheels when leaving with a knapsack sprayer.

- All movements of livestock, trailers, cattle boxes and any other equipment associated with livestock to be put at a standstill island wide, except under licence from the Agricultural Authority.

- Secure all fences and gates. Move stock internally away from neighbouring stock wherever practically possible to avoid nose-to-nose contact.

- Have a dedicated set of boots and overalls for your livestock which never leaves your property.

- Wash your hands after handling livestock.

- Discourage visitors to your premises and avoid visiting other livestock premises.

- Report any unusual symptoms to the Veterinary Section at ANRD on 24724. Symptoms affect multiple animals and may include all or some of these:
    - Lameness
    - Salivation
    - Visible blistering on the lips, tongue and around the coronary band of the hooves
    - Scabbing in the same areas
    - Loss of appetite (due to fever)
    - Extensive morbidity – looking depressed, poor coat, reluctance to move
    - Low death rate (5-10% in cattle)
    - Flocks of sheep fail to ‘come to feed’

Annex B. Procedure for Site Visit on Suspicion of FMD (a 'report case')

This procedure is for authorised ANRD staff.

- ANRD receives notification of suspicious symptoms in livestock.
- ANRD vehicle is parked off the premises.
- PPE to be employed before entering premises. This is not only to prevent infection being taken off the premises, but to prevent authorised staff carrying infective agents between livestock units during inspections:
    - Reusable waterproofs, sprayed with a recommended disinfectant (eg Sorgene or Virkon) once on.
    - Rubber boots
    - Gloves: 2 layers of latex examination gloves
    - Dust mask
    - Safety glasses
    - Outer layer of disposable paper suit with hood to be deployed over waterproofs
- Foot bath containing recommended disinfectant (eg Sorgene or Virkon) placed and used by all staff entering premises.
- Minimise equipment taken onto premises.
- Any paperwork to be placed in a sealable plastic bag with a pencil. This can be dipped on the way back out. To disinfect the paperwork prior to opening, use a microwave.
- Mobile phones to be placed in a sealable plastic bag. These are not to be taken out on the premises, but used through the protection of the plastic bag. The bag can be dipped on the way back out.
- Owner of the livestock may be present during the visit and is required to use the footbath, but not to put on PPE. If the case proves positive, the owner and resident family will have their movements restricted as they will be living on the infected premises.
- Visual examination of the livestock for symptoms; move the stock to ascertain reluctance to stand, walk, and degree of lameness, as well as general appearance and demeanour.
- Physical examination of suspect cases for blisters and/or ulcerated areas on the feet, nose, mouth and tongue, and for fever.
- If FMD is suspected, the Procedure for Treatment and Control of Affected Livestock (Annex D) is implemented.
- In all cases on leaving the premises, a disinfection routine is followed, as outlined in the following points.
- At the entrance before leaving the premises:

  - Paper suits and all other disposable PPE are removed and bagged for incineration. The bag is sealed and sprayed with a recommended disinfectant externally, then placed in the back of the vehicle for incineration
  - Wetsuits are sprayed with a recommended disinfectant (eg Sorgene or Virkon) before taking them off.
  - All equipment is sprayed, washed or dipped with a recommended disinfectant (eg Sorgene or Virkon). This includes bagged paperwork and bagged mobile phones.
  - All staff must pass through the footbath. Rubber boots are not removed until they have passed through the foot bath. The tread of each boot should be picked clean of mud and debris before entering the footbath. A hoofpick or nail may be useful. A brush should be employed to further scrub the surfaces and remove all organic contamination.
- All other protective clothing is removed and placed in the back of the vehicle before leaving the site, and washed in the ANRD washing machine immediately on arrival at ANRD.
- If FMD suspected, all authorised personnel who entered the premises are redesignated as dirty, and must no longer be used to inspect clean livestock. In addition they must not attend or approach their own livestock but delegate to other family members (Note: it is believed humans can carry FMD virus in the back of the throat for up to two weeks).
- If FMD suspected, all neighbouring premises with livestock to be inspected by clean inspectors. Any neighbour with livestock that have nose-to-nose contact with infected livestock must be assumed to be infected (Note: no or few diagnostic symptoms will be seen in the incubation period).

Annex C. Procedure for Establishing Infected Area and Quarantine Area.

This procedure is for authorised ANRD staff once FMD has been confirmed in premises.

- SVO or a designated member of the Technical Group decides whether a Quarantine Area and/or Infected Area is to be declared.
- Both Quarantine and Infected Area designation applies for up to 72 hours as decided necessary by the Agricultural Authority.
- Beyond 72 hours both Quarantine Area and Infected Area designation requires formal approval by EDC and public gazetting, and is for any specified period as determined by Committee on advice of the Agricultural Authority.
- The procedure is the same for both:
    - ANRD vehicle is parked off the premises.
    - The entrance ways are marked and taped using “Biosecurity” tape and appropriate signage.
    - Check the perimeter for old gateways, footpaths etc and mark accordingly.
    - Signage states: Infected Area or Quarantine Area; NO ENTRY UNTIL FURTHER NOTICE, legal basis, contact details, and date of enforcement, authority under which it is declared.

Annex D. Procedure for Treatment and Control of Infected Livestock.

This procedure is for authorised ANRD staff in quarantined premises. The procedure is dependent on control strategy decided by the TCG: slaughter, vaccination, or a combination of both.

- ANRD vehicle is parked off the premises.
- PPE precautions etc as in Annex B.
- Foot bath containing recommended disinfectant to be in place and used by all staff entering premises to precoat their boots.
- Any culling is to be carried out by authorised ANRD staff.
- Culling to be done by an approved method.
- Disposal of dead livestock to be determined, dependent on quantity and location. Factors to be determined are whether to dispose on site (by burial/incineration) or off site. The latter involves more risk of spreading infection, but might be necessary for practical reasons.
- If carcasses are to be taken off site, all possible precautions should be taken to prevent spread of infection, such as spraying the carcasses before removing, spraying the carrying area of the vehicle, and making sure the vehicle is leak proof.
- If stock is not to be culled, symptomatic treatment may be employed, such as the provision of oral electrolyte rehydration fluids, NSAIDs, and antibiotics for secondary infection of ulcerated areas where appropriate.
- Bags are knotted and sprayed with disinfectant before leaving the premises, and disinfected bags, are placed in the vehicle and taken to the incinerator for immediate incineration.
- The vehicle is disinfected with a recommended disinfectant once all bags have been removed.
- Procedure for leaving the premises as in Annex B and to be strictly adhered to.

Annex E. Procedure for Disinfection of Livestock Premises.

This procedure is for infected premises, where a complete cull strategy is employed or on recovery of clinical cases where culling is not employed.

- The entire site is quarantined for 6 months or for a period as determined, during which only authorised personnel and licensed members of the public are allowed to enter.
- Drinking troughs, feeding troughs and any other husbandry equipment is sprayed with a recommended disinfectant, and placed outside to be fully exposed to UV.
- All faeces, bedding materials and other rubbish and debris should be burned on-site. Where this is not possible, ANRD will collect the material for disposal by incineration.
- All absorbent surfaces such as wooden panels and rails in livestock pens should be cleaned and sprayed but where not practical, stripped and burned.
- Any restocking after the lifting of quarantine should be monitored on a weekly basis for 4 weeks for possible recrudescence of the disease.
- If a policy of ‘sentinel restocking’ is employed, only a few animals should be allowed but deliberately deployed in the areas of previous infection, then monitored as above and/or blood tested after 4 weeks before declaring a full lifting of quarantine. (Sentinel stocking – the use of a small number of healthy sentinels to graze previously infected areas to determine the continued presence of virus, used to allow farms back into production at an earlier stage).

Annex F. Procedure to be followed by ANRD personnel if vaccination strategy employed

If vaccination is employed:

- Depending on availability of personnel, priority is given to adjacent uninfected premises, a process of ring vaccination.
- Next target large groups susceptible to major proliferation of the infective agent, such as commercial pig and cattle herds and sheep syndicates.
- Subsequently vaccinate all other cloven hoofed animals island wide.
- If a non-cull strategy is employed, consideration should also be given to vaccinating livestock on the infected premises, trying to 'get ahead' of the spread of infection.
- Procedure for entering and exiting the premises as in Annex B.
- All sharps to be disposed of with care in screw top plastic bottles or proper sharps containers, and bagged, disinfected and incinerated with all other materials as proscribed in Annex B.

Annex G. General Biosecurity measures to be followed.

This procedure is for all livestock owners and authorised personnel.

- Livestock vehicles, cars or trailers must be parked outside the premises, wherever possible, on hard standing away from farm animals and must be visibly free of animal excreta, slurry etc.

- It is recommended that livestock owners wear either clean non-disposable protective clothing or waterproof protective clothing and waterproof boots are worn.

- Livestock owners should discourage visitors, especially if they also have livestock.

- For authorised personnel, suitable protective clothing and footwear must be worn on all premises where visits include entering areas where livestock is present or has access. The purpose of the protective clothing and footwear is to prevent any contamination being carried from premises to premises. Procedures as in Annex B.

- All equipment used must be clean on arrival and on departure. Great care must be taken when cleaning electrical apparatus or tools. Where possible equipment should be protected from contamination e.g. using plastic bags. **Health and Safety rules must be observed.** Where equipment can be cleansed and disinfected this must be done before entry to the premises and again on departure. Because of this logistical challenge, equipment carried onto infected premises should be minimised to that which is strictly necessary.

- Sufficient water, disinfectant and disinfecting equipment should be taken on the visit, even if facilities for disinfecting clothes, footwear, equipment or vehicles are thought to be available on the premises.

Annex H. Vaccination Data.

- There are 7 strains and cross protection between vaccines is variable.

- However the latest FMD vaccines are purer and more potent than their forerunners and give at least partial protection even if the match is not perfect.

- Another aspect of modern vaccines is the speed at which protection is generated. Thus in cattle a single dose begins to protect by 4 days—although in pigs it takes longer, about 21 days.

- One often-mentioned drawback of vaccination strategies is the difficulty of establishing whether antibodies found are due to infection or vaccination. In fact, these two sorts of response can now be distinguished in the laboratory.

- Another concern is food safety. However, there is plenty of evidence that products from vaccinated (and even infected) animals are safe. In Continental Europe vaccination was for many decades the general policy to control the disease, before the slaughter policy was introduced in 1992; no human-health issues arose.

- Advances in vaccine technology, particularly the possible development of synthetic peptide vaccines that allow very rapid production in response to new strains, have strengthened the case for vaccination as the bedrock of control.

- However vaccination is not a trivial exercise. For sheep and cattle though a single dose is recommended for outbreak control, routine immunization requires a primary course of two doses 3-4 weeks apart, a booster at 4-6 months and thereafter an annual booster. For pigs the question of boosters depends on the husbandry and the time to slaughter.

- A vaccination programme will be most effective if it incorporates modern techniques of diagnosis— differential serology to distinguish vaccinated animals from those infected, and a rapid PCR-based test on the farm for current infection.

(Precis from *Foot and mouth disease: why not vaccinate?* J R Soc Med. 2001 Jun; 94(6): 263–264. Author John Beale)

Appendix C. Emergency Response Action Plan for Level 3 Disease

Level 3: disease has potential to become a problem for public health. Example used: Rabies

Legal provisions

- Animal Disease Ordinance Cap. 96, 2001 (as amended).
    - Emergency powers as the Agricultural Authority for infected area, quarantine area declaration and others.
    - Declaration of Quarantine Area and Infected Area by Agricultural Authority for up to 72 hours, and subsequently by EDC for period as determined necessary.
    - Agricultural Authority is advisory lead: 'Enforcement: 4 - Members of the Police Force and Inspectors appointed under this Ordinance shall, subject to the general directions of the Agricultural Authority, enforce the provisions of this Ordinance and of every regulation made thereunder.'
    - 6 - The Agricultural Authority and an Inspector shall have, for the purposes of this Ordinance, all the powers which a policeman has under this Ordinance.
- Customs Ordinance (Import and Export Control Regulations) Cap. 145.
    - Control on movement of imports and exports of animals and food of animal origin.

Financial provisions

- Operational costs shared by relevant services: ANRD, police, public health.
- Extra contingency costs will have to be met by central government.
- No legal provision for compensation for loss of animals.

Chain of command

- ANRD is the lead agency, the Agricultural Authority is Head, ANRD.
    - SVO is the recognised Expert, leading and informing the Technical Group coordinating the operational plan.
    - Technical Group members include: BSO, ADO, LSO, representatives from Public Health.
    - The Field team work under the guidance of the Technical Group, and include: two VLAs and a Senior Field Worker.
    - Agricultural Authority to appoint additional 'Inspectors' as defined under the Animal (Diseases) Ordinance to carry out the provisions of the ordinance with regard to quarantine controls, surveillance, and arrests if necessary, depending on scale and extent of problem.

- The scale of and extent of the operation may involve the training and recruitment of additional technical staff on advice from the Technical Group.
- ANRD to advise Director of Public Health.
- ANRD to advise Chief of Police.
- ANRD to notify Silver.
- Silver to notify Gold.
- ANRD to advise and cooperate with police to enforce quarantine restrictions such as road blocks to control movements of vehicles and people, and to make arrests if necessary.
- ANRD to advise and cooperate with police to search for suspect animal(s). This will involve the use of marksmen.

Operational Plan

Key facts:

- Rabies is a highly fatal viral encephalomyelitis with 100% mortality in affected animals and humans.
- Symptoms of the disease usually appear within 3-8 weeks of infection, but can be within 1 week or as long as 1 year. 1 year should therefore be taken as the cut off period for no new cases.
- There are 3 phases: (i) *prodromal phase*– a change of behaviour and temperament characterised by restlessness, snapping at imaginary objects, and inappropriate vocalisation. 2-3 days. (ii) *furious phase* – easily excited, attempt to bite or ingest anything including solid objects, self mutilation, seizures, inability to swallow, drooling, incoordination. 3-4 days. (iii) *paralytic* or *dumb phase* - death through respiratory arrest. 2-4 days.
- The virus is spread through the saliva of infected animals, therefore principally via bites but also via exposure of scratches, open wounds, or mucous membranes with saliva or infected tissues (brain or spinal cord). Note: importance during post mortem procedures or sample collection.
- The virus is NOT spread by blood, urine or faeces, or by petting or touching a rabid animal.
- The virus does not persist in the environment.
- Bats spread another strain of rabies, lyssavirus, with the same symptoms and outcome. Although there are no bats in St Helena, because of the prolonged incubation period this may still be the source of an on-island case in either humans or imported animals.
- Statistically bats and dogs are the main sources of cases of rabies in humans.

- All mammals can be affected, but dogs are effective spreaders of the virus as they have a tendency to run around biting anything that moves. This includes livestock.
- Biting other dogs propagates the situation, but with long time delays because of the incubation period. Hence it is imperative that all pet dogs are kept in until the situation is resolved.
- There are serious human health issues.

Health and Safety

- No attempt should be made to approach suspect dogs. All stray and straying dogs should be shot on sight by the appropriate personnel on the basis that all pet dogs are confined at home. Announcements using media to this effect should be made on a regular and frequent basis.
- Any dead mammals found should be handled as suspect, as the end result of infection is death.
- Any personnel handling dead mammals, whether shot or as found, should be suitably trained, and the appropriate Personal Protective Equipment worn to protect mucous membranes.
- No personnel with fresh or healing wounds should be permitted to handle such dead mammals.
- Special attention should be given to avoiding contact with saliva or central nervous tissue (especially if the animal has been killed with a head shot).
- Collection of samples for definitive diagnosis should be by qualified personnel only.

Control strategy – immediate action on suspicion

- Three main scenarios:
    - If the suspect animal is still under control, it should be immediately euthanased in the safest way possible. This may require the use of a free bullet so that direct handling is avoided. Owner and other local residents must isolate themselves within a secure room until the threat is dealt with. (Note: secondary cases of infected livestock are easier to handle and pose less threat, so that a captive bolt pistol can be used).
    - If the suspect animal is not under control, but its location is known, all persons in the area should be instructed to stay indoors and access roads blocked until police marksmen remove the threat.
    - If the suspect animal is not under control, and its location in unknown, all persons should be instructed to stay indoors until the threat is eliminated. See suggested *Threat Elimination Strategy* in next section.
- In all cases, once the animal has been destroyed it should be double bagged, the bags sealed and disinfected, and then the area disinfected.

- All contacts of this animal, bearing in mind the duration of symptoms, should be monitored.
- Any animals that have been bitten should be euthanased.
- Other pet dogs in the household should be euthanased, even if bite marks are not visible, as they present too high a risk for future development.
- Pet cats in the household present a low risk because of their nature and need only be monitored, unless they have clearly sustained a bite.
- Prophylaxis for the animal's owner and any other dangerous human contacts should be considered as a precaution, depending on history and circumstances, as it can be highly effective at preventing onset. See Appendix A, Post Exposure Prophylaxis (PEP).
- FAO reference laboratory to be contacted in first instance for advice on sample taking, and arrangements made for confirmation of diagnosis through sampling. Meanwhile if presumptive diagnosis is made on symptoms, then full precautionary measures should be taken despite lack of scientific corroboration (Note: this is the practical approach as laboratory confirmation will always be too slow to come).
- If the premises of origin has livestock, quarantine signs should be placed at appropriate entrance points and all animal movements prohibited until further notice, unless under licence to the slaughter house.
- Consider slaughter of all such livestock, depending on numbers and history of the case.
- EDC to be convened and appropriately advised for continuance of quarantine.
- The virus does not persist in the environment and is highly susceptible to UV light, desiccation and disinfectants, so the property itself and objects on it are not a source of further infection.
- Source of infection to be back tracked without delay. If the animal was imported, it was probably the primary case. If not imported, the primary case and all dangerous contacts to be sought. This may be a previously unexplained death, but because of the prolonged incubation period of the disease, all other associated potential cases need to be established for monitoring.
- Announcements to be made using all forms of media that all pet dogs must be kept in with immediate effect, and that any stray or straying dogs will be shot on sight until further notice.
- Human antiserum and vaccine to be ordered immediately and brought in on the next available flight (see Appendix A).
- Convene TCG without delay to consider strategies.
- Export of all pets suspended with immediate effect.
- All pet imports to be fully vaccinated against rabies at least 21 days before travel.
- Notification of SILVER.

Threat Elimination Strategy – when location of infected animal unknown

General considerations:

- For this to occur, the animal is in the furious phase.
- A dog in this phase can cover vast distances, so the whole island is under threat.
- Declare the island an infected area to empower the authorities under the Animal (Diseases) Ordinance and Regulations Cap. 96.
- The animal will reach the non-threatening paralytic phase in less than 4 days.
- The period of threat to the general public from this case if therefore 2-4 days. After that the animal is approachable, or dead.
- The longer it is before the animal is located, the more it may have infected other mammals, including livestock.
- Despite this, however, and the prolonged incubation period, livestock represent a minimal public health threat since, even if they develop symptoms in the future, they do not attempt to bite other mammals. The main threat would be through handling mouths and getting covered in saliva because the animal is unwell and being examined and/or drenched.
- The main threat is other dogs, hence all pet dogs to be confined at home, all stray or straying dogs to be shot on sight.
- All humans to stay inside at their place of work, school, or home, or inside their vehicles while in transit. All outdoor work to be temporarily suspended until the threat has passed (4 days or less if animal shot).

Locating the affected animal:

Two possible strategies:

- Search parties with marksmen. However, a rabid dog is ferocious and illogical in its attack. Serious consideration should be given as to whether the use of search parties would endanger human lives as once the animal is located it is likely to attack at speed. Each member of a search party would also have to be armed not just for the cull, but for self defence against an attacking rabid animal, and this creates another level of threat, the uncontrolled discharge of a firearm in a panicked situation.
- The safer alternative is to use the eyes of the general public, and have a team of fully briefed marksmen on standby. Any sighting to be reported and to be attended to immediately. This is a more controlled situation and is time limited, as the animal will become paralytic anyway in a matter of days.

Control strategy

- Only the affected animal is a current threat to the general public, but consideration has to be given to the development of future cases as a result of bites received and the prolonged incubation period.

- Hence, a shoot to kill policy for all stray and straying dogs. They pose no threat to the shooter unless symptoms have developed.
- Vaccinate all dogs against rabies. Vaccination is cheap and very effective. While this does not prevent the development of the disease (though it may help), it will prevent the creation of still more cases should another case develop symptoms and run loose.
- Monitor all possible dangerous contacts such as livestock or dogs on neighbouring properties.
- Assess reason for breach in biosecurity and take appropriate steps.

Biosecurity

- Procedures are outlined in the Annexes as follows:
    - Annex A. Post Exposure Prophylaxis (PEP).
    - Annex B. Procedure for Site Visit if Suspect Case Known to be Present.
    - Annex C. Procedure for Establishing Infected Area and Quarantine Area.
    - Annex D. Procedure for Control of Infected Livestock.
    - Annex E. General Biosecurity Measures to be followed.

Communication

- Inform TCG
- Inform Public Health
- Inform Police.
- Updating Council Committee on a frequent basis and when extension of quarantine is required.
- Updating Director of ENRD as and when necessary on the progress.
- Updating the Chief Secretary as and when necessary on the progress.
- Press releases issued:
    - Initial press release: All people to stay indoors or within their vehicles. All open air activities to be suspended until further notice (a maximum of 4 days or less if the suspect case is eliminated). All pet dogs to be confined at home. All stray and straying dogs to be shot on sight. No one to approach a stray or straying dog, but to inform the police immediately.
    - Confirmation of rabies press release.
    - Update press releases.
- Radio interviews held to accompany press releases.
- SVO to log onto and advise the World Organisation for Animal Health (OIE).
- SVO to advise Defra

Equipment and Resources

- See resources required under the Plan’s Procedures in Annex A to E.

Annex A. Post Exposure Prophylaxis (PEP)

This procedure is for all humans who have had any form of dangerous contact with the affected animal:

1. Scrub wound vigorously with soap and water for 15 minutes – considered one of the best preventatives of all.
2. Treatment regimens:
    A. Non-vaccinated victims:
        i. Immunocompetent – 4 dose schedule:
            a) Human rabies immunoglobulin (HRIG)
            b) Rabies vaccine days 0, 3, 7, 14.
        ii. Immunocompromised – 5 dose schedule:
            a) Human rabies immunoglobulin (HRIG)
            b) Rabies vaccine days 0, 3, 7, 14, 28.
    B. Fully vaccinated victims:
        i. HRIG not necessary.
        ii. Rabies vaccine days 0, 3.

(Ref: Professor Radford Davis DVM, MPH, DACVPM, Ohio State University, USA. For latest information refer to WHO http://www.who.int/rabies/human/postexp/en/)

Annex B. Procedure for Site Visit if suspect case known to be present.

This procedure is for authorised ANRD staff and marksman.

- ANRD receives notification of suspect case.
- ANRD vehicle is parked off the premises.
- Foot bath containing disinfectant to be in place and used by all staff entering premises to precoat their boots.
- Number of personnel entering premises to be minimal.
- Any paperwork to be placed in a sealable plastic bag with a pencil. This can be dipped on the way back out. Paperwork can be microwaved if there are concerns about contamination.
- Mobile phones to be placed in a sealable plastic bag. These are not to be taken out on the premises, but used through the protection of the plastic bag. The bag can be dipped on the way back out.
- ANRD personnel to carry dog restrainer, as method of last resort.
- PPE to be employed before entering premises. The virus is not spread via contact so full PPE not necessary. Protection should be aimed at minimising the effect of a bite.
    - Heavy waterproof jacket covering torso and arms
    - Rubber boots to cover shins and calves
    - Thick gloves such as leather gloves/welding gloves
    - Full length trousers covered with waterproofs
- Ideally animal should not be approached, but culled with a free bullet.
- Dog restrainer to be employed only where circumstances dictate, for example dog may be on a chain but need steadying. However personnel must not be put at risk.
- Kit required for handling and removal of culled animal.
    - Heavy duty clinical waste bags
    - Gloves: 2 layers of latex examination gloves
    - Dust mask
    - Safety glasses
    - Disinfectant
    - Bucket
    - Spray
- Once culled, animal to be handled minimising contact with mouth and saliva, or any brain matter.
- ANRD personnel to put on extra PPE for handling the cull.
- Animal to be double bagged, each bag to be sprayed with disinfectant.
- Area of cull to be washed down with standard disinfectant.

- Any other areas such as kennels, feed bowls etc to be washed or sprayed with disinfectant.
- In all cases on leaving the premises, a disinfection routine is followed, as outlined in the following points.
- At the entrance before leaving the premises:
    - All other disposable PPE are removed and bagged for incineration. The bag is sealed and sprayed with a recommended disinfectant externally, then placed in the back of the vehicle for incineration
    - Waterproofs are sprayed with disinfectant before taking them off.
    - All equipment is sprayed, washed or dipped with disinfectant. This includes bagged paperwork and bagged mobile phones.
    - Rubber boots are not removed until they have been dipped and rinsed in disinfectant. The tread of each boot should be picked clean of mud and debris. A hoofpick or nail may be useful. A brush should be employed to further scrub the surfaces and remove all organic contamination.
- All other protective clothing is removed and placed in the back of the vehicle before leaving the site, and washed in the ANRD washing machine immediately on arrival at ANRD.
- Disinfected bags are placed in the vehicle and taken to the incinerator for immediate incineration.
- The vehicle is disinfected with a recommended disinfectant once all bags have been removed.

Annex C. Procedure for Establishing Infected Area and Quarantine Area.

This procedure is for authorised ANRD staff once FMD has been confirmed in premises.

- SVO or a designated member of the Technical Group decides whether Quarantine Area and/or Infected Area is to be declared.
- Both Quarantine and Infected Area designation applies for up to 72 hours as decided necessary by the Agricultural Authority.
- Beyond 72 hours both Quarantine Area and Infected Area designation requires formal approval by EDC and public gazetting, and is for any specified period as determined by Committee on advice of the Agricultural Authority.
- The procedure is the same for both:
    - ANRD vehicle is parked off the premises.
    - The entrance ways are marked and taped using “Biosecurity” tape and appropriate signage.
    - Check the perimeter for old gateways, footpaths etc and mark accordingly.
    - Signage states: Infected Area or Quarantine Area; NO ENTRY UNTIL FURTHER NOTICE, legal basis, contact details, and date of enforcement, authority under which it is declared.

Annex D. Procedure for Control of Infected Livestock.

This procedure is for authorised ANRD staff. These are cases that might subsequently develop up to a year after the primary case in a dog, if it had entered the furious phase and roamed freely.

- ANRD vehicle is parked off the premises.
- PPE precautions etc as in Annex B.
- Foot bath containing recommended disinfectant to be in place and used by all staff entering premises to precoat their boots.
- Handling of animal's mouth to be minimised.
- Any culling is to be carried out by authorised ANRD staff.
- Culling to be done by an approved method.
- Culling involves a head shot – brain matter should be treated as potentially infective via mucous membranes, cuts and wounds.
- Disposal of dead livestock to be determined, dependent on location. Factors to be determined are whether to dispose on site (by burial/incineration) or off site. The latter might be necessary for practical reasons.
- If carcasses are to be taken off site, all possible precautions should be taken to prevent spread of contamination, such as spraying the carcasses before removing, spraying the carrying area of the vehicle, and making sure the vehicle is leak proof.
- Bags are knotted and sprayed with disinfectant before leaving the premises, and disinfected bags are placed in the vehicle and taken to the incinerator for immediate incineration.
- The vehicle is disinfected with a recommended disinfectant once all bags have been removed.
- Procedure for leaving the premises as in Annex B are to be strictly adhered to.

Annex E. General Biosecurity measures to be followed.

- For authorised personnel, suitable PPE must be worn as described. The purpose of the protective clothing and footwear with rabies is largely to protect personnel from infection, as this virus is otherwise not spread by routine contact. Procedures as in Annex B.

- All equipment used must be clean on arrival and on departure. Great care must be taken when cleaning electrical apparatus or tools. Where possible equipment should be protected from contamination e.g. using plastic bags. **Health and Safety rules must be observed.** Where equipment can be cleansed and disinfected this must be done before entry to the premises and again on departure. Because of this logistical challenge, equipment carried onto infected premises should be minimised to that which is strictly necessary.

- Sufficient water, disinfectant and disinfecting equipment should be taken on the visit, even if facilities for disinfecting clothes, footwear, equipment or vehicles are thought to be available on the premises.

Appendix D. Veterinary equipment and PPE to be held within ANRD

Minimum essential PPE stock levels to be held at level 1

ITEM	MINIMUM STOCK HOLDING (REVIEW AS RISK LEVEL VARIES)
Disposable coveralls (Medium to L)	50
Gloves (small, medium, large)	25 pairs of each
Face masks	50
Overboots (pairs)	50 pairs
Protective spectacles	25
Gauntlets	1 pair L, 1 pair XL

Other items

ITEM	MINIMUM STOCK HOLDING (REVIEW AS RISK LEVEL VARIES)
Alcohol hand scrub	1
Surgical scrub	5l
Bleach	5l (neat)
Virkon disinfectant	Powder or tablets to make 50 l
Clinical waste bags (yellow)	50 (double bagging policy)
Euthanase	500ml
Chloroform	1l
Skolene	100mls
Syringe needles, 1 inch	100
Syringe needles, 1.5 inch	100

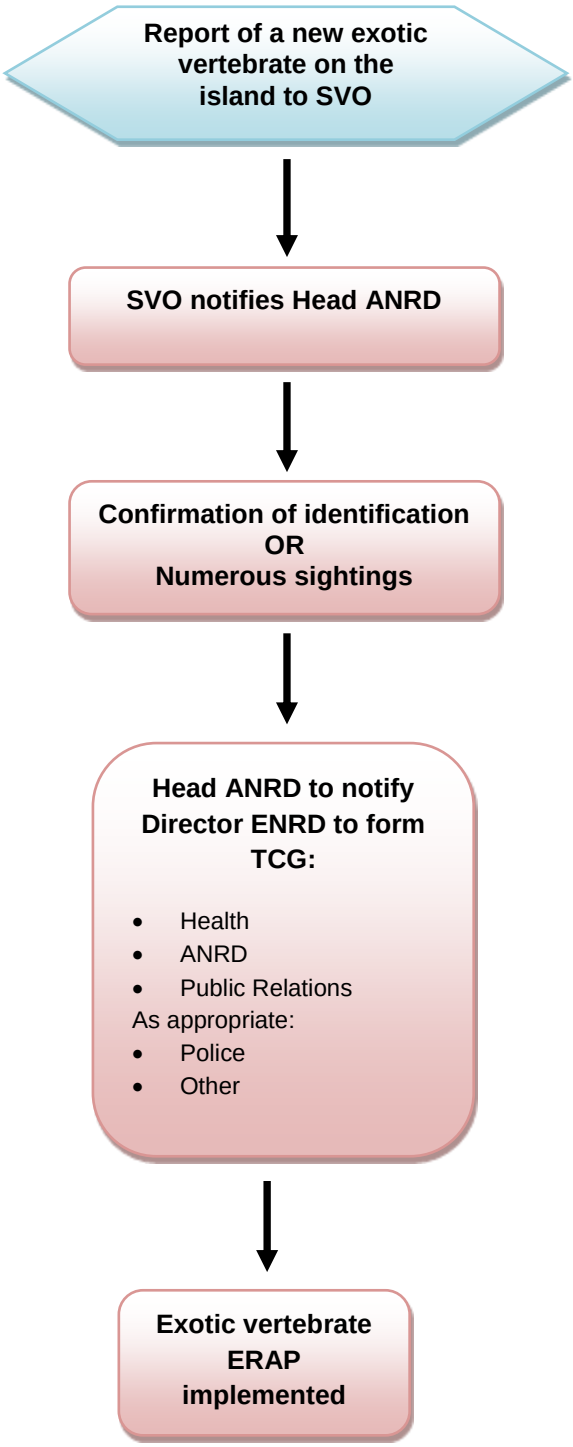
2. Zoosanitary risks – Exotic Vertebrate

Speed sheets for use in respect of a high risk case being identified by the Biosecurity Team

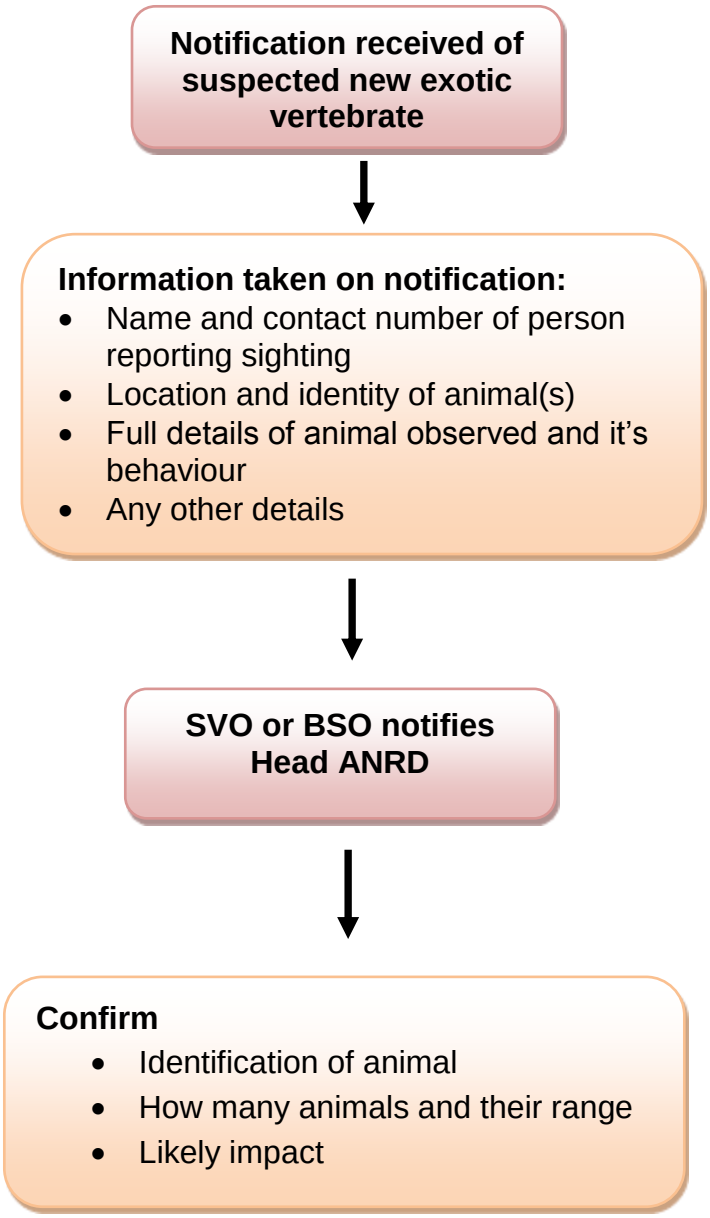
1. **Suspected case of introduction of an exotic vertebrate on the island**
2. **Veterinary team actions speed sheet**

Follow the process as per the sheet then refer to the main plan for further information.

1. SUSPECTED CASE OF A NEW EXOTIC VERTEBRATE



2. VETERINARY TEAM ACTIONS SPEED SHEET



Information

The introduction of a new exotic (ie not known to occur on the island) vertebrate to the island is potentially very harmful both to other animals and to public health. It is concerned with the first detection of a new potentially invasive species to St Helena, and not with the containment, management or eradication of a known established invasive species.

Invasive species of concern are those which are:

- Not native to St Helena;
- Likely to survive on St Helena;
- Able to spread by human mediated or natural means;
- Likely to become a pest or nuisance to social, environmental or economic values.

It is important to note that not all introduced species will survive to reproduce, spread, or become a pest. Therefore, once identification has been confirmed a rapid risk assessment is required to determine the likelihood of the species becoming a pest, noting that the best predictor of undesirable invasive characteristics is that the species has become a pest elsewhere.

Mammalian species can host diseases and parasites which could spread to other animals and, in some cases, to people. The most extreme example of this would be rabies, carried mainly by members of the dog family, which would have a drastic impact on public and animal health, as well as a knock-on negative impact on tourism. Birds can host diseases and parasites which could impact poultry and also affect the endemic Wirebird.

Introduced exotic vertebrates could also affect people, animals and wildlife though predation or attacks. This is particularly of concern for introduced carnivorous mammals and reptiles such as snakes with the high associated public health concerns. Introduced amphibians and reptiles such as lizards or skinks are of concern due to the potential for predating St Helena's unique endangered invertebrate fauna.

This plan seeks to mitigate risk by early identification of cases which are considered to be high risk. Intervention points have been identified at notification of a suspected case in order to minimise risk to the wider population.

.

Intention

Working with multi agency partners, utilising a risk based approach SHG will seek to:

- Protect life
- Protect the agricultural economy of the island

- Undertake measures to minimise the risk of spread of a contagious animal disease outbreak
- Warn and inform the public as to the risk providing reassurance to maintain confidence in the SHG response
- Ensure the restoration of normality as soon as possible

Method

All members of the St Helena community are responsible for reporting any unusual sightings. Reports can be made to the Police, organisations such as the National Trust or Tourism, or directly to SVO or the BSO.

Levels of Response:

Two trigger levels which determine the action and response have been identified, to help assess the risk to St Helena and inform action that may be required.

Suggested actions are listed against each level for guidance purposes. The response will need to fully take account of the developing threat and risk so as to ensure actions are proportionate and effective and be compatible with broader SHG strategic intentions.

Level 1

High risk of establishment or impact: no or minimal public health risk Example: lizard, bird (any species)	
Suggested Actions	**Further Considerations**

• Containment of affected premises / area, if possible
• Implementation of specific plan and any associated protocols
• Raise awareness with key stakeholders
  ○ Farmers Association
  ○ Tourism
  ○ Other as appropriate
• Continued horizon and environmental scanning
• Review information and intelligence updates daily
• Implement additional border control procedures, as appropriate
• Public reassurance / warning and informing
	• Risk of spread within St Helena
	• Command Structure
	• Review membership of the TCG
	• Pre deployment of PPE to affected area
	• Review supplies of PPE and reorder as necessary
	• Requests for international assistance

Level 2

High risk of establishment or impact: potential associated public health risk Example: jackal, tree snake, parrot	
Suggested Actions	**Further Considerations**

• Containment of affected premises / area
• Activate Command Structure
• Activate Major Incident Plan
• Hold IEG, Strategic and Tactical Coordination Meetings
• Implementation of specific plan and any associated protocols
• Raise awareness with key stakeholders
  o Police
  o Public Health
  o Tourism
  o Farmers Association
  o Other as appropriate
• Continued horizon and environmental scanning
• Review information and intelligence updates daily
• Implement additional border control procedures, as appropriate
• Public reassurance / warning and informing
	• Risk of spread within St Helena
	• Review membership of the TCG
	• Requirement to establish a Tactical Coordination Centre
	• Need to establish Strategic Coordination Group and IEG
	• Pre deployment of PPE to affected area
	• Review supplies of PPE and reorder as necessary
	• Requests for international assistance

Emergency response action plans

The emergency response action plan is generic and covers the introduction of new vertebrate species in general. Specific emergency response action plans provide the details required for different taxonomic groups:

Appendix A. Emergency response action plan for exotic vertebrate pest

Administration

This plan will be administered by the Emergency Planning Officer. This will include review and updates as the situation develops.

Command and Control

A command and control structure will be implemented to support this plan

Gold: Chief Secretary

Silver: Chair TCG: Chief of Police

Tactical Coordination Group Membership:
Agriculture: Head of ANRD, Director of ENRD, Senior Veterinary Officer, Biosecurity Officer
Communications: Chief Public Relations Officer
Health: Director of Health, Senior Medical officer, Environmental Health
Police: Chief of Police
Port Authority: Harbour Master / Head of Customs
Shipping Agents: Solomons General Manager (Agencies)
TA: Emergency Planning Manager

The Tactical Coordination Group (TCG) will meet on an ad hoc basis until such point as the increase in risk rises. At this point consideration should be given to membership of the TCG and as to whether a Tactical Coordination Centre should be established. Consideration should also be given, based on the risk as to whether a Strategic Coordination Group meeting should be held and if necessary extended to include an Incident Executive Group.

Business Continuity Management
The level at which public services will operate will be a strategic decision made by Gold. Critical business activity will need to be identified in advance of an escalation of threat and consideration given as to how these services will be maintained.

Personal Protective Equipment (PPE)
Any decision to deploy PPE will be made by the Silver Commander and will be based on an appropriate risk assessment to the threat posed. This may include the pre deployment of 'go boxes' to strategic locations as a result of an increase in the threat and subsequent change to the response level. Veterinary equipment and PPE held at ANRD is given in Appendix B.

Waste Management
The World Health Organisation has produced guidance in relation to the management and safe disposal of waste resulting from contact or potential contact with infected animals. This guidance should be applied both within healthcare settings and also for PPE issued to staff outside of such environments.

Communications

Communications will utilise various media channels including online, radio, newspaper and TV and will look to build upon previous good practice including daily media briefings, if the situation escalates.

Contingencies

The St Helena Major Incident Plan is available via the Emergency Planning Manager.

A decision will be made by Silver in relation to whether the Major Incident Plan should be activated and its timing.

Appendix A. Emergency response action plan for an introduced exotic vertebrate

Legal provisions

- Animal Disease Ordinance and Regulations Cap. 96 (as amended)
    - Import controls on all live animals, including fish, birds, insects, reptiles, and their young, eggs and semen thereof.
    - Emergency powers as the Agricultural Authority for infected area, quarantine area declaration and others.
    - Declaration for quarantine by EDC for specified period.
- Customs Ordinance (Import and Export Control Regulations) Cap. 145.
    - Control on movement of live animals, meat and eggs.
- Environment Protection Ordinance, 2015. The objectives of this Ordinance are to preserve and sustain the natural environment of St Helena, including by (c) minimising the risks to the environment from the introduction of potentially harmful materials or organisms:
    - Art. 22: it is an offence to release or allow to escape into the wild a non-native species;
    - Art. 24: newly discovered species are considered protected pending identification; where a person makes a discovery of an animal or plant which appears or is believed to be a species previously unknown in St Helena, he shall notify the Chief Environmental Officer of that discovery as soon as is reasonably practical;
    - Arts. 25 & 26: a licence can be granted to catch or kill native species, if justified;
    - Art. 87: the enforcement officer has powers to take samples, inspect, seize equipment or articles, search articles, restrict movement of articles, stop and search vessels;
    - Art. 98: the enforcement officer can serve an emergency environmental protection notice, which expires after 49 days.

Financial provisions

- All operational costs fall to ANRD budget.

Chain of command

- ANRD is the lead agency, the Agricultural Authority is Head, ANRD.
    - SVO is the recognised Expert, leading and informing the Technical Group coordinating the operational plan.
    - Technical Group members include: BSO, ADO, LSO.

Operational Plan

Key facts:

- Exotic vertebrate species could be reptile (eg snake, lizard, gecko), amphibian (eg frog, toad), fish, mammal or bird.
- Potential issues are huge, for example:
    - they can carry diseases which affect people, pets and livestock such as rabies (especially mammals and birds)
    - they can predate our livestock and the wirebird (especially mammals)
    - they can predate our endemic invertebrates (especially reptiles and birds)
    - animal welfare issues with regards the trapping, handling, confinement and/or euthanasia

Health and Safety

- Handling of exotic vertebrates is considered high risk due to the unknown disease risk. This includes: bodies (alive and dead), excreta, saliva, urine, and all other body fluids. This is of particularly concern with exotic mammals due to the risks to people, pets and livestock.
- Basic recommended personal protection equipment is: disposable coveralls, rubber boots, gloves, face shield.

Control strategy – immediate action on suspicion

- Confirm identification: through observation, samples, photos.
- Isolate the occurrence, as far as possible.
- Formation of the Emergency Response Action Team (ERAT). Members depend on the nature of the suspected introduction and will likely include:
    - Senior Veterinary Officer (lead)
    - Biosecurity Officer
    - Environmental sector representative
    - Public Health representative
- Notification of SILVER.

Control strategy – action on confirmation

The exact nature of the response will depend on the identity of the exotic vertebrate; it could include all or some of the following:

- Declaration of quarantine for premises or area for containment
- GIS mapping of hosts, refuges, location of prey species, dispersion pathways, or other key information, as appropriate, to predict likely patterns of dispersion
- Initiation of a trapping programme
- Euthanasia of captured animals
- Cleaning of the affected premises or land; methods and materials as recommended by the ERAT.
- Disposal of contaminated or infested materials, including euthanased animals.

- Control on movement of goods and materials, as recommended by the ERAT.

Biosecurity

- Procedures for finding, capturing and handling exotic vertebrates are outlined in the Annexes as follows:
    - Annex A Finding and trapping amphibians
    - Annex B Finding and trapping reptiles (excluding snakes)
    - Annex C Finding and trapping snakes
    - Annex D Finding and trapping birds
    - Annex E Finding and trapping mammals

Communication

- Inform TCG
- Updating Council Committee on a fortnightly basis and when need for formal quarantine is required.
- Updating Director of ENRD as and when necessary on the progress of the programme.
- Updating the Chief Secretary as and when necessary on the progress of the programme.
- Press releases issued:
    - Confirmation of identification press release.
    - Update press releases
- Radio interviews held to accompany press releases.

Equipment and Resources

- See resources required under the Plan's Procedures in Annex A to E.
- General equipment required:
    - PPE
    - Heavy duty gloves
    - Torches
    - Trap materials
    - Baits
    - Cloth bags
    - Nets
- Handling materials, including veterinary drugs
- Transport

Annex A. Finding and trapping amphibians.

- Amphibians are frogs, toads, newts and salamanders.
- Different amphibian groups have different biology. Research the internet on the likely group based on the initial report. Frogs and toads are the most likely amphibians to be introduced as their ecology is more generalist than that of the tailed amphibians.
- Amphibians tend to be highly secretive and spend a great part of their lives underground or hidden. They are therefore difficult to find.
- Typically they only venture out at night.
- Amphibians have extremely low food requirements and so emerge only when conditions are optimal; they also tend to be highly seasonal.
- The best time to monitor for amphibians is when they are breeding as this is when they are most active and evident, for example frogs may be calling. Amphibians are typically long lived and produce huge numbers of eggs when they breed, so not all females attempt to breed every year.
- Most species of amphibian need water to breed in, so target this.
- Most amphibians don't travel far by themselves.
- Search techniques:
    - Target damp places
    - Turn over stones to look underneath
    - Check under and inside rotten wood, trees
    - Any pools and ponds, at night with a torch, in water, at bottom, around edge
    - For cane toads, under lights at night as they hunt insects attracted to the lights
    - For frogs, listen for calling, especially during spring season
- Trapping techniques:
    - Drift net by ponds
    - If the first report/site of introduction is relatively dry, set up an "amphibian hotel" of ideal conditions (pool, refuges around it, vegetation) and check regularly. This won't work if the area is wet anyway.
    - In water: funnel trap. Large entrance which narrows, with a baffle to make it difficult to animal to find its way out. The surface is out of water, with the body of the trap in water. No bait is needed, the trap will intercept animals as they move around. Newts and salamanders tend to move from deep water during the day to shallower water at night, so the funnel trap should face deep water at dusk, and towards bank at dawn.
    - Pitfall trap – sink a bucket into the ground, with a small drainage hole in bottom and the lip is flush with the ground, and a layer of leaf litter at the the bottom. Pitfall traps can be combined with drift nets. Pitfalls are not so

good for frogs as they can jump out, but good for toads, newts and salamanders.

- Capture techniques:
  - Use a net, or your hand (don't need gloves, they won't bite)
  - Put the specimen in a cloth bag in the shade, and hand it to SVO as soon as possible.
- Links for further information and advice:
  - http://www.edgeofexistence.org/amphibian_conservation/survey_methods.php
  - http://www.froglife.org/

Annex B. Finding and trapping reptiles (excluding snakes)

- Reptiles (excluding snakes): geckoes, lizards, skinks, iguanas, terrapins. Collectively, they are known as “herpetofauna”.
- Different reptile groups have different biology. Research the internet on the likely group based on the initial report.
- They tend to be mobile and also quite shy or cryptic (hard to spot).
- Weather conditions affects activity levels, reptiles are sluggish or remain hidden in cold weather, and very active and evident in hot weather.
- Geckoes are nocturnal and hide during the day; the other reptile groups are active over the day and hide at night.
- Search techniques:
    - Turn over logs, rocks, etc. Look underside as well (geckoes will cling on underneath)
    - Look into trees, along branches.
    - Watch for basking animals in sunny spots, mid-morning is best time for this.
    - Terrapins: look for them basking on rocks or logs emerging from water.
    - Look on walls by lights at night (geckoes)
- Trapping:
    - Place metal sheeting on the ground – when sun-warmed it makes a very attractive refuge for small reptiles.
    - Pitfall trap – sink a bucket into the ground with a small drainage hole in bottom, the lip is flush with ground, with a layer of leaf litter at the bottom. Pitfall traps can be combined with drift nets. A normal bucket is an adequate size for animals up to 10cm from snout to tail end. Pitfalls are no good for geckoes as they can climb out.
    - Wide funnel trap: like a lobster trap, plus a drift net. Bait the trap with fresh or canned fish and/or fruit. Funnel traps can be used in rocky areas, and also used for terrapins in water.
    - Check all traps daily.
- Capture techniques:
    - Hand capture: pounce on the animal with an open cupped hand and grasp it round neck or body. Don’t grasp the tail – many species can drop the tail and escape.
        - Use gloves – gardening gloves are fine. The bite of small reptiles isn’t bad, gloves are primarily to protect from tree scratches and the bites of spiders etc found during the search. Most reptiles aren’t venomous (only 2 rare venomous reptiles in the world, excluding snakes).
    - Use a hand net – an aquarium net is fine.

- Noosing: a long pole with a loop of string at the tip tied in a slip knot. Work this over the head of the animal and tighten it around the neck. Fishing line or dental floss can be used. Approach the animal from the front or side.
- Tropical skinks: attach a small insect to the end of a stick, dangle it in front of the lizard which will attack it, once it has a firm grip, flick it into the air with the rod and catch with a net.
- Put in cloth bag in shade, hand to SVO as soon as possible.

Annex C. Finding and trapping snakes

- Many species are venomous, so assume it is venomous in order to be safe.
- Snakes tend to be mobile and also quite shy or cryptic (hard to spot).
- Weather conditions affect activity levels, snakes are sluggish or remain hidden in cold weather, and are very active and evident in hot weather.
- Species vary in when they are most active over the day, so be aware that an unknown species might be nocturnal and hide during the day or active over the day and hide at night.
- Search techniques:
    - Turn over logs, rocks, etc.
    - Look into trees, along branches, with a torch at night.
    - Watch for basking snakes in sunny spots, mid-morning is best time for this.
- Trapping techniques:
    - Place metal sheeting on ground – when sun-warmed it makes a very attractive refuge for small snakes.
    - Use a wide funnel trap, like a lobster trap, plus a drift net.
- Capture techniques:
    - Always assume that it could be venomous, and knowing it shouldn't be here:
        - Pin the snake behind the head with a Y-shaped stick with some padding in the fork (wrap some cloth around it)
        - Then decapitate it with a quick blow from a sharp knife, axe or machete, right behind the head.
        - Be careful of the decapitated head as it could still have a reflex bite, so handle it with care.
        - Put the head and body in a bag, hand to SVO as soon as possible.

Annex D. Finding and trapping birds

- Birds are easiest of animals to spot, as they are active over the day, relatively easy to see and highly vocal.
- Research the internet on likely bird group based on initial report.
- Search techniques:
    - Listen for calls and song
    - Response to playback – get a call from the internet, play it and listen for response. This won't work with all species, but can be useful for more secretive species.
    - Walk and look
    - Stand and look/listen. Chose an open area.
- Trapping and capture techniques:
    - Mist netting. This need professional equipment and advice: it is illegal to do this under UK legislation unless licenced. Contacts:
        - http://www.rspb.org.uk/
        - http://www.bto.org/
    - Stalk with a hand net – this is only likely to be successful for, example, young birds, escaped pets with relatively low fear of people.
    - Traps – large cage traps with funnel entrance, baited with fruit/grain. Note that different designs will work for different species so you need to have a good idea of the identity of the bird (at least the family to which it belongs) before deciding which design to use. Traps can be made very simply with local materials.
    - Check all traps at least twice daily.
    - Put the bird in cloth bag in shade, hand to SVO as soon as possible.
    - Shooting – for experts only, consult police department. This is probably the most effective method. An introduced bird won't have an established habitat and if not ground based in all likelihood is more likely to be eliminated by shooting than setting up traps. It becomes more important to cull at least one bird if it is a pair, so live capture is not important.

Annex E. Finding and trapping mammals

- Mammal species can include: rodents, jackals, mongooses, insectivores, etc.
- Many species are very secretive and often nocturnal, emerging only at night.
- Research internet on likely group based on initial report.
- Search techniques:
    - Walk and look
    - Stand and look/listen. Chose open area.
    - Search for footprints and dung.
    - Response to playback – get a call from internet, play it and listen for response. This won't work with all species as only some will respond to a call.
    - Place camera traps along paths and at the edge of clearing, bait with fruit/canned fish.
- Trapping and capture techniques:
    - Cage trap, size depends on likely identity of animals, bait with fruit/fish. The design of the trap will depend on the provisional or confirmed identification of the animal, and can be research on-line.
    - Set the trap in a likely place such as alongside a path, make sure it is level and sheltered from sun and rain.
    - Pre-bait for up to 3 days with the door pinned up to maximise the likelihood of capture once the trap is set.
    - Check all traps at least twice daily when set.
    - If an animal is captured, call the veterinary team to check it for removal and euthanasia.
    - Shooting – for experts only, consult the police department.

Appendix B. Veterinary equipment and PPE to be held within ANRD

Minimum essential PPE stock levels to be held at level 1 and 2

ITEM	MINIMUM STOCK HOLDING (REVIEW AS RISK LEVEL VARIES)
Gauntlets	1 pair L, 1 pair XL

Other items

ITEM	MINIMUM STOCK HOLDING (REVIEW AS RISK LEVEL VARIES)
Euthanase	500ml
Chloroform	1l
Skolene	100mls
Syringe needles, 1 inch	100
Syringe needles, 1.5 inch	100
Tranquilising gun	1
Darts, for tranquilising gun	5
Dog catcher	1
Large cage traps (dog size)	4
Cat cage traps	5
Cat carriers, crush	2
Cat carriers, standard	2

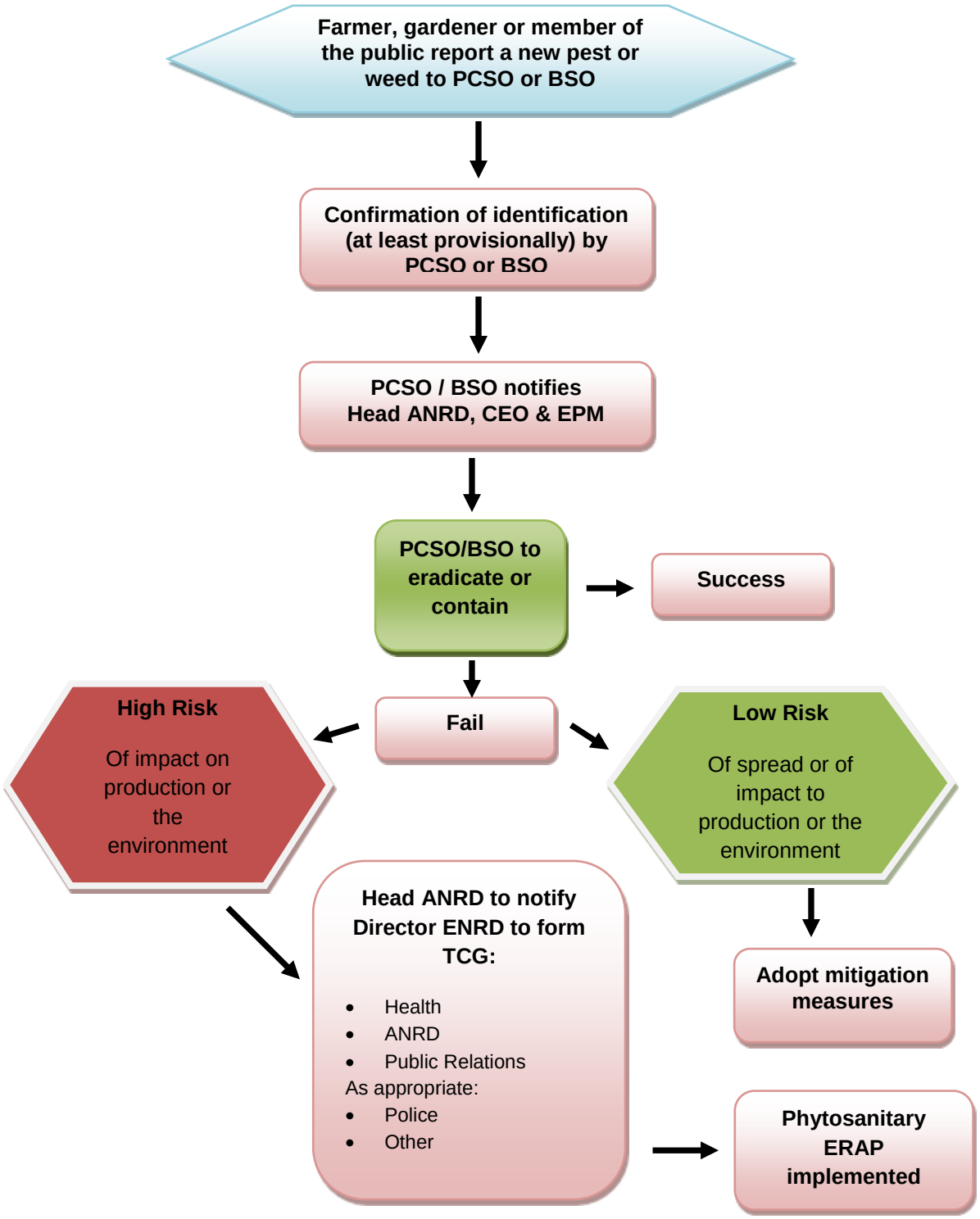
3. Phytosanitary Risks

Speed sheets for use in respect of a high risk case being identified by the Biosecurity Team

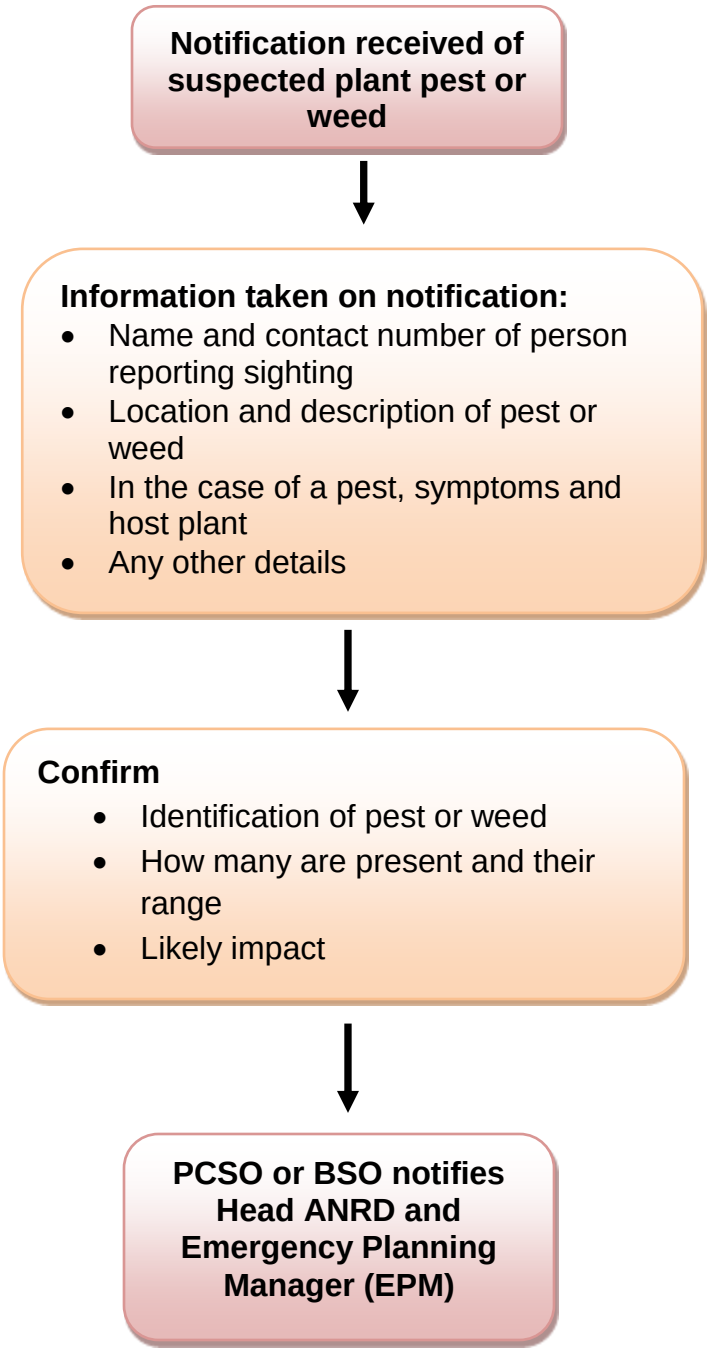
1. **Suspected case of introduction of a new plant pest or weed on the island**
2. **Pest Control team actions speed sheet**

Follow the process as per the sheet then refer to the main plan for further information.

1. SUSPECTED CASE OF A NEW PLANT PEST OR WEED



2. PEST CONTROL TEAM ACTIONS SPEED SHEET



Information

The introduction of a new plant pest or weed to the island is potentially very harmful to both the agricultural and environmental sectors. It is concerned with the first detection of a new potentially invasive species to St Helena, and not with the containment, management or eradication of a known established invasive species.

Invasive species of concern are those which are:

- Not native to St Helena;
- Likely to survive on St Helena;
- Able to spread by human mediated or natural means;
- Likely to become a pest or nuisance to social, environmental or economic values.

It is important to note that not all introduced species will survive to reproduce, spread, or become a pest. Therefore, once identification has been confirmed a rapid risk assessment is required to determine the likelihood of the species becoming a pest, noting that the best predictor of undesirable invasive characteristics is that the species has become a pest elsewhere.

A plant pest could consist of a sap-sucking invertebrate such as a mite, mealybug, aphid or bug, or a leaf-eating invertebrate such as a caterpillar (the young of a species of butterfly or moth), beetle or snail. Sap-suckers debilitate plants and can also transmit plant diseases, while leaf-eaters can destroy plants in their entirety. Both agricultural crops and endemic species are potentially at risk, depending on the nature of the introduced species. Fruit flies of the Family Tephritidae are of particular concern to the agricultural sector due to their destructive, economic impact on the production of orchard crops, tomatoes, peppers and squashes.

This plan seeks to mitigate risk by early identification of cases which are considered to be high risk. Intervention points have been identified at notification of a suspected case in order to minimise risk to the wider sector.

.

Intention

Working with multi agency partners, utilising a risk based approach SHG will seek to:

- Protect life
- Protect the agricultural economy of the island
- Protect the native and endemic plants of the island
- Undertake measures to minimise the risk of spread of a plant pest or weed outbreak

- Warn and inform the public as to the risk providing reassurance to maintain confidence in the SHG response
- Ensure the restoration of normality as soon as possible

Method

All members of the St Helena community are responsible for reporting any unusual sightings. Reports can be made to the Police, organisations such as the National Trust or Tourism, or directly to the Biosecurity Officer (BSO) or Pest Control Services Officer (PCSO).

Level of Response:

A single level has been identified which determines the actions and responses to help assess the risk to St Helena and inform action that may be required.

Suggested actions are listed for guidance purposes. The response will need to fully take account of the developing threat and risk so as to ensure actions are proportionate and effective and be compatible with broader SHG strategic intentions.

Level 1

Plant pest (including disease) or weed species, with potential economic or environmental impact	
Suggested Actions	**Further Considerations**

• Containment of affected premises / area
• Implementation of specific plan and any associated protocols
• Raise awareness with key stakeholders
  o Farmers Association
  o Environmental Management Division
  o Other as appropriate
• Continued horizon and environmental scanning
• Review information and intelligence updates, daily / weekly as appropriate
• Implement additional border control procedures, as appropriate
• Public reassurance / warning and informing
	• Risk of spread within St Helena
	• Command Structure
	• Review membership of the TCG
	• Pre deployment of pesticides and PPE to affected area
	• Review supplies of pesticides and PPE and reorder as necessary
	• Restrictions on movement of plants, produce or commodities, as appropriate
	• Restrictions on movement of vehicles, if appropriate
	• Destruction of crops, fruit trees or plants, as appropriate
	• Requests for international assistance

Emergency response action plans

This plan is generic and covers the introduction of a new plant pest or weed species in general. Specific emergency response action plans (ERAP) provide the details required for different taxonomic groups:

- Appendix A. ERAP for Potato ring rot, as an example of a plant disease
- Appendix B. ERAP for Tephritid fruit flies, as an example of a crop pest
- Appendix C. ERAP for *Galenia pubescens*, as an example of a weed.

Administration

This plan will be administered by the Emergency Planning Manager. This will include review and updates as the situation develops.

Command and Control

A command and control structure will be implemented to support this plan

Gold: Chief Secretary

Silver: Chair TCG: Chief of Police

Tactical Coordination Group Membership:
Agriculture: Head of ANRD, Director of ENRD, Pest Control Officer, Biosecurity Officer
Environment: Chief Environmental Officer
Communications: Chief Public Relations Officer
Police: Chief of Police
Port Authority: Harbour Master / Head of Customs
Shipping Agents: Solomons General Manager (Agencies)
Emergency Planning Manager

The Tactical Coordination Group (TCG) will meet on an *ad hoc* basis until such point as the increase in risk rises. At this point consideration should be given to membership of the TCG and as to whether a Tactical Coordination Centre should be established. Consideration should also be given, based on the risk as to whether a Strategic Coordination Group meeting should be held and if necessary extended to include an Incident Executive Group.

Business Continuity Management

The level at which public services will operate will be a strategic decision made by Gold. Critical business activity will need to be identified in advance of an escalation of threat and consideration given as to how these services will be maintained.

Personal Protective Equipment (PPE)

Any decision to deploy PPE will be made by the Silver Commander and will be based on an appropriate risk assessment to the threat posed. This may include the pre deployment of 'go boxes' to strategic locations as a result of an increase in the threat and subsequent change to the response level. Pesticide application equipment and PPE held at ANRD is given in Appendix D.

Waste Management

The World Health Organisation has produced guidance in relation to the management and safe disposal of waste resulting from contact or potential contact with pesticides. This guidance should be applied both within healthcare settings and also for PPE issued to staff outside of such environments.

Communications

Communications will utilise various media channels including online, radio, newspaper and TV and will look to build upon previous good practice including daily media briefings, if the situation escalates.

Contingencies

The St Helena Major Incident Plan is available via the Emergency Planning Manager.

A decision will be made by Silver in relation to whether the Major Incident Plan should be activated and its timing.

Appendix A. Emergency Response Action Plan for New Crop Disease

This ERAP covers an outbreak of Potato ring rot (*Clavibacter michiganensis* subsp. *sepedonicus*) as an example of an economically serious crop disease.

Legal provisions

- Plants Protection Ordinance Cap. 93, 2011 (as amended).
    - Provisions for declaring a notifiable plant disease; declaring an area as infected with plant disease; and regulating its disinfection.
    - The Agricultural Authority has power to enter land with known or suspected plant disease, and destroy plants.

- Environment Protection Ordinance, 2015. The objectives of this Ordinance are to preserve and sustain the natural environment of St Helena, including by (c) minimising the risks to the environment from the introduction of potentially harmful materials or organisms:
    - Art. 22: it is an offence to release or allow to escape into the wild a non-native species;
    - Art. 24: newly discovered species are considered protected pending identification; where a person makes a discovery of an animal or plant which appears or is believed to be a species previously unknown in St Helena, he shall notify the Chief Environmental Officer of that discovery as soon as is reasonably practical;
    - Arts. 25 & 26: a licence can be granted to catch or kill native species, if justified;
    - Art. 87: the enforcement officer has powers to take samples, inspect, seize equipment or articles, search articles, restrict movement of articles, stop and search vessels;
    - Art. 98: the enforcement officer can serve an emergency environmental protection notice, which expires after 49 days.

Financial provisions

- All operational costs fall to ANRD budget.
- Costs of removal of diseased plants fall to private individuals.
- No legal provision for compensation for loss of crops.

Chain of command

- ANRD is the lead agency; the Agricultural Authority is Head, ANRD.
    - PCSO is the recognised Expert, informing the Technical Group coordinating the operational plan.
    - Technical Group members include: BSO, ADO.

- The Field team work under the guidance of the Technical Group, including at least 1 pesticide sprayer.

Operational Plan

Key facts:

- Transmission can be by contamination of tools used for potato production, and movement of soil, compost, potato tubers and potato plant material.
- There are not likely to be human health issues.
- Infection may not always be apparent in the early stages.
- Symptomless foliage and tubers may harbour latent infections

Health and Safety

- Pesticides must be applied according to label instructions and the appropriate Code of Best Practice.
- The appropriate Personal Protective Equipment must be worn before preparing or using pesticides, according to the Code of Best Practice.

Control strategy – immediate action and rapid response

- Confirmation of identification made by one or more of the following:
  - Samples sent to a local expert
  - On-line resources
  - Digital photos sent to a local expert, international expert or diagnostic laboratory such as Fera, UK
  - Samples sent to an international expert or diagnostic laboratory such as Fera, UK
- Once the identification of the novel species has been confirmed, notification of:
  - Head, ANRD
  - Emergency Planning Manager
  - Chief Environmental Officer
- ANRD planning group formed, consisting of Head, ANRD, PCSO, ADO, BSO and other officers as appropriate. This group will plan the subsequent actions, the details of which will depend on the exact nature of the interception, such as time of year, location of the outbreak, etc. and will include:
  - Determination of the area to be surveyed and monitored; see Annex A.
  - Access to private properties and any likely issues;
  - Guidance on accessing steep or hazardous terrain:
    - Assessment of host plants present
    - Monitoring effort required at the borders
    - Treatment options
    - Access options, if required
  - Preparation of equipment and materials;

  - Organisation of labour and transport.
- A short fact sheet of key facts for the species will be prepared by the technical expert, to include where available:
  - Identification, including photos
  - Life cycle details
  - Host species, noting the main hosts
  - Dispersal ability
  - Monitoring methods
  - Biosecurity information
- Extent of infestation determined around the site of known infestation by visual inspection of plants (main hosts): see Annex A.
- ANRD-led participatory attempt initiated to eliminate the incursion in the immediate vicinity of the outbreak, for example host plants in adjacent fields. This may include, as appropriate:
  - Destruction of infected crops and other host plants.
  - Pesticide treatment of infected crops and other host plants.
  - Removal of volunteer potatoes.
- Containment programme initiated in all Districts:
  - Visits to promote removal of volunteer potatoes, and practices which reduce infection and spread, and raise awareness of symptoms and preventing spread.
- Routine monitoring of host plants should continue following the guidelines in Annex A.
- There are 3 possible scenarios resulting from the actions outlined above:
  1. Number of infected plants decline to zero and no further outbreaks are detected.
     - ⇨ Monitoring continues and is wound down following the guidelines in Annex A.
  2. Number of infected plants remain constant or increase.
     - ⇨ Further actions required (see the section below)
  3. Other outbreaks are detected in separate locations.
     - ⇨ Further actions required (see the section below)

Control strategy – further actions

- Notification of Tactical Coordination Group (TCG).
- Further actions may include all or any of those listed below. Additional resources (labour, materials, etc.) and powers may be required at this stage.
- Declaration of quarantine in the infected area.
- All movements controlled on and off the area of potato tubers, plants, soil, tools and equipment.

- ANRD-led participatory eradication programme and containment programme initiated at a much wider level, up to the entire District, following the methods outlined for the rapid response.
- GIS mapping of hosts, refuges, location of prey species, dispersion pathways, or other key information, as appropriate, to predict likely patterns of dispersion

Contingency plan: in the event of further outbreaks in other districts

- The same procedure will be followed as laid out for the initial outbreak.
- Extent of infestation determined in zones 1 and 2 around the new outbreak by visual inspection of plants (potatoes and other main hosts), based on guidelines in Annex A.
- ANRD-led participatory eradication programme initiated which may include, as appropriate:
    - Destruction of infected crops and other host plants.
    - Pesticide treatment of infected crops and other host plants.
    - Removal of volunteer potatoes.
- Suspected outbreaks which have not been confirmed may be subject to precautionary treatment pending confirmation.
- If number of infected plants decline to zero and no further outbreaks are detected, monitoring continues and is wound down following the guidelines in Annex A.
- If numbers remain constant or increase, reaction will be proportionate to the level of risk identified, and may include:
    - District-wide destruction or pesticide treatment will be considered, if necessary, with advice from PCSO and BSO.
    - Declare quarantine in the infected area with immediate effect: a buffer zone will be established at a suitable radius as advised by the Technical Group.
    - Prohibitions on planting host plants for a prescribed period.
- Analysis of the pathway of dispersal to try and predict and prevent new outbreak areas.
- GIS mapping of hosts, refuges, location of prey species, dispersion pathways, or other key information, as appropriate, to predict likely patterns of dispersion

Control strategy – when to stop

- A typical pattern of progress for a successful intervention is as follows:
    - Rapid response at each outbreak location;
    - Intensive monitoring programme at each outbreak location for at least 6 months OR 1 complete growing season, as outlined in Annex A;
    - Reduced monitoring programme for one full season;

    - Some additional monitoring around the outbreak area for a further complete growing season.
- Eradication should not be considered achieved until 2 years from the last sighting on the island.
- In the event of an unsuccessful intervention, the TCG should consider when it is appropriate to step down the emergency response, considering:
    - The level of expected economic and/or environmental impact of the species;
    - Available mitigation measures ;
    - The cost-benefit of continued action.

Biosecurity

- An important aspect is to analyse the introduction pathway, if possible, to minimise the risk of further incursions.
- The biosecurity team will analyse fresh produce imports for at least the two voyages previous to detection of the novel species to assess the likelihood of this pathway, noting any interceptions, and considering the main hosts of the species, season and seasonality.
- Biosecurity actions for a specified number of voyages to be agreed by the ANRD planning group may include, as appropriate:
    - Sampling rates increased for identified high risk produce groups;
    - Temporary ban on identified high risk produce groups;
    - Temporary ban on high risk produce groups with specific Production Unit Codes.
- Annex B. General biosecurity measures to be followed.
- Annex C. Fact sheet for Potato ring rot.

Communication

- The EPM is notified of the situation once the identification of the novel species has been confirmed and will advise on the level of communications.
- For the initial response (as outlined under “immediate action and rapid response”) unless otherwise advised by EPM, ANRD will lead the communications which may include, as considered appropriate:
    - Posters and signs advising of the actions around zones1 and 2;
    - Radio reports;
    - Press release.
- Updating the Head, ANRD on a regular basis.
- In event of a larger programme (as outlined under “further actions”) the TCG will lead on communications.
- Updating Council Committee on a fortnightly basis and when need for formal declaration of quarantine is required.

- Updating Director of ENRD as and when necessary on the progress of the programme.
- Updating the Chief Secretary as and when necessary on the progress of the programme.
- Press releases issued:
    - Simple measures to prevent the spread and a list of symptoms developed and included in all press releases henceforth.
    - Update press releases.
- Radio interviews held to accompany press releases.

Equipment and Resources

- Pesticide application devices, eg knapsack sprayers and mistblowers
- Appropriate pesticide products
- PPE for pesticide application
- Disposable protective clothing and waterproof boots for site visits
- Sterilising fluid, bleach

Annex A. Guidelines for monitoring

This procedure is for ANRD Pest Control Service

Determination of the area

- In the first instance this is provisionally set at District level. By the time a plant disease is spotted infestation could have been tracked extensively around the entire District, while the Districts are reasonably isolated from each other. Consider likely pathways for infestation from the location of infected plants, such as:
    - Pathways along which contaminated soil could be tracked by farmers, hikers and animals;
    - Roads and tracks along which contaminated soil could be tracked by vehicles;
    - Have any tools or potentially contaminated equipment been used in other fields?
    - Have any crops been harvested from in or near the infected area, and where have they been taken?
    - Are there any other factors which could have resulted in the spread of infested plants, soil or other means?
- Taking these factors into consideration, the high risk area (zone 1) is defined; this may be the entire District, a part of it, or even include parts of other Districts.
- Within zone 1 all known main host plants (as identified by a source such as the CABI Crop Protection Compendium) are checked for signs of the disease.
- Spot checks of all known host plants are made in other Districts, island-wide.

How often to monitor

- Host plants are checked on at least a monthly basis at each outbreak location for at least 6 months OR 1 complete growing season, as appropriate.
- Each location where disease is suspected or identified is mapped, either by GPS or a sketch map.
- A reduced monitoring programme will continue for 1 year (a complete season), as appropriate.
- Some additional monitoring will take place around the outbreak area for a further complete growing season.
- Note that the exact timing and duration of the monitoring programme will depend on the presence of host plants, the season and the weather patterns.

Annex B. General biosecurity measures to be followed.

This procedure is for all users of declared quarantine areas.

- No crops, plants, plant material, harvested crops, soil or compost to be moved outside the area.

- Gardening and farming tools such as garden forks and spades etc not to be used on any other plot outside the area.

- Footwear, including waterproof boots, hiking boots etc, to be thoroughly cleaned of mud and debris, with particular attention to any Velcro fastenings, when leaving the area.

- Vehicles, cars, tractors, rotivators or trailers must be parked outside the declared quarantine area, wherever possible, on hard standing away from loose soil which could be carried in the tyres.

- A separate set of non-disposable protective clothing or waterproof protective clothing and waterproof boots to be worn within the declared quarantine area, and not used on any other plot outside it.

- Discourage visitors, especially if they also have crops or plants which might be infected.

- All equipment used must be clean on arrival and on departure. Great care must be taken when cleaning electrical apparatus or tools. Where possible equipment should be protected from contamination e.g. using plastic bags. **Health and Safety rules must be observed.** Where equipment can be cleansed and disinfected this must be done before entry to the area and again on departure.

- Sufficient water, disinfectant and disinfecting equipment should be taken on the visit, even if facilities for disinfecting clothes, footwear, equipment or vehicles are thought to be available in the area.

Annex C. Fact sheet for Potato ring rot

http://www.cabi.org/cpc/datasheet/15343

Potato ring rot *Clavibacter michiganensis* subsp. *sepedonicus* (Spieckermann & Kotthoff) Dye & Kemp.

Symptoms

Potato cultivars vary greatly in their propensity to show symptoms. Foliage symptoms develop from mid to late season and usually first become apparent as a wilt on the lower leaves. Margins of symptomatic leaves often curl upwards and interveinal areas become pale green to yellowish and develop necrotic areas. Symptoms may occur on only one or a few stems of a plant and proceed upwards from the lower leaves until the entire stem is wilted. Severely infected plants die prematurely. Certain cultivars sometimes develop a rosette-like symptom characterized by short internodes without the presence of wilt. Exudation of white ooze from freshly cut cross-sections of lower stems is considered diagnostic for the disease. Symptoms are readily obscured by other wilts and foliage diseases, and natural senescence.

The primary tuber symptom is discoloration of the vascular tissue at the stolon end and is most readily observed in tuber cross-sections. Discoloration varies from creamy-yellow to brown zones encompassing all or only a portion of the vascular ring. When pressure is applied to a cut tuber, a creamy odourless ooze may be expressed from the tissue. Distinctive corky-brown tissue sometimes surrounds hollows that develop in the vascular ring. Advanced infections are often modified by proliferation of secondary micro-organisms which obliterates typical ring rot symptoms. External tuber symptoms, apparent as reddish to brown blotches and/or surface cracks, are sometimes but not always present in severe infections. Tuber symptoms may be confused with those caused by the bacterium *Ralstonia solanacearum*.

Symptomless foliage and tubers may harbour latent infections. Although some cultivars have a much greater tendency than others to remain symptomless upon infection, all cultivars can potentially serve as latent carriers of the pathogen. Latent infections can be detected by laboratory tests.

Natural infection causing disease has been found only on potatoes.

Impact

Introduction of the bacterium to a production unit could, in a worst case scenario, cause total loss of a potato crop.

Spread

The bacterium also spreads from infected tubers through direct contact and by contamination of equipment used for potato production such as seed cutters, planters,

harvesters, transport vehicles, storages, etc. *Potato ring rot* survives for extended periods of many months to years in a dry and cool environment. Hence its persistence on farm equipment, in storages, and on transport vehicles is an important means by which the bacterium is maintained and spread within farm units and disseminated to other production units.

Seed potato tubers infected or contaminated with *Potato ring rot* are the primary source of infection. Infected tubers are the main source of *Potato ring rot* and the pathogen is spread to other tubers by direct contact or via contamination of machinery and other equipment with which potatoes come in contact. Cutting knives and picker-type planters are particularly prone to spread infection. Spread of the pathogen on contaminated grading machines and transport trucks is also important. Plant-to-plant spread in the field is usually low but there is experimental evidence that insects can transmit the disease. Infected volunteer plants and potato plant debris may also serve as a source of infection.

Potato ring rot has the propensity to exist asymptomatically as latent infections in potato; it is not known to naturally infect other plant species.

Management

Implementation of crop rotation, disinfection and other sanitation practices is most important whenever the disease has occurred to prevent recurrence of the disease and spread of the pathogen. Disinfectants such as quaternary ammonia, chlorine, iodine or phenol-containing compounds applied to equipment and other contaminated surfaces for a minimum of 10 min under low organic load are effective against Potato ring rot. The use of whole rather than cut seed and avoidance of picker-type planters helps to reduce the spread of the disease.

No immune cultivars are available and the use of tolerant cultivars is discouraged because they could serve as symptomless carriers of the pathogen.

Phytosanitary measures

Phytosanitary measures must be aimed at the entire potato production system on account of the insidious nature of the disease. Consideration must be given to the use of micropropagated material, implementation of field inspection and laboratory testing, seed potato certification, and regional geographic isolation. In addition, inspection of individual consignments is warranted. All seed and ware potatoes must come from stock and a place of production that is free from ring rot, and from a field inspected during the last growing season (or two growing seasons if the previous crop was also potatoes) and found free from ring rot. Applicable sanitary precautions must be taken in storage and packing houses. Only new or disinfected packing material and containers must be used.

Appendix B. Emergency Response Action Plan for New Tephritid Fly

This ERAP covers an outbreak of fruit flies of the family Tephritid as an example of an economically serious crop pest. There are 5 species of Tephritid fly present in South Africa which don't occur on St Helena: *Bactrocera cucurbitae, B. dorsalis, B. zonata, Certatitis rosa* and *C. cosyra*. They attack either fruit (eg peaches, mangoes) or squashes; tomatoes and sweet peppers can also be infested. There are many other economically important Tephritid fruit fly species around the world.

Legal provisions

- Plants Protection Ordinance Cap. 93, 2011 (as amended).
    - Provisions for declaring a notifiable plant disease; declaring an area as infected with plant disease; and regulating its disinfection.
    - "Plant disease" definition includes deterioration due to insects "or any other cause".
    - The Agricultural Authority has power to enter land with known or suspected plant disease, and destroy plants.
- Environment Protection Ordinance, 2015. The objectives of this Ordinance are to preserve and sustain the natural environment of St Helena, including by (c) minimising the risks to the environment from the introduction of potentially harmful materials or organisms:
    - Art. 22: it is an offence to release or allow to escape into the wild a non-native species;
    - Art. 24: newly discovered species are considered protected pending identification; where a person makes a discovery of an animal or plant which appears or is believed to be a species previously unknown in St Helena, he shall notify the Chief Environmental Officer of that discovery as soon as is reasonably practical;
    - Arts. 25 & 26: a licence can be granted to catch or kill native species, if justified;
    - Art. 87: the enforcement officer has powers to take samples, inspect, seize equipment or articles, search articles, restrict movement of articles, stop and search vessels;
    - Art. 98: the enforcement officer can serve an emergency environmental protection notice, which expires after 49 days.

Financial provisions

- All operational costs fall to ANRD budget.
- Costs of removal of infected plants fall to private individuals.
- No legal provision for compensation for loss of crops.

Chain of command

- ANRD is the lead agency; the Agricultural Authority is Head, ANRD.
    - PCSO is the recognised Expert, informing the Technical Group coordinating the operational plan.
    - Technical Group members include: BSO, ADO.
    - The Field team work under the guidance of the Technical Group, including pesticide sprayers.

Operational Plan

Key facts:

- Two species of Tephritid fruit fly are already present on St Helena, and identification of species is only possible in the adult phase. All the maggots look alike.
- Transmission is by wind-blown adults, and movement of infested fruit.
- There are not likely to be human health issues.
- Infestation may not always be apparent in the early stages within the fruit.

Health and Safety

- Pesticides must be applied according to label instructions and the appropriate Code of Best Practice.
- The appropriate Personal Protective Equipment must be worn before preparing or using pesticides, according to the Code of Best Practice.

Control strategy – immediate action and rapid response

- Confirmation of identification of species (adult phase) made by one or more of the following:
    - Samples sent to a local expert
    - On-line resources
    - Digital photos sent to a local expert, international expert or diagnostic laboratory such as Fera, UK
    - Samples sent to an international expert or diagnostic laboratory such as Fera, UK
- Once the identification of the novel species has been confirmed, notification of:
    - Head, ANRD
    - Emergency Planning Manager
    - Chief Environmental Officer
- ANRD planning group formed, consisting of Head ANRD, PCSO, BSO and other officers as appropriate. This group will plan the subsequent actions as details will depend on the exact nature of the interception, such as time of year, location, and species concerned, etc., and will include:

  - Determination of the size of the area to be surveyed and monitored, see Annex A;
  - Access to private properties and any likely issues;
  - Guidance on accessing steep or hazardous terrain:
    - Assessment of host plants present
    - Monitoring effort required at the borders
    - Treatment options
    - Access options, if required
  - Preparation of equipment and materials;
  - Organisation of labour and transport.
- A short fact sheet of key facts for the species will be prepared by the technical expert, to include where available:
  - Identification, including photos
  - Life cycle details
  - Host species, noting the main hosts
  - Dispersal ability
  - Trapping and monitoring methods
  - Biosecurity information
- Note that there are two possible reactions at this point: map the extent of the infestation before moving on to treatment, *OR* initiate treatment more or less at the same time as mapping.
  - If there are relatively few flies in the delta traps, it is recommended that mapping is done first;
  - If there are large numbers of flies in the delta traps it is recommended that treatment is initiated as soon as possible, as any delay could compromise the chance of successful elimination.
- Extent of infestation determined in the defined area around the site of known infestation by:
  - Placing pheromone-baited delta traps (see Annex B) where pheromone lures are available; OR
  - Placing protein baited bucket traps (see Annex C) where pheromone lures aren't available.
  - Trap density and checking rates to be agreed by the planning group, based on guidelines laid out in Annex A;
  - Sampling infested fruit and breeding through; see Annex D. Note that it may take some time for maggots to breed through.
- ANRD-led participatory attempt initiated to eliminate the incursion. This may include, as appropriate:
  - Pesticide treatment of infected trees, other host plants, and below host trees using a registered product such as Lebaycid, Malathion or Garden Ripcord, following label instructions.

  - Splash-baiting of fruit trees and surrounding vegetation using a protein bait and registered product such as Malathion or Garden Ripcord, following label instructions.
  - Destruction of infected trees, crops and other host plants.
  - Widespread severe pruning of fruit trees and other potential host trees.
- Area of potential infestation is identified (neighbouring areas with likely host plants, pathways of infection, etc) within zone 2 and up to 4km downwind.
- There are 3 possible scenarios resulting from the actions outlined above:
    1. Numbers decline to zero and no further interceptions are detected.
        ⇨ Monitoring continues and is wound down following the guidelines in Annex A.
    2. Numbers remain constant or increase.
        ⇨ Further actions required (see the section below)
    3. Other interceptions are detected in separate locations.
        ⇨ Further actions required (see the section below)

Control strategy – further actions

- Notification of TCG.
- Further actions may include all or any of those listed below. Additional resources (labour, materials, etc.) and powers may be required at this stage.
- Declaration of quarantine in the infested area.
- All movements of fruit controlled on and off the area.
- ANRD-led participatory eradication programme initiated which may include, as appropriate:
  - District-wide destruction of crops or trees.
  - District-wide pesticide treatment will be considered, if necessary, with advice from PCSO and BSO.
  - Widespread severe pruning of fruit trees and other potential host trees.
  - Visits to promote management techniques which reduce infection and spread, and raise awareness of symptoms and preventing spread.
  - Where suspicion is raised of a possible outbreak, visits made to check crops, fruit trees and other likely host plants.
- GIS mapping of hosts, refuges, location of prey species, dispersion pathways, or other key information, as appropriate, to predict likely patterns of dispersion.

<u>Contingency plan: in the event of further outbreaks in other districts</u>

- The same procedure will be followed as laid out for the initial interception.
- Extent of infestation determined in zones 1 and 2 around the new location using the same method as used for the initial incursion, based on the guidelines in Annex A.

- ANRD-led participatory attempt initiated to eliminate the new incursion. This may include, as appropriate:
    - Pesticide treatment of infected trees, other host plants, and below host trees using a registered product such as Lebaycid, Malathion or Garden Ripcord, following label instructions.
    - Splash-baiting of fruit trees and surrounding vegetation using a protein bait and registered product such as Malathion or Garden Ripcord, following label instructions.
    - Destruction of infected trees, crops and other host plants.
    - Widespread severe pruning of fruit trees and other potential host trees.
- Suspected outbreaks which have not been confirmed may be subject to precautionary treatment pending confirmation.
- If numbers decline to zero and no further interceptions are detected, monitoring continues and is wound down following the guidelines in Annex A.
- If numbers remain constant or increase reaction will be proportionate to the level of risk identified, and may include:
    - District-wide destruction of crops or trees.
    - District-wide pesticide treatment will be considered, if necessary, with advice from PCSO and BSO.
- Declaration of quarantine in the infected area.
- Analysis of the pathway of dispersal to try and predict and prevent new outbreak areas.
- GIS mapping of hosts, refuges, location of prey species, dispersion pathways, or other key information, as appropriate, to predict likely patterns of dispersion

Control strategy – when to stop

- A typical pattern of progress for a successful intervention is as follows:
    - Rapid response at each interception location;
    - Intensive monitoring programme at each interception location for at least 6 months, as outlined in Annex A;
    - Reduced monitoring programme for 1 year (one full season);
    - Some additional monitoring around the incursion area for a further 1 year.
- Eradication should not be considered achieved until 2 years from the last sighting on the island.
- In the event of an unsuccessful intervention, the TCG should consider when it is appropriate to step down the emergency response, considering:
    - The level of expected economic and/or environmental impact of the species;
    - Available mitigation measures;
    - The cost-benefit of continued action.

Biosecurity

- An important aspect is to analyse the introduction pathway, if possible, to minimise the risk of further incursions.
- The biosecurity team will analyse fresh produce imports for at least the two voyages previous to detection of the novel species to assess the likelihood of this pathway, noting any interceptions, and considering the main hosts of the species, season and seasonality.
- Biosecurity actions for a specified number of voyages to be agreed by the ANRD planning group may include, as appropriate:
    - Sampling rates increased for identified high risk produce groups;
    - Temporary ban on identified high risk produce groups;
    - Temporary ban on high risk produce groups with specific Production Unit Codes.
- Annex D. General biosecurity measures to be followed.
- Annex E. Fact sheet for Tephritid fruit flies

Communication

- The EPM is notified of the situation once the identification of the novel species has been confirmed and will advise on the level of communications.
- For the initial response (as outlined under “immediate action and rapid response”) unless otherwise advised by EPM, ANRD will lead the communications which may include, as considered appropriate:
    - Posters and signs advising of the actions around zones1 and 2;
    - Radio reports;
    - Press release.
- Updating the Head, ANRD on a regular basis.
- In event of a larger programme (as outlined under “further actions”) the TCG will lead on communications.
- Updating Council Committee on a fortnightly basis and when need for formal declaration of quarantine is required.
- Updating Director of ENRD as and when necessary on the progress of the programme.
- Updating the Chief Secretary as and when necessary on the progress of the programme.
- Press releases issued:
    - Simple measures to prevent the spread and a list of symptoms developed and included in all press releases henceforth.
    - Update press releases.
- Radio interviews held to accompany press releases.

Equipment and Resources

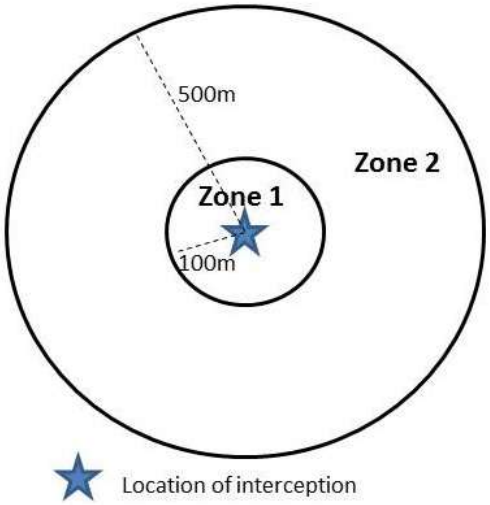
- Pesticide application devices, eg knapsack sprayers and mistblowers
- Appropriate pesticide products
- PPE for pesticide application
- Insect collecting materials: collecting boxes, bags, forceps
- Insect-proof cages for breeding through maggots
- Delta traps with pheromone lures for the 5 highest risk species
- Bucket traps with protein lure.

Annex A. Guidelines for trap density and monitoring area

This procedure is for ANRD Pest Control Service.

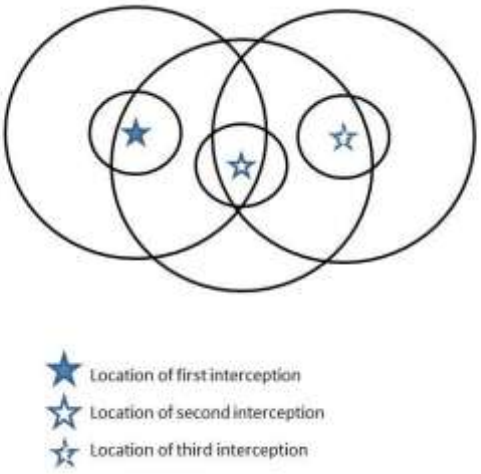
Deciding how many traps to place.

- These areas are recommended guidelines. Note that the size of each zone may vary depending on the species and exact nature of the location and any variation from the guidelines will be agreed by the ANRD planning group.
- On a map, mark the location where the novel species was found.
- Draw a circle with a radius of 100m. The area inside the circle is **zone 1**.
- Draw a second circle with a radius of 500m. The area inside the circle, and excluding the bit already covered by zone 1, is **zone 2**.
- This is illustrated in the diagram below.

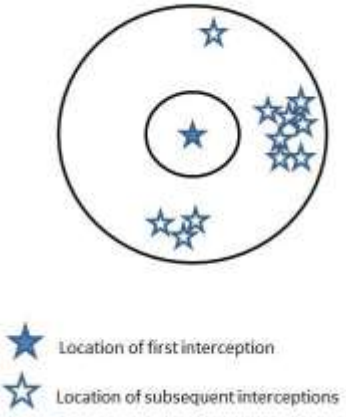


- In zone 1 place traps at a density of up to 10 traps per hectare. For a circle of radius 100m the area is 3.14 hectares, which equals up to 30 traps placed in zone 1 (rounded down).
- In zone 2 place traps at a density of up to 2 traps per hectare. For a circle of radius 500m (minus the area already covered by zone 1) the area is 75.35 hectares, which up to 150 traps placed in zone 2 (rounded down).
- Note that there may be areas within zones 1 and 2 which are considered unsuitable for fruit flies or inaccessible and the figures should be adjusted accordingly.
- Outside zone 2, fill in the gaps in the existing monitoring trap network for the area, aiming to place around 1 trap per square kilometre.
- Repeat the above for every new interception of the novel species which takes place outside the initial zone 1.

- The outbreak source can be tracked by analysing the pattern of consecutive interceptions in terms of factors such as dispersal pathways, distribution of host plants, etc.
- The diagram below illustrates the track of 3 interceptions, showing the overlapping zoning which can occur. Exact trap numbers for each zone are decided by the ANRD planning group, based on local knowledge and the specific details of the incursion.



- An initial interception could be followed by a scatter of subsequent interceptions as new specimens are detected in traps placed in zones 1 and 2. This is illustrated in the diagram below. In cases such as this, the ANRD planning group will decide exactly how to proceed. Suggested actions are:
    - Expand zone 2 around the single point: it may be a one-off
    - Create a new zone 1 and 2 around the dense cluster of points
    - Use local knowledge to decide how to react to the cluster of 3 points



How often to check traps

- Initially, all traps in zones 1 and 2 should be checked once a week. Other additional traps outside zone 2 are ideally also checked once a week or at least once a fortnight.
- When no further interceptions have been detected for 4 weeks clear, trap checks can be made fortnightly.
- When no further interceptions have been detected for at least 3 further months clear, trap checks can be made monthly.
- When no further interceptions have been detected for at least 2 further months clear (a total of 6 months with no interceptions), trap density can be thinned throughout the monitoring area, and checks continued to be made monthly.
- The timing and extent of the reduction of effort will depend on species, season, and the exact nature of the incursion, and will be agreed by the ANRD planning group.
- Any new interceptions will take the procedure back to the beginning again.

Annex B. Monitoring using pheromone-baited delta traps.

This procedure is for ANRD Pest Control Service to monitor Tephritid fly species for which there is a pheromone lure.

- Delta traps are placed in trees, ideally fruit trees, 1.5m to 2m high above the ground.
- Each trap is given a unique number and its location mapped, either by GPS or a sketch map.
    - For numbering, use a code of at least 5 digits to make it compatible with GPS. For example AZ1001 (= location *A*, *Zone 1*, trap number *001*).
- Each Delta trap contains a sticky insert to catch insects, and a species specific pheromone lure.
- Pheromone lures are replaced as required.
- Guidelines for trap density and checking frequency are given in Annex A.
- Data is recorded in the field, and then entered in an Excel database, noting:
    - Date of check
    - Unique number of the trap
    - Zone
    - Catch, specifically Tephritid fruit flies

Annex C. Using baited bucket traps.

This procedure is for ANRD Pest Control Service, to monitor Tephritid fly species for which there is no pheromone lure.

- Bucket traps are placed in fruit trees, 1.5m to 2m high above the ground
- Each trap is given a unique number and its location mapped, either by GPS or a sketch map.
    - For numbering, use a code of at least 5 digits to make it compatible with GPS. For example AZ1001 (= location *A*, *Zone 1*, trap number *001*).
- Each bucket trap contains 200 – 200ml water with a dash of detergent to contain and kills insects, and baited in the lid consisting of both fruit and hydrolysed protein
- Guidelines for trap density and checking frequency are given in Annex A.
- Data is recorded in the field, and then entered in an Excel database, noting:
    - Date of check
    - Unique number of the trap
    - Zone
    - Catch, specifically Tephritid fruit flies

Annex D. Sampling infested fruit.

This procedure is for ANRD Pest Control Service.

- Collect infested fruit:
  - From the ground or the tree (as long as they are seen to contain maggots)
  - Aim for 1kg per fruit type per site
- Place in a breeding cage at the Biocontrol Unit:
  - 2-3cm of sterilised sand at the base of the cage
  - Keep moist by spraying tap water as required
  - Hold at 18 to 20°C
- Fruit is held until all maggot stages are either dead or bred through; this may be more than 6 months, depending on the season.
- Adult flies are collected, identified, sexed, and either destroyed or preserved

Annex E. General biosecurity measures to be followed.

This procedure is for all users of declared quarantine areas.

- No fruit/produce to be moved outside the area.
- No soil to be moved outside the area.
- Vehicles can carry adult fruit flies. Where possible they should be parked outside the area, and movement of vehicles in and out of the area minimised. Vehicles which are required to move in and out of the area should be lightly sprayed inside and out on a daily basis with a residual contact insecticide such as a commercially available “Doom” or “Mortein” spray.
- Restrict the number of visitors moving in and out of the area, to avoid inadvertent carrying of adult flies on clothing, packs etc.

Annex F. Fact sheet for Tephritid fruit flies

Tephritids are small to medium-sized (2.5–10 mm) flies that are often colourful, and usually with wings with yellow, brown or black markings or are dark coloured with lighter markings.

Biology and ecology

Females deposit eggs in living, healthy plant tissue using their telescopic ovipositors. Here the larvae find their food upon emerging. The larvae develop in leaves, stems, flowers, seeds, fruits and roots of the host plant, depending on the species. The adults sometimes have a very short lifespan. Some live for less than a week. Some species are monophagous (feeding on only one plant species) others are polyphagous (feeding on several, usually related plant species).

The behaviour of Tephritid fruit flies is of great interest to biologists. Some fruit flies have extensive mating rituals or territorial displays. Many are brightly coloured and visually showy. Adult Tephritidae are often found on the host plant and feeding on pollen, nectar, rotting plant debris or honeydew.

Economic impact

Fruit flies (Diptera: Tephritidae) include some of the world's most serious agricultural pests. Besides causing billions of dollars in direct losses to a wide variety of fruit, vegetable and flower crops (e.g., citrus, apple, mango, sunflower), they limit the development of agriculture in many countries because of the strict trade quarantines imposed to prevent their spread. Of the more than 4,400 species known worldwide, nearly 200 are considered pests. The genus *Bactrocera* is of worldwide notoriety for its destructive impact on agriculture.

Because there are so many species, many of which are extremely similar, the identification of pest fruit flies is very difficult.

Tephritid fruit flies cause major losses in fruit and vegetables, and are often the target of intensive insecticide applications to protect commercial production. In addition, few pests have a greater impact on world trade in agricultural products than Tephritid fruit flies. Their economic consequences are so great that countries free of the major Tephritids (Chile, Japan, New Zealand and USA) prohibit the import of fresh produce from countries where these pests are endemic and have active detection and emergency response programmes in place to maintain their fruit fly free status.

Achieving a low pest prevalence or even pest-free status has therefore been the goal of many other area-wide integrated pest management programmes.

Appendix C. Emergency Response Action Plan for a New Weed

This ERAP covers an outbreak of the ice plant *Galenia pubescens* (Azoaceae: Sesuvioideae) as an example of an introduced potentially invasive weed.

Legal provisions

- Agriculture and Livestock Improvement Ordinance, Cap. 94, Noxious Weeds Rules – Section 5, 2009.
    - Provisions to declare a noxious weed, enter land, and destroy or require a noxious weed to be destroyed.
- Environment Protection Ordinance, 2015. The objectives of this Ordinance are to preserve and sustain the natural environment of St Helena, including by (c) minimising the risks to the environment from the introduction of potentially harmful materials or organisms:
    - Art. 22: it is an offence to release or allow to escape into the wild a non-native species;
    - Art. 24: newly discovered species are considered protected pending identification; where a person makes a discovery of an animal or plant which appears or is believed to be a species previously unknown in St Helena, he shall notify the Chief Environmental Officer of that discovery as soon as is reasonably practical;
    - Arts. 25 & 26: a licence can be granted to catch or kill native species, if justified;
    - Art. 87: the enforcement officer has powers to take samples, inspect, seize equipment or articles, search articles, restrict movement of articles, stop and search vessels;
    - Art. 98: the enforcement officer can serve an emergency environmental protection notice, which expires after 49 days.

Financial provisions

- All operational costs fall to ANRD budget.
- Costs of removal of noxious weeds on private land fall to the owners.
- No legal provision for compensation for loss of crops.

Chain of command

- ANRD is the lead agency; the Agricultural Authority is Head, ANRD.
    - PCSO is the recognised Expert, informing the Technical Group coordinating the operational plan.
    - Technical Group members include: BSO, ADO, TCO.
    - The Field team work under the guidance of the Technical Group, including at least 1 pesticide sprayer.

Operational Plan

Key facts:

- *G. pubescens* can grow well in arid, dry conditions, with poor soil.
- Transmission can be by spread of seeds or root fragments, which can grow if they come into contact with moist soil.
- Seeds can survive in dry conditions for an unknown period, germinating when it rains or they are transported to moist conditions.
- Animals can carry seeds in their guts to places outside the outbreak area.
- Plants growing in fertile soils can be toxic to livestock.
- There are not likely to be human health issues.

Health and Safety

- Pesticides must be applied according to the appropriate Code of Best Practice.
- The appropriate Personal Protective Equipment must be worn before preparing or using pesticides, according to the label instructions and Code of Best Practice.

Control strategy – immediate action and rapid response

- Confirmation of identification made by one or more of the following:
    - Samples of entire plant, including roots, stems, leaves, flowers and fruiting bodies if possible, sent to a local expert
    - On-line resources
    - Digital photos of entire plant, including roots, stems, leaves, flowers and fruiting bodies if possible, sent to a local expert, international expert or diagnostic laboratory such as Fera, UK
    - Samples of entire plant, including roots, stems, leaves, flowers and fruiting bodies if possible, sent to an international expert or diagnostic laboratory such as Fera, UK
- Once the identification of the novel species has been confirmed, notification of:
    - Head, ANRD
    - Emergency Planning Manager
    - Chief Environmental Officer
- A short fact sheet of key facts for the species will be prepared by the technical expert, to include where available:
    - Identification, including photos
    - Life cycle details
    - Dispersal ability
    - Monitoring methods
    - Biosecurity information
- ANRD planning group formed, consisting of Head, ANRD, PCSO, ADO, BSO and other officers as appropriate. This group will plan the subsequent actions,

the details of which will depend on the exact nature of the interception, such as time of year, species identified, location of the outbreak, etc and will include:

- Determination of the area to be surveyed and monitored; see Annex A.
- Access to private properties and any likely issues;
- Guidance on accessing steep or hazardous terrain:
  - Assessment of host plants present
  - Monitoring effort required at the borders
  - Treatment options
  - Access options, if required
- Preparation of equipment and materials;
- Organisation of labour and transport.

- Extent of infestation determined around the site of known infestation by searching: see Annex A.
- ANRD-led participatory attempt initiated to eliminate the incursion in the defined area. This may include, as appropriate:
  - Removal of all visible plants in outbreak area by hand.
  - Removed plants destroyed by incineration to ensure destruction of seeds.
  - Pesticide treatment using broad spectrum herbicides such as Roundup.
- Containment programme initiated in the outbreak area, in at least zone 1 with possible expansion to zone 2 or beyond if deemed appropriate:
  - All movements on and off the area of vehicles, equipment and machinery is restricted to prevent dispersion of root fragments and seeds via soil stuck to tyres, etc.; see Annex B.
  - All movements of livestock on and off the area are also restricted to prevent the dispersal of seeds in the gut.
  - Visits to local landowners to promote removal of plants and practices which reduce spread, and raise awareness of *G. pubescens* identification and preventing spread.
  - Removed plants destroyed by incineration to ensure destruction of seeds.
  - Where suspicion is raised of a possible outbreak, visits made to carry out visual surveys.
  - Where public footpaths or post box walks cross an outbreak area, signs must be posted up at all entry and exit points alerting walkers to the situation and on exit requiring boot soles to be cleaned and trouser turn-ups and Velcro fastenings to be checked for fruiting bodies.
- Routine monitoring of host plants should continue following the guidelines in Annex A.
- There are 3 possible scenarios resulting from the actions outlined above:
  1. Number of plants decline to zero and no further outbreaks are detected.
     ⇨ Monitoring continues and is wound down following the guidelines in Annex A.

2. Number of plants remain constant or increase.
    ⇨ Further actions required (see the section below)
3. Other outbreaks are detected in separate locations.
    ⇨ Further actions required (see the section below)

Control strategy – further actions

- Notification of Tactical Coordination Group (TCG).
- Further actions may include all or any of those listed below. Additional resources (labour, materials, etc.) and powers may be required at this stage.
- Declaration of quarantine in the infected area.
- ANRD-led participatory eradication programme and containment programme initiated at a much wider level, to be defined by the TCG, following the methods outlined for the rapid response.
- GIS mapping of hosts, refuges, location of prey species, dispersion pathways, or other key information, as appropriate, to predict likely patterns of dispersion.

<u>Contingency plan: in the event of further outbreaks in other districts</u>

- The same procedure will be followed as laid out for the initial outbreak.
- Extent of infestation determined in zones 1 and 2 around the new outbreak by visual inspection for plants, based on guidelines in Annex A.
- ANRD-led participatory eradication programme initiated which may include, as appropriate:
    - Removal of all visible plants in outbreak area by hand.
    - Removed plants destroyed by incineration to ensure destruction of seeds.
    - Pesticide treatment using broad spectrum herbicides such as Roundup.
- If necessary, restrict movement of vehicles and livestock in and out of the outbreak area.
- Where public footpaths or post box walks cross an outbreak area, signs must be posted up at all entry and exit points alerting walkers to the situation and on exit requiring boot soles to be cleaned and trouser turn-ups and Velcro fastenings to be checked for fruiting bodies.
- Analysis of the pathway of dispersal to try and predict and prevent new outbreak areas.
- GIS mapping of hosts, refuges, location of prey species, dispersion pathways, or other key information, as appropriate, to predict likely patterns of dispersion.
- If number of infected plants decline to zero and no further outbreaks are detected, monitoring continues and is wound down following the guidelines in Annex A.

Control strategy – when to stop

- A typical pattern of progress for a successful intervention is as follows:

    - Rapid response at each outbreak location;
    - Intensive monitoring programme at each outbreak location for at least 6 months as outlined in Annex A;
    - Reduced monitoring programme for 1 year (a complete season);
    - Some additional monitoring around the outbreak area for a further year.
- Eradication should not be considered achieved until 2 years from the last sighting on the island.
- In the event of an unsuccessful intervention, the TCG should consider when it is appropriate to step down the emergency response, considering:
    - The level of expected economic and/or environmental impact of the species;
    - Available mitigation measures ;
    - The cost-benefit of continued action.

Biosecurity

- An important aspect is to analyse the introduction pathway, if possible, to minimise the risk of further incursions.
- The biosecurity team will assess the likelihood of introduction by sea or air pathways: passengers and cargo.
- Biosecurity actions for a specified number of voyages to be agreed by the ANRD planning group may include, as appropriate:
    - Treatment of passengers footwear;
    - Checks on shipping containers and/or cargo;
- Annex B. General biosecurity measures to be followed.
- Annex C. Fact sheet for Fact sheet for *Galenia pubescens*.

Communication

- The EPM is notified of the situation once the identification of the novel species has been confirmed and will advise on the level of communications.
- For the initial response (as outlined under “immediate action and rapid response”) unless otherwise advised by EPM, ANRD will lead the communications which may include, as considered appropriate:
    - Posters and signs advising of the actions around zones1 and 2;
    - Radio reports;
    - Press release.
- Updating the Head, ANRD on a regular basis.
- In event of a larger programme (as outlined under “further actions”) the TCG will lead on communications.
- Updating Council Committee on a fortnightly basis and when need for formal declaration of quarantine is required.

- Updating Director of ENRD as and when necessary on the progress of the programme.
- Updating the Chief Secretary as and when necessary on the progress of the programme.
- Press releases issued:
    - Simple measures to prevent the spread and a list of symptoms developed and included in all press releases henceforth.
    - Update press releases.
- Radio interviews held to accompany press releases.

Equipment and Resources

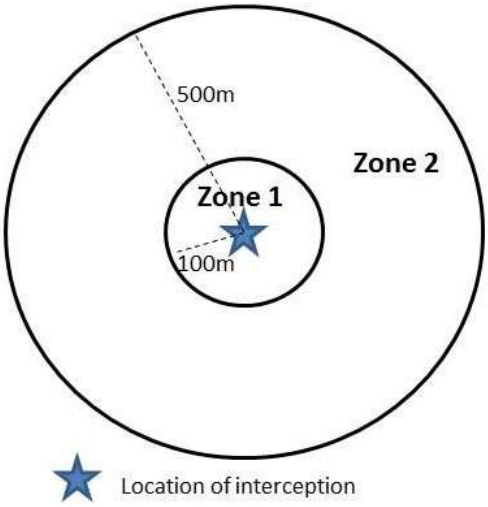
- Pesticide application devices, eg knapsack sprayers and mistblowers
- Appropriate herbicide products
- PPE for pesticide application
- Digital camera
- Disposable protective clothing and waterproof boots for site visits
- Sterilising fluid, bleach

Annex A. Guidelines for monitoring

This procedure is for ANRD Pest Control Service.

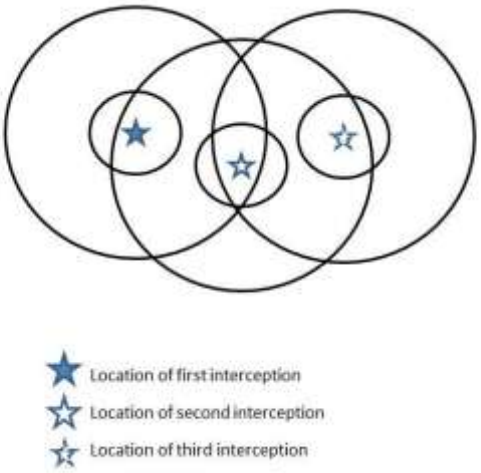
Deciding the high risk area.

- These areas are recommended guidelines. Note that the size of each zone may vary depending on the species and exact nature of the location and any variation from the guidelines will be agreed by the ANRD planning group.
- On a map, mark the location where the novel species was found.
- Draw a circle with a radius of 100m. The area inside the circle is **zone 1**.
- Draw a second circle with a radius of 500m. The area inside the circle, and excluding the bit already covered by zone 1, is **zone 2**.
- This is illustrated in the diagram below.

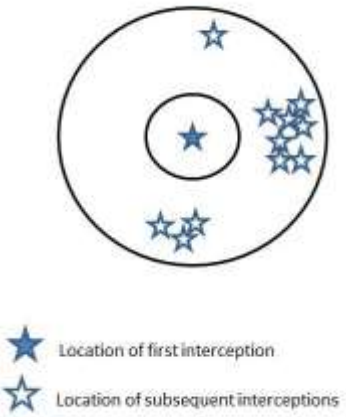


- In zone 1 intensive searching for specimens of the new plant species will occur, attempting to cover all areas where the species could occur to locate all growing plants of the new species.
- In zone 2 less intensive searching takes place, targeting the most likely places.
- Outside zone 2, spot checks are carried out in areas where the new plant species is most likely to occur.
- When deciding which areas are *most likely* consider:
    - Preferred soil types
    - Climate match
    - Dispersal pathways

- Repeat the above for every new interception of the novel species which takes place outside the initial zone 1.
- The outbreak source can be tracked by analysing the pattern of consecutive interceptions.
- The diagram below illustrates the track of 3 interceptions, showing the overlapping zoning which can occur. The searching programme for each zone are decided by the ANRD planning group, based on local knowledge and the specific details of the incursion.



- An initial interception could be followed by a scatter of subsequent interceptions as new specimens are detected in zones 1 and 2. This is illustrated in the diagram below. In cases such as this, the ANRD planning group will decide exactly how to proceed. Suggested actions are:
    - Expand zone 2 around the single point: it may be a one-off
    - Create a new zone 1 and 2 around the dense cluster of points
    - Use local knowledge to decide how to react to the cluster of 3 points



How often to monitor

- Monitoring of zones 1 and 2 should take place on at least a monthly basis for at least 1 year for newly germinated plantlets.
- A reduced monitoring programme will continue for a further 1 year (a complete season), as appropriate.
- Note that the exact timing and duration of the monitoring programme will depend on the presence of host plants, the season and the weather patterns.
- Any new interceptions will take the procedure back to the beginning again.

Annex B. General biosecurity measures to be followed

This procedure is for all users of declared outbreak areas.

- No soil or compost to be moved outside the area.

- Gardening and farming tools such as garden forks and spades to be cleaned of all soil and debris before being taken out of the area.

- Footwear, including waterproof boots, hiking boots etc, to be thoroughly cleaned of mud and debris, with particular attention to any Velcro fastenings, when leaving the area.

- Vehicles, cars, tractors, rotivators or trailers must be parked outside the outbreak area, wherever possible, on hard standing away from loose soil which could be carried in the tyres.

- Where vehicles, cars, tractors and rotivators etc are required to move in and out of the outbreak area, care must be taken to minimise the transmission of soil and debris on the tyres, chassis etc. through thorough washing.

- Livestock and pets should be kept out of the outbreak area.

- Any public walking paths crossing the outbreak area should be closed, with detours clearly marked around the outbreak site. Walkers should be advised by signage to clean their boots thoroughly of mud when exiting the buffer zone, and to check their bags for mud, vegetation or seeds, with particular attention to any Velcro fastenings.

Annex C. Fact sheet for *Galenia pubescens*

Galenia pubescens is a plant species native to South Africa.

Identification

Galenia pubsecens is a long-lived creeping herbaceous plant that usually forms a dense mat of vegetation over the ground. It is greyish in appearance, up to 60cm high and 1.6m wide or wider. It has a taproot of up to 2m deep in the soil. The stems are covered in scale-like hairs and woody at the base. The leaves are alternately arranged, slightly fleshy, egg shaped, with smooth margins and the surface covered in small bumps. The flowers are small (2-3mm across), stalkless, and found between the leaf and the branch. They have 5 small white or pinkish petals which go yellow with age. The fruit is 2-3mm long, cup shaped, dry and leathery.

This species reproduces mostly by seed and is a prolific seeder.

Impact

In Spain and Australia *G. pubescens* is considered an invasive weed threatening native vegetation.

- *Galenia* grows over the top of native vegetation smothering it and preventing its regrowth. In Australia it is recorded as invading dry coastal vegetation, low grasslands, grassy woodland, dry sclerophyll forest and rock outcrop vegetation. This species forms a dominant understorey mat in degraded woodland sites to the exclusion of other native ground flora.
- Research has found that *Galenia* contains levels of nitrates and soluble oxalates that can be toxic to livestock. On infertile soils these chemical were not found to be in high levels but plants grown in fertile soils accumulated the chemicals in toxic amounts.
- Bees love the flowers but it taints the taste of honey.

Spread

The seeds may be dispersed by water, animals, machinery (e.g. mowers) and in dumped garden waste or lawn clippings. In pasture areas, coastal *Galenia* may also be spread by livestock that ingest its seeds. Contaminated soil and machinery also spreads the plant by carrying both seed and root segments.

Management

It is best removed manually when still in small numbers.

G. pubescens is difficult to treat with herbicides due to the long tap root, and repeat applications are needed. Removal of large infestations will expose areas of bare ground and a revegetation strategy should be planned to prevent the invasion of other weeds.

Appendix D. Pesticide application equipment and PPE to be held within ANRD

Minimum essential PPE stock levels to be held at level 1

ITEM	MINIMUM STOCK HOLDING (REVIEW AS RISK LEVEL VARIES)
Coveralls, Type 3	2
Coveralls, Type 5/6, size L, XL	100
Face shield (to EN 166)	10
Nitrile gloves (0.5mm thick, 300mm long)	10 pairs
Respirator (EN 149 to EN 141)	10
Respirator filter cartridge	20

Other items

ITEM	MINIMUM STOCK HOLDING (REVIEW AS RISK LEVEL VARIES)
Knapsack sprayers, 20l - herbicide	2
Knapsack sprayers, 20l – insecticide/fungicide	2
Knapsack sprayers - biopesticide	1
Mistblower	2
Measuring jug	2
Pesticide transport box	2

ANRD pesticides held in stock

Active ingredient	Trade name	Target	MAPP number	Normal quantity in stock
Insecticides				
Cypermethrin	Supasect	Caterpillars in general, fruit fly	15536	10l
Dimethoate	Danadim Progress	Aphids, red spider mite, thrip, leaf miner	12208	5l
Abamectin	Dynamec	Rust mites	13331	5l
Spiromesifen	Oberon 2 SC	Whitefly	11819	5l
Etoxazole	Borneo	Mites	13919	5l
Pirimiphos-methyl	Actellic dust	Wasps nests		5kg
Malathion	Malathion 60	Mealybug		5l
Lecanicillium muscarium	Mycotal	Whitefly, thrip		5l
Beauvaria bassiana	Naturalis-L	Whitefly, thrip, mites	14655	5l
Bacillus thuringiensis	Dipel	Diamondback moth		5l

Herbicides				
Glyphosate	Clearout 360	Grass, weeds	N/A	10l
Glyphosate	Gallup 360	Grass, weeds	02044	10l
Glyphosate	Roundup Probio	Grass, weeds		5l
Glyphosate	Barbarian	Grass, weeds, including on hard surfaces	12714	5l
2,4-D + Dicamba + Triclopyr	Nushot	Stumps, foliage		5l
Triclopyr	Garlon 480	Stumps, foliage	N/A	20l
Linuron	Afalon	Weed in carrot	14187	5l
Dimethenamid	Frontier	Weed in maize		5l
2,4–D Amine	2,4–D Amine	Weed in oats and barley	??	5l
Pendimethalin	Stomp Aqua	Weed in onion	14664	5l
2,4-D + Mecaprop	Sydex	Weed in lawns	MAFF: 02061	5l
Fungicides				
Mancozeb + metalaxyl	Sanlaxyl	Blight (early and late), Pythium rot	L6100	5l
Chlorothalonil	Odeon 720 SC	Blight (early and late), Pythium rot		5l
Bupirimate	Nimrod	Powdery mildew	13046	5l

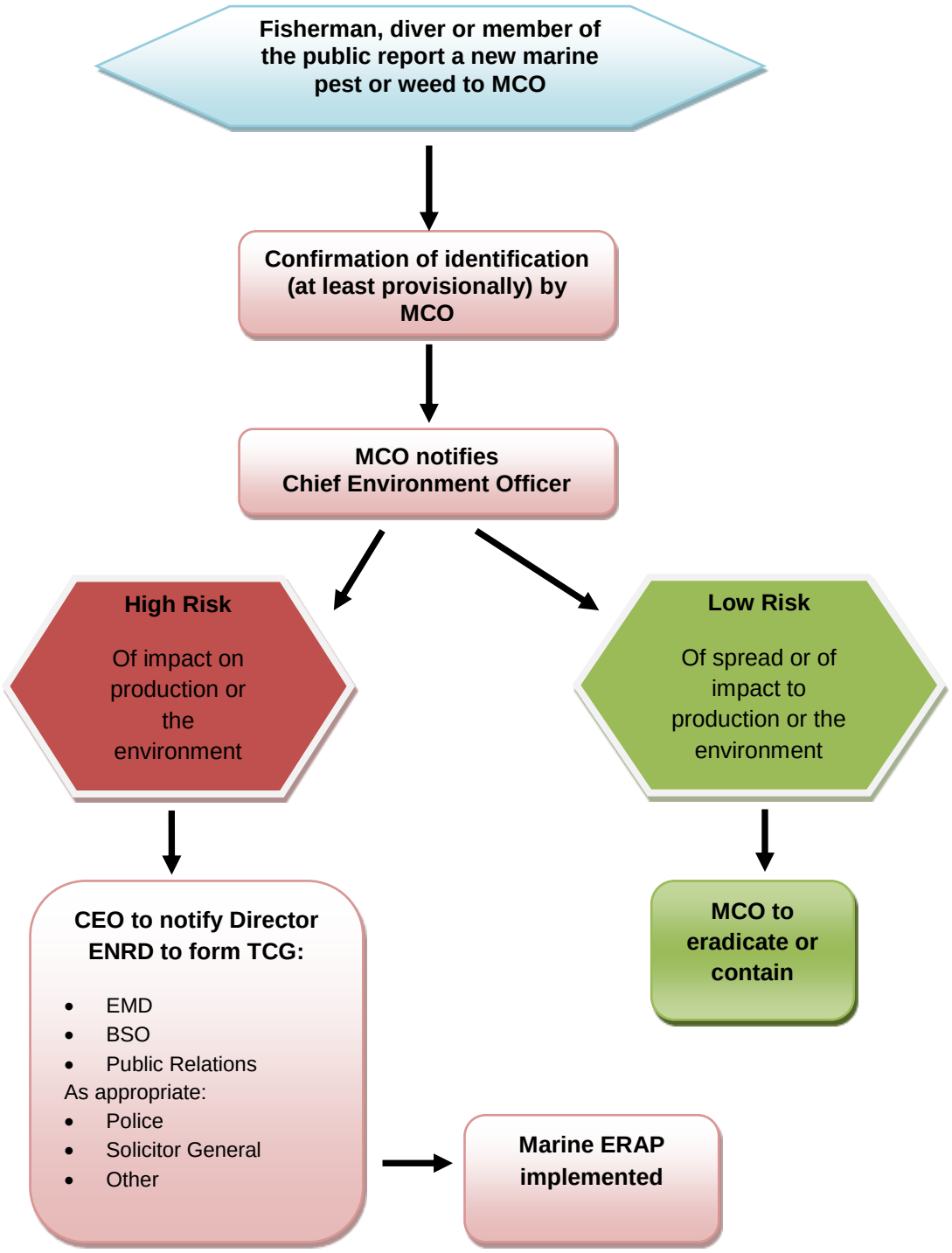
4. Biosecurity Risks in the Marine Environment

Speed sheets for use in respect of a high risk case being identified by the Marine Team

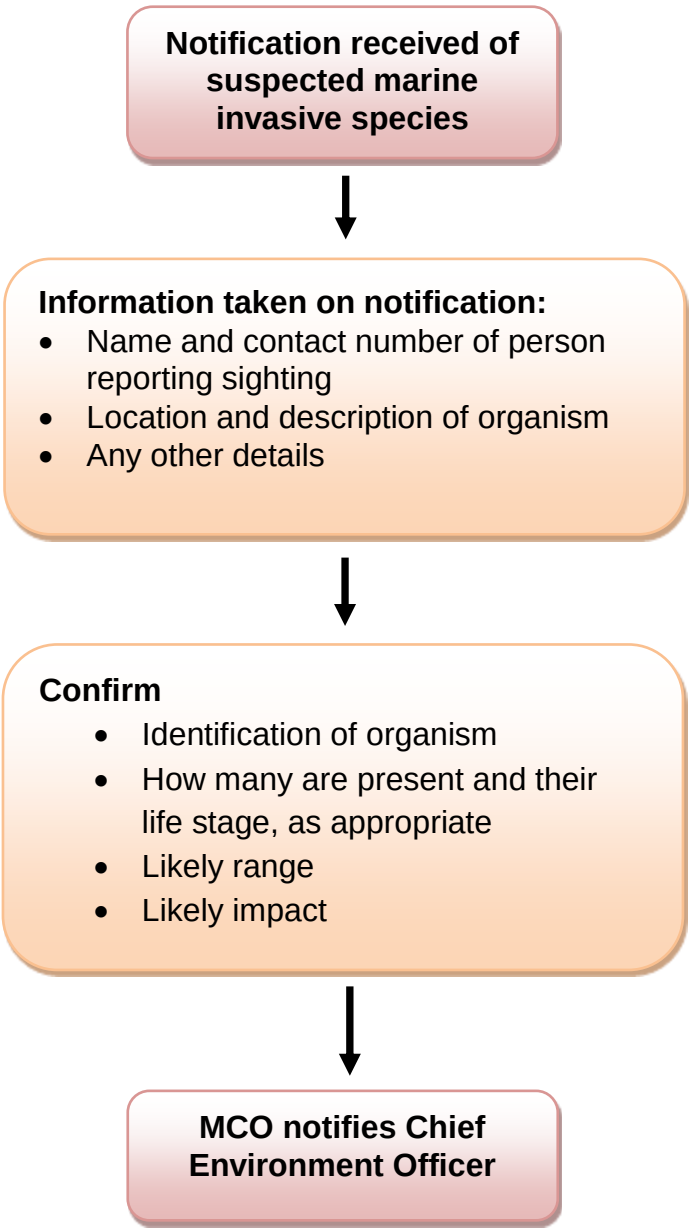
1. **Suspected case of introduction of a new marine invasive species in island waters**
2. **Marine team actions speed sheet**

Follow the process as per the sheet then refer to the main plan for further information.

1. SUSPECTED CASE OF A NEW MARINE INVASIVE SPECIES



2. MARINE TEAM ACTIONS SPEED SHEET



Information

This plan deals with the detection of a new marine invasive species to the island, plant or animal. It is concerned with the first detection of a new potentially invasive species to St Helena, and not with the containment, management or eradication of a known established invasive species.

Invasive species of concern are those which are:

- Not native to St Helena;
- Likely to survive in our waters;
- Able to spread by human mediated or natural means;
- Likely to become a pest or nuisance to social, environmental or economic values.

It is important to note that not all introduced species will survive to reproduce, spread, or become a pest. Therefore, once identification has been confirmed a rapid risk assessment is required to determine the likelihood of the species becoming a pest, noting that the best predictor of undesirable invasive characteristics is that the species has become a pest elsewhere.

Once widespread and abundant it is very difficult to control marine invasive species as options are far more limited than in the terrestrial environment. Prevention of introduction of a new species is therefore even more important than for terrestrial invasive species and to this end a Biosecurity Protocol for the Marine Environment (See Appendix A) has been developed. Successful management on new introductions depends on early detection and implementation of a rapid response. Species may be from a wide taxonomic range, and the main concerns are:

- Fish parasites and diseases
- Sessile encrusting organisms such as worms, molluscs and tunicates
- Algae

Potential damage could occur to the fisheries, environment and tourism sectors through, for example, declines of commercial fish species, excessive biofouling on vessel hulls requiring more frequent cleaning, and algal blooms which may affect fish productivity, human health and tourism activities.

This plan seeks to mitigate risk by early identification of cases which are considered to be high risk. Intervention points have been identified at notification of a suspected case in order to minimise risk to the wider sector.

Intention

Working with multi agency partners, utilising a risk based approach SHG will seek to:

- Protect life
- Protect the fisheries economy of the island
- Protect the native and endemic fauna and flora of the island
- Protect the marine related tourism economy of the island
- Undertake measures to minimise the risk of spread of a marine invasive species outbreak
- Warn and inform the public as to the risk providing reassurance to maintain confidence in the SHG response
- Ensure the restoration of normality as soon as possible

Method

All members of the St Helena community are responsible for reporting any unusual sightings. Likely detection of a new species includes:

- EMD during monitoring dives;
- EMD from settlement plate monitoring;
- Fisherman lands a new species of fish;
- Recreational diver spots something new;
- Worker on the wharf while carrying out hull cleaning;
- Hull inspection of a boat new to the island.

Reports can be made to the Harbour Master, Chief Environmental Officer, Biosecurity, organisations such as the National Trust or Tourism, or directly to the Marine Conservation Section.

Level of Response:

A single level has been identified which determines the actions and responses to help assess the risk to St Helena and inform action that may be required.

Suggested actions are listed for guidance purposes. The response will need to fully take account of the developing threat and risk so as to ensure actions are proportionate and effective and be compatible with broader SHG strategic intentions.

Level 1

Marine invasive species, with potential social, economic or environmental impact	
Suggested Actions	**Further Considerations**
• Containment of affected vessels / area • Implementation of specific plan and	• Risk of spread within St Helena waters • Command Structure

any associated protocols
• Raise awareness with key stakeholders
  o Fisherman's Association
  o Dive groups
  o Yacht Club
  o EMD
  o Other as appropriate
• Continued horizon and environmental scanning
• Review information and intelligence updates, daily / weekly as appropriate
• Implement additional border control procedures, as appropriate
• Public reassurance / warning and informing
	• Review membership of the TCG
	• Restrictions on movement of vessels, if appropriate
	• Restrictions on activities in affected areas, if appropriate
	• Compulsory cleaning of hulls and mooring devices, if appropriate
	• Requests for international assistance

Emergency response action plan

This plan is generic and covers the introduction of a new marine invasive species in general. A specific marine invasive species emergency response action plan provides the details required across the different taxonomic groups:

- Appendix A. Emergency response action plan for marine invasive species
- Appendix B. Dive gear and monitoring equipment held by EMD

Administration

This plan will be administered by the Emergency Planning Manager (EPM). This will include review and updates as the situation develops.

Command and Control

A command and control structure will be implemented to support this plan

Gold: Chief Secretary

Silver: Chair TCG: Chief of Police

Tactical Coordination Group Membership:
Environment: Chief Environmental Officer
Agriculture: Biosecurity Officer
Communications: Chief Public Relations Officer
Police: Chief of Police
Port Authority: Harbour Master / Head of Customs
Shipping Agents: Solomon's GM (Agencies)
Emergency Planning Manager

The Tactical Coordination Group (TCG) will meet on an *ad hoc* basis until such point as the increase in risk rises. At this point consideration should be given to membership of the TCG and as to whether a Tactical Coordination Centre should be established. Consideration should also be given, based on the risk as to whether a Strategic Coordination Group meeting should be held and if necessary extended to include an Incident Executive Group.

Business Continuity Management

The level at which public services will operate will be a strategic decision made by Gold. Critical business activity will need to be identified in advance of an escalation of threat and consideration given as to how these services will be maintained.

Personal Protective Equipment (PPE)

Any decision to deploy PPE will be made by the Silver Commander and will be based on an appropriate risk assessment to the threat posed. This may include the pre deployment of 'go boxes' to strategic locations as a result of an increase in the threat and subsequent change to the response level. Dive gear and monitoring equipment held at EMD is given in Appendix C.

Waste Management

The World Health Organisation has produced guidance in relation to the management and safe disposal of waste resulting from contact or potential contact with biocides. This guidance should be applied both within healthcare settings and also for PPE issued to staff outside of such environments.

Infested marine debris must be disposed of in the Landfill site in an appropriate manner.

Communications

Communications will utilise various media channels including online, radio, newspaper and TV and will look to build upon previous good practice including daily media briefings, if the situation escalates.

Contingencies

The St Helena Major Incident Plan is available via the Emergency Planning Manager.

A decision will be made by Silver in relation to whether the Major Incident Plan should be activated and its timing.

Appendix A. Emergency Response Action Plan for Marine Invasive Species

This ERAP covers an outbreak of a new marine invasive species, plant or animal. This could be a species from a wide taxonomic range, all of which are covered in this general plan.

Legal provisions

- Environment Protection Ordinance, 2015. The objectives of this Ordinance are to preserve and sustain the natural environment of St Helena, including by (c) minimising the risks to the environment from the introduction of potentially harmful materials or organisms:
    - Art. 22: it is an offence to release or allow to escape into the wild a non-native species;
    - Art. 24: newly discovered species are considered protected pending identification; where a person makes a discovery of an animal or plant which appears or is believed to be a species previously unknown in St Helena, he shall notify the Chief Environmental Officer of that discovery as soon as is reasonably practical;
    - Arts. 25 & 26: a licence can be granted to catch or kill native species, if justified;
    - Art. 87: the enforcement officer has powers to take samples, inspect, seize equipment or articles, search articles, restrict movement of articles, stop and search vessels;
    - Art. 98: the enforcement officer can serve an emergency environmental protection notice, which expires after 49 days.
- Harbour Ordinance, 2015. The Harbour Master can:
    - Art. 5 (1a): move the mooring of such vessel to such other place as he may specify;
    - Art. 8 (1g): give directions regarding the use of ballast;
    - Art. 8 (4) prohibit or limit any recreational activities.

Financial provisions

- All initial operational costs fall to EMD budget.
- Costs of removal of infected organisms fall to the vessels owner, where this can be established.

Chain of command

- EMD is the lead agency; the authority is the Chief Environment Officer (CEO), who is responsible for the “formulation of plans and planning activities for the prevention of, preparedness for and response to environmental emergencies and

for the restoration of any part of the environment damaged by or during such an emergency" according to the EPO, Art. 8 (2f);

- Marine Conservation Officer (MCO) is the recognised Expert, informing the Technical Group coordinating the operational plan.
- Technical Group members include: Biosecurity Officer (BSO), Marine Conservation Officer (MCO), CEO, Harbour Master.
- The diving team works under the guidance of the Technical Group, including four qualified divers.

Operational Plan

Key facts:

- Once a new marine species has been detected it is often too late to take effective action for containment or eradication.
- Monitoring may have to be undertaken over a period of time to establish the range of a newly detected species;
- There are practical limitations to the actions that can be done to contain or eradicate marine organisms.
- It will take time to react to a new species detected, during which period the appropriate expertise will be consulted.
- There are not likely to be human health issues, with the possible exception of algal blooms.

Health and Safety

- Diving activities must only be undertaken by qualified divers, applying the appropriate risk assessment for working practices.
- In the event of detection of venomous species such as Lionfish, some Molluscs or some Echinoderms, specific protocols for their sampling and handling will be required.
- Appropriate PPE will be worn at all times, according to the relevant risk assessment.

Control strategy – immediate action on suspicion

- Sampling of the suspect organisms by the Marine Conservation Section.
- Confirmation of identification of species made by one or more of the following:
  - Samples sent to a local expert
  - On-line resources
  - Digital photos sent to a local expert, international expert or diagnostic laboratory
  - Samples sent to an international expert or diagnostic laboratory
- Extent of infestation determined around the site of known infestation by an appropriate method for that taxonomic group, such as:

    - Sampling using standard techniques, and this may have to take place over a long period of time (hulls, water, fish or dive sampling); see Annex A
    - Placing existing and additional settlement plates; see Annex B
- Area of potential infestation is identified (neighbouring areas with likely settlement surfaces, refuges, pathways of infection, etc).
- Notification of TCG.

Control strategy – action on confirmation

Main strategy

- Declaration of quarantine in the infested area, as appropriate. This may need authorisation under the Governor's emergency powers (if not provided for under the EPO).
- GIS mapping of settlement surfaces, refuges, location of prey species, dispersion pathways, or other key information, as appropriate, to predict likely patterns of dispersion.
- Area-wide monitoring using a method appropriate to the taxonomic group.
- EMD-led participatory eradication programme initiated which may include, as appropriate:
    - Restriction of vessel movements in the affected area.
    - Compulsory cleaning of infected vessel hulls and mooring buoys.
    - Destructive sampling to achieve local eradication.
    - Wrapping of structures to smother encrusting species, with the possible addition of fresh water, chlorine or acetic acid treatment applied within the wrapping.
    - Visits to promote management techniques which reduce infection and spread, and raise awareness of symptoms and preventing spread.
    - Where suspicion is raised of a possible outbreak, visits made to check vessel hulls, mooring buoys, settlement sites, or the waters, as appropriate.

Contingency plan: in the event of further outbreaks in other areas

- Declaration of quarantine in the infested area, as appropriate. This may need authorisation under the Governor's emergency powers (if not provided for under the EPO).
- GIS mapping of settlement surfaces, refuges, location of prey species, dispersion pathways, or other key information, as appropriate, to predict likely patterns of dispersion.
- Reaction will be proportionate to the level of risk identified, and may include:
    - Restriction of vessel movements in the affected area.
    - Compulsory cleaning of infected vessel hulls and mooring buoys.

- Appropriate control methods.

Biosecurity

- Annex C. Haul-out procedures for visiting yachts.
- Annex D. General biosecurity measures to be followed.
- Annex E. Fact sheet for marine invasive species

Communication

- Inform TCG
- Updating Council Committee on a fortnightly basis and when need for formal declaration of quarantine is required.
- Updating Director of ENRD as and when necessary on the progress of the programme.
- Updating the Chief Secretary as and when necessary on the progress of the programme.
- Press releases issued:
  - Precautionary press release: Simple measures to prevent the spread and a list of signs to look out for included in all press releases henceforth.
  - Confirmation of identification press release.
  - Update press releases.
- Radio interviews held to accompany press releases.

Equipment and Resources

- Diving gear: air tanks, buoyancy control devices, regulators, mask, fins, snorkel, wet suit
- Underwater cameras
- Basic sampling gear: nets, containers
- PPE: latex gloves, plastic aprons

Annex A. Collection of marine samples

This procedure is for EMD Marine Conservation Section.

For Divers

- Take sample tubes pots with you on every dive
- Get GPS of dive site and depth of sample collection
- Take underwater photo of sample prior to collection if possible

In laboratory

- Take lab photo of sample
- Preserve in correct chemical for that species – use information on taxonomists list which includes the preservative to use for that specialist/phylum
- Place waterproof label into sample pot with specimen

  Data on label to include:
  - Sample code: yymmdd/site number/sample number
  - Species name
  - Preservative
- Complete lab sample record form
- Complete JNCC habitat form

In the office

- Update excel sheet Dive site and sample collection – complete both worksheets with details of the dive and details of the samples collected.
- Download photos and label with Sample code and site name. Save photos to Marine section dive survey pictures hardrive in folder St H dive pics, St Helena underwater photos. Place in new folder labelled date backwards and site (label photos the same)
- Import photos into Adobe lightroom catalogue and label with known information.

Sending samples to taxonomists

- Contact the taxonomist prior to sending any samples to ensure they have time and relevant expertise to analyse samples being sent. Use list of known taxonomists.
- Complete export permit
- Update excel sheet Dive site and sample collection with who you have sent which samples to
- Pack up the samples well – ensure all lids are sealed properly, tape up top of pots with parafilm, places pots in plastic bag inside box, ensure sufficient padding
- Contact taxonomist to let them know samples are on their way and ask to be updated when they arrive

What to do when taxonomists send in identification of a sample

- Update lightroom photo catalogue by using the sample reference number to locate any photographs of the sample. Label any other photos of the same species where possible
- Update identification guide
- Update species database
- Update excel sheet Dive site and sample collection with confirmed species name

Annex B. Monitoring protocol for settlement plates.

This procedure is for EMD Marine Conservation Section.

To be advised.

Annex C. Haul-out procedures for visiting yachts

This procedure is for all yacht owners visiting St Helena.

These procedures are designed to minimise the risk of introducing a new and potentially invasive species to St Helena's marine environment. Hauling-out is permitted in emergency situation and by arrangement with the Port Authorities.

Contact:

- David Caswell, Harbourmaster, tel (00 290) 22287, david.caswell@hmrc.gov.sh.

Bilge water should have been pumped out before entering St Helena's territorial waters, in compliance with St Helena's Biosecurity Protocol for the Marine Environment. If this was not applied you must inform the Harbourmaster for advice on how to proceed.

Immediately before hauling-out:

To be done the same day as the vessel is hauled-out:

- Aerosol insecticidal spray (with a synthetic pyrethroid as the active ingredient) to be applied in all below-deck areas, including cabins, galley, engine room, etc. All doors, port holes and windows to be closed, and the spray applied as you leave the vessel.

Any known infestations of rats, mice, mosquitoes or other invertebrates must be communicated to the Port Authorities for treatment before the vessel is hauled-out.

Hull cleaning:

- Place a tarpaulin below the hull to collect scrapings and debris.
- All material scraped from the hull must be contained, collected up and double bagged for disposal in the land-fill site.
- The area must then be well washed down with a solution of 1 part domestic bleach with 4 parts water.

Further information, import health standards and import licence applications can be found at http://www.sainthelena.gov.sh/st-helena-biosecurity-service/ or call ANRD on 00 290 24724.

Annex D. General biosecurity measures to be followed.

This procedure is for all users of declared quarantine areas.

- No vessel, mooring buoy or other floating equipment to be moved outside the area.

- Diving gear and equipment to be cleaned after use in affected area by rinsing in fresh water and air drying.

- Enforcement of controls over recreational diving, water sports and fishing

Annex E. Fact sheet for marine invasive species

http://jncc.defra.gov.uk/default.aspx?page=1532

http://ocean.nationalgeographic.com/ocean/explore/pristine-seas/critical-issues-marine-invasive-species/

The problem

Thousands of marine species and plants and algae are transported from their native range to "new" areas. These species are called non-native, alien or invasive species. Species can be introduced to non-native environments accidentally or deliberately.

Most marine invasive species stow away in ship ballast. Large boats have tanks in their hulls that are filled with seawater to counterbalance cargo weight. Boats draw in water at their loading port, in some cases more than 20 million gallons (75 million litres). When the ship arrives at its destination, it releases the ballast—along with whatever species happen to be inside, from schools of fish to microscopic organisms. Some 45,000 cargo ships move more than 10 billion tons of ballast water around the world each year and at any given moment some 10,000 different species are being transported between bio-geographic regions in ballast tanks alone.

Invasive species also hitch rides on the outside of ship hulls and on the millions of tons of plastics and other trash that floats around the globe in ocean currents.

Deliberate introductions occur through the import and release of fish and bivalves for commercial purposes in new locations. Other species living in or on these commercial species may be accidentally introduced, at the same time unless careful precautions are taken. Pets acquired through the aquarium and exotic pet trade—and then released—can become invasive species, as can escapees from aquaculture farms.

Ongoing sea temperature rise caused by global warming is allowing non-native species to populate ocean habitats that were once too cold to be hospitable.

Effects of the introduction of marine invasive species

Once established in a new region, non-native species may invade new areas adjacent to the occupied area by natural dispersal, e.g. via transport in water currents in the case of many seaweeds and phytoplankton.

Non-native species may displace native organisms by preying on them or out-competing them for resources such as for food, space or both. In some cases this has led to the elimination of indigenous species from certain areas. Occasionally non-native species can reproduce with native species and produce hybrids, which will alter the genetic pool (a process called genetic pollution), which is an irreversible change. When

an invasive species has established itself in the marine environment, it is likely to be impossible to get rid of it.

One infamous example of a marine invasive species is the zebra mussel, accidentally introduced by a cargo ship into the North American Great Lakes from the Black Sea in 1988. The tiny mollusc multiplied uncontrollably, starving out many of the Great Lakes' native mussel populations and interfering with human structures from factory intake pipes to ship rudders. They've now spread from Canada to Mexico and are considered a major nuisance species. Hundreds of millions of dollars are spent annually to control their numbers.

In response to the growing concern about the increase in damage caused by non-native species, the International Maritime Organisation (IMO) member countries have agreed to develop a mandatory international Convention to regulate and control ballast water transfers. Antifouling paints are applied to coat the bottom of ships to prevent alga and molluscs becoming attached to the hull of the boat.

Appendix B. Dive gear, PPE and equipment routinely held by EMD

Minimum essential PPE stock levels to be held at level 1

ITEM	MINIMUM STOCK HOLDING (REVIEW AS RISK LEVEL VARIES)
Latex gloves	1 box large
Plastic aprons	50
Air tanks	8
Buoyancy control devices	4
Weight belts	4
Regulators	4
Mask, snorkel and fins	4 sets
Wet suit	4
Dive computers	4
Life jacket	4
First aid kit	1

Other items

ITEM	MINIMUM STOCK HOLDING (REVIEW AS RISK LEVEL VARIES)
Settlement plate	6
Other monitoring equipment – nets and containers	2 nets, 2x5l buckets, 20 small containers, 3 mesh bags
Handling equipment	1 set
Dissection kit	2
Measuring equipment	1 set
Dissecting Microscope	1
GPS	1
VHS radio	2
Hand held radio	4
Telescope and tripod	1
Underwater torch	4
Dive knife	4
Fibre-optic illuminator	1
Oxygen kit	1
Flare	4
Abseiling equipment	3 sets
Range finder	1

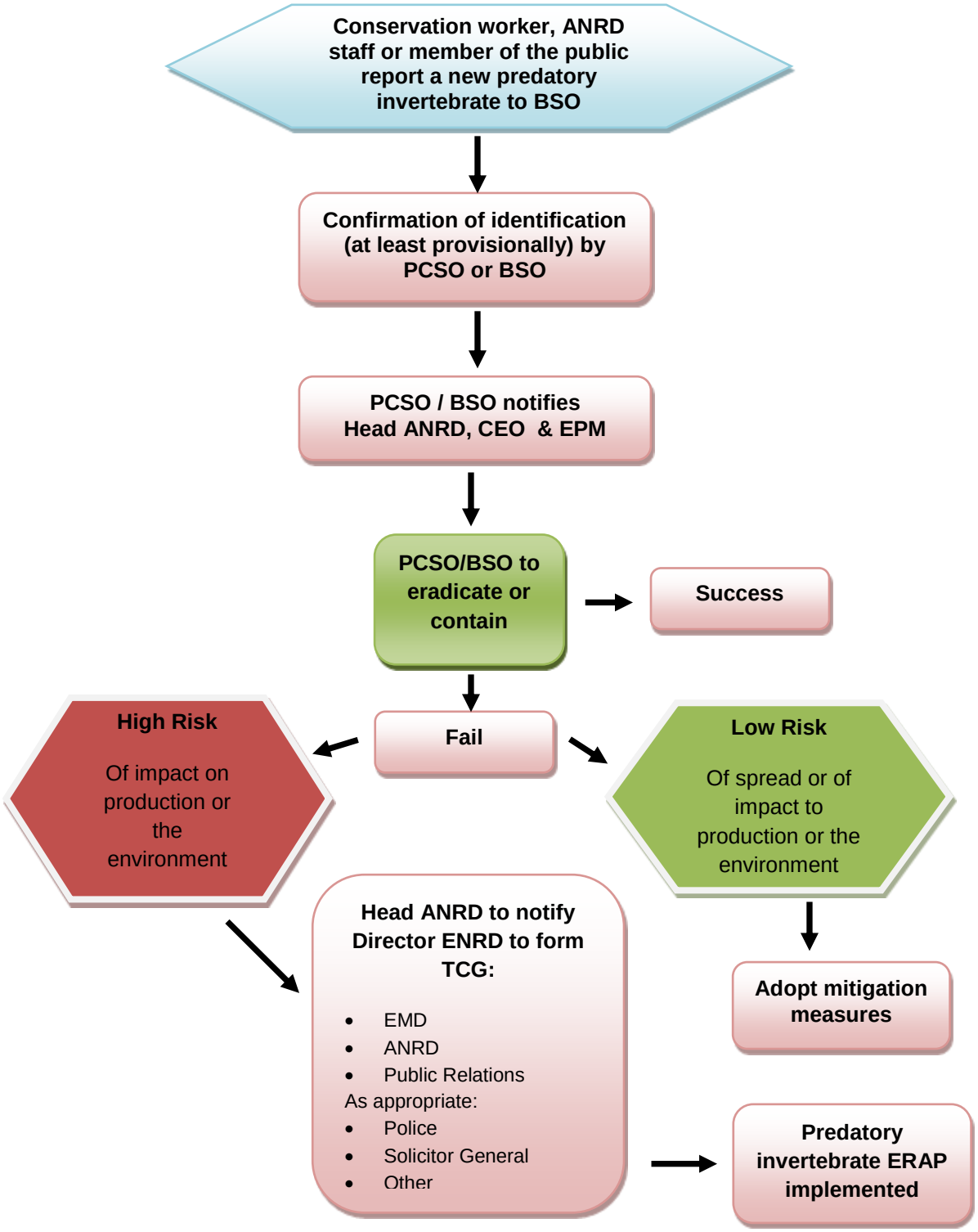
5. Biosecurity Risks – Predatory Invertebrate

Speed sheets for use in respect of a high risk case being identified by EMD

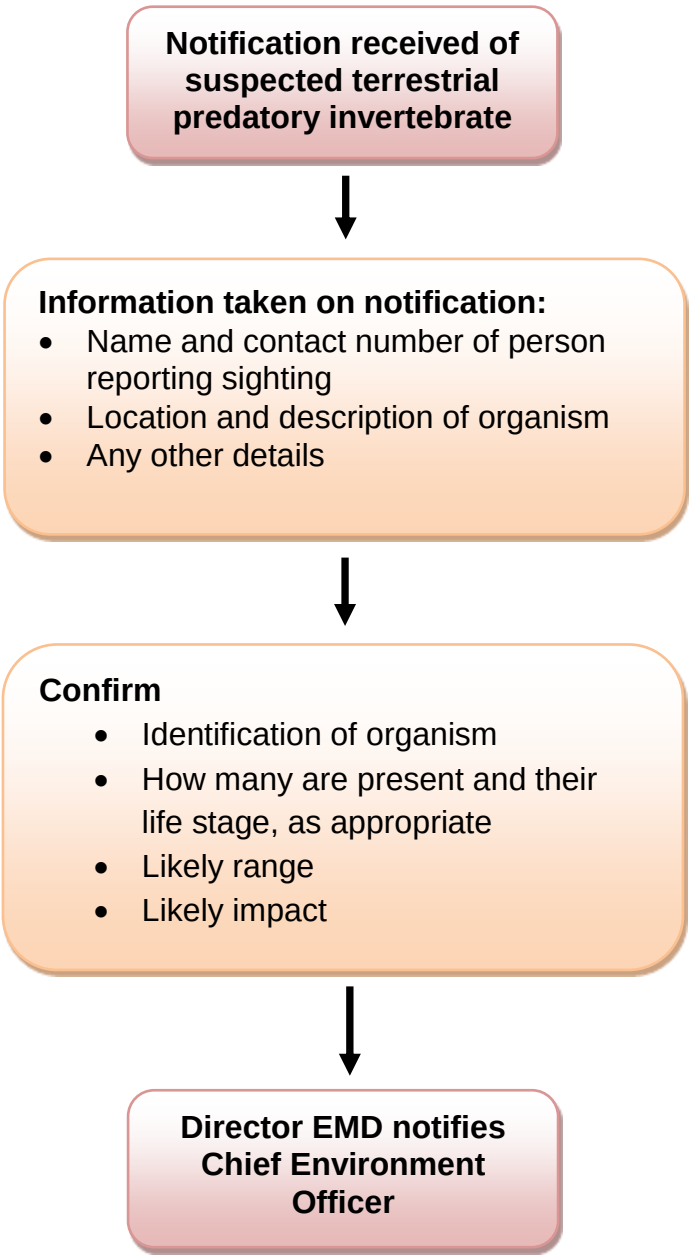
4. **Suspected case of introduction of a new terrestrial predatory invertebrate**
5. **Conservation team actions speed sheet**

Follow the process as per the sheet then refer to the main plan for further information.

1. SUSPECTED CASE OF A NEW PREDATORY TERRESTRIAL INVERTEBRATE



2. EMD TEAM ACTIONS SPEED SHEET



Information

This plan deals with the detection of a new species of terrestrial predatory invertebrate to the island. It is concerned with the first detection of a new potentially invasive species to St Helena, and not with the containment, management or eradication of a known established invasive species.

Invasive species of concern are those which are:

- Not native to St Helena;
- Likely to survive on St Helena;
- Able to spread by human mediated or natural means;
- Likely to become a pest or nuisance to social, environmental or economic values.

It is important to note that not all introduced species will survive to reproduce, spread, or become a pest. Therefore, once identification has been confirmed a rapid risk assessment is required to determine the likelihood of the species becoming a pest, noting that the best predictor of undesirable invasive characteristics is that the species has become a pest elsewhere.

Examples of terrestrial predatory invertebrates of concern include centipedes, spiders and mites, and ants. All of these could impact St Helena's biodiversity by predating endemic invertebrates. Centipedes and spiders are venomous and larger species are capable of biting people, this can have a serious negative impact on society.

Of particular concern are fire ants. Fire ant is the common name for several species of stinging ants, the most notable of which is the Red Imported Fire Ant (RIFA: *Solenopsis invicta*). RIFA is an aggressive generalist forager ant that occurs in high densities. They breed and spread rapidly and, if disturbed, can relocate quickly so as to ensure survival of the colony. Their stinging ability allows them to subdue prey and repel even larger vertebrate competitors from resources. RIFA can kill and injure breeding birds and turtle hatchlings. They also sting people and may cause an allergic reaction. Public areas such as parks and recreational areas may become unsafe for children. They may infest electrical equipment (such as computers, swimming pool pumps, cars or washing machines) becoming a nuisance, or even a danger, to people.

This plan seeks to mitigate risk by early identification of cases which are considered to be high risk. Intervention points have been identified at notification of a suspected case in order to minimise risk to the wider sector.

Intention

Working with multi agency partners, utilising a risk based approach SHG will seek to:

- Protect life
- Protect the native and endemic fauna and flora of the island
- Protect the terrestrial tourism economy of the island
- Undertake measures to minimise the risk of spread of an invasive species outbreak
- Warn and inform the public as to the risk providing reassurance to maintain confidence in the SHG response
- Ensure the restoration of normality as soon as possible

Method

All members of the St Helena community are responsible for reporting any unusual sightings. Likely detection of a new species includes:

- Biosecurity during monitoring activities at ports of entry;
- Conservation workers (EMD, SHNT, LEMP, SNCG, etc) during work;
- Forestry and agricultural workers, during their normal activities;
- Members of the public on recreational activities.

Reports can be made to ANRD, Biosecurity, Chief Environmental Officer, organisations such as the National Trust or Tourism, or directly to the Environmental Management Division.

Level of Response:

A single level has been identified which determines the actions and responses to help assess the risk to St Helena and inform action that may be required.

Suggested actions are listed for guidance purposes. The response will need to fully take account of the developing threat and risk so as to ensure actions are proportionate and effective and be compatible with broader SHG strategic intentions.

Level 1

Predatory invertebrate, with potential social, economic or environmental impact	
Suggested Actions	**Further Considerations**

• Containment of affected vehicles / area
• Implementation of specific plan and any associated protocols
• Raise awareness with key stakeholders
  ○ EMD
  ○ ANRD
	• Risk of spread within St Helena
	• Command Structure
	• Review membership of the TCG
	• Restrictions on movement of vehicles, if appropriate
	• Restrictions on activities in affected

○ Biosecurity ○ Farmers Association ○ Tourism ○ St Helena National Trust ○ Other as appropriate • Continued horizon and environmental scanning • Review information and intelligence updates, daily / weekly as appropriate • Implement additional border control procedures, as appropriate • Public reassurance / warning and informing	areas, if appropriate • Requests for international assistance

Emergency response action plans

This plan is generic and covers the introduction of a terrestrial predatory invertebrate species in general. A specific terrestrial predatory invertebrate emergency response action plan provides the details required across the different taxonomic groups:

- Appendix A. Emergency response action plan for terrestrial predatory invertebrate.
- Appendix B. Pesticides and pesticide application equipment held in stock by ANRD, and invertebrate monitoring equipment held by ENRD.

Administration

This plan will be administered by the Emergency Planning Officer. This will include review and updates as the situation develops.

Command and Control

A command and control structure will be implemented to support this plan

Gold: Chief Secretary

Silver: Chair TCG: Chief of Police

Tactical Coordination Group Membership:
Environment: Chief Environmental Officer
Agriculture: Biosecurity Officer
Communications: Chief Public Relations Officer
Police: Chief of Police
Legal: Solicitor General
Shipping Agents: Solomon's GM (Agencies)
TA: Emergency Planning Manager

The Tactical Coordination Group (TCG) will meet on an *ad hoc* basis until such point as the increase in risk rises. At this point consideration should be given to membership of the TCG and as to whether a Tactical Coordination Centre should be established. Consideration should also be given, based on the risk as to whether a Strategic Coordination Group meeting should be held and if necessary extended to include an Incident Executive Group.

Business Continuity Management

The level at which public services will operate will be a strategic decision made by Gold. Critical business activity will need to be identified in advance of an escalation of threat and consideration given as to how these services will be maintained.

Personal Protective Equipment (PPE)

Any decision to deploy PPE will be made by the Silver Commander and will be based on an appropriate risk assessment to the threat posed. This may include the pre deployment of 'go boxes' to strategic locations as a result of an increase in the threat and subsequent change to the response level. Pesticide application equipment held in stock by ANRD is given in Appendix B.

Waste Management

The World Health Organisation has produced guidance in relation to the management and safe disposal of waste resulting from contact or potential contact with biocides. This guidance should be applied both within healthcare settings and also for PPE issued to staff outside of such environments.

Communications

Communications will utilise various media channels including online, radio, newspaper and TV and will look to build upon previous good practice including daily media briefings, if the situation escalates.

Contingencies

The St Helena Major Incident Plan is available via the Emergency Planning Manager.

A decision will be made by Silver in relation to whether the Major Incident Plan should be activated and its timing.

Appendix A. Emergency response action plan for terrestrial predatory invertebrate.

This ERAP covers an outbreak of a terrestrial predatory invertebrate. This could be a species from a wide taxonomic range, all of which are covered in this general plan.

Legal provisions

- Environment Protection Ordinance, 2016. The objectives of this Ordinance are to preserve and sustain the natural environment of St Helena, including by (c) minimising the risks to the environment from the introduction of potentially harmful materials or organisms:
    - Art. 22: it is an offence to release or allow to escape into the wild a non-native species;
    - Art. 24: newly discovered species are considered protected pending identification;
    - Arts. 25 & 26: a licence can be granted to catch or kill native species, if justified;
    - Art. 87: the enforcement officer has powers to take samples, inspect, seize equipment or articles, search articles, restrict movement of articles, stop and search vessels;
    - Art. 98: the enforcement officer can serve an emergency environmental protection notice, which expires after 49 days.
- Endangered Species Protection Ordinance, 2004 (as amended).
    - Control on the growing or cultivation of any plant liable to damage the welfare of any plant or animal.

Financial provisions

- All operational costs fall to EMD budget.
- Costs of removal of infected plants, materials and goods fall to private individuals.

Chain of command

- EMD is the lead agency; the authority is the Chief Environment Officer, who is responsible for the “formulation of plans and planning activities for the prevention of, preparedness for and response to environmental emergencies and for the restoration of any part of the environment damaged by or during such an emergency” according to the EPO, Art. 8 (2f);
    - Terrestrial Conservation Officer (TCO) is the recognised Expert, informing the Technical Group coordinating the operational plan.
    - Technical Group members include: BSO, PCSO, local invertebrate experts.

Operational Plan

Key facts:

- Terrestrial invertebrates could be members of the Class Insecta (eg fire ant), Chilopoda (eg centipede) or Arachnida (eg spider, mite, ticks).
- Potential issues are:
    - Extinction of an endemic invertebrate species
    - Disruption for livestock and agriculture
    - Human health effects
    - Negative impact on tourism
- If detected early, with a limited range, they are probably relatively easy to control using insecticides.
- Main points of entry are the air and seaports, and the main vector of introduction is likely to be shipping containers.

Health and Safety

4. Care should be taken when handling predatory invertebrates as some species are venomous, some can cause allergic reactions, and some can sting. Appropriate PPE should be worn when collecting specimens, and when handling potentially infested materials or goods.
5. Pesticides must be applied according to the appropriate Code of Best Practice.
6. The appropriate Personal Protective Equipment must be worn before preparing or using pesticides, according to the label instructions and Code of Best Practice.

Control strategy – immediate action and rapid response

- Confirmation of identification of species made by one or more of the following:
    - Samples sent to a local expert
    - On-line resources
    - Digital photos sent to a local expert, international expert or diagnostic laboratory such as Fera, UK
    - Samples sent to an international expert or diagnostic laboratory such as Fera, UK
- Once the identification of the novel species has been confirmed, notification of:
    - Head, ANRD
    - Emergency Planning Manager
    - Chief Environmental Officer
- ANRD planning group formed, consisting of Head ANRD, TCO, PCSO, BSO and other officers as appropriate. This group will plan the subsequent actions as details will depend on the exact nature of the interception, such as time of year, location, and species concerned, etc., and will include:
    - Determination of the size of the area to be surveyed and monitored, see Annex A;

  - Access to private properties and any likely issues;
  - Guidance on accessing steep or hazardous terrain:
    - Assessment of host plants present
    - Monitoring effort required at the borders
    - Treatment options
    - Access options, if required
  - Preparation of equipment and materials;
  - Organisation of labour and transport.
- A short fact sheet of key facts for the species will be prepared by the technical expert, to include where available:
  - Identification, including photos
  - Life cycle details
  - Host species, noting the main hosts
  - Dispersal ability
  - Trapping and monitoring methods
  - Biosecurity information
- Note that there are two possible reactions at this point: map the extent of the infestation before moving on to treatment, *OR* initiate treatment more or less at the same time as mapping.
  - If numbers intercepted are low it is recommended that mapping is done first;
  - If numbers intercepted are high it is recommended that treatment is initiated as soon as possible, as any delay could compromise the chance of successful elimination.
- Extent of infestation determined in the defined area around the site of known infestation by sampling, visual surveys, trapping or other method as appropriate to the species.
- ANRD-led participatory attempt initiated to eliminate the incursion. This may include, as appropriate:
  - Pesticide treatment using a registered product appropriate to the species, following label instructions.
  - Destruction of infected good, materials plants, crops and other host plants.
  - Destructive sampling to achieve local eradication.
  - Restriction of vehicle movements in the affected area.
- Area of potential infestation is identified (neighbouring areas with likely host plants, pathways of infection, etc) within zone 2 (see Annex A).
- There are 3 possible scenarios resulting from the actions outlined above:
  1. Numbers decline to zero and no further interceptions are detected.
     - ⇨ Monitoring continues and is wound down following the guidelines in Annex A.
  2. Numbers remain constant or increase.

⇨ Further actions required (see the section below)

3. Other interceptions are detected in separate locations.
   ⇨ Further actions required (see the section below)

Control strategy – further actions

- Notification of TCG.
- Further actions may include all or any of those listed below. Additional resources (labour, materials, etc.) and powers may be required at this stage.
- Declaration of quarantine in the infested area.
- All movements of plants, material or crops (as appropriate) controlled on and off the area.
- Intensive ANRD-led participatory eradication programme which may include, as appropriate:
  - Pesticide treatment using a registered product appropriate to the species, following label instructions.
  - Destruction of infected good, materials plants, crops and other host plants.
  - Destructive sampling to achieve local eradication.
  - Restriction of vehicle movements in the affected area.
  - Compulsory clearing of host material and refuges.
  - Visits to promote management techniques which reduce infection and spread, and raise awareness of symptoms and preventing spread.
  - Where suspicion is raised of a possible outbreak, visits made to check likely host plants.
- GIS mapping of hosts, refuges, location of prey species, dispersion pathways, or other key information, as appropriate, to predict likely patterns of dispersion.

<u>Contingency plan: in the event of further outbreaks in other districts</u>

- The same procedure will be followed as laid out for the initial interception.
- Extent of infestation determined in zones 1 and 2 around the new location using the same method as used for the initial incursion, based on the guidelines in Annex A.
- ANRD-led participatory attempt initiated to eliminate the new incursion. This may include, as appropriate:
  - Pesticide treatment using a registered product appropriate to the species, following label instructions.
  - Destruction of infected good, materials plants, crops and other host plants.
  - Destructive sampling to achieve local eradication.
  - Restriction of vehicle movements in the affected area.
- If numbers decline to zero and no further interceptions are detected, monitoring continues and is wound down following the guidelines in Annex A.

- Suspected outbreaks which have not been confirmed may be subject to precautionary treatment pending confirmation.
- If numbers remain constant or increase reaction will be proportionate to the level of risk identified, and may include:
    - District-wide destruction of host plants or materials.
    - District-wide pesticide treatment will be considered, if necessary, with advice from PCSO and BSO.
- Declaration of quarantine in the infected area.
- Analysis of the pathway of dispersal to try and predict and prevent new outbreak areas.
- GIS mapping of hosts, refuges, location of prey species, dispersion pathways, or other key information, as appropriate, to predict likely patterns of dispersion

Control strategy – when to stop

- A typical pattern of progress for a successful intervention is as follows:
    - Rapid response at each interception location;
    - Intensive monitoring programme at each interception location for at least 6 months, as outlined in Annex A;
    - Reduced monitoring programme for 1 year (one full season);
    - Some additional monitoring around the incursion area for a further 1 year.
- Eradication should not be considered achieved until 2 years from the last sighting on the island.
- In the event of an unsuccessful intervention, the TCG should consider when it is appropriate to step down the emergency response, considering:
    - The level of expected economic and/or environmental impact of the species;
    - Available mitigation measures ;
    - The cost-benefit of continued action.

Biosecurity

- An important aspect is to analyse the introduction pathway, if possible, to minimise the risk of further incursions.
- The biosecurity team will analyse imports for at least the two voyages previous to detection of the novel species to assess the likelihood of this pathway, noting any interceptions, and considering the main vectors or hosts of the species, season and seasonality.
- Biosecurity actions for a specified number of voyages to be agreed by the ANRD planning group may include, as appropriate:
    - Sampling rates increased for identified high risk vectors;
    - Temporary ban on identified high risk vectors;
    - Temporary ban on high risk vectors from specific locations.

- Annex B. General biosecurity measures to be followed.
- Annex C. Fact sheet for an example of a terrestrial predatory species: Red Imported Fire Ant

Communication

- The EPM is notified of the situation once the identification of the novel species has been confirmed and will advise on the level of communications.
- For the initial response (as outlined under “immediate action and rapid response”) unless otherwise advised by EPM, ANRD will lead the communications which may include, as considered appropriate:
    - Posters and signs advising of the actions around zones1 and 2;
    - Radio reports;
    - Press release.
- Updating the Head, ANRD on a regular basis.
- In event of a larger programme (as outlined under “further actions”) the TCG will lead on communications.
- Updating Council Committee on a fortnightly basis and when need for formal declaration of quarantine is required.
- Updating Director of ENRD as and when necessary on the progress of the programme.
- Updating the Chief Secretary as and when necessary on the progress of the programme.
- Press releases issued:
    - Simple measures to prevent the spread and a list of symptoms developed and included in all press releases henceforth.
    - Update press releases.
- Radio interviews held to accompany press releases.

Equipment and Resources

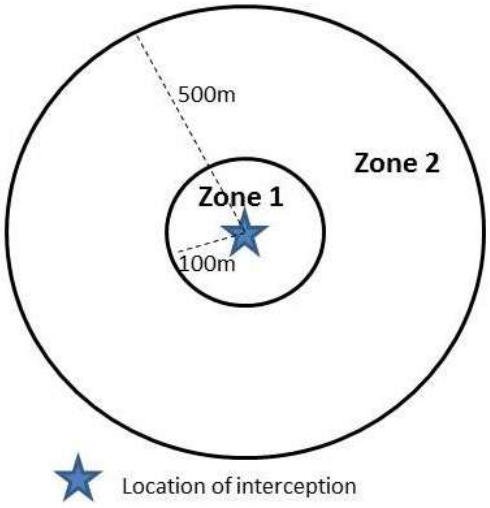
- Monitoring equipment
- Pesticide application devices, eg knapsack sprayers and mistblowers
- Appropriate pesticide products
- PPE for handling potentially venomous, biting or stinging species
- PPE for pesticide application
- Digital camera
- Insect collecting materials: collecting boxes, bags, forceps
- Disposable protective clothing and waterproof boots for site visits

Annex A. Guidelines for monitoring

This procedure is for ANRD Pest Control Service and EMD.

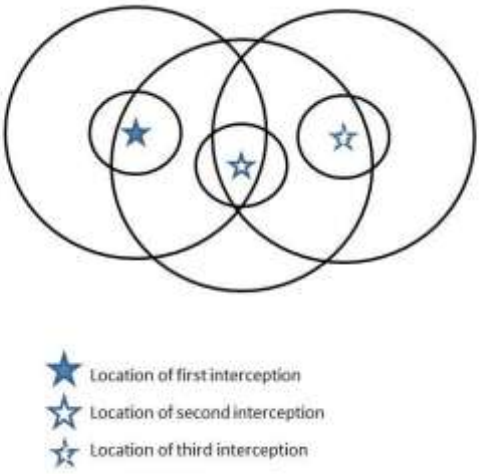
Deciding where to monitor

- These areas are recommended guidelines. Note that the size of each zone may vary depending on the species and exact nature of the location and any variation from the guidelines will be agreed by the ANRD planning group.
- On a map, mark the location where the novel species was found.
- Draw a circle with a radius of 100m. The area inside the circle is **zone 1**.
- Draw a second circle with a radius of 500m. The area inside the circle, and excluding the bit already covered by zone 1, is **zone 2**.
- This is illustrated in the diagram below.

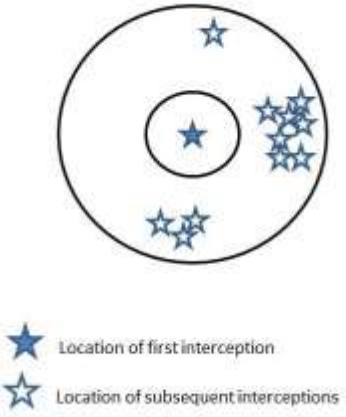


- In zone 1 intensive searching for specimens of the new species will occur, attempting to cover all areas where it could occur.
- In zone 2 less intensive searching takes place, targeting the most likely places.
- Outside zone 2, spot checks are carried out in areas where the new species is most likely to occur.
- When deciding which areas are *most likely* consider, as appropriate:
    - Preferred habitat types
    - Host plants or refuges
    - Climate match
    - Dispersal pathways
- Repeat the above for every new interception of the novel species which takes place outside the initial zone 1.

- The outbreak source can be tracked by analysing the pattern of consecutive interceptions in terms of factors such as dispersal pathways, distribution of hosts, etc.
- The diagram below illustrates the track of 3 interceptions, showing the overlapping zoning which can occur. The exact search programme for each zone are decided by the ANRD planning group, based on local knowledge and the specific details of the incursion.



- An initial interception could be followed by a scatter of subsequent interceptions as new specimens are detected in zones 1 and 2. This is illustrated in the diagram below. In cases such as this, the ANRD planning group will decide exactly how to proceed. Suggested actions are:
    - Expand zone 2 around the single point: it may be a one-off
    - Create a new zone 1 and 2 around the dense cluster of points
    - Use local knowledge to decide how to react to the cluster of 3 points



How often to monitor

- Monitoring of zones 1 and 2 should take place on at least a monthly basis for at least 1 year for newly emerged adults/colonies/etc as appropriate.
- A reduced monitoring programme will continue for a further 1 year (a complete season), as appropriate.
- Note that the exact timing and duration of the monitoring programme will depend on the species, the presence of hosts, the season and the weather patterns.
- Any new interceptions will take the procedure back to the beginning again.

Annex B. General biosecurity measures to be followed.

This procedure is for all users of declared quarantine areas.

- Any public walking paths crossing the outbreak area should be closed, with detours clearly marked around the outbreak site. Walkers should be advised by signage to clean their boots thoroughly of mud when exiting the buffer zone, and to check their bags for mud, vegetation or seeds, with particular attention to any Velcro fastenings.

- Vehicles, cars, tractors, rotivators or trailers must be parked outside the outbreak area, wherever possible, on hard standing away from loose soil which could contain invertebrates and be carried in the tyres.

- Where vehicles, cars, tractors and rotivators etc are required to move in and out of the outbreak area, care must be taken to minimise the transmission of soil and debris on the tyres, chassis etc. through thorough washing.

- All movements of livestock on and off the area are also restricted to prevent them acting as agents for dispersal.

- All equipment used must be clean on arrival and on departure. Great care must be taken when cleaning electrical apparatus or tools. Where possible equipment should be protected from contamination e.g. using plastic bags. **Health and Safety rules must be observed.** Where equipment can be cleansed and disinfected this must be done before entry to the area and again on departure.

- Sufficient water and cleaning equipment should be taken on the visit, even if facilities are thought to be available in the area.

Annex C. Fact sheet for an example of a predatory invertebrate species: Red Imported Fire Ant *Solenopsis invicta.*

Fire ant is the common name for several species of stinging ants, the most notable of which is the Red Imported Fire Ant (RIFA: *Solenopsis invicta*).

RIFA is an aggressive generalist forager ant that occurs in high densities. They breed and spread rapidly and, if disturbed, can relocate quickly so as to ensure survival of the colony. Their stinging ability allows them to subdue prey and repel even larger vertebrate competitors from resources. RIFA is one of the most notorious invasive ants and has been nominated for the 100 World's Worst Invaders list compiled by the Invasive Species Specialist Group.

What damage do they do?

RIFA can kill and injure breeding birds and turtle hatchlings. They also sting people and may cause an allergic reaction. Public areas such as parks and recreational areas may become unsafe for children. They may infest electrical equipment (such as computers, swimming pool pumps, cars or washing machines) becoming a nuisance, or even a danger, to people.

Worker ants bite (with mandibles) and sting (with stingers) aggressively and repeatedly. The sting feels like being burned. A day or so later, *RIFA* venom forms a white fluid-filled pustule or blister at the red sting site, a symptom characteristic only of fire ants.

RIFA is a "hot climate specialist" and inhabits hot arid regions. It has become widespread in the southern USA and Caribbean after its introduction in the 1930s. In infested areas, colonies are common in lawns, gardens, school yards, parks, roadsides and golf courses. Nests generally occur in sunny open areas and are especially common in disturbed and irrigated soil.

How do they spread?

RIFA is spread via the shipment of infested articles such as nursery potting media, bales of hay or soil, air conditioning units, power company transformers, traffic signal control cabinets, electrical pumps, car electrical systems, vehicles and machinery, and beehives. Objects contaminated with soil pose a high risk as soil is the natural nesting material.

RIFA are known to infest shipping containers and spread via international trade.

Appendix B. Pesticides and pesticide application equipment held in stock by ANRD, and invertebrate monitoring equipment held by ENRD.

Invertebrate monitoring equipment held in stock

ITEM	MINIMUM STOCK HOLDING (REVIEW AS RISK LEVEL VARIES)	WHERE HELD
Butterfly nets	2	ANRD - PCSO
Butterfly net	1	EMD - TCO
Collection vials	50	ANRD - PCSO
Delta traps for flying insects	20	ANRD – PCSO
Aspirators	5	ANRD - PCSO
Kevlar gloves, size M	2 pairs	ANRD - BO
Sticky traps for crawling invertebrates	20	ANRD - BO
Sticky traps for flying insects	20	EMD - TCO

Minimum essential PPE stock levels to be held at level 1

ITEM	MINIMUM STOCK HOLDING (REVIEW AS RISK LEVEL VARIES)
Coveralls, Type 3	2
Coveralls, Type 5/6, size L, XL	100
Face shield (to EN 166)	10
Nitrile gloves (0.5mm thick, 300mm long)	10 pairs
Respirator (EN 149 to EN 141)	10
Respirator filter cartridge	20

Other items

ITEM	MINIMUM STOCK HOLDING (REVIEW AS RISK LEVEL VARIES)
Knapsack sprayers, 20l – insecticide	2
Knapsack sprayers - biopesticide	1
Mistblower	2
Measuring jug	2
Pesticide transport box	2

ANRD insecticides held in stock

Active ingredient	Trade name	Target	MAPP number	Normal quantity in stock
Insecticides				
Cypermethrin	Supasect	Caterpillars in general, fruit fly	15536	10l
Dimethoate	Danadim Progress	Aphids, red spider mite, thrip, leaf miner	12208	5l
Abamectin	Dynamec	Rust mites	13331	5l
Spiromesifen	Oberon 2 SC	Whitefly	11819	5l
Etoxazole	Borneo	Mites	13919	5l
Pirimiphos-methyl	Actellic dust	Wasps nests		5kg
Malathion	Malathion 60	Mealybug		5l
Lecanicillium muscarium	Mycotal	Whitefly, thrip		5l
Beauvaria bassiana	Naturalis-L	Whitefly, thrip, mites	14655	5l
Bacillus thuringiensis	Dipel	Diamondback moth		5l

6. Biosecurity Risks – Aerial Insect Vectors

To be advised