# Ascension Island Biosecurity Strategy

2020-2025

**Ascension Island Government Conservation and Fisheries Directorate**

November 2020

## Executive Summary

- The purpose of a biosecurity system is to prevent damage to public health, the economy and wildlife from the deliberate or unintentional introduction of non-native species and diseases.

- Ascension currently has no comprehensive biosecurity controls and that leaves the island vulnerable to the introduction of species such as fire ants, crazy ants and mosquitoes carrying malaria or the zika virus, which could profoundly affect people's quality of life.

- This risk based strategy aims to put in place an effective biosecurity system that balances the need to reduce the risk of damaging introductions without placing a heavy resource burden on AIG and importers or disrupting island operations.

- Primary responsibility for preventing introductions will be placed on importers through the use of Import Health Standards (IHS) or licenses for certain types of goods such as fresh produce and aggregate, and will specify what measures need to be taken for goods to be allowed into Ascension.

- The measures and treatments that are specified in IHSs or licenses will be reasonable and proportionate to the risk so as not to create unnecessary cost or disruption.

- Inspections will be carried out by AIG as a way of monitoring compliance with the IHSs and license conditions. These inspections will be combined with customs checks wherever possible.

- Any breaches of the IHSs or conditions will be dealt with in a proportionate manner, with guidance and education as a starting point and prosecution only considered as a last resort or for the most serious and culpable breaches.

- Any new introductions found will be contained and dealt with through threat-specific response plans. Treatment of the contaminated goods will be attempted and destruction of goods would be a last resort in extreme circumstances.

- Efforts to control existing non-native species will be targeted at those with the greatest impact and will use the most efficient methods possible.

- An effective awareness-raising campaign will be essential to achieve the objectives of the Biosecurity Strategy. This will target importers, employing organisations, people living on the island and visitors to ensure they understand the system and the need for compliance.

## Acknowledgements

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**St Helena Government**

## 1. Introduction

Biosecurity is the prevention of harm from the spread of non-native species and diseases. Whilst there are some existing controls, there is currently no dedicated biosecurity system in place on Ascension and that threatens the health and wellbeing of the population as well as the island's critical infrastructure and unique biodiversity. The damage that can be caused by non-native species is plain to see on Ascension with aggressive invasive species such as Mexican thorn and black rats altering the character and habitability of the island.

Many non-native species have already been introduced and become established on Ascension, but there are many more potential threats that could be prevented from arriving or intercepted before they gain a foothold. An analysis carried out for Ascension identified fire ants and disease carrying mosquitoes as the greatest future threats (Roy *et al*. 2019)[1]. Both would result in serious public health impacts. A well-designed, risk-based biosecurity system is required to reduce the likelihood of new introductions and protect Ascension's population, economy and natural heritage.

A report prepared for the Ascension Island Government (AIG) by a specialist consultant concluded that:

*'Given the unmanaged nature of the three main sea pathways and two air pathways it is certain that unless [a biosecurity system], is implemented, Ascension Island will continue to see unabated entry and establishment of new organisms, some of which will have irreparable negative impacts on biodiversity, livelihoods and human health.'* Biofume 2016[2]

## 2. Principles

This Biosecurity Strategy is based on the following principles:

- There is a presumption that all non-native species are potentially damaging to Ascension unless demonstrated otherwise.
- Biosecurity measures should apply to all island users and be targeted based on the risk to public health, biodiversity and the island economy
- Primary responsibility is placed on importers to take measures to prevent introductions
- Measures (both preventative and reactive) taken to prevent new introductions are proportionate to the risk, and efforts are made to minimise disruption to island operations
- Education and awareness raising are the preferred methods to ensure compliance and proportionate enforcement action will only be taken when this approach has been exhausted
- Eradication is the goal for all established non-native species, but in the many cases where this is not feasible, management will be targeted to reduce damaging impacts in the most efficient way

[1] Helen E. Roy, Jodey M. Peyton, Oliver L. Pescott, Stephanie L. Rorke (2019). Prioritising Invasive Non-Native Species through Horizon Scanning on the UK Overseas Territories

[2] Biofume (2016). *Ascension Biosecurity Review*. Report prepared for Ascension Island Government

## 3. Strategy Objectives

1. Reduced risk of non-native species being introduced to Ascension Island
2. Early detection of any new introductions that do occur
3. Effective response to contain quickly new introductions when they are detected
4. Reduced impact of established non-native species on biodiversity, public health and island infrastructure
5. Good level of knowledge about the risks of non-native species and understanding of the measures needed to minimise these risks amongst the Ascension population and employing organisations

## 4. Existing Biosecurity provisions

### 4.1 Domestic legislation

The powers required to implement this strategy will largely be contained within a new Biosecurity Ordinance, which will provide the comprehensive legal framework required to address biosecurity threats. This will supersede the Animal (Diseases) Ordinance, 1944, which will no longer apply to Ascension. The Animal (Diseases) Regulations, 1950 – made under the Animal (Diseases) Ordinance – will also no longer apply, and the Prohibited Animals Regulations 1967 (which apply to Ascension only)– will be repealed.

Other Ascension legislation contains relevant provisions, but biosecurity is not its primary purpose. The new Biosecurity Ordinance will be designed to be consistent with and complementary to the following existing legislation:

The **Dogs and Cats Ordinance, 2000** regulates the import of pet cats and dogs.

The **Control of Trade in Endangered Species Ordinance, 2015** restricts the import and export of animals and plants listed in the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES). It allows for the warranting of CITES Enforcement Officers who have powers to board vessels and aircraft and inspect consignments if they suspect a breach of the Ordinance.

The **Customs Ordinance, 2002** requires that masters of vessels must, on arrival at Ascension, provide two copies of the cargo manifest. The Ordinance also gives warranted customs officers the power to search vessels, aircraft and people where they suspect prohibited, restricted or dutiable goods are present, and to seize any goods that contravene the Ordinance. These powers can only be exercised for goods listed in **Customs (Tariffs and Exemptions) Regulations (2002)**, which are limited to alcoholic beverages, fuel and tobacco.

The **Public Health Ordinance, 1967** gives the Administrator power to prevent the landing or importation of anything likely to introduce disease.

The **Entry Control Ordinance, 2007** prohibits landing and remaining on Ascension without permission from the Administrator.

### 4.2 International Agreements

Ascension is party to CITES and its obligations are covered by the CITES Ordinance 2015 (described above)

The International Convention for the Control and Management of Ships' Ballast Water and Sediment (BWMC) came into force in 2017. All vessels flagged to nations signed up to the Convention are required to have a ballast water management plan in place and not to exchange ballast water within 200NM of a port. By 2024, most vessels will need to be fitted with a ballast water treatment system that meets the required standard and minimises the risk of new introductions. Vessels are required to carry certificates demonstrating they are meeting the requirements of the Convention.

The World Health Organisation recommends that all aircraft are sprayed with insecticide to prevent the spread of insect-borne diseases. This can be an aerosol sprayed in the cabin while passengers are onboard, or a residual insecticide sprayed onto the surfaces of an empty cabin. Under the Convention on International Civil Aviation (also known as the **Chicago Convention**) countries can require insecticide treatment to be carried out on non-government flights. To date, Ascension has not introduced any requirements under the Chicago Convention, but insecticide spraying is routinely carried out on SA Airlink and UK Ministry of Defence (MOD) flights under their own policies.

### 4.3 Relationship with Other Countries

The Bahamas Agreement (1956) governs the conduct of the US Airforce on Ascension. An Exchange of Notes from 1959 on the Administrative Arrangements Regarding Sites in Ascension states:

*The United States authorities shall afford protection to the fauna and flora of Ascension Island and the waters adjacent thereto and take steps to prohibit the introduction by members of the United States Forces, civilian employees of the United States, contractors of the United States or employees of United States contractors, of animal or vegetable organisms which are in the opinion of the Governor of St. Helena inimical to the growth and existence of living animals or plants or which are likely to become pests.*

The subsequent 'Final Governing Standards for Environmental Protection by United States Forces when operating on Ascension Island' signed in 2010 states that:

> *Installations shall take steps to prohibit the introduction of animal or vegetable organisms which are in the opinion of the Governor of St. Helena harmful to the growth and existence of living animal or plants or which are likely to become pests.*

Where possible, Ascension's new Biosecurity Ordinance will also be consistent with biosecurity legislation in St Helena and the Falkland Islands to minimise disruption to importers and raise compliance.

### 4.4 Other non-legislative provisions

The MOD requires all its personnel, contractors and partners to follow biosecurity measures described in JSP 800, Vol 3 -PT2- Leaflet 25. This stipulates that:

N*o animal or plant products should be imported except with specific permission; all vehicles, equipment and cargo transport units must be thoroughly cleaned and accompanied by a Biosecurity Certificate and containers should be swept clean inside and the exterior cleaned.*

Personal belongings from the UK are shipped to Ascension by Richard James International, who require a signed biosecurity declaration to be completed for all consignments. The declaration states that all personal effects must be free from mud, soil and organic material such as plant matter and seeds.

All vehicles shipped to Ascension from the UK or St Helena must be cleaned to export standards both inside and out and must be free of soil, mud and leaves and unclean vehicles will be refused shipment.

USAF has indicated that it follows internal biosecurity procedures, but has not yet made the details of these available.

## 5. Assessment of introduction risk

### 5.1 Pathways of Introduction

Ascension is a remote island and there are relatively few routes by which new species can be introduced. Understanding these pathways is essential to identify those that pose the greatest risk and target resources accordingly. Analyses of Ascension's pathways were carried out by Biofume in 2016 and as part of the Overseas Territories Biosecurity Project (Key 2017[3]). The results are summarised in Table 1 at Annex A.

### 5.2 Horizon Scanning

A horizon scanning exercise was undertaken to identify the species that pose the greatest risk to Ascension (Roy *et al.* 2019). The risk analysis was based on the likelihood of a species reaching Ascension, the chance of it surviving on the island and the scale of impact it would have on public health, biodiversity and the economy. The ten highest risk species and their likely route of introduction are shown in Table 2 at Annex B.

## 6. Staff Resource

The Biosecurity Strategy has been developed and will primarily be implemented by the new AIG Biosecurity Team. This will consist of members of existing AIG staff drawn from the Resources and Conservation Directorates including those working in the Customs and Environmental Health Teams. All members of the Biosecurity Team will receive dedicated training in their new duties and be warranted as Biosecurity Officers under the new legislation.

The Senior Biosecurity Officer is a part-time (0.5 full time equivalent) role based in the Conservation Directorate and part funded by the Royal Society for the Protection of Birds (RSPB). They will have responsibility for coordinating the implementation of the strategy and for reviewing its effectiveness. This will include allocating staff resource from within the team to biosecurity tasks in consultation with line managers.

Other members of the AIG Biosecurity Team will incorporate the role into their existing workplans and will individually spend less than 10% of their time on biosecurity tasks.

Ultimate oversight of the AIG Biosecurity Team and the implementation of the Biosecurity Strategy will be undertaken by the Director of Conservation and Fisheries, who will act as the Chief Biosecurity Officer and have direct line management responsibility for the Senior Biosecurity Officer.

## 7. Implementation of Objectives

## 7.1 Minimise the risk of non-native species being introduced to Ascension Island

Preventing new non-native species from arriving on Ascension is the most important element of this strategy as it represents the best opportunity to control biosecurity risks in an effective and cost-efficient manner.

### 7.1.1 Controlled Articles

Biosecurity legislation will identify 'controlled articles' for import that will be subject to some form of control. These articles have been selected because they pose a risk of introducing new species to Ascension. They can be the non-native animals or plants themselves (e.g. live animals), or other goods likely to harbour non-native species (e.g. aggregate). There will be no biosecurity controls on the import of items not on the list of controlled articles.

**Controlled articles**

- Live animals
- Plant material
- Aggregate
- Fresh produce
- Compost, peat and soil
- Natural packing material
- Shipping material
- Vehicles
- Wood products

Different classes of controlled article are defined according to the risk they pose and the import controls applied (see Table 3 in Annex C). The import of a small number of specific high risk articles will be prohibited in all circumstances. For lower risk articles, importers will have a legal duty to adhere to conditions that ensure the risk of new introductions is reduced to an acceptable level. These conditions could be in the form of Import Health Standards (IHS) or specific licence conditions.

### 7.1.2 Import Health Standards and Licences

A suite of IHSs will be prepared covering the controlled articles commonly brought into Ascension where the risk and mitigation measures are predictable. The provisions in the IHSs will be specifically designed to reduce the risk posed by the import of these common articles such that compliance with the IHS will be sufficient to reduce the risk to an acceptable level. In this way, the administrative burden on AIG and the importer is reduced. The measures required will be proportionate to the risk and can be varied with the quantity being imported so that they are reasonable and practical for private individuals to comply with.

The IHSs will not have been designed to manage the risk of importing more unusual articles or articles where the level of risk varies over time. In these circumstances the standards may not in themselves be sufficient mitigation and so a licence will be required for import to Ascension. This will allow for a specific risk assessment to be carried out for that article and the imposition of conditions that require importers to take measures beyond those in the IHSs. AIG will have the power to apply a fee for licences to contribute to the cost of administering the system, but has no intention of introducing fees other than the existing fees for live animal imports. The fee structure would be fixed in a schedule to the regulations and only set or amended with the approval of the Ascension Island Council.

[3] Gillian Key (2017). *Tackling invasive non-natives in the Overseas Territories. Pathway Analysis results, Ascension Island.* Report prepared by the Ascension Island Government.

The categorisation of articles will be kept under regular review and it is possible that controlled articles may move between the categories. For example, if a previously unusual article became a common import, the relevant IHS could be amended as necessary to manage the risk of it and the need for a licence could then be removed to reduce administration time. Alternatively, the risk posed by an article could increase if there was a disease outbreak in the source country meaning the IHS provisions no longer provided adequate protection. In this situation it may be appropriate to introduce the requirement for an import licence.

### 7.1.3 Information for importers and visitors

The creation of new import restrictions would be accompanied by a targeted information and education campaign to raise awareness and compliance. There are relatively few commercial companies that import goods to Ascension. These will be contacted directly to set out the new legislation including a list of controlled articles, list of prohibited articles, guidance on licence applications and the IHSs. We will also provide guidance to help importers comply with the

legislation such as example application forms and required treatments, as well as advice on the maintenance of their warehousing facilities and shipping materials.

All people entering Ascension must have an entry visa or be working on the island. We will issue guidelines to be distributed to people before they arrive on Ascension as part of the visa application, recruitment or deployment process. We will also work with the Harbour Master's Office on St Helena to ensure yachts sailing from there to Ascension are aware of our biosecurity requirements. For existing residents on the island, a public information campaign will be run involving public notices, articles in the press, broadcast on Saint FM, school assemblies, posters and banners at the airport.

#### 7.1.4 Declarations

All importers to Ascension will be required to sign a declaration to say that no prohibited articles have been imported and that all necessary import health standards and licence conditions have been followed. This will apply to all imports of any size and quantity and form part of the standard paperwork that already needs to be completed for goods to be imported to Ascension.

All passengers arriving on commercial and military flights and all visitors arriving by ship or boat will also be required to fill out a personal declaration stating that they are not bringing any prohibited items with them and have complied with any import health standards for controlled articles. These will be distributed and collected along with the existing customs declaration forms for passengers and become part of the entry process for people coming ashore from ships or boats.

#### 7.1.5 Compliance and inspections

It will be the importers' responsibility to:

- Adhere to the IHSs,
- Apply for a licence where necessary
- Adhere to any licence conditions
- Not import any prohibited goods

The importer is the person on Ascension who has ordered the goods, be that a company or an individual. Prevention measures will need to be undertaken before goods depart for Ascension, so importers will need to pass this responsibility to their suppliers through contracts and agreements. Private individuals will need to contact people sending them goods and ensure the relevant measures are taken. Where goods are sent to a person on Ascension without their knowledge, any biosecurity threat detected could result in treatment and in extreme circumstances confiscation or destruction of the goods.

AIG will monitor and ensure compliance with the legislation by undertaking targeted inspection of vessels, aircraft and imports based on an assessment of risk. Inspections on the Base will be carried out jointly between AIG and the USAF contractor with authorisation from the USAF Base Commander. Not all vessels, aircraft and imports will be inspected due to resource constraints. The aim of the inspections is not to provide a comprehensive barrier to introductions, but rather to deter deliberate non-compliance and detect if measures being put in place by importers are adequate.

Inspection protocols for all routes of entry have been prepared by the AIG Biosecurity Team and these are provided in the Inspection Procedures document along with guidance on the frequency and intensity with which each route will be inspected. The inspection intensity will be based on an assessment of risk and so will be dynamic. For example, if new introductions are repeatedly detected on one pathway, then inspections will focus on it until it is established that remedial measures have been effective. All inspections will be conducted to gather evidence of sufficient quality to support a prosecution if required.

For practical reasons it will not be possible to inspect containerised cargo at the point of entry. The difficulty of unloading and reloading containers at the Pierhead during ship operations mean this would be unworkable; instead inspections will be carried out at the unloading points for containers. This is not ideal as it increases the risk of new introductions spreading around the island, but is a necessary compromise to minimise disruption.

#### 7.1.6 Measures taken in event of non-compliance

The IHSs and import licences will specify measures to be taken by importers, shipping companies, airlines and passengers. Evidence of non-compliance with these measures will trigger an escalating response from guidance to warnings and finally prosecution. The scale of the response will depend on the severity of the non-compliance and the number of previous breaches.

There will be situations where IHSs or licence conditions are followed by importers but plant and animal material is still inadvertently introduced. The inspection regime will be designed to distinguish between infringement of an IHS or licence and inadequacy of the conditions to reduce the biosecurity risk to an acceptable level. Where it is the latter, a review of the IHS or licence conditions will be carried out and more stringent measures introduced where appropriate.

#### 7.1.7 Contamination in transit

There is potential for non-native species to become attached to incoming vessels and cargo whilst in transit to Ascension. This will be beyond the control of importers. Shipping and airline companies will share responsibility to minimise this risk through:

- Spraying of aircraft cabin and holds with insecticide during flights
- Pest detection and control methods present and in use on vessels visiting Ascension
- Requirement to destroy all living animals discovered onboard vessels that are not licensed for import to Ascension or other port on route
- Creation of an 'inhospitable habitat' on vessels and aircraft that removes potential refuges for hitch hikers

#### 7.1.8 Vessel ballast water and hull fouling

Ballast water is a high risk pathway for the introduction of invasive species. Vessels arriving on Ascension should be following the International Convention for the Control and Management of Ships' Ballast Water and Sediment (BWMC) and AIG Biosecurity Officers will be able to check their management plan and certification.

Most vessels arriving on Ascension offload more cargo onto the island than they take on, therefore there should be no need to reduce weight and they are unlikely to be discharging ballast water. The exception is the vessels used by USAF for backloading waste. These vessels could be looking to reduce weight as they leave Ascension, but they should still be following best practice and not releasing ballast within Ascension's Exclusive Economic Zone (EEZ). There are also numerous other vessels that exercise their right to navigate through Ascension's EEZ but never come close to the island. Most should also be complying with the BWMC and should have little need to adjust weight in transit.

Vessels also present a biosecurity threat through the transport of encrusting organisms such as mussels and barnacles on their hulls. Fouled hulls reduce the efficiency of a vessel's movement and so most commercial ships will undertake regular cleaning and treatment. The greatest threat on Ascension probably comes from yachts, which can be at sea for months at a time and visit many ports.

Demonstration of a recent anti-fouling treatment will become part of the entry process for yachts visiting Ascension, but there is little that can be done once they have arrived since they may require

food and fuel and so cannot be made to leave immediately for safety reasons. Removing yachts from the water and carrying out mandatory cleaning at the owner's expense could be an option, but would create a huge liability for AIG undertaking the craning and cleaning operations on potentially multi-million pound yachts. Ultimately sanctions could be counterproductive if they result in yacht owners attempting to clean their hulls in the water around Ascension, as this would only exacerbate the risk.

## 7.2 Early detection of any new introductions that do occur

Eradication of non-native species is most easily and cheaply achieved soon after introduction. Concerted and targeted efforts to detect new introductions capitalise on this opportunity to act swiftly and effectively before species become established. This will be achieved through a combination of inspections, education, monitoring and habitat manipulation. It will be assumed that all species detected in cargo or the very immediate vicinity of offloading sites are non-native and should be destroyed. At greater distances from offloading sites, species identification will be required to distinguish between native and non-native species.

### 7.2.1 Inspections

As described above, inspections carried out by the AIG Biosecurity Team (and jointly with the USAF contractor on Base) are primarily aimed at identifying non-compliance with import regulations or situations where the regulations and standards are inadequate to reduce the risk of introductions to acceptable levels. However, inspections do also provide an opportunity to detect newly-arrived species and initiate rapid treatment. Not all cargo will be inspected by biosecurity staff due to resource constraints, but when inspections do occur, thorough searches will be made and Response Plans put into action to contain the introduced species and mount an effective response.

### 7.2.2 Upskilling of other employees

Biosecurity staff will not inspect all cargo, but any other customs officers and those responsible for unloading it will be in an excellent position to detect any live animals or plants. All those involved in cargo operations including:

AIG Customs
AIG ship workers
Wolf Creek ship workers
Organisations receiving goods (NAAFI, Chandlery, Jams)

will receive education in how to conduct a search, the high risk species to be vigilant for and action to be taken in the event of a detection. Posters showing high risk species will be distributed and prominently displayed in locations where cargo is unloaded. Insecticide sprays and personal protective equipment (PPE) will be provided to trained staff along with instructions on how to alert the AIG Biosecurity Team and initiate a larger-scale response when required.

### 7.2.3 Monitoring

Specific surveillance monitoring for high risk groups of non-native species will be conducted by the AIG Biosecurity Team to detect if any have arrived on Ascension. This will focus on entry points and unloading sites and the areas immediately surrounding them. Monitoring methods are designed to give the greatest chance of intercepting high risk groups identified during the horizon scanning exercise conducted as part of the Overseas Territory Biosecurity Project (see Table 4 at Annex D).

The MOD has an existing programme to monitor mosquito populations on the island. An extensive survey of residential areas and natural habitats was initiated in order to collect mosquito larvae and

adults by methods such as larval sampling, adult trapping and human landing catches. The results of this monitoring are shared with the AIG Biosecurity Team. Rat trapping is carried out as part of the AIG and Wolf Creek Environmental Health Teams' routine work. Where necessary, they will be given training to distinguish between black and brown rats and any suspect animals will be examined in detail and photographs sent to the GB Non-native Species Secretariat (GBNNSS) for validation.

Effective surveillance monitoring will require species-level identification to distinguish between high risk species and those already present on the island or new introductions that are likely to be less damaging. This will be achieved by the creation of a library of digital and preserved specimens to aid identification on island.

More detailed methods for the surveillance monitoring are provided in Table 4 at Annex D.

#### 7.2.4 Community education and citizen science

Through awareness raising we can increase the island's overall vigilance and increase the probability of early detection of new introductions. This is most effectively achieved by focusing on a small number of high risk species or groups that people can recognise with little specialist training. We have selected the following species in the first instance:

- Fire ants
- Crazy ants
- Brown rat
- Lionfish

Posters will be produced showing how to identify them as well as the threat they pose and how to alert the AIG Biosecurity Team is there is a suspected sighting. Articles in the local press and broadcasts on Saint FM will be used to highlight how people can contribute, and repeated at regular intervals. In addition, groups such as the scouts and hash will be offered specific training to enable them to recognise high risk species.

#### 7.2.5 Habitat adaptation

There are only a small number of entry and unloading points for cargo and passengers on Ascension. Newly-arrived non-native species will encounter these areas first and measures taken to make these bare and hostile will increase the probability of detection and reduce the chance of survival.

Requirements will be placed on AIG and employing organisations to create and maintain 'inhospitable habitats' at such sites. This will involve the removal of all vegetation, large rocks, sand, standing water and clutter to deny introduced species cover. Ideally highly compacted earth would cover the entire site out to at least 50m from the offloading point. Consideration should be given to the creation of a pesticide barrier around the site to prevent the dispersal of crawling invertebrates.

#### 7.2.6 Record keeping

Records of all detections will be kept in a central database overseen by AIG's Senior Biosecurity Officer. These will be used to analyse any patterns in the type, seasonality, entry location or potential source country of introductions that do occur and help to identify where failures in the system may be occurring.

### 7.3 Effective response to new introductions when they are detected

The detection of new introductions should trigger a rapid and effective response. This requires trained staff, clear response protocols and the availability of equipment and pesticides.

### 7.3.1 Verification of a new introduction

A precautionary approach will be adopted whereby all organisms found in newly-imported cargo or in the vicinity of entry points and offloading sites will be treated as non-native and destroyed. At other sites, suspected recent introductions will be contained where possible, but not destroyed until species identification has been carried out.

### 7.3.2 Emergency response plans

The response to a reported introduction will depend on the type of introduced species and the context. In all cases the aims will be in order of importance:

1. Ensure the safety of AIG staff and members of the public
2. Avoid significant environmental impact of any treatment
3. Eradicate the introduced species
4. Prevent or limit damage to contaminated goods where applicable
5. Use the most cost-effective treatment approach

Response plans will be created for the following scenarios:

- Live vertebrate introduction
- Live invertebrate introduction
- Live plant introduction
- Plant seed introduction
- Introduction of potentially contaminated unlicensed material

These plans will set out the steps to be taken and the thresholds for the level of authorisation required to undertake a treatment action. The most serious interventions will require authorisation from the Administrator and the USAF Commander where incidents are detected on the Base.

Nominated trained responders will be listed in the plans and their contact details will be distributed to those checking cargo and passengers (see section 7.2.2) and be kept up to date. There will be multiple people trained in each role to allow for periods of staff absence.

### 7.3.3 Power of Biosecurity Officers

Attempts will be made to contact the owner of any contaminated goods or land, and to seek their agreement before any treatment is undertaken. However, the legislation will give Biosecurity Officers the power to take treatment action without the permission of the importer if this is deemed necessary to contain the threat. No compensation will be payable for any goods destroyed during a treatment.

### *7.3.4 Equipment and pesticides*

The equipment, pesticides and PPE required to undertake all potential responses listed in the plans will be maintained on island at all times. This will be incorporated into AIG's Environmental Health Team's current stock management and storage procedures. All responders listed in the response plans will have a means of accessing the equipment and chemicals.

### 7.3.5 Training

A large-scale response should hopefully be an infrequent occurrence, but it is important that all involved understand the protocol and their role in it. Simulated exercises will be carried out to train staff and volunteers and this will be repeated on an annual basis to ensure skills remain current.

All staff required to administer pesticides will have received appropriate training and understand the potential risks to human health and the environment. The aim is to create a large group of trained responders so that an effective team is always present on island should they be required.

### 7.3.6 Record Keeping

Records of all monitoring, correspondence with owners, authorisations and treatments applied will be kept by the Senior Biosecurity Officer. The efficacy of the treatment in destroying the introduced species will be recorded to identify any failures or the development of resistance.

## 7.4 Reduced impact of established non-native species

It is estimated that over 95% of the species on Ascension are not native. Of these only a small number are invasive and damaging (see Table 5 at Annex E), but these have had a dramatic impact on the landscape, biodiversity and quality of life on the island.

### 7.4.1 Potential for eradication

The optimum solution would be to eradicate these species from the island; this would end the damage and remove the need for ongoing management. However, this is not always possible. The five case studies at Annex F illustrate the challenges and lessons learned from managing non-native species once they have been introduced.

All of the most damaging invasive species listed in Table 5 (Annex E) are abundant and widespread across the island; eradication is currently prohibitively expensive or not feasible. However, this conclusion needs to be kept under constant review as techniques and strategies advance. This is particularly true of species such as black rat, Mexican thorn and rabbits that are economically damaging in many countries and so stimulate a large amount of global research into innovative treatment methods.

### 7.4.2 Control methods

In the meantime, control and management are the only options on Ascension and will require ongoing and sustained effort. This needs to be undertaken strategically with the aim of reducing the most damaging impacts on human health, biodiversity or island infrastructure.

Table 6 at Annex G lists the current and potential future control methods for the most damaging non-native species on Ascension. It is essential that these methods are kept under constant review since resistance to treatments can evolve and reduce their efficacy, or more effective methods could be developed. The AIG Biosecurity Team has established and will maintain relationships with the GNNSS and the Centre for Agriculture and Bioscience International (CABI) to ensure current best-practice control methods are employed. Evaluation of all control methods used on Ascension will be carried out as part of the workplans of AIG Conservation and Environmental Health Teams.

Preference will always be given to low-input, long-lasting control measures such as biocontrol where natural predators, parasites or pathogens of an invasive species are released. Any such release needs to be rigorously assessed to prevent unintended damaging consequences, but biocontrol can be extremely effective and offer the most resource-efficient way of managing non-native species. Ascension will never have the capacity to develop novel biocontrol agents, but research elsewhere can lead to 'off-the-shelf' options that Ascension could adopt. A species of moth (*Evippe* spp.) has proved effective in reducing the spread of Mexican thorn in Australia and ladybird species have been used to control mealy bugs in St Helena; both could potentially be used on Ascension and options for funding and testing these methods are being explored.

Effective control or eradication requires a detailed knowledge of the biology of the non-native species. This will allow the method and likely pattern of spread to be predicted and identify any interactions with other species that need to be considered. It will also highlight any weak points in the life cycle that can be exploited for control actions. The means by which a non-native species spreads or

colonises will be used to determine the buffer zones that need to be cleared around a sensitive site to reduce the invasion pressure and provide proper protection.

#### 7.4.3 Monitoring and evaluation

The outcome of all management will be monitored to assess its effectiveness. This will include a measure of the resource input, the immediate result of control actions and the long-term clearance achieved. Comprehensive records will be kept to ensure experience is built on for the future. Maps of areas cleared of non-native plant species will be maintained and updated to measure progress and direct further work.

#### 7.4.4 Developing new control methods

There is probably limited scope for innovative control methods to be initiated on Ascension, but it could play a role in the research and development of new techniques. The island is small with relatively simple ecosystems and a remote location that limits natural migration. These factors could combine to make Ascension an attractive site for field trials of new methods. Any such proposals would have to undergo rigorous assessment to ensure there would be no adverse impact on humans, biodiversity and infrastructure, but if this were demonstrated then Ascension could benefit from early adoption of these new techniques.

## 8. Awareness raising and Education

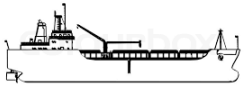
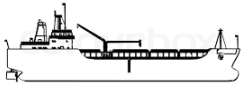
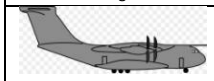
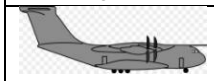
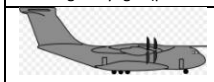
Education will be an essential part of this strategy and crucial to preventing the introduction of new species and their establishment on the island. Education has been mentioned in many of the proceeding sections and Table 7 summarises the audiences and messages that will be focused on.

**Table 7. Key audiences and messages that the awareness raising will focus on**

| Audience | Key messages | Method |
|---|---|---|
| Ascension community | ■ Non-native species can damage Ascension's public health, economy and environment<br>■ Biosecurity controls will reduce that risk<br>■ New restrictions are in place on what can be brought into Ascension<br>■ Very few items are prohibited, but some will require a licence or special treatment before they can be imported<br>■ On arrival to Ascension people will need to make a biosecurity declaration<br>■ Everyone can help by looking out for high risk species and reporting them to AIG | ■ Public meetings<br>■ Leaflets<br>■ Banners at the Airhead<br>■ Film shown at Airhead and cinema<br>■ Posters of high risk species |
| People moving to Ascension | | ■ Information provided during recruitment process<br>■ AIG website |
| Visitors to Ascension | | ■ Information provided with entry visa<br>■ Banners at Airhead<br>■ Video at Airhead<br>■ AIG website |
| Ascension employing organisations | ■ IHSs and licences will need to be followed for imports of controlled goods<br>■ Inspections will be carried out on some incoming goods<br>■ Assistance with the detection of | ■ Meetings<br>■ Direct email contact<br>■ AIG website |
| Ascension military organisations | | |

| | | |
|---|---|---|
| Shipping agents | contamination would be appreciated | |
| Suppliers | | |

## Annex A

| | Origin and other ports | Frequency | Cargo/passengers | Pathways for introduction | Overall risk |
|---|---|---|---|---|---|
| MV St Helena | | | | | |
|  | Cape Town via St Helena | Approximately every 3 months | Three reefers at -18, 0 and 8°C<br>One dry container of food stuffs and personal goods<br>Vehicles<br>Occasional cats, dogs and fish | Cargo – deliberate<br>Cargo – unintentional<br>Vessel - unintentional<br>Vessel hull<br>Ballast water | High |
| Falkland Islands Resupply Ship | | | | | |
|  | UK | 4-5 voyages per year | Reefers<br>Dry containers<br>Vehicles<br>Break bulk<br>Cats and dogs | Cargo – deliberate<br>Cargo – unintentional<br>Vessel - unintentional<br>Vessel hull<br>Ballast water | Low<br>(poor climate matching) |
| USAF Resupply Ship | | | | | |
|  | Florida to offload cargo<br>Africa to backload cargo | Approximately every two months | Reefers<br>Dry containers<br>Vehicles<br>Break bulk | Cargo – deliberate<br>Cargo – unintentional<br>Vessel - unintentional<br>Vessel hull<br>Ballast water | High |
| SA Airlink | | | | | |
|  | Johannesburg via St Helena | Monthly | Approximately 85 passengers and crew<br>Luggage<br>Freight | Freight – intentional<br>Freight – unintentional<br>Passengers and luggage – intentional<br>Passengers and luggage – unintentional<br>Hold and cabin - unintentional | Medium |
| A400M RAF flight | | | | | |
|  | UK via Cabo Verde | Every three weeks | Passengers and crew<br>Luggage<br>Freight | Freight – intentional<br>Freight – unintentional<br>Passengers and luggage – intentional<br>Passengers and luggage – unintentional<br>Hold and cabin - unintentional | Medium<br>(If hold and cabin open at Cape Verde) |
| ATI USAF flight | | | | | |
|  | Florida | Every two weeks | Passengers and crew<br>Luggage<br>Freight | Freight – intentional<br>Freight – unintentional<br>Passengers and luggage – intentional<br>Passengers and luggage – unintentional<br>Hold and cabin - unintentional | Medium |
| Yachts and Cruise ships | | | | | |
|  | Rest of the Atlantic but typically St Helena | Approximately 20-30 per year | Passengers<br>Luggage<br>Waste disposal | Passengers – intentional<br>Passengers – unintentional<br>Vessel hull | Medium |
| Airbridge Voyager (predicted to resume late 2021) | | | | | |
|  | UK and Falkland Islands | Twice weekly | Passengers<br>Luggage | Freight – intentional<br>Freight – unintentional<br>Passengers and luggage – intentional<br>Passengers and luggage – unintentional<br>Hold and cabin - unintentional | Low<br>(poor climate matching) |

**Annex B**

**Table 2.** Species that represent the highest biosecurity threat to Ascension, from (Roy *et al.* 2019)

| Common name | Scientific name | Potential impacts | Likely route of introduction |
|---|---|---|---|
| Red imported fire ant | *Solenopsis invicta* | Aggressive ant with very irritant bite that can cause severe skin reaction | Cargo, probably aggregate |
| Yellow fever mosquito | *Aedes aegypti* | Could introduce yellow fever, which can be fatal. Would require all people on or visiting the island to be vaccinated. | Stowaway on airplane |
| Tiger mosquito | *Aedes albopictus* | Could introduce yellow fever, dengue fever or Zika virus, all of which can be fatal | Stowaway on airplane |
| Common malaria mosquito | *Anopheles quadrimaculatus* | Could introduce malaria, which can be fatal. Would require all people on or visiting the island to be vaccinated. | Stowaway on airplane |
| Malaria mosquito | *Anopheles gambiae* | Could introduce malaria, which can be fatal. Would require all people on or visiting the island to be vaccinated. | Stowaway on airplane |
| Brown rat | *Rattus norvegicus* | Could spread disease such as salmonella and listeria | Ship |
| Harlequin ladybird | *Harmonia axyridis* | Can form large swarms that damage plants and native insects | With imported plant material |
| Yellow crazy ant | *Anoplolepis gracilipes* | Would threaten our land crab population and other native invertebrates | Cargo, probably aggregate |
| Little fire ant | *Wasmannia auropunctata* | Has a very painful sting that can cause severe irritation. | Cargo, probably aggregate |
| Devil Firefish (Lionfish) | *Pteriois miles* | Fearsome predator that could devastate marine fish and invertebrate populations | Imported as a pet |

**Annex C**

**Table 3. Diagram showing requirements for goods entering Ascension**


| **Description** | | | | | |
|---|---|---|---|---|---|
| Uncontrolled articles that present no risk (risks from containers and pallets dealt with separately) | Controlled articles that are commonly imported to Ascension and pose a risk of introducing non-native species, but where the risk has been comprehensively mitigated through inclusion of measures in Import Health Standards | Controlled articles that pose a risk of introducing non-native species but that are not commonly imported to Ascension so decisions on what mitigation measures are needed and whether the residual risk is acceptable are made on a case by case basis | | | Controlled articles that have been identified as posing a very high risk of introducing damaging non-native species and that risk cannot be mitigated to acceptable levels |
| **Import requirement** | | | | | |
| No restriction on imports | Must follow Import Health Standards | Must obtain a licence to import | | | Import Prohibited |
| | | Licence likely to be granted with sole condition that Import Health Standards adhered to | Licence likely to be granted with conditions to follow Import Health Standards and additional specific measures | Licence unlikely to be granted | |
| **Examples** | | | | | |
| Frozen goods<br>White goods | Apples<br>Onions<br>Aggregate<br>Vehicles | Lychees | Freshwater fish<br>Non-invasive ornamental plants | Live snakes<br>Invasive ornamental plants | Species on CITES list<br>Primates |

**Annex D**

**Table 4. Surveillance monitoring methods used to detect high risk introductions**

| Species | Monitoring method | Monitoring locations |
|---|---|---|
| Red imported fire ant | Baited traps and general invertebrate monitoring stations | High risk areas including:<br>• All container yards<br>• Aggregate storage areas |
| Little fire ant | Baited traps and general invertebrate monitoring stations | High risk areas including:<br>• All container yards<br>• Aggregate storage areas |
| Yellow crazy ant | Baited traps and general invertebrate monitoring stations | High risk areas including:<br>• All container yards<br>• Aggregate storage areas |
| Aedes mosquito | MOD yearly mosquito surveys | Island wide where standing water is present |
| Anopheles mosquito | MOD mosquito surveys | Island wide where standing water is present |
| Brown rat | Snap traps | One Boat Dump |

**Annex E**

**Table 5. The most damaging non-native invasive species currently on Ascension**

| | | | | | |
|---|---|---|---|---|---|
|  |  |  |  |  |  |
| Mexican thorn | Tree tobacco | Australian pine | Prickly pear | Guava | Black rat |
| *Prosopis julifolia* | *Nicotiana glauca* | *Casuarina equisetifolia* | *Opuntia vulgaris* | *Psidium guajava* | *Rattus rattus* |
| Spreading across island threatening infrastructure, access, turtle nesting beaches and seabird colonies. Harbours rodents. | Spreading across island threatening turtle beaches and seabird colonies. Harbours rodents | Spreading across north of island threatening infrastructure, access and endemic *Euphorbia* sites | Spreading across drier areas of the island threatening access and infrastructure. Spines are irritant to humans | Spreading across island affecting roads restricting access, threatening seabird colonies and harbouring rodents | Potential vectors of disease, predators of seabirds, turtles and endemic invertebrates. Major public nuisance |

| | | | | | | |
|---|---|---|---|---|---|---|
|  |  |  |  |  |  |  |
| House mouse | Rabbit | Cockroaches | Dry wood termite | Mosquitoes | Ants | Mealy bug |
| *Mus musculus* | *Oryctolagus cuniculus* | Blattodea | *Cryptotermes brevis* | Culcidae | Formicidae | Pseudococcidae |
| Potential vectors of disease and threat to food stores. Predators of endemic invertebrates and a public nuisance | Damages native, garden and cultivated plants | Potential vectors of disease and public nuisance | Damage timber and potentially make structures unsafe | Public nuisance | Public nuisance and threat to food stores. Encourages mealy bugs | Damages native, garden and cultivated plants |

**Annex F – Case studies of existing non-native species control on Ascension**

### Feral Cats

Cats were introduced to the island by early human settlers and some quickly became feral and spread across the island. They decimated breeding seabird populations and probably caused the extinction of two flightless bird species. In 2002 an RSPB-led initiative began a concerted trapping programme that resulted in the eradication of feral cats from Ascension in 2004. Fifteen years later, three species of seabird that were once confined to a single offshore island have begun breeding on the mainland again. The eradication was not welcomed by all members of the Ascension community due to the unintended killing of pet cats and a perceived increase in rodent populations.

**Lessons learned:** Full eradication of certain widespread species is possible, but it requires time, a large amount of money and political will to see it through. Public consultation and support should form an important part of any eradication attempt.

### Wild mango

Wild mango is a notorious invasive tree in many countries. A small number of trees were found at two locations on Ascension in the early 2000s. These trees were cut down and herbicide applied, but they had already set seed. Repeated visits to the area where the wild mango was found have allowed any new seedlings to be identified and cut down before they are able to set seed. In 2019, only four trees were found. Checks will need to be made for years to come and AIG Conservation staff trained to be vigilant for any further populations, but it has been possible to prevent the mango from spreading and eradication is a realistic prospect in the next decade.

**Lessons learned:** If an introduction is detected and acted on quickly, then eradication requires only a small (if sustained) effort.

### Prickly pear

Prickly pear were introduced to Ascension in the mid-19$^{th}$ Century and spread through the drier parts of the island. In the early 20$^{th}$ Century Henry Cronk embarked on an effort to eradicate the species through cutting back. He nearly succeeded, but had to leave the island with only an estimated three plants remaining. The subsequent absence of any control effort allowed the species to recover and resume its expansion across the island. Eradication is now unlikely and that opportunity will probably never exist again.

**Lessons learned:** Eradication attempts require long-term sustained effort and if full eradication isn't achieved then gains can quickly be lost and the resources invested wasted.

### Mosquitoes

Mosquito larvae are aquatic and require open standing fresh water to complete their life cycle. There is very little fresh water on Ascension and the application of a film of oil can be successfully used to prevent egg deposition or adult emergence. This has been carried out on Ascension, but not in a comprehensive or coordinated manner so that some untreated standing water was always available.

**Lessons learned:** It is important to understand the life history of an invasive species to exploit any bottlenecks that may make eradication easier. Eradication attempts will only succeed if it is the clear aim and there is good planning and coordinated action.

### Mexican thorn

Mexican thorn was introduced to Ascension in the 1960s in an effort to stabilise soil and reduce dust. For two decades it remained largely within the area in which it had originally been planted, but in the 1980s it began a phase of rapid expansion that has continued to the present day despite the release of biocontrol agents and cutting back of the plant from sensitive areas.

**Lessons learned:** If the opportunity to control a non-native species shortly after introduction is missed, then it may spread quickly, become impossible to eradicate and cause significant damage to environments and infrastructure.

**Annex G**

**Table 6. Current and potential control efforts for existing non-native species on Ascension**

| Species | Current or *proposed* management objectives | Current control methods | Potential future control methods | Likelihood of eradication |
|---|---|---|---|---|
| Mexican thorn | Remove from sensitive conservation sites and adjacent buffer zones<br><br>Remove Mexican thorn from pipelines and road edges | Use of cutting and herbicide to kill plants<br><br>Biocontrol agents – mirid bug (*Rhinocloa sp*) and the psyllid (*Heteropsylla reducta*) may be slowing spread | Biocontrol agent *Evippe* moth, which has successfully halted the spread of this species in parts of Australia | Low |
| Casuarina, Nicotiana, Prickly pear, Guava | Remove from sensitive conservation sites and adjacent buffer zones (MAP) | Use of cutting and herbicide to kill plants | No prospect of improved methods | Low |
| Bermudan Pine | Remove from Green Mountain above Elliot's contour | Use of cutting and herbicide to kill plants | No prospect of improved methods | Low |
| Black rat, House mouse | Reduce rodent densities in areas of human habitation to a level where they are not a threat to human health or cause a nuisance<br><br>Reduce rodent densities in turtle nesting beaches and seabird colonies to levels where there is no impact on the populations | Bait boxes containing rodenticide bromadiolone<br><br>Removal of non-native vegetation that provides cover for rats | Chemical contraception<br><br>Gene drive technology to spread sterility | Medium in 10-20 years |
| Rabbit | Prevent damage to endemic plant populations<br><br>Prevent damage to hydroponics operation and privately cultivated plants | Physical exclusion form sensitive site by fencing or netting | Gene drive technology to spread sterility<br><br>Introduction of disease agent | Low-medium |
| Ant species | Prevent infestation of buildings | Pesticide spraying and fumigation | No prospect of improved methods | Very low |
| Mealy bugs | Prevent damage to endemic *Euphorbia* plants | Pesticide spraying of *Euphorbia* plants | Biocontrol using naturalised ladybird species | Very low |
| Termites | *Reduce economic and safety impacts of termite damage on wooden features of buildings* | Pesticide treatment of wood<br>Tent fumigation has been used on USAF Base | Wider use of tent fumigation<br><br>Switch to building materials less susceptible to damage | Very low |
| Mosquito species | Prevent nuisance caused by mosquitoes | Surface covering chemical added to standing fresh water<br><br>Personal use of mosquito repellent | Comprehensive and concerted effort to remove or treat all areas of standing fresh water over a synchronised three month period | Medium |