Ten Year Eradication Plan

National Red Imported Fire Ant Eradication Program

South East Queensland

2017–18 to 2026–27

Queensland Government

Document approval

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Issue/approval date: 17 November 2017

Internal reference: Edocs #4647871

Revision history:

Version #	Approval date	Comments
1	8/9/2016	Submitted to Manager, Policy, Legislation and Compliance
2	4/9/2016	Submitted draft to Director, BQCC
3	20/12/16	Revised draft to Director, BQCC
4	16/6/17	Revised draft to Director, BQCC
5	5/7/17	Draft to Steering Committee
6	8/11/17	Final version to Steering Committee for approval
7	17/11/17	Plan approved by Steering Committee

This publication has been compiled by Biosecurity Queensland, Department of Agriculture and Fisheries.

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Executive summary

The National Red Imported Fire Ant Eradication Program (National Program) was first established in 2001 in response to the discovery of *Solenopsis invicta*[1] (commonly known as red imported fire ant or fire ant) in western Brisbane and Fishermans Island. The implementation of the National Program has prevented the widespread environmental, social, health and economic impacts seen in other countries where fire ants have invaded.

An Independent Review of the National Program in South East Queensland (SEQ) (the Independent Review), undertaken during 2015 and 2016, found that eradication of fire ants is technically feasible, cost-beneficial and in the national interest. The Independent Review panel concluded that the National Program has the tools and skills to achieve eradication, provided there is sufficient funding to ensure the tools are applied correctly in a timely way to infested areas, and with the required intensity.

The panel believes there is only a small window of opportunity left to eradicate fire ants, and a concerted national investment is required now while eradication is still possible. Guaranteed whole-of-life funding at the level recommended by the panel will allow the National Program to double treatment efforts; enhance information technology, science and compliance capabilities; and update remote sensing[2] technologies to enable the program to search for fire ants over significantly large tracts of land. This is what needs to occur to ensure eradication success.

Fire ants are not just another invasive ant; fire ants are a 'super pest'. Without an eradication program, the impacts of fire ants will surpass the *combined* effects of many of the pests we currently regard as Australia's worst invasives. These pests include rabbits, cane toads, foxes, camels, wild dogs and feral cats. In the United States of America (USA) where fire ants can occur at densities up to 600 mounds per hectare (Porter et al. 1988), lifestyles are severely impacted, with people reducing their use of local parks, sports ovals and even their own backyards due to the risk of injury or death. Approximately 100 deaths from fire ants have been reported in the USA since they first became established (Taber 2000). Similarly devastating impacts and costs have been reported to agricultural and other industries (e.g. communication, electrical and tourism), the environment, infrastructure (e.g. roads, airports and telecommunication), and the social sector (e.g. schools, hospitals and sporting industries).

The Independent Review found that the National Program had successfully delimited the extent of fire ant infestation in SEQ using remote sensing surveillance (RSS) of areas adjacent to the recorded distribution of fire ants in 2015. This finding was supported by Monash University modelling, which estimated that there was a 99.9% probability that the invasion was contained.

The National Program is recognised as a world leader in the eradication of fire ants, and it does this through the continual refinement and improvement of treatment, surveillance and diagnostic techniques, methodologies, technologies and methods. These tools and processes were used to successfully eradicate three incursions of fire ants (from Yarwun in 2010, the Port of Brisbane in 2012, and a second Yarwun incursion in 2016, discovered in 2013). This demonstrates that fire ants can be eradicated provided there is sufficient funding to do so. The challenge for the National Program now is to apply these tools and processes in a more sophisticated manner to deal with the larger SEQ incursion.

The key strategies of the Ten Year Eradication Plan (Ten Year Plan) include:

- **a significant boost in all eradication activities**, including increasing the total area receiving treatment and undergoing surveillance, and dedicating additional resources to preventing human-assisted spread, encouraging the industry and community to look for and report suspected fire ant infestations, and other eradication activities
- **a progressive 'rolling' strategy** that focuses intensive eradication activities initially in infested areas on the outer western and south-western perimeter of the operational area[3], and then shifts eradication effort inwards to areas with persistent infestation

- **a risk-based eradication planning approach** using different types of modelling, including spread (mathematical and trend), optimal eradication strategy, scientific, and land use and habitat classification, to inform the prioritisation of treatment and surveillance areas[4] based on the risk of fire ant spread
- **coordinated and focused eradication activities** in priority areas over three phases: search and suppress[5], treat, and search and clear (summarised in **Figure 1**), with detailed information on the treatment of, and surveillance for, fire ants within SEQ to be included in an annual Work Plan to be developed and approved by the National Red Imported Fire Ant Eradication Program (SEQ) Steering Committee (Steering Committee)
- **extended operational area** for eradication activities 5 km beyond all known existing infestation, including a combination of treatment, surveillance, activities to prevent human-assisted spread, and communication and stakeholder engagement to provide confidence that the area has been fully delimited
- **collaboration to promote shared responsibility between the National Program, industry[6] and the wider community to achieve eradication objectives**, including communication and engagement with the public and other stakeholders to encourage reporting of suspected fire ants, prevent human-assisted movement and ensure awareness of their general biosecurity obligation (GBO)[7] in regard to fire ants; and greater engagement with industry, other levels of government and landowners, with a particular focus on developing collaborative arrangements for them to treat and undertake structured surveillance on their own land
- **quality assurance to closely monitor the implementation of eradication activities**, which is critical to ensure success and continued absence of infestation in treated and cleared areas. The Steering Committee will monitor and evaluate National Program performance and progress against targets specified in the annual Work Plan
- **staged clearing of suburbs and confirmation that priority areas[8] are free from fire ants** following the completion of treatment, which will progressively reduce the operational area and provide confidence that eradication is successful. A proof of freedom verification and retention process will be implemented following the completion of final treatment.

Map 1 provides a visual representation of the progressive rolling strategy to be implemented under this plan. Initially the operational area will be divided into four indicative priority areas for focused eradication activity over the four successive stages of the ten-year life of the National Program.

A feature of the progressive rolling strategy is the need to overlap the staged treatment areas to ensure that areas are not at risk of reinfestation. The priority areas below are indicative only and will be updated as a part of the biennial review of the Ten Year Plan to be endorsed by the Steering Committee.

1 Buren 1972.

2 RSS has involved airborne cameras mounted on helicopters, which fly over broad areas to capture visible, near infrared and thermal images of possible fire ant mounds. The National Program will investigate new technologies.

3 Total area of known infestation confirmed by delimitation, and adjusted for known and predicted infestation spread since completion of delimitation (approximately 5 km from the nearest known infestation). The area is made up of Priority Areas 1–4. The operational area will not remain static, possibly increasing initially as surveillance increases around Area 1, then decreasing as the areas with confirmed infestation reduce over the life of the National Program.

4 An area within a priority area that will receive planned treatment.

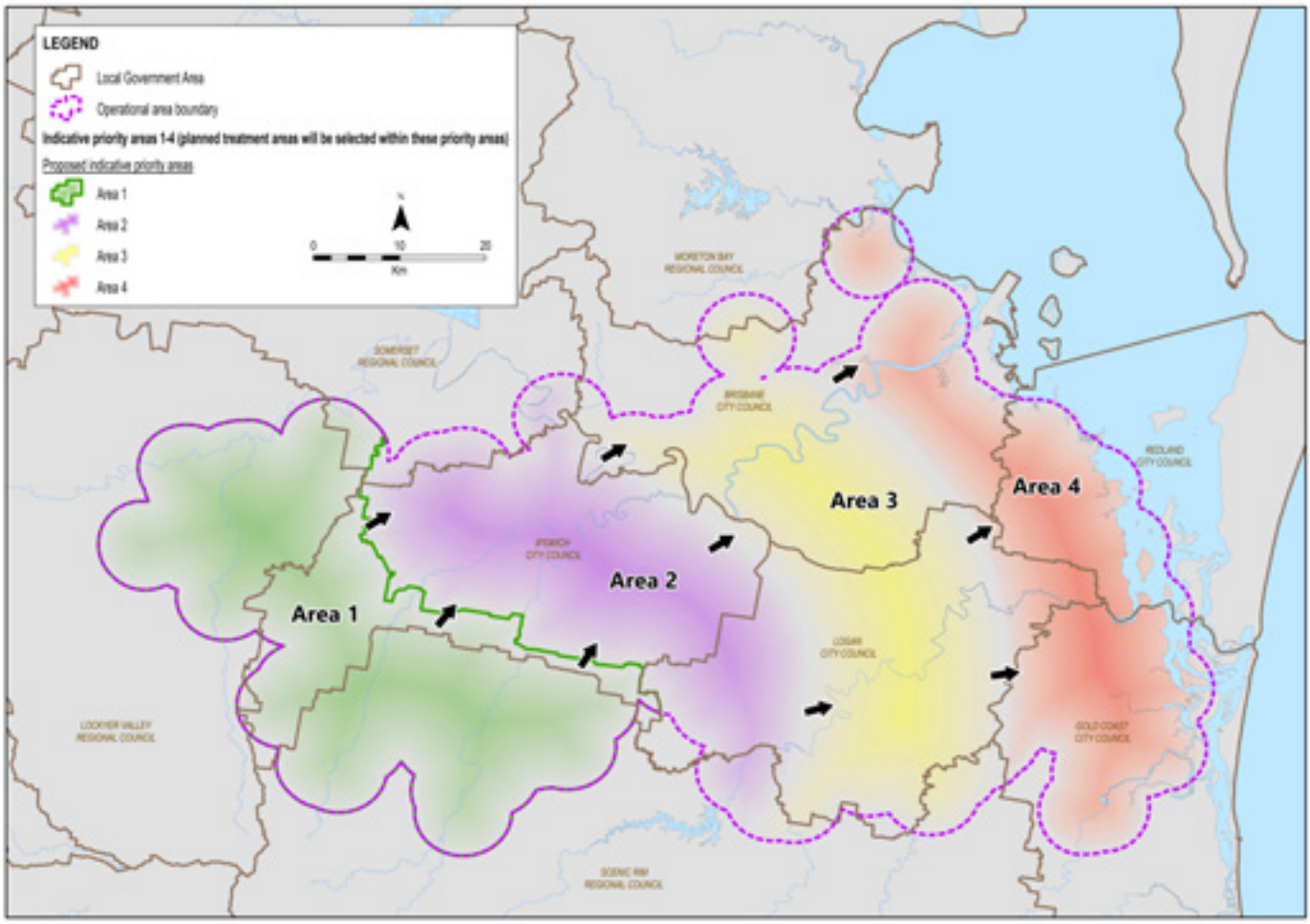
5 The minimum required treatment and surveillance required to contain and suppress spread, in accordance with the National Program treatment protocol. Infestation in areas that are not in the current priority area receiving treatment (i.e. areas to receive targeted treatment in a later stage) will receive suppression treatment. The intent of suppression treatment will be to mitigate spread from and in the areas that have not yet undergone focused and coordinated eradication activity. Further detail will be provided in the annual Work Plan.

6 There is a broad range of industries that are impacted by fire ants, and which exacerbate the risk of spread of fire ants. These include not only many agricultural industries, but construction and development, and communications and electrical.

7 All Queenslanders have a GBO under Queensland's *Biosecurity Act 2014*.

8 Geographical sub-areas within the operational area, which will receive coordinated and focused eradication activity.

Map 1: Indicative priority areas for intensive eradication activities[9]



A staged approach will be undertaken in priority areas throughout the life of the National Program.

Eradication activity in the Ten Year Plan is grouped into two types:

- **planned**—targeted areas will undergo phases of planned activity, including search and suppression, treatment, and search and clearance at different stages throughout the 10-year life of the plan
- **responsive**—infestations will continue to be detected, from small and isolated to high-density infestations, and responsive activities will occur in response to detections in areas which are not currently in a planned treatment area.

Planned activities for each area are outlined in **Figure 1**. **Figure 1** should be viewed in conjunction with **Figure 2**, which summarises the indicative timeframes for each area to undergo the different phases.

9 Infested areas (known and predicted) within the operational areas (Areas 1–4) will receive coordinated and focused activity; however, it is important to note that treatment will be targeted, as it is not possible to apply treatment over the entire operational area.

Figure 1: Planned approach for each priority area

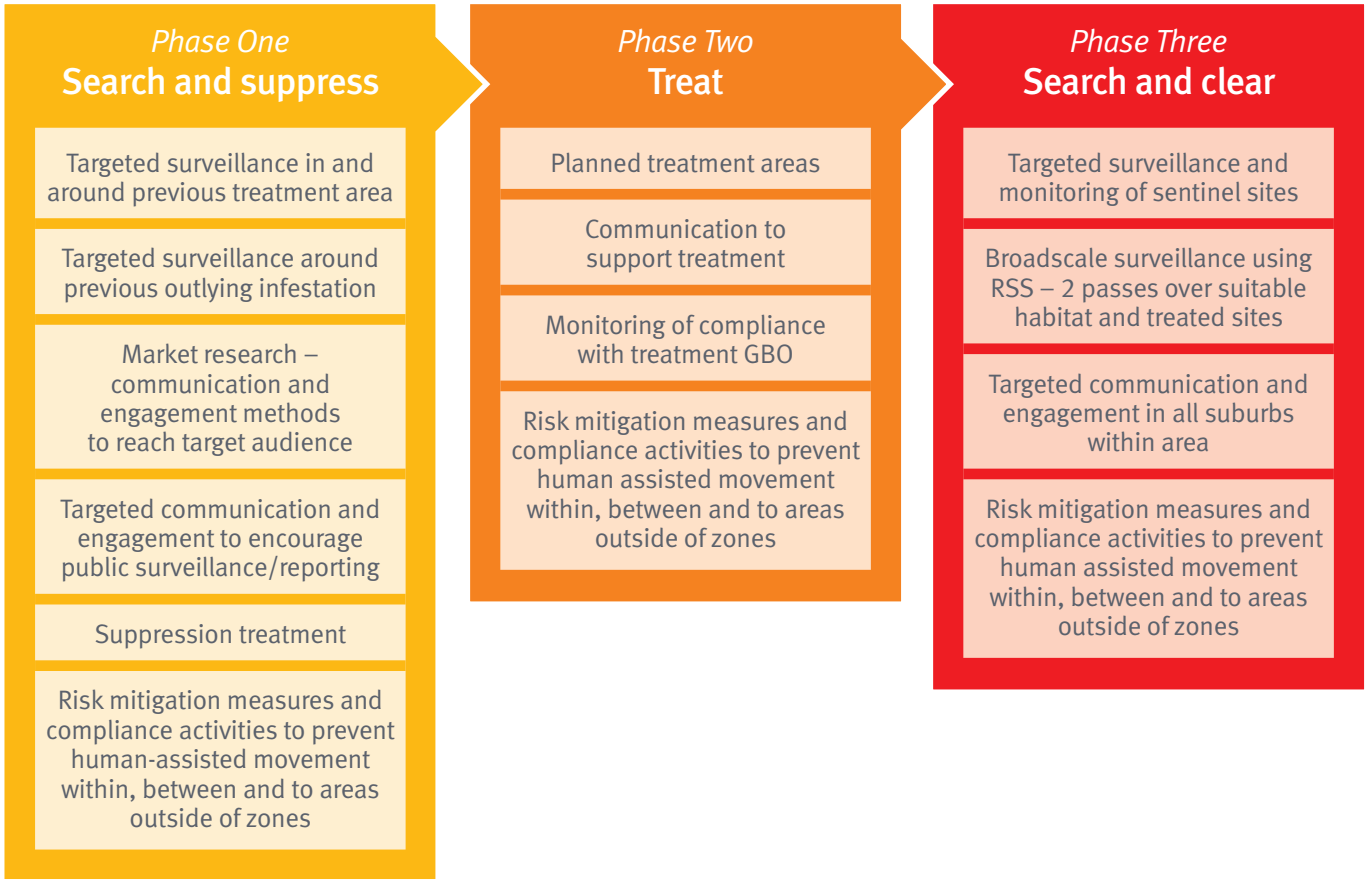
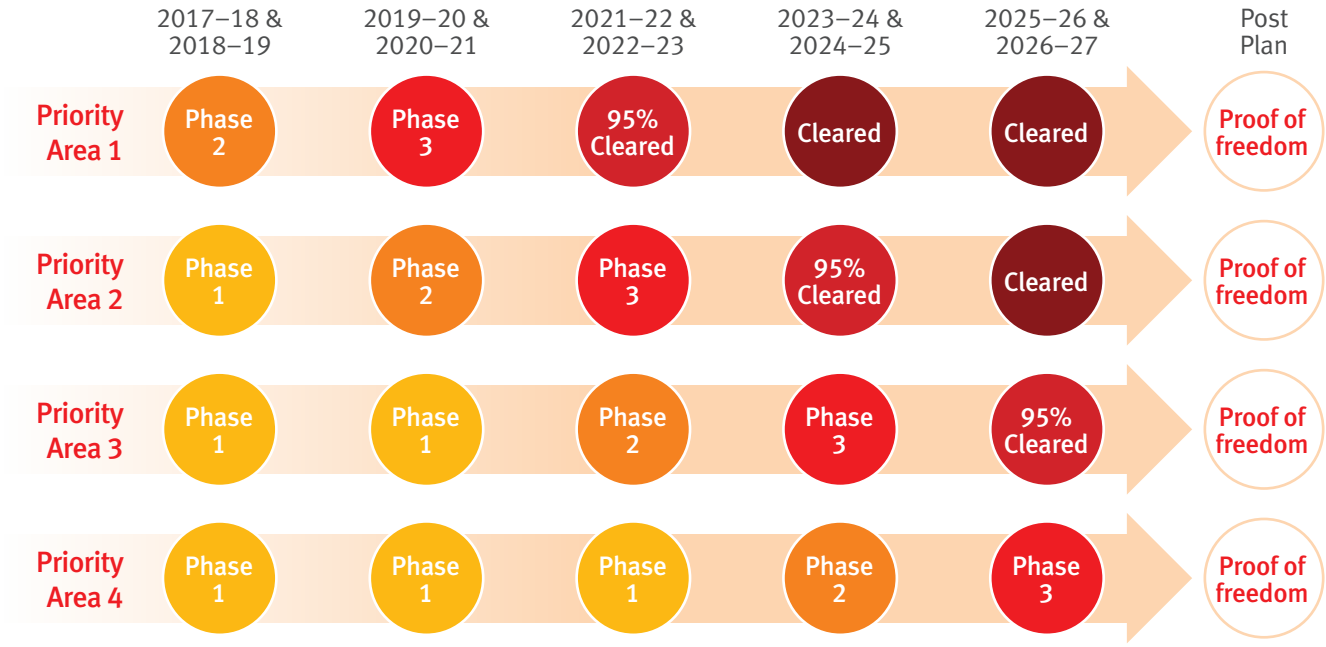


Figure 2: Indicative timeframes



Note that these timeframes are indicative only, and subject to change due to factors such as the weather and program success.

During the life of the Ten Year Plan, the National Program will continue to provide other Australian states and territories with expert scientific and technical advice, and operational assistance and resources, to support responses to fire ant and other exotic invasive ant incursions. Such cooperation enhances cross-jurisdictional capability, particularly through applied surveillance and invasive ant detection, and boosts Australia's biosecurity reputation.

The total indicative cost of the activities outlined in this Ten Year Plan is approximately $38 million per annum (adjusted annually for inflation rises), with a total cost of $411.426 million over 10 years. Detailed eradication activities and budgets will be developed each year as a part of the annual Work Plan.

The Ten Year Plan is also complemented by:

- the National Program Governance Plan, which provides a high level overview of the governance arrangements for this Ten Year Plan. Robust governance arrangements are designed to ensure transparency and monitor progress toward the National Program's aim and objectives, and include independent efficiency and financial audits, performance monitoring, and strategic oversight by the Steering Committee
- the National Exotic Invasive Ant Biosecurity Plan, developed by the Commonwealth Government, which proposes actions for the prevention, detection and response to exotic invasive ants, such as a nationwide media campaign to raise awareness of the dangers of fire ants and encourage reporting, and a targeted annual surveillance program at first ports to provide early detection ability. These activities will be critical to protecting the investment and reputation of the National Program
- the Building Skills and Capacity in Tramp Ant Management Project in Northern Australia (funded through the Agricultural Competitiveness White Paper)
- annual National Program Work Plans
- National Program policies, protocols and procedures.

The strategies and activities outlined in the Ten Year Plan have been developed by the National Program using a combination of scientific analysis, spread modelling, risk assessment and mitigation techniques, as well as the application of practical experience in the detection (surveillance and identification) and treatment of fire ants, communication and engagement, preventing human-assisted spread and other eradication tools and methods.

Due to the nature of the mathematical modelling, many elements of the optimal strategy recommended by Monash University to the Independent Review panel were simplified. The panel recognised this, stating that 'the value of the Monash University modelling is to estimate a quantum of funding required by the National Program to achieve eradication', and it recommended that the National Program 'develop the specific treatment and surveillance actions to be implemented'. This Ten Year Plan outlines how the National Program will implement eradication practices in line with the scientific standards required for eradication success.

1. Aim

The aim of this Ten Year Eradication Plan (Ten Year Plan) is to provide a comprehensive strategy and plan for the National Red Imported Fire Ant Eradication Program (National Program) to eradicate red imported fire ants (*Solenopsis invicta* (Buren 1972); fire ants) from South East Queensland (SEQ).[10]

2. Objectives

The objectives of this Ten Year Plan are:

Objective 1

Reduce infestation until fire ants are no longer present in SEQ and ensure areas remain free from fire ants through the implementation of eradication measures as outlined in this Ten Year Plan.

Objective 2

Prevent spread of fire ants to non-infested areas (using a combination of treatment, monitoring of compliance with movement restrictions pertaining to fire ant carriers, and public education/engagement).

Objective 3

Provide evidence to demonstrate freedom from fire ant infestation in the SEQ region following the process to declare proof of freedom described in **Section 5** of this Ten Year Plan.[11]

Objective 4

Help prevent the establishment of new incursions of invasive ant species Australia-wide by building capability in, and provision of, invasive ant response and eradication expertise.[12]

10 Refer to **Appendix 1** for background information including program history, pest details, risk assessment and potential fire ant impacts.

11 Final proof of freedom will be declared two years following the last treatment of confirmed infestation. The Monash University modelling did not estimate the budget for the process to declare proof of freedom at the completion of the eradication program. Due to the difficulty in determining the exact timing of the last treatment, the final proof of freedom process may require further consideration, and additional budget, at the completion of this plan in 2026–27.

12 Note: This objective cannot be achieved in isolation of efforts undertaken by the Commonwealth Government at the border that complement the aim of preventing new incursion.

3. Strategy, innovation and actions

This document outlines a Ten Year Plan to eradicate fire ants from SEQ, with a key focus to significantly boost eradication activities. The National Program is a world leader in delivering eradication techniques, and this plan outlines the ways in which the National Program will build on these proven techniques, and will operate in a more innovative, efficient and cost-effective manner.

The 2015–16 Independent Review (Independent Review) provided recommendations on strategies and options for achieving eradication of fire ants in SEQ. The Independent Review panel recognised that the large size of the delimited area makes it infeasible to apply treatment or surveillance effort over every hectare of land within the area. The panel also found that complete treatment or surveillance coverage of the entire delimited area is not required, as the actual area infested is only a small fraction of the delimited area, and the infestation is widely dispersed and generally at low density. Scientific and mathematical modelling will assist to estimate projected spread of fire ants using past program data and the biology of the ant, and to calculate the optimal level of treatment and surveillance to achieve eradication in the most timely and cost-efficient manner.

The National Program considered mathematical modelling undertaken by Monash University; however, this plan is based on the expert knowledge of the National Program gained over the past 16 years, as well as advice from the Independent Review panel comprising a range of international fire ant, eradication and biosecurity experts. Due to delays in the decision on funding to commence the Ten Year Plan, it is highly probable that the infestation may have spread beyond the operational area originally modelled for the Independent Review.

In order to eradicate, the operational area will be extended approximately 5 km beyond all known past infestations as at 30 June 2017. Treatment will be applied to a minimum of 2 km around all known past infestations, and targeted surveillance will occur from 2 km to 5 km around all known past infestations. Refer to **Appendix 2** for information on the Monash University modelling.

During recent years, it has been necessary to prioritise areas to be treated and surveyed due to resource limitations.[13] This has resulted in eradication activities being focused on areas that present the highest risk in terms of fire ant spread. Through implementation of this Ten Year Plan, the National Program will focus on eradication activities to complement and build on the treatment and surveillance activities undertaken in 2015–16 and 2016–17, in accordance with an annual Work Plan to be approved by the Steering Committee. This plan will enable the National Program to increase its capacity to deal with new high-density infestation[14], and many areas that were unable to be treated in 2016–17 will be prioritised in 2017–18. **Table 1** describes the key strategies of this Ten Year Plan.

13 This was partially a result of redirection of funds from treatment activities into delimitation activities using remote sensing technology.

14 The definition of high-density or high occurrence of fire ant is currently being reviewed. High-density infestation has been defined in the past as more than 10 mounds in a 500 m radius.

Table 1: Key strategies

Significant boost in eradication activities

The National Program will significantly boost its treatment and surveillance activities. The total area undergoing treatment each year will be significantly increased. During Phase 1: search and suppression, additional targeted surveillance and community engagement will be conducted to encourage industry and the community to look for, report, and not move fire ants, in and around the priority area to detect infestation and inform planning for Phase 2: treatment. During Phase 3: search and clearance, targeted surveillance and community engagement will be undertaken to confirm absence and clear suburbs. Additional compliance officers will also be dedicated to preventing human-assisted spread. Underpinning this, science and eradication planning will also be increased to ensure timely and cost-effective implementation. Infestations reported or found in a future priority area will receive suppression treatment (in the form of responsive treatment or planned suppression treatment of known high-density infested areas – see below).

Planned and responsive eradication activity

Eradication activity in this Ten Year Plan is grouped into two types:

- **planned**—the priority areas will undergo phases of planned activity at different stages throughout the 10-year life of the plan, including

  Phase 1: search and suppression

  Phase 2: treatment

  Phase 3: search and clearance

- **responsive**—it is anticipated that infestations will continue to be detected. Responsive activities will continue to occur for new detections in areas that are not currently undergoing Phase 2. Some planned suppression treatment will occur within future priority areas known to have high-density infestations (as this will be more cost-effective than the application of responsive treatment).

Refer to the following section for further explanation on planned and responsive eradication activity.

Progressive 'rolling' strategy

A progressive 'rolling' strategy will focus eradication activities initially in infested areas on the outer, western and south-western perimeter of the operational area, as these areas present the greatest risk in terms of suitable habitat, spread and impact. At the same time, infestations in areas not within the current priority area will receive 'suppression activities', which is the minimum treatment and surveillance required to contain and suppress spread until the area becomes a priority area (i.e. in later years).[15]

Subsequent eradication effort will then shift inwards to these areas with persistent and higher density infestation. The outer areas are predominantly rural and semi-rural, while the inner areas are predominantly more densely populated, urban with peri-urban properties (including market gardens). This means that, in these inner areas, the National Program's ability to treat aerially will be limited.

Priority areas will receive the maximum treatment[16] and surveillance effort, particularly focusing on high-density and high-risk infested areas.

A key feature of this strategy is overlapping the staged treatment areas to ensure that areas do not become reinfested. This means that some areas along the edge of the previous area treated will require retreatment as the stages progress. Compliance monitoring and intervention will also be important to prevent reinfestation.

15 Suppression activities are the minimum required treatment and surveillance to contain and suppress spread, in accordance with the National Program treatment protocol. Infestation in areas that are not in the current priority area receiving treatment (i.e. areas to receive targeted treatment in a later stage) will receive suppression treatment. The intent of suppression treatment will be to mitigate spread from and in the areas that have not yet undergone focused and coordination eradication activity. This may be in the form of planned suppression (of one–two bait treatments per year) or responsive treatment.

16 The optimal treatment regime is currently three treatments per year for two years.

Staged clearing of suburbs

Priority areas will be confirmed free (and subsequently kept free) from fire ants following the completion of treatment, progressively reducing the operational area and providing confidence that eradication in the area has been successful.

As it is not cost-effective or efficient to search the entire operational area to provide certainty of the absence of ants, a coordinated 'clearing' approach will be undertaken as follows:

- targeted searches and monitoring of sentinel sites in areas of suitable habitat within the suburb and adjacent suburbs
- post-treatment surveillance of individual nests (to confirm that all fire ants have been destroyed)
- targeted communication and engagement campaigns
- engagement with councils and other government agencies to encourage a collaborative/collective approach
- engagement with business and industry to ensure areas do not become reinfested through human-assisted movements
- two passes over suitable habitat and previously treated sites when remote sensing surveillance (RSS) becomes operational in 2019–20.

Risk-based eradication planning approach

Scientific analysis and mathematical spread, optimal eradication strategy, and land use and habitat modelling and classification will be used to inform the prioritisation of treatment and surveillance areas based on the risk of fire ant spread.

Research has been undertaken to identify which land use types are most commonly infested by fire ants through analysis of historical fire ant distribution patterns. Studies have found that farming enterprises, road corridors, areas adjacent to waterways, and new residential and development sites are more likely to have fire ant infestation.

Polygyne colonies (those with multiple queens) are of particular concern because they tend to have high nest densities and reproductive rates, and are generally more difficult to destroy due to the ability of the multiple queens to found new colonies if they become dispersed. They also tend to cause greater economic, public health and environmental impacts than monogyne colonies (those with a single queen). The National Program will investigate these risks and develop strategies to mitigate them.

Coordinated and focused eradication activity

The prioritisation of areas for coordinated eradication activity is based on where these risk areas are located in SEQ. The initial focus will be to halt the spread of fire ants west into farming areas in the Lockyer Valley, Somerset and Scenic Rim regional council areas and parts of the Ipswich City Council area, and across new housing development sites in these areas.

Coordinated eradication activities will be staged in each area. This will include detection, delineation, treatment, post-treatment surveillance, monitoring of sentinel sites, preventing human-assisted spread by controlling the movement of fire ant carriers, and communication and engagement focusing on targeted areas/suburbs (initially from the outer western perimeter of the operational area).

Detailed information on the treatment and surveillance areas will be included in the annual Work Plan.

Collaboration

Collaboration promoting shared responsibility between government, industry and the wider community will be required to achieve eradication objectives. It is the legal responsibility of all Queenslanders to report fire ants should they be discovered.[17] The National Program relies on industry, other levels of government and the community to be vigilant in searching for and reporting suspected fire ants, and in preventing human-assisted movement of fire ants. The National Program will increase stakeholder engagement effort, including industry, other levels of government and landowners, with a particular focus on developing collaborative arrangements for them to undertake structured surveillance and treatment on their own land.

Quality assurance

Quality assurance to closely monitor the implementation of eradication activities is critical to ensuring success and the continued absence of infestation in treated and cleared areas.

Confirmation of area freedom from fire ants

Confirmation of area freedom from fire ants will occur throughout the life of the 10-year program.[18] Final proof of freedom from fire ants in SEQ will be declared following completion of this Ten Year Plan.

17 Queensland's *Biosecurity Act 2014*.

18 Final proof of freedom will be declared two years following the last treatment of confirmed infestation. The Monash modelling did not estimate the budget for the process to declare proof of freedom at the completion of the eradication program. Due to the difficulty in determining the exact timing of the last treatment, the final proof of freedom process may require further consideration, and additional budget, at the completion of this plan in 2026–27.

19 There is the potential for infestation of the islands off the SEQ coast, including Bribie, North and South Stradbroke islands, and smaller islands in between. Surveillance of these locations will be undertaken during implementation of Phase 1: search and suppress for Priority Area 4.

Planned eradication activity

Eradication activity will be coordinated so that each priority area will undergo three phases of planned eradication activity. Each phase will be implemented over approximately two years. The staged approach is outlined below.

Phase 1: search and suppression

Within each priority area (with the exception of Priority Area 1), eradication will commence with implementation of Phase 1: search and suppression (refer to **Figure 1**). During the implementation of Phase 1, the National Program will undertake a range of activities to detect fire ant nests in the priority area. This will help inform the planning for when that priority area enters into Phase 2.

To account for delays in approval of this Ten Year Plan, Priority Area 1 will commence the intensive eradication activity of Phase Two: treatment in the first year of implementation (2017–18). Refer to **Figure 2** for an overview of the timeframes for implementation of each phase in each priority area. While Priority Area 1 is undergoing Phase 2, Priority Areas 2, 3 and 4 will be under Phase 1.

Phase 1 also includes the implementation of planned suppression treatment in targeted areas of high-density fire ant infestation in future priority areas. The intent is to continue to suppress the infestation until the area undergoes intensive treatment in Phase 2. Planned suppression treatment will complement responsive treatment of new detections. In some circumstances, suppression treatment is more cost-effective than repeated responses to newly reported infestations.

The National Program will undertake the following activities in areas undergoing Phase 1: search and suppression:

- targeted surveillance in and around previous treatment areas
- targeted surveillance in and around previous outlying/isolated infestations[19]
- market research to determine the best communication and engagement methods to reach target audiences
- targeted communication and engagement to encourage the public and industry to search for and report suspected fire ants
- planned suppression treatment of targeted fire ant infestations and responsive treatment of all new infestations
- risk mitigation measures and compliance activities to prevent human-assisted movement within, between and to areas outside of zones.

Phase 2: treatment

Using the data obtained through the implementation of the search activities in Phase 1, the National Program will identify and target specific locations within each priority area as they enter into Phase 2. These treatment areas will receive the optimal treatment regime determined by the National Program as necessary to eradicate fire ants. Communication will also occur with stakeholders within the treatment area and surrounding areas to:

- enlist public support
- ensure that the public, industry and other levels of government are searching for and reporting suspected fire ants
- ensure that stakeholders are aware of the non-regulatory general biosecurity obligation (GBO)[20] to ensure that the area that has received treatment is not disturbed.

The National Program will undertake the following activities in areas undergoing Phase 2:

- planned treatment of selected treatment areas
- communication to support treatment
- monitoring of compliance with respect to treatment in accordance with GBO
- risk mitigation measures and compliance activities to prevent human-assisted movement within, between and to areas outside of fire ant biosecurity zones.

This phase will take approximately two treatment seasons (i.e. September to May over two years).

Phase 3: search and clearance

Following Phase 2: treatment, the National Program will undertake activities to provide certainty that treatment has resulted in the successful destruction of all fire ant colonies and the area is free from fire ants.

The National Program will undertake the following activities in areas undergoing Phase 3:

- targeted surveillance and monitoring of sentinel sites
- broadscale surveillance—two passes over suitable habitat and treated sites
- targeted communication and engagement in all suburbs within the priority area
- risk mitigation measures and compliance activities to prevent human-assisted movement between zones.

The aim is to progressively reduce the infestation by targeting outer infested areas initially, progressively moving towards the eastern infested areas. The indicative priority areas are detailed in **Map 1**.

Responsive eradication activity

Responsive activities are unplanned and occur in response to new detections. New detections may be reported by the public, industry or other levels of government, or detected by the National Program through its treatment and surveillance activities. The National Program will undertake responsive eradication actions appropriate for the situation (refer to A**ppendix 3**).

Key activities

The following sections outline the key activities that will be undertaken to achieve the objectives stated in Section 2 of this plan. These activities include:

- treatment
- surveillance
- preventing human-assisted spread
- communication and engagement
- science, research and development
- planning, processes and systems to support eradication.

20 All Queenslanders have a GBO under Queensland's *Biosecurity Act 2014*.

3.1 Treatment

The National Program will significantly boost its treatment activities, focusing on intensive treatment in priority areas in accordance with the phased approach outlined above. During Phase 2: treatment, the National Program will determine specific areas within the priority area to receive planned targeted treatment, based on presence and risk of infestation (see **Section 3.1.1**).

Infestations reported within the priority area that are not in a planned treatment area will also receive treatment, and undergo delineation surveillance to determine the extent of the infestation (responsive treatment).

For infestations that are not in the current priority area (i.e. in future priority areas to receive treatment in a later stage), suppression treatment will be applied to mitigate spread from and in these areas until such time as they undergo Phase 2. This suppression treatment will be either planned suppression treatment of areas known to have had a high-density infestation, or responsive treatment of a new infestation.

Any residual infestation detected during the surveillance activities to clear priority areas (Phase 3: search and clearance) following the completion of Phase 2 will receive coordinated and focused eradication activity as an immediate priority.

In 2017–18 and 2018–19 (Years 1 and 2), it is estimated that the National Program will treat a minimum of 283 000 hectares each year (including multiple treatments of the selected planned treatment area in Priority Area 1). Treatment targets (i.e. hectares targeted for treatment) beyond Years 1 and 2 are difficult to estimate, as it is difficult to predict precise spread patterns. Targets (total hectares of treatment, including multiple rounds, as well as total area receiving treatment) will be detailed in the annual Work Plan.

3.1.1 Types of treatment

The National Program will undertake two types of treatment:

- planned treatment
- responsive treatment.

a) Planned treatment

Planned treatment is undertaken using an insect growth regulator (IGR) (see **Section 3.1.2**). The treatment areas (i.e. areas targeted for planned treatment) within each priority area will be determined through a rigorous analysis and planning process based on the highest densities of confirmed fire ant sites, anticipated spread patterns and highest risk of further spread (as outlined in **Section 3.5.3**). The annual Work Plan, approved by the Steering Committee prior to the commencement of each financial year, will detail the exact area (hectares) for treatment and surveillance activity. The planning process will be informed by mathematical modelling, run periodically using updated infestation, treatment and search data.

Once a planned treatment area has received the optimal treatment regime (up to six rounds of treatment), it will either undergo Phase 3: search and clearance, which is the staged clearing of suburbs process outlined above and in **Section 5** to verify that the area is free from infestation, or will continue to receive at least one treatment per year to prevent reinfestation from adjacent areas until such a time it undergoes the staged clearing of suburbs process.

Some planned suppression treatment will occur within future priority areas known to have had high-density infestation (as this can be more cost-effective than the application of responsive treatment).

b) Responsive treatment

It is anticipated that infestations will continue to be detected, particularly at the beginning of the Ten Year Plan. These new infestations will range from small and isolated to high-density infestations.

Treatment will be applied as appropriate considering the location and situation in accordance with National Program treatment protocol outlined above. For instance, infestations found within planned treatment areas will receive no additional treatment application unless there is a public safety risk, in which case the infestation will receive responsive treatment.

Responsive treatment may include direct nest injection (DNI) in conjunction with broadcast baiting (see **Section 3.1.2**) in a radius of up to 100 m around all fire ant mounds, or multiple rounds of broadcast baiting, or, if required, a combination of both options. In addition, to minimise risk in some circumstances, 100% delineation surveillance will be undertaken out to at least 500 m, and targeted surveillance will be undertaken out to at least 5 km surrounding a new infestation. These circumstances include infestations discovered within a priority area currently undergoing Phase 2: treatment, but which are outside a planned treatment area, or infestations beyond the operational area.

Detections on complex sites, such as developments, market gardens, agricultural lands and other high-risk sites, will receive tailored and coordinated operational activities.

3.1.2 Treatment methods

The treatment methods used by the National Program include broadcast baiting with IGRs, and DNI.

a) Broadcast bait treatment

The biological basis of eradication treatment with IGR baits is the foraging and food sharing behaviour of fire ants, and it is a very efficient way to deliver insecticidal active ingredients to an entire ant colony. Published data from the USA indicates that broadcast baiting has proven to be effective against fire ants (Drees et al. 1996), with reports indicating 80–95% control within one to six months (Barr 2000). A higher level of confidence in achieving eradication of a confirmed infestation is achieved through multiple rounds of treatment and combining the confidence obtained from each treatment, and by accounting for other factors such as weather and foraging activity. Assuming a treatment efficacy of 80% for each round of bait treatment, the confidence level of success in destroying fire ant infestation in the treatment area after six rounds of treatment is 99.994% (refer to **Appendix 4**). Analysis of early National Program data on 60 study sites demonstrated that the bait treatment regime used by the National Program successfully removed fire ants from these sites in Brisbane (McNaught et al. 2014). All monogyne infestations were eradicated in 15–18 months, but polygyne infestations took 24–30 months.

This optimal treatment regime is the basis for the treatment strategy for eradication of fire ants in SEQ, and will be applied over planned treatment areas identified for Phase 2, in targeted areas that are known to have had infestation or are at high risk of becoming infested.

Broadcast bait treatment can be conducted by air, all-terrain vehicle (ATV) or on foot. Aerial baiting is the most cost-efficient method of application, and is the preferred method of treatment. However, due to current Civil Aviation Safety Authority regulations and public sentiment, the National Program is unable to distribute bait aerially over residential areas. This means that bait treatment in all built-up areas, and buffering treatment around dwellings in rural areas, must be manually applied by foot teams or ATVs. Manual application of bait by a field team is the most labour-intensive and expensive method of treatment, but it is the only option available for use in heavily built-up areas, or other areas where it is not possible or practical to treat using mechanical methods.

Broadcast bait treatment activities are scheduled to occur during the warmer months of the year when ground temperatures are consistently above 18°C. This is likely to commence in September and conclude in May–June. Thermal regulation of the colony is stable during warmer months of the year, resulting in a tendency of ants to forage above ground and actively take up bait.

b) Direct nest injection

DNI of a non-repellent pesticide directly into the mound has proven effective at destroying nests in a once-off application. DNI generally occurs (in accordance with the National Program's protocols) in instances where there is a risk to human or animal health and safety, to allow movement of fire ant carriers from a commercial site to allow continuation of business activities, when there is a threat to the National Program, or if DNI is the more cost-effective option. DNI can be undertaken throughout the year, including during the months of May through to September when ground temperatures are generally too low for baiting to be optimal.

c) Treatment by landowners and licensed pest controllers

A new National Program priority will be to investigate the possibility of developing arrangements for landowners, industry and other government agencies, including the Commonwealth and local councils, to undertake structured surveillance or treatment on their own land, for example, in areas such as Department of Defence facilities.

As a first step, the National Program will investigate the establishment of arrangements for licensed pest controllers to administer bait and nest injections for landowners. Policy and procedures detailing how this will occur must be developed before this can be implemented.

3.2 Surveillance

Structured surveillance is an important part of the long-term National Program because it provides information on fire ant locations, whereas baiting without prior search (i.e. aerial baiting) does not.

As such, surveillance forms a part of the following elements of this Ten Year Plan:

- planned eradication activity (Phase 1: search and suppression and Phase 3: search and clearance)
- responsive eradication activity (delineation surveillance in response to new infestation and post-treatment surveillance)
- the processes to declare priority areas (post-Phase 2) and SEQ free from fire ants following the completion of this Ten Year Plan (refer to **Section 5**).

The National Program will commence implementation of planned intensive eradication activity with Phase 1 in each priority area.[21] Targeted surveillance will be undertaken around outlying areas that have been treated in previous years to confirm that fire ants have not spread beyond these areas. Targeted surveillance may also occur in and around planned treatment areas that have already received the treatment regime prior to implementation of this Ten Year Plan to confirm there is no remnant infestation remaining or reinfestation from beyond the treatment area.

21 Due to the delay in commencement of this plan, Priority Area 1 will receive Phase 2: treatment at the commencement of the Ten Year Plan.

The key surveillance focus will be on a broader search around areas previously known to be infested, and beyond planned treatment areas to confirm the extent and distribution of the infestation. The surveillance areas to be targeted will be determined through a rigorous, risk-based assessment of potential spread.

After planned treatment is completed (i.e. completion of Phase 2) an area will move into Phase 3. Surveillance activities will be undertaken to clear these areas, and will form a part of the staged clearing of suburbs process.

The National Program will transition from an intensive treatment focus in the early years of the Ten Year Plan to an intensive surveillance focus in the final two years. As intensive eradication activity shifts from west to east, surveillance activities to confirm absence of fire ants will be undertaken to clear priority areas and reduce the operational area. Following completion of the four stages, the surveillance focus will include activities to declare SEQ free from fire ants.

3.2.1 Types of surveillance

Different types of surveillance will be undertaken as a part of the National Program's planned or responsive eradication activity, and as a part of activities to declare the area free from fire ants following the completion of the National Program. These surveillance activities are outlined in the next section.

a) Planned (targeted surveillance)

During Phase 1, targeted surveillance will be undertaken across a broad area around planned treatment areas to ensure fire ants have not spread beyond the planned treatment areas. Targeted surveillance will also be undertaken to confirm absence around previous outlying isolated infestation. This will inform planning for where additional treatment may be needed, and will be undertaken using a combination of the tools listed below. Once RSS commences, it will be possible for the National Program to undertake surveillance across broader areas.

During Phase 3, targeted surveillance will be undertaken to confirm absence of ants in completed treatment areas and provide confidence that the area is free from fire ants. It is anticipated that RSS will be the primary tool to provide confidence of the absence of fire ants and clear priority areas. However, other tools will also be used as appropriate.

b) Planned (sentinel sites)

'Sentinel site' is a term used to describe an area of land that will be used to monitor for the presence or absence of fire ants. A sentinel site may be a highly suitable habitat for fire ants (e.g. cleared and disturbed land), and provides the most likely location to detect an infestation in any given area.

The main objective of sentinel sites in the first two years of this Ten Year Plan is to monitor and assess the extent of the spread of infestation. Selected sites may be immediately bordering planned treatment areas, inside treatment areas or in nearby suburbs that contain suitable habitat, or have been previously infested.

Sentinel sites will also be used to provide an indication of the success of multiple rounds of treatment and to confirm the absence of ants in these areas. When an area is undergoing Phase 3, sentinel sites will form a component of clearance. Absence of fire ants will be confirmed in the priority areas using the appropriate surveillance method. Sentinel sites may also form a part of proof of freedom strategies.

Surveillance activities undertaken at sentinel sites can include on-ground surveillance by field teams, odour detection dogs or community volunteers. Trials of lures for the detection of fire ant infestation will also be undertaken at selected sentinel sites. The timing for surveillance and duration of sentinel sites will depend on the purpose of the surveillance being undertaken. The National Program will conduct food preference trials to determine the most attractive lures prior to implementing the field trials. Experiments will be conducted using cultured ant colonies as a preliminary experiment to optimise luring success in the field at sentinel sites.

c) Responsive (delineation surveillance in response to new detections)

The National Program will give priority to undertaking broader surveillance around new infestations found in outlying areas. Any new infestation detected that is outside a current treatment area, but within a priority area currently in Phase 2: treatment, will also be prioritised for broader surveillance activities around the infestation. For a new infestation found in an area that is not in a priority area currently undergoing Phase 2 (i.e. areas to receive intensive planned treatment in a later stage), minimal delineation surveillance will be undertaken. The exception to this would be if the infestation presents a significant human health risk or is a threat to the National Program's eradication objectives (in accordance with the National Programs protocols).

d) Responsive (post-treatment surveillance)

Post-treatment (also referred to as validation) surveillance will be undertaken to confirm whether treatment has successfully resulted in the destruction of the nest. It is undertaken following the responsive treatment of a nest. It is undertaken to clear individual sites, rather than as a broadscale clearance method. Post-treatment surveillance is best undertaken by the odour detection dogs due to their ability to detect fire ants, although surveillance by field teams or luring may also be used to monitor the efficacy of treatment of individual sites.

Validation surveillance will be undertaken on outlying and outlier detections in suburbs that contain little or no known previous infestation, either inside or beyond the fire ant biosecurity zones. It is important to conduct validation surveillance on detections outside the treatment area boundary to determine if additional action is required. Extended operational treatment and surveillance, additional compliance actions, communication and genetic testing may be required. Initially, post-treatment surveillance will be undertaken on infestation beyond the northern, western and southern extent of Priority Area 1 planned treatment area.

Post-treatment surveillance will not be undertaken in areas that are undergoing or are yet to undergo Phase 2.

3.2.2 Surveillance methods

The methods currently used by the National Program for undertaking surveillance are summarised below.

The usefulness and need for each of these methods will be reviewed at regular intervals during the Ten Year Plan to ensure that the most efficient and effective techniques are used. New surveillance methods will be investigated as they emerge over the life of the Ten Year Plan.

a) Visual surveillance by field teams

Field teams are the primary method used by the National Program to undertake planned surveillance activities outlined in **Section 3.2.1** above. Techniques employed include food lures and visual inspection of the ground in a systematic search method. Operational staff who undertake and coordinate treatment in the warmer months will undertake planned visual surveillance activities in the cooler months when fire ant mounds are more visible.

Field teams may also undertake delineation surveillance as a part of the responsive eradication process.

b) Odour detection dog teams

Odour detection dogs are an important surveillance method as they can detect immature fire ant nests, with no visible soil disturbance, from a distance of several metres away. Dog team validation testing will be undertaken throughout each year, with a minimum 80% detection rate required for each dog.

The dogs are a useful tool for detecting fire ants over small areas of land. The focus of the odour detection dog teams will be to confirm the absence of fire ants following treatment of isolated infestations, and to assist in targeted surveillance as a part of the staged clearing process.

The odour detection dogs are also a useful publicity tool to encourage community surveillance, and can be used to assist in delineation surveillance in areas where this is a public risk such as schools, and for outliers. The odour detection dog teams will continue to be used to assist other jurisdictions in dealing with other incursions. This service will be provided on a fee-for-service basis. It should be noted that when the odour detection dogs are diverted to assist with other incursions, they cannot be ‘backfilled’, so the National Program loses this resource for that period.

Following the completion of Phase 2 in Priority Area 1, the National Program will consider whether additional odour detection dogs are required. As the aim is to progressively clear each stage, the surveillance undertaken by the odour detection dogs is expected to move progressively inwards as the infestation shrinks. As odour detection surveillance dogs reach retirement age (approximately 6–8 years), they will be considered for communication and engagement, or alternatively transition to retirement.

c) Remote sensing surveillance

The National Program has used RSS in the past to assist in confirming the absence of fire ants around the perimeter of a known infestation, thus delimiting the area of infestation. The RSS method used at the time involved broadscale surveillance using airborne cameras mounted on helicopters that flew over broad areas to capture visible, near infrared and thermal images of possible fire ant mounds. Nests have a distinctive size and shape, and in suitable weather conditions, are about 10°C hotter than the surrounding ground. Images were further refined using algorithms developed by The University of Sydney for the National Program and analysed by program officers manually. The final step in the process was to verify identified points of interest, using field teams to ascertain whether fire ants were present.

The technologies used by the National Program to undertake RSS in the past have been superseded. The National Program will engage universities and other contract partners to investigate the use of better technologies for broadscale surveillance, and will develop and test identified new technologies that can improve the efficacy of RSS as a means of remotely detecting fire ants. An extensive investigation of new technology and potential collaborations with multiple organisations, including private enterprise and universities, will be undertaken. Therefore, the lead-in and development phase of this activity is expected to take two years before a new solution can be made operational. Investment in RSS research and development, including piloting of the new technology, will occur in the first two years of this plan (2017–18 and 2018–19), with the intent that it will become operational in 2019–20 and operate until proof of freedom has been declared or the technique is superseded.

The Monash modelling commissioned by the Independent Review panel found that the continued use of RSS technologies as a surveillance technique would have significant cost savings and efficiencies in the eradication of fire ants. The adoption of modern RSS technology has the potential to provide improved aerial imagery, detection sensitivity and application compared with previous National Program RSS activity.

Monash modelling estimates the benefit of RSS (measured in terms of avoided eradication costs) at approximately $6 million per year for the duration of the program. The modelling also found that any future program strategy that does not use RSS technologies increases the risk of infestations in rural areas remaining undetected. The panel's view is that it would be extremely difficult to achieve eradication if the program does not invest in new RSS technologies as soon as practical.

RSS provides a cost-efficient method to survey large areas for fire ants, providing additional confidence that these areas and their surrounds are free from fire ants following the completion of intensive treatment. It is expected that a minimum of 100 000 hectares can be surveyed using RSS in one surveillance season (May–September). This will be a vital tool for the broadscale surveillance required to allow areas to be cleared from the operational area, and ultimately for proof of freedom surveillance to support and confirm eradication.

Targeted RSS will also be undertaken around the edge of the area that has been previously delimited to provide confidence that ants have not spread since delimitation was completed in 2014–15 (refer to **Map 2** in **Appendix 5**). Targeted RSS may also be undertaken during Phase 1: search and suppression to inform treatment planning.

The use of RSS in combination with odour detection dog teams and other on-ground surveillance methods will enable the National Program to achieve the best possible results, and the most cost-effective budget for fire ant detection and eradication. Wider applications of this methodology could also be considered for future incursions of other exotic pests by adjusting the spectral 'signals' and algorithms used to automate detection.

e) Community surveillance and reporting

To complement the surveillance undertaken by the National Program, the community, industry and other areas of government will be encouraged to search for and report suspected fire ants. Surveillance activities will be supported by community and stakeholder engagement activities including, but not limited to: mail-outs and signage in the area, use of the Queensland Department of Agriculture and Fisheries (DAF) mobile office unit, and media and promotions encouraging community surveillance in surrounding locations, particularly focusing on each stage as described above. Further information on communication and engagement activities is detailed in **Section 3.4**.

3.3 Preventing human-assisted spread

While treatment and surveillance activities for fire ant eradication are predominantly based around natural spread and known infestation, human-assisted spread is far less predictable, more difficult to plan for and potentially harder to control. With SEQ being one of the fastest growing areas in Australia, the potential for human-assisted spread is greatly increased.

3.3.1 Reporting requirements

Under the *Biosecurity Act 2014* (Queensland) (the Act), a person must advise an appropriate authorised officer of the presence of fire ants as soon as practicable, and no later than 24 hours after becoming aware of it. Failure to comply with this requirement is an offence under the Act, and carries a maximum penalty of 750 penalty units or six months imprisonment.

Enforcement action will be taken should an offence under this provision become apparent.

3.3.2 Movement controls

While movement of live fire ants is undesirable, it is the movement of a fire ant queen along with enough workers to establish a new, viable colony that poses the greatest biosecurity risk. Fire ant carriers (materials that are capable of moving fire ants such as soil, mulch, animal manure, baled hay or straw, potted plants and turf) pose varying degrees of risk of human-assisted spread.

Under the Act, there is provision to establish the whole or a part of the state as a biosecurity zone for a stated biosecurity matter, in this case fire ants and fire ant carriers. Zones have been established in areas of SEQ where fire ants have been detected, or where it is likely that fire ant infestation exists. Regulatory provisions restrict movement of fire ants and fire ant carriers in these zones to help prevent human-assisted spread.

Under the Act, risk minimisation requirements apply to fire ant carriers (other than soil) that are held on a place within the zones for over 24 hours, then moved from that place. These requirements include appropriate production, storage and treatment with a suitable chemical product.

Movement of soil within a zone relies on a non-regulatory GBO to mitigate the risk of movement of fire ants. Effective risk mitigation measures include activities undertaken prior to the movement, such as checking for fire ants, and removing the top one metre of soil or processing the soil in a way that would be likely to separate the queen from its workers. Currently soil can also be moved directly to a waste facility within the zones, as these facilities will be regularly treated by the National Program.

Following completion of Phase 3: search and clearance, the National Program will investigate a strategy for dealing with waste facilities in areas within the search and clear zone until the zoning is amended. The National Program may need to continue treatment of these facilities, or the facilities may be required to undertake their own treatment, to ensure the area does not become infested as a result of human-assisted spread from priority areas that have not yet undergone Phase Three: search and clearance.

Any proposed movement of fire ant carriers that cannot comply with the legislated requirements must have a biosecurity instrument permit (BIP). A risk-based decision-making process is used by the National Program's compliance officers to assess risk mitigation measures proposed for this type of movement. These decisions are based on a set of principles specific to the fire ant carrier, which is underpinned by scientific research (refer to **Appendix 6**). Considerations include practical risk mitigation options that would allow movement of the fire ant carrier with an acceptable level of risk that a viable fire ant colony will not be moved with the carrier. Once a risk assessment is made, an information notice outlining the basis of the decision is provided with or without the BIP.

Compliance with movement controls is best monitored in the field, and requires a significant presence of compliance officers in key areas in and around the zone, which history has shown promotes voluntary compliance. Where serious non-compliance has been identified, a prioritised approach will be undertaken. Priority will be placed on polygyne infestations, product movement outside the fire ant biosecurity zones, previous non-compliance, and non-compliance in relation to issued BIPs. Depending on the nature of the non-compliance, appropriate enforcement action could include education, an advisory or warning letter, or prosecution action. Further investigation will be undertaken on any serious instance of non-compliance that is identified. Additional compliance officers will be appointed to monitor compliance with movement controls.

3.3.3 Monitoring of compliance with respect to treatment in accordance with GBO

It is also important that treatment efficacy is not adversely affected, and a non-regulatory GBO has been established to assist in achieving this objective. Methods by which a landowner or occupier may discharge their GBO regarding treatment include leaving ground undisturbed for a specified period after bait application (including irrigating or watering), or not disturbing a one metre area around each mound for at least two weeks following DNI of a colony. These methods must be clearly communicated to be effective.

Compliance with this obligation needs to be proactively monitored, particularly given the quantum of treatment that will be applied under this plan. Again, this requires a presence in the field, and any such activities must be coordinated with the National Program's treatment regime. Additional compliance officers will be appointed to undertake this task.

3.3.4 Changes to the biosecurity zones

One of the key strategies for this Ten Year Plan is the staged clearing of suburbs. The objective of this strategy is to gradually verify that areas are free from fire ants, thereby reducing the operational area.

Consistent with the planned approach in this Ten Year Plan, the following zones will be established:

- suppression/containment zones, which will apply to priority areas undergoing Phase 1
- treatment zones, which will apply to priority areas undergoing Phase 2
- search and clearance zones, which will apply to priority areas undergoing Phase 3.

As outlined in **Section 3.2**, a range of surveillance tools will be used to provide confidence that eradication in the area has been successful. Once clearing activity is complete in an area, it will be removed from the search and clearance zone, which will effectively reduce the area of focus for compliance activity.

It may be necessary initially to increase one of the zones if significant infestation is detected beyond the current controlled area. However, increases to the zone will only occur following further assessment based on scientific principles. Implementation of Phase 3, including the coordinated clearing of the area, will be required before a decision will be made about amendments to zone boundaries.

These changes will require amendments to the Biosecurity Regulation 2016.

3.3.5 Compliance agreements

Under the Act, there is the provision for the establishment of compliance agreements with any other party to enable the self-management of biosecurity risks. This will be piloted initially with major stakeholders that rely on contractors or subcontractors, such as councils or road construction companies. Collaboration will also occur with local councils to encourage early notification of proposed developments in the zones, which may involve the movement of stockpiles of soil, mulch or compost.

3.4 Communication and engagement

Communication and engagement is an important component of this plan, as it promotes community surveillance and public reporting of suspected fire ants, and assists in the prevention of human-assisted spread.

As indicated in **Section 3.2.2**, public surveillance and reporting is an important surveillance method. Public reporting has accounted for up to 70% of new detections over the last four years (National Program data). This demonstrates the importance of fostering collaboration to promote shared responsibility between the National Program, industry and the wider community to achieve eradication objectives. The community, industry and other areas of government will be encouraged to search for and report suspected fire ants.

As indicated in **Section 3.3**, communication and engagement is also an important means of preventing human-assisted movement. Communication and engagement will focus on ensuring people are aware of their reporting requirements, the movement controls, their GBO and changes to the zones.

3.4.1 Types of communication and engagement

a) Planned communication and engagement activity

Over the life of the Ten Year Plan, communication and engagement activities will be closely aligned to the treatment, surveillance and prevention of human-assisted spread activities outlined in this Ten Year Plan. The community will be engaged across the entire operational area, with particular focus on the outer areas of the operational area first, moving progressively to the eastern areas, consistent with the Ten Year Plan staged approach. An intensive awareness campaign will be implemented, including increased communication and engagement activities, which will complement other eradication activities as part of the coordinated and focused approach in each phase of planned activity.

Market research is critical to understanding target audiences' behaviours, the way they interact with the National Program (i.e. how they absorb information) and the most effective methods of communication. At the commencement of Phase 1, market research will be undertaken to assess the most effective methods of communicating the key 'search and report' and 'stop human-assisted spread' messages to the local community and industry within the priority area. This will inform the National Program's messaging, and help identify the most effective tools to influence and encourage target audiences' active participation in each phase of the planned activity.

Based on this research, priority area and audience-specific messaging for communication and engagement campaigns will be developed and implemented prior to, and during, each phase of the Ten Year Plan. The overarching aim will be to advise people of program operational activities, to encourage people to check their properties for fire ants and report suspected sightings, and to advise people of their obligations in relation to preventing human-assisted spread of fire ants.

Phase 1: search and suppression

During Phase 1, communication and engagement will complement surveillance across a broad area around previously treated areas to encourage community surveillance and public reporting, in order to better inform where further treatment should occur during Phase 2. The specific locations within the priority area, and therefore the focus of the communication and engagement activities, will be determined by the National Program's planning processes. Community surveillance results will help to provide more confidence in the absence of fire ants in and around previously treated areas, and previously outlying isolated infestations, in order to inform future planning for treatment. This will be particularly important in Phase 1 to help provide confidence that fire ants have not spread to surrounding areas. Targeted communication and engagement may also occur outside the operational area to provide confidence that fire ant infestation does not exist beyond the delimitation boundary.

Phase 2: treatment

Phase 2 will involve communication and engagement with residents and businesses in the areas targeted for planned treatment, as well as engagement with stakeholders within the broader priority area. A key activity will be to communicate with residents in the current targeted treatment area about:

- the National Program's operational treatment activities and what to expect
- authorisation under the Act for officers to enter all targeted properties to conduct treatment for fire ants
- the need for property occupiers to comply with their GBO, not disturb areas following treatment, and comply with restrictions to prevent human-assisted spread of fire ants.

Phase 3: search and clearance

Following the completion of Phase 2, further targeted communication and engagement campaigns will be undertaken to provide confidence that the priority area is free from fire ants. National Program planning processes will identify the areas for targeted surveillance, and communication and engagement activities should occur to assist in confirming absence of fire ants in and around the completed targeted treatment areas, as well as within the broader priority area.

Surveillance to declare proof of freedom

A pest-free verification process will be undertaken within the operational area to provide evidence of pest absence on completion of treatment in Priority Areas 1–4. This will include a widespread communication and engagement campaign targeting the entire operational area. The purpose of this will be to encourage community surveillance and reporting, and detect any residual infestation.

b) Responsive communication and engagement activity

As outlined in **Section 3.2.1**, the National Program will undertake responsive eradication activity to deal with any new infestation which is not in a current planned treatment area. Priority will be given to undertaking broader surveillance around new infestations found in outlying areas, or in priority areas that have completed Phase 2. As a part of this, communication and engagement activities will be tailored in response to any new outlying infestations, or new infestations in priority areas, as required.

3.4.2 Communication and engagement methods and tools

Although approximately 95% of people in Brisbane are aware of fire ants, the proportion of people who believe fire ants are still a problem in SEQ is significantly lower (56.2% in 2013) (Queensland Treasury and Trade 2013). Fire ants are not highly prevalent because of the suppression activities in many areas. The National Program will investigate ways to increase public understanding of the risks of fire ants, community vigilance and participation in eradication efforts (by overcoming complacency). The aim will be to change people's behaviour in response to the significant risk that fire ants present, including actively checking their yards and reporting any suspicious ants, and complying with movement controls to prevent human-assisted spread.

Community and stakeholder engagement activities will include a combination of traditional and modern communication methods, as outlined below.

a) Information briefings and training

The National Program will provide information briefings and training for council and other government organisations, business, industry, community groups and landholders in targeted areas to provide a deeper level understanding of identification and control of fire ants. Business, industry and local government engagement will also be undertaken to encourage compliance with movement controls to prevent human-assisted spread, and encourage reporting of suspected fire ants across the entire operational area. The National Program will investigate whether e-training solutions might be developed to deliver these briefings and training more broadly (see **Section 3.4.2 b**).

b) Digital communication technologies

Better use of communication technologies will be investigated to provide a more efficient and cost-effective means of reaching the public and influencing their behaviour. This includes:

- expanding website and online functions to provide target groups with more timely and self-automated information, such as hosting of webinars and online training or e-learning for industry, council and residents
- providing more communication via email and short message service (SMS) rather than traditional mail-out techniques
- developing a mobile app for use on handheld personal devices to assist the public with the easy identification of fire ants and surveillance of their property to provide confidence of the absence of fire ants in an area
- using social media to capitalise on growing online audiences and enable links to reporting functions. Social media is a cost-effective, interactive and immediate communication channel that can be used to build online communities and communicate with stakeholders and clients. Online campaigns will also be implemented through channels such as Facebook, Instagram and Twitter.

These contemporary communication methods will increase efficiencies and save time.

c) Traditional mass communication channels

Mass communication channels to reach people in the greater Brisbane region will also be investigated for possible implementation at appropriate stages of the Ten Year Plan. Mass communication involves sending a message through a channel of communication to a large group of people and organisations, such as email, e-news and SMS services, as well as mass media advertising such as television, radio, print, online and outdoor.

d) School education program

The National Program will present the 'Aka the Fire Ant Tracker' show, and provide teaching resources to educate primary school students about fire ants. The interactive and inquiry-based education show addresses the effects and hazards of fire ants, and describes how and where to look for them.

f) Targeted media promotion

The National Program prepares and issues targeted media announcements to inform the public of eradication activities and to encourage the public to look for fire ants. The National Program also responds to media requests for information.

g) Mail-outs

The National Program will notify the public of eradication activities and encourage the public to check for fire ants via mail-out where appropriate.

h) Signage

The National Program will use variable message signage (VMS) and other signage located throughout the operational area to raise awareness of fire ants.

i) Public displays and participation in public events

The National Program will conduct public relations events to build awareness and involvement in searching for and reporting suspected fire ants. Attendance by program officers at events such as the Royal Queensland Show (the Ekka) will encourage the public to remain vigilant. The National Program will use DAF's mobile office unit to promote the eradication of fire ants at key locations throughout SEQ.

3.5 Science, research and development

The National Program is science-based, relying heavily on scientific and technical research, advice and expertise provided by program scientists and external Australian-based and international research partners. This will continue throughout the life of the National Program.

Science priorities include:

- fire ant diagnostics
- genetic analysis and genotyping of fire ant individuals and populations to determine origin and relatedness
- research, review and scientific advice on eradication techniques and processes.

3.5.1 Diagnostic services

Formal identification of ants collected in SEQ, either during surveillance or from public reports, will be conducted. A positive identification of fire ant is the trigger for a range of activities, including further surveillance, treatment, genetic analysis and tracing.

3.5.2 Genetic analysis and genotyping

The National Program performs a variety of genetic analyses on positive fire ant samples, including:

- social form—monogyne (which produces single queens that are strong fliers) and polygyne (multiple queens that generally do not fly)
- population assignment—determines whether a colony belongs to an existing population or is the result of a new incursion
- colony assessment—assesses how many colonies are present at a given location
- relatedness between colonies—can assist in determining the number of generations (how long a colony has been present) and the route of spread for those colonies
- bottleneck analysis (including next generation sequencing)—determines the level of genetic instability or genetic viability of a population
- geographical source of incursion (i.e. the country of origin).

The National Program will increase its capability to deal with the expected increase in demand for genetic analyses that will result from the expansion of eradication activities. New technologies to create efficiencies and improve quality assurance will also be investigated and implemented as appropriate.

Genetic analysis of the SEQ fire ant population is showing inbreeding and reduced genetic diversity, which can be attributed to the pressure exerted by the eradication program and provides evidence that the eradication process is working.

An effective measure of the success of the eradication process will be maintaining or increasing the levels of genetic instability currently exhibited by the SEQ population. Similarly, this work demonstrated the importance of ensuring there is no opportunity for the introduction of new genes (that may reinvigorate the population) through interbreeding with new incursions, such as the more recent Brisbane Airport (2015) and Port of Brisbane (2016) detections.

3.5.3 Scientific advice on eradication techniques and processes

National Program scientists continually review and research current and emerging scientific techniques and processes relevant to fire ant detection, diagnosis and treatment to ensure best practice in fire ant eradication. The main areas of current review and immediate future research include:

- regular assessments of fire ant bait (the cornerstone of the National Program's ability to eliminate fire ants) to provide confidence that treatments are effective, with scientists keeping up-to-date with the latest research, and when appropriate, running trials on alternative baits and treatment methods
- access to effective chemical products by engaging with the Australian Pesticides and Veterinary Medicines Authority and other stakeholders to maintain access to current pesticides and potentially obtain approvals for new fire ant control products
- monitoring scientific literature and maintaining key networks to stay abreast of the latest in fire ant research, with a particular focus on water-resistant baits and bait stations, monitoring new developments in biological control, and investigating options for year-round treatments to expedite eradication processes, prevent down-time and provide additional treatment options
- investigating a workable treatment solution for high-risk sites (e.g. polygyne colonies, which are more difficult to eradicate than monogynes colonies), and tailoring treatment regimes in these areas where possible—genetic analysis of colonies to determine their social form is essential to inform such treatment requirements
- investigating a workable treatment solution for turf farms infested with fire ants, and continuing to work with industries such as organic growers and turf farms to resolve treatment issues and prevent loss of organic status
- improving detection tools, including developing and refining land classification methods to identify preferred fire ant habitat and spread patterns

- dealing with polygyne infestations by investigating the risk that polygyne colonies present to eradication, and assessing potential enhancements to treatment, surveillance and tracing processes to mitigate the risks
- assessing fire ant identification kits to enable accurate, timely diagnosis of potential new fire ant incursions to prevent their establishment and reduce their impact. A simple, reliable fire ant identification kit has recently been evaluated for use by non-experts from biosecurity agencies, which will greatly enhance fire ant surveillance capacity across Australia (Valles et al. 2017).

Scientific research provides the basis for the policies, procedures and protocols governing program eradication activities, including treatment (e.g. baits, DNI, aerial, ATVs and field), surveillance (e.g. odour detection dogs, field and RSS), compliance, spatial services, science laboratories, diagnostics and genetics. Scientific advice on a range of matters is provided to develop appropriate solutions.

Live fire ant colonies will be maintained for the imprinting of odour detection dogs. This requires a temperature-controlled colony room where fire ants can be kept in isolation for the purpose of producing a continuous supply of fabric impregnated with fire ant odour. Purpose-built quarantine containment facilities for the culture of invasive ants will be investigated to ensure the quality of odour produced, and to undertake other experiments such as food/bait preference trials. Hundreds of individual pieces of scented material are produced monthly from the colony room for both training odour detection dogs and maintaining their fire ant detection capabilities. The odour detection dogs are a key surveillance resource, and ensuring that the odour they are imprinted on is of high quality is essential to their usefulness. In addition, live fire ants from the colony room are provided for use in communication and engagement activities, including for educational purposes around SEQ (e.g. shows and other local events).

The National Program will continue to contribute to other national exotic tramp ant eradication programs by maintaining colonies of other exotic ants to produce odour, and allow the imprinting of odour detection dogs to those species of ant. This has been a valuable service to other eradication programs. (e.g. shows and other local events and industry training).

3.6 Planning, processes and systems

Critical to successful implementation of this plan are a range of supporting functions:

- information management and data analysis
- spatial and mapping services
- management of budget and financial systems
- planning and logistical support
- customer service, policy, human resources, workplace health and safety, accommodation and administrative services.

These are essential elements of this plan, and are necessary to support the eradication activities. The resources required to undertake these tasks will be increased to support the larger National Program.

3.6.1 Eradication planning

Eradication planning entails the collection, collation, analysis and dissemination of information on when, where and how the eradication activities detailed in this plan will occur. Eradication planning is informed by scientific-based research, technical expertise and international best practice in eradication techniques. Underpinning the planning will be a risk-based eradication approach, prioritising treatment and surveillance areas based on the risk of fire ant spread.

The National Program will monitor and analyse fire ant spread patterns and colony relatedness, and use expert knowledge on the biology of fire ants and the effectiveness of treatment and surveillance methods as the basis for eradication planning. The planning unit will assess the risk of fire ants establishing in certain areas, based on preferred habitat and land use, to assess the

required treatment, surveillance and other eradication activities to be undertaken in each area. Mathematical modelling will also be used, as appropriate, to help inform the development of the optimal treatment and surveillance actions each year.

The rural areas of the Lockyer and Scenic Rim regional councils present one of the biggest risks to achieving the successful eradication of fire ants in SEQ. To address this risk, Priority Area 1 will focus on these council areas. The areas targeted for planned treatment within each priority area will be based on confirmed fire ant sites, anticipated spread patterns (determined from analysis of fire ant spread over the past five years) and risk. The areas targeted for surveillance will also be determined by this analysis.

The intent of planning will be to conduct eradication activity in a coordinated and focused manner. Detailed information on the treatment and surveillance areas will be included in the annual Work Plan.

Planning and analysis is integral to successful treatment and surveillance, and also plays an important role in the development of policies, procedures and protocols, as well as tailored responses to isolated, outlying detections when required. Following intensive treatment, planning will inform the implementation of the staged clearing of suburbs process. Planning will also inform where community and stakeholder engagement effort will be focused, and where and when scientific trials and testing of eradication methods will occur.

Resource planning will also be undertaken to forecast the resource requirements, such as facilities, equipment, and human, financial and supporting services required to achieve the objectives of this Ten Year Plan.

3.6.2 International collaboration

The National Program will continue to establish networks with fire ant experts in other countries that have had fire ant incursions. This includes the provision of advice and exchange of information between scientists and biosecurity experts in the USA, New Zealand, Japan, Taiwan and China. This collaboration is mostly informal in nature, and is undertaken on an as-required basis. The National Program will investigate formal exchange programs between other nations undertaking control, containment or eradication of fire ants.

3.6.3 Quality assurance

Quality assurance ensures that eradication activity, tasks, procedures and processes are executed consistently as intended. Quality assurance is essential within the National Program to demonstrate accountability, and to ensure continued absence of infestation in treated and cleared areas.

The implementation of activities contained in this Ten Year Plan and the annual Work Plan will be monitored to ensure that all eradication activities have occurred, and that targeted areas have received the amount of treatment and surveillance required to achieve eradication. Operational implementation will be closely monitored to ensure that treatment and surveillance occurs in accordance with the agreed areas of eradication activity within each stage.

The implementation of National Program procedures and protocols will be closely monitored, as these are critical to ensuring that eradication techniques and methods have been applied correctly. This will also include ensuring that all policies, protocols and procedures are current, and are regularly assessed and audited. Technical expertise and scientific research will provide the basis for the continual refinement of policies, procedures and protocols governing program eradication activities. The enhanced Ten Year Plan also provides an opportunity to review existing protocols and procedures and incorporate any necessary changes to facilitate a more streamlined process. This will minimise risk and ensure overall eradication success.

National Program scientists will also evaluate and validate the efficacy of the tools, products and methods used for surveillance and treatment in a structured manner. For example, they will regularly assess bait efficacy and the ability of the odour detection dogs to reliably detect fire ants. Efficacy testing will occur annually (at a minimum).

3.6.4 Information systems

The National Program uses a range of information systems to record and represent data, plan work and report on effort. These systems include:

a) Fire Ant Management System (FAMS)

b) Client Contact System (CCS)

c) ArcGIS (geographic information system).

The National Program also uses a range of programs and systems to represent National Program data spatially.

As part of the implementation of the Ten Year Plan, the National Program's information systems will be reviewed to ensure that they provide the most efficient and cost-effective means of managing information.

a) FAMS

The main information system is FAMS, which records, stores and provides access to program data such as clients, treatment and surveillance jobs, samples and bookings. It is important that the system provides functionality that allows the prioritisation of areas for eradication activity, and facilitates accurate and timely reporting on areas treated. The current system requires improvements to provide this functionality.

Furthermore, there is a large manual, or paper-based, element to data collection; currently field personnel write job details on paper forms, with the data later input into FAMS by office-based data entry personnel. The National Program will review FAMS and investigate possible replacements or upgrades.

The capacity of the program's information technology infrastructure and software will be enhanced to support the increased amount of data anticipated as a result of the additional treatment and surveillance activities undertaken. This enhancement will reduce the need for paper-based record keeping, manual data analysis and entry, and reporting, which are time-consuming and inefficient. Efficiencies created by these changes will allow personnel to focus on other priority eradication tasks.

b) CCS

The CCS is a basic information system that records client information. A new client relationship management (CRM) system will be investigated to record and facilitate events and contacts. This CRM system will provide a reliable mechanism to maintain and monitor the National Program's relationships with clients and stakeholders, and where their activities intersect across the biosecurity continuum.

c) Spatial systems

The spatial representation of information is also paramount to the treatment and surveillance program. Maps and forms are produced to provide field personnel with relevant, up-to-date information to ensure they can undertake their duties safely and effectively.

Information system priorities

The information systems enhancement priorities include:

- improvements to usability to allow users to extract operational data, which will enable better monitoring of program performance and costs, and improve decision-making and accountability
- data cleansing, rectification of functional issues and addition of mobile functionality to enable real-time data capture and reporting, and allow National Program personnel to issue reports and check compliance history of individuals and businesses in the field
- improvements to spatial systems, including upgrades to data servers and automated mapping portals
- development of a CRM information database, including seamless integration with other databases used by the National Program
- investigation of improved system functionality to enable use of email and SMS instead of mass postal mail-outs to members of the public
- potential use of, and integration with, other Biosecurity Queensland systems.

3.6.5 Policy and strategic planning

It is critical that the National Program develops, implements and monitors policies, protocols and procedures to govern all activities undertaken under this Ten Year Plan. Key activities include:

- development, monitoring and reporting on implementation of this Ten Year Plan to cost-share partners
- preparation and coordination of the annual National Program Work Plan
- updating of the zones where restrictions apply on the movement of materials likely to harbour fire ants
- ongoing development and review of the eradication program, management strategies, policies and protocols to ensure they remain effective to eradicate the current pattern of infestation
- preparation of the pest-free area submission at the completion of the National Program
- strategic planning and coordination of national, state and territory stakeholder input to the National Program
- secretariat support for the Steering Committee.

3.6.6 Administration, workplace health and safety and human resources

The critical activities which underpin the successful operation of the National Program include administration, human resource management, workplace health and safety, accommodation, procurement and contract management. These are essential activities that ensure the smooth operation of the program and the successful implementation of this plan. Administrative tasks also include treatment and surveillance job creation, data entry, records management, asset management, and general office and field support.

With the increase in treatment and surveillance, the National Program will be in a better position to negotiate new supplier agreements with potential savings due to increased products and services required (e.g. bait supply and helicopter hire). Opportunities to establish satellite offices and co-locate the central and operational offices of the National Program will also be investigated to maximise efficiencies. The costs of undertaking specific eradication activities in each stage will also be further analysed to better inform eradication planning as outlined in **Section 3.6.1**.

3.6.7 Client service

An important element of the National Program is client service. The National Program manages thousands of stakeholder and client interactions per year via multiple communication channels including phone, website, email and post, often providing a first point of contact for the public in regard to many fire ant related queries and requests. The National Program will continue to provide client-responsive services, which are integral to the successful delivery of the eradication activities in this Ten Year Plan.

4. Assistance for other tramp ant incursions

When requested, expert assistance and resources will be provided to other Australian states and territories in the event of fire ant or other exotic ant incursions.

Assistance provided to other responses may include:

- diagnostics (using morphology/taxonomy or genetic analysis)
- practical expertise and the availability of trained staff to respond rapidly to determine the extent of the infestation, physically destroy the infestation and confirm that no ants remain
- scientific advice and technical expertise on treatment and surveillance of exotic ant species
- collection of reproductive ant colonies and establishment of colonies to produce ant species-specific odour for the imprinting and training of odour detection dogs to detect live ants in the 'wild'
- access to odour detection dogs
- the development of genetic analysis tools to investigate the source of exotic ant incursions.

This assistance will be provided on a fee-for-service basis (i.e. full reimbursement from the recipient jurisdiction for the cost of the service provided). It is important to note that the diversion of resources (e.g. an odour detection dog surveillance team) to assist in other responses may impact on the National Program's ability to implement this plan and achieve the desired outcomes within the prescribed timeframes.

5. Declaration of proof of freedom

As outlined in the staged clearing of suburbs process in **Table 1**, the National Program will progressively reduce the operational area by confirming local area freedom from fire ants through validation surveillance of nest destruction, targeted surveys of areas that have been infested in the past, and targeted communication and engagement to encourage public surveillance and reporting throughout the life of the Ten Year Plan.

Specifically, Phase 3: search and clearance will comprise a staged process to provide evidence of absence for individual suburbs. This process will include:

- targeted surveillance and monitoring of sentinel sites in areas of suitable habitat within the suburb and adjacent suburbs
- post-treatment surveillance of individual sites (isolated/outlier) to determine treatment success
- targeted communication and engagement campaign
- engagement and, where appropriate, a memorandum of understanding with councils and other government agencies to encourage a collaborative/collective approach (e.g. council field officers can actively check for ants when they are conducting other duties)
- engagement with business and industry to ensure areas do not become reinfested through human-assisted movements
- RSS of suitable habitat and previously treated sites
- continued compliance program to minimise potential movement of residual infestation.

Mathematical modelling may also be used to estimate the probability that the priority area is cleared. This will minimise the risk of prematurely declaring an area cleared. To minimise risk and ensure the invasion actually reduces in geographic area over time, analyses will be undertaken to determine an appropriate minimum probability of fire ant absence in a suburb or area for it to be considered free of fire ants.

Following completion of this Ten Year Plan, it is proposed that the National Program will transition into a proof of freedom verification phase.[22] A pest-free area will be declared two years after the final known nest has been treated. An area freedom verification process will be undertaken within the operational area to provide evidence of fire ant absence in SEQ. This verification process will include:

- two passes of RSS over priority areas that have been previously infested and areas which present a high-risk of infestation (once following completion of optimal treatment rounds, and once during the proof of freedom verification phase), undertaken approximately 12 months after the final treatment in the area
- two rounds of sentinel site surveys, including suitable and unsuitable fire ant habitat
- a widespread community and stakeholder engagement campaign targeting the entire area undergoing the pest-free verification surveillance, and adjacent regional council areas, to increase community surveillance and reporting
- modelling to determine an estimated minimum pest prevalence in the area should at least one fire ant colony have survived the treatment program, with a very high level of confidence (minimum of 95%) that the area is fire ant free required
- maintenance of a compliance program to minimise potential movement of residual infestation.

Freedom from fire ants will be declared when no fire ants are detected for two years. This includes reports by the public, as well as detections by the odour detection dogs, RSS or National Program staff. Activities to maintain proof of freedom retention beyond the life of the National Program have not been included in the budget for this plan.

A Pest Eradication Report will be prepared on completion of the pest-free verification process.

22 The provision of cost-shared funding for the post–Ten Year Plan proof of freedom phase will require consideration during the final years of the Ten Year Plan.

6. Budget and finance

The budget required to achieve eradication is $411.426 million over 10 years ($38 million per year, adjusted for inflation[23]). This is consistent with the findings of the Independent Review panel. Indicative budgets over the 10-year life of the program, which are based on the actions and strategies outlined in this plan, are summarised in **Appendix 7**. Final budget breakdowns for the next financial year will be developed by June of each year as a part of the annual Work Plan.

The cost-sharing apportionments are based on calculations undertaken by the Commonwealth Department of Agriculture and Water Resources. The process is outlined in **Appendix 7**.

The principles for cost-sharing contributions to the Ten Year Plan are outlined in the Principles for Cost-sharing Contributions to the Ten Year Plan.

The National Program will also receive in-kind support from industry, government and the public. This in-kind support is summarised in **Appendix 8**.

A part of the budget allocation for the first year will be to undertake significant work to 'ramp up' the program. A ramp-up taskforce was established within the National Program in 2016–17 to commence the activities required. This includes increases to staffing, accommodation, RSS capability and supporting information systems. Further funding may be required at the completion of the 10-year treatment and surveillance phase to undertake declaration of proof of freedom.

The National Program will commission work to further explore alternative funding models, including options for financial contributions from private beneficiaries, and risk creators and mitigators. Mechanisms such as levies will also be considered, acknowledging that any decision to implement levies is beyond the authority of the National Program. This work will be overseen by the Steering Committee.

23 These budget estimations were based on current costs and must be adjusted for future inflation. The CPI adjustment is 2.46% per annum, and was calculated based on the average inflation increase over the past 20 years.

7. Governance

Robust governance arrangements will ensure program transparency and progress toward the attainment of National Program goals. This Ten Year Plan will be managed by the National Program (on behalf of the National Program's cost-share partners) and overseen by the Steering Committee.

The National Program was established prior to the development of the National Environmental Biosecurity Response Agreement (NEBRA), which sets out the national arrangements for responses to nationally significant biosecurity incidents where there are predominantly public benefits. Nevertheless, the National Program operates under a NEBRA-like arrangement, and the eradication of fire ants continues to meet the national interest criteria outlined in the NEBRA aimed at preventing the potential environmental, social, health and economic impacts seen in other countries where fire ants have invaded.

This plan will replace the Red Imported Fire Ant Eradication Program Response Plan 2013–2018.

The reporting structure, including key committees responsible for high level direction, control and advice over the National Program, is set out in the National Program Governance Plan, approved by AGMIN on 26 July 2017. The Steering Committee will monitor progress and performance through the review of National Program progress reports.

7.1 Plans

This plan describes the actions that will be taken to eradicate fire ants over a 10-year period, and will be revised as needed throughout the life of the National Program. At a minimum, the Steering Committee will review and endorse updated versions of the Ten Year Plan biennially.

The Ten Year Plan will be supported by an annual Work Plan to be submitted to the Steering Committee for approval prior to the commencement of each financial year (when possible). The Work Plan will contain detailed eradication activities to be undertaken by the National Program for the upcoming year. However, due to ongoing changes that occur during each year, there also needs to be some flexibility for the Work Plan to be adapted to allow the National Program to respond to changing circumstances/environments during the year.

7.2 Reporting

The National Program will submit a monthly progress report to the Steering Committee for approval to inform cost-sharing partners of program activities and ensure accountability. The National Program will advise the Steering Committee as soon as any significant detections are confirmed. A full report on significant detections will be provided for assessment by the Steering Committee once treatment and surveillance activities have been completed (refer to **Section 7.3.1**).[24] The Steering Committee will provide monthly reports, including any significant detection reports, to the National Biosecurity Management Consultative Committee (formerly known as the Tramp Ant Consultative Committee).

The progress report will provide updates on the program's operations and management, including:

- quantitative data on expenditure of funds and policy, planning, surveillance, treatment, science, research and development
- community and stakeholder engagement
- compliance with movement restrictions
- support services, including information and mapping systems, administration, finance, workplace health and safety, and human resources.

Quarterly, half-yearly and annual reports will also provide more detailed qualitative information for the National Program's cost-share partners to monitor whether the program is on track to achieve eradication.

7.2.1 Performance indicators

a) Milestones

Detailed targets will be developed each year as a part of the annual Work Plan. The Steering Committee will monitor progress via the milestones contained in **Table 2** (where appropriate).

24 A significant detection is defined as any new infestation discovered outside of the current operational area.

Table 2: National Program milestones

Desired outcome	Outputs/deliverables	Milestone target/key performance indicator	Reporting timeframe
Activity: Treatment			
• Treatment results in the absence of fire ants in the planned eradication treatment areas • Treatment results in the suppression of fire ants in the planned suppression treatment areas • Treatment results in the eradication and suppression of new infestations in areas that are not within a planned treatment area • Treatment protocols are fully applied to all planned and responsive treatment areas in accordance with the Ten Year Plan	• Planned eradication treatment of selected treatment areas • Planned suppression treatment of targeted fire ant infestations • Responsive treatment of new infestations (not currently within a planned treatment area)	• Targets for number of hectares to receive planned eradication treatment as detailed in annual Work Plan	• Timeframes defined in monthly reports. Reported monthly, quarterly and annually
		• Targets for number of hectares to receive planned suppression treatment as detailed in annual Work Plan	• Timeframes defined in monthly reports. Reported monthly, quarterly and annually
		• Destruction of all new infestations – amount of responsive bait treatment budgeted – estimate based on previous year	• Timeframes defined in monthly reports. Reported monthly, quarterly and annually
		• Destruction of all new infestations, number of direct nest injections budgeted – estimate based on previous year[25]	• Timeframes defined in monthly reports. Reported monthly, quarterly and annually
		• Map of fire ant infestation showing total number of new grids containing fire ants[26]	• Timeframes defined in monthly reports. Reported monthly, quarterly and annually
		• Number of significant detections	• As required. Reported immediately. Details to be provided as soon as the National Program has completed all actions to determine the extent of the infestation.

25 Due to the nature of responsive actions, it is difficult to estimate targets for responsive treatment and surveillance.

26 Note: As Phase 3: clearance will not commence until 2019–20, the number of new grids containing fire ants will not decrease until this time.

Desired outcome	Outputs/deliverables	Milestone target/key performance indicator	Reporting timeframe
Activity: Surveillance			
• Surveillance results in clearly delineated areas of infestation • Surveillance results are used to inform the selection of high-risk areas for treatment • Surveillance protocols are fully applied around all planned and responsive surveillance areas to confirm absence of fire ants • Surveillance results in clearly delineated areas of new infestation	• Targeted surveillance in and around previous treatment areas and previous outlying/ isolated infestations • Targeted surveillance to provide certainty that treatment has resulted in the successful destruction of all fire ant colonies • Selected sentinel site monitoring • Broadscale surveillance (using RSS) over suitable habitat and treated sites • Surveillance around new infestations reported that are not currently in planned treatment area • Post-treatment validation surveillance to confirm treatment success	• Targets for number of hectares to undergo planned surveillance (search and suppression, and search and clearance) as detailed in annual Work Plan. (Note this figure will be higher once RSS becomes operational in 2019–20)	• Timeframes defined in monthly reports. Reported monthly, quarterly and annually
		• Number of sentinel sites to be surveyed as detailed in annual Work Plan	• Timeframes defined in monthly reports. Reported monthly, quarterly and annually
		• All new detections receive delineation surveillance – total estimated hectares to undergo delineation surveillance – based on previous year	• Timeframes defined in monthly reports. Reported monthly, quarterly and annually
		• All outlier and outlying detections to receive post-treatment surveillance, total hectares to undergo post-treatment surveillance	• Timeframes defined in monthly reports. Reported monthly, quarterly and annually
		• Targets for priority areas cleared: – 95% of Area 1 cleared – 95% of Area 2 cleared – 95% of Area 3 cleared – 95% of Area 4 cleared	• Areas cleared by: – 30 June 2021 – 30 June 2023 – 30 June 2025 – 30 June 2027 – 30 June 2029 Reported quarterly and annually
		• 100% of all areas cleared and SEQ proof of freedom declared[27]	• Timeframes detailed in quarterly report. Reported quarterly and annually
		• Key RSS sensing development milestones	

27 Actions to declare proof of freedom from fire ant in SEQ are outside the scope of this Ten Year Plan.

Desired outcome	Outputs/deliverables	Milestone target/key performance indicator	Reporting timeframe
Activity: Preventing human-assisted spread			
• Human-assisted spread is prevented through community and industry compliance with movement controls	• Suburb monitoring to ensure people are complying with movement controls and with respect to treatment in accordance with GBO • Compliance checks and follow-ups performed to ensure people are complying with movement controls • Investigations into breaches of movement controls completed within 12 months	• Eight compliance areas (comprising over 50 suburbs) to be monitored for human-assisted movements	• Monthly, quarterly and annually
		• Compliance checks and follow-ups will be undertaken as required, number of compliance checks and follow-ups on infested sites, number of suburbs monitored, targeted compliance checks for issuing of BIPs, instruments, treatment GBO monitoring and compliance initiatives will be reported; however, as this is a responsive action, targets cannot be set	• Monthly, quarterly and annually
		• Investigations will be undertaken as required – targets cannot be set	• Ongoing (as required). Reported monthly, quarterly and annually (as required)

Desired outcome	Outputs/deliverables	Milestone target/key performance indicator	Reporting timeframe
Activity: Community and stakeholder engagement			
• Community and industry participation in National Program activities • Community knowledge and understanding of the risks of fire ants • Public searching and reporting of suspected fire ants • Public compliance with their GBO (not to disturb their land following treatment) • Community and industry compliance with legislated movement controls	• Communication activities will be tailored for Phases 1–3 • Engagement activities will be tailored for Phases 1–3 • Website and Facebook pages will be maintained to encourage people to look and report suspected fire ants, and to prevent movement of fire ants • Customer service centre will assist people to report suspected fire ants • Industry training sessions provided, as required • Deliver 'Aka the Fire Ant Tracker' school education sessions	• Maintain high levels of public reporting, number of public reports and % confirmed as fire ants	• Monthly, quarterly and annually (benchmarked against previous years)
		• Communication and engagement activities delivered to suburbs within the priority area as detailed in annual Work Plan	• As detailed in annual Work Plan. Reported monthly, quarterly and annually
		• Market research and mass communication activities as detailed in annual Work Plan	• Ongoing. Reported monthly, quarterly and annually
		• Target external group training	• Ongoing. Reported monthly, quarterly and annually
		• Target 'Aka the Fire Ant Tracker' sessions will be delivered as required, so targets cannot be predicted	

Desired outcome	Outputs/deliverables	Milestone target/key performance indicator	Reporting timeframe
Activity: Science, research and development			
• Diagnostic testing confirms whether samples submitted are positive • Science monitoring confirms treatment efficacy • Science trials identify alternative treatment options • Science investigations resolve operational issues (as required) • No unexplained measureable increase in genetic fitness	• Diagnostics undertaken to assess whether samples submitted are fire ants • Application of chemical/bait and surveillance to assess efficacy • Genetic analysis of selected fire ant infestations as required	• Number of ant samples received from the public and % positive identifications will be reported. No target will be set	• Ongoing. Reported monthly. Reported monthly, quarterly and annually
		• Target number of bait efficacy tests and trials will be detailed in annual Work Plan	• As detailed in annual Work Plan. Reported monthly, quarterly and annually.
		• No unexplained measureable increase in genetic fitness – baselines will be detailed in progress reports	• Ongoing. Reported annually
		• Changes to proportion of monogyne/polygyne colonies dealt with effectively	• Ongoing. Reported annually
		• Support for key National Program functions	• Ongoing. Reported quarterly and annually
Activity: Budget			
• Total program expenditure is under the total indicative budget in this plan	• Expenditure will be managed within budget	• Ongoing expenditure does not exceed indicative budget allocation for each financial year	• Ongoing. Reported monthly, quarterly and annually
Activity: Planning and processes			
• Quality assurance measures support National Program delivery • Policies, protocols and procedures are documented to support efficient National Program delivery	• New planning and quality assurance section established • Planning and quality assurance systems and procedures established • Policy and protocols are updated and developed to support implementation of this Ten Year Plan	• New planning and quality assurance section and systems established	• June 2018. Reported quarterly and annually
		• Policy and procedures developed and updated (as detailed in annual Work Plan)	• Timeframes defined in annual Work Plan

Desired outcome	Outputs/deliverables	Milestone target/key performance indicator	Reporting timeframe
Activity: Systems			
• RSS research and development completed to enable means for National Program to undertake broadscale surveillance • Information technology systems support National Program functional requirements	• Investigate and develop new RSS technologies to detect fire ants, including algorithm and data capture solutions • Complete RSS trials • Implement RSS	• Prototype image capture solution developed and ready for RSS trials	• 31 May 2018. Reported quarterly and annually
		• Testing of prototype and training of imagery analysis/detection algorithm	• 31 May 2019. Reported quarterly and annually
		• Commence RSS operations	• June 2019. Reported quarterly and annually
		• All field staff provided with mobile solutions	• June 2018. Reported quarterly and annually
		• Information technology system improvements implemented	• June 2018. Reported quarterly and annually
		• Client relationship management system implemented	• June 2018. Reported quarterly and annually
		• Mobile application developed	• June 2018. Reported quarterly and annually
Activity: Risk management			
• All risks to National Program delivery identified and mitigated	• Implementation and monitoring of the National Program risk management plan (Appendix 9)	• Risks reported only in the case of incident or exception	• Ongoing. Reported quarterly and annually

Due to the planned increase in surveillance and community and stakeholder engagement effort in the Ten Year Plan, it is expected that there will be an increase in the number of fire ant reports and confirmed infested sites in the initial years of the plan. Furthermore, there may be small residual infestations found post-treatment phase. This should not be viewed as eradication failure provided the National Program can deal with these promptly and successfully.

7.3 Risk management

A risk management plan, detailed in **Appendix 9**, considers a range of risk sources, such as community, environment, health, legal, planning and implementation. The risk management plan will be updated as required throughout the life of the 10-year program. The Steering Committee will approve and monitor the risk management plan.

7.3.1 Triggers for review

The triggers outlined in **Table 4** would necessitate an assessment by the Steering Committee to determine if the National Biosecurity Committee (NBC) should be notified of a threat to the National Program objectives.

Significant detections are defined as new infestations discovered outside the current operational area. These detections will be reported to the Steering Committee as soon as the National Program has completed all actions to determine the extent of the infestation. The National Program will provide information on:

- the extent, location and severity of the infestation
- treatment and surveillance undertaken
- genetic testing, including relationship testing, social form (i.e. polygyne/monogyne) and new incursion/ sub-population assignment
- compliance activities, including tracing investigations
- communication and engagement activities undertaken
- budget implications and recommendations.

The Steering Committee will review information prepared by the National Program and assess whether the infestation is beyond the capacity of the existing National Program to treat. If the Steering Committee, having considered the National Program reports, believes that it is unlikely that the National Program can achieve eradication according to the expected timetable within the agreed level of funding, it will undertake an assessment to determine if the NBC should be notified.

Table 3: Triggers

Assumption	Trigger	Reporting mechanism
The pest is delimited	There is a new infestation discovered outside the current operational area[28]	Significant detection report forwarded to National Program Steering Committee
Techniques for destruction of the pest are effective	There is a detection of the pest on a site that was deemed no longer infested following completion of clearance protocols, and there is evidence that the detection is a remnant infestation rather than a reinfestation	Significant detection report forwarded to National Program Steering Committee
Response plan costs are as budgeted	The cost of delivering the Ten Year Plan activities exceeds the proposed indicative budget for the National Program (over the life of the plan)	Monthly, quarterly, half-yearly and annual reports to NRIFAEP Steering Committee
Response plan timeframes are as estimated	Response timeframes exceed those specified in the Ten Year Plan	Annual reports to NRIFAEP Steering Committee
Milestones can be achieved within the scope of the response plan	Program milestones are not being achieved	Annual reports to NRIFAEP Steering Committee

28 The operational area is defined as the 'Total area of known infestation confirmed by delimitation and adjusted for known and predicted infestation spread since completion of delimitation' (5 km beyond all known infestation). The operational area will not remain static, possibly increasing initially as surveillance increases around Priority Area 1, then decreasing as the priority areas with confirmed infestation reduce over the life of the National Program.

7.3.2 Audits and review

An efficiency evaluation and a financial audit of the National Program will be scheduled every two years, or as required by the Steering Committee.

Audits will be conducted by an independent provider. Provision has been made in the indicative budget for the conduct of efficiency and financial audits during the course of this plan.

Where possible, these audits will be conducted in conjunction with efficiency audits being undertaken of the Brisbane Airport response. The efficiency and financial auditor will provide a final report to the Steering Committee within 60 days of completion of the audit.

A financial audit will be conducted at the conclusion of this plan in 2027–28, and the final financial audit report will be provided to all associated parties and the Steering Committee within 60 days of the declaration of proof of freedom.

At any time, the Steering Committee may direct additional operational, scientific, financial or efficiency audits, or review the implementation of this plan, or direct that a strategic review of the National Program be carried out. Such a review may involve systematic and independent examination to determine whether activities undertaken by the National Program comply with this Ten Year Plan, and whether the plan is being implemented effectively and is on track to achieve program objectives.[29]

29 However, if a major review is requested by the Steering Committee, additional funding may need to be sought from AGMIN.


Queensland
Government