

**Consultancy Report for the
Steering Committee for the National Red
Imported Fire Ant Eradication Program**



**Efficiency and Effectiveness Review of
the National Red Imported Fire Ant
Eradication Program**

Bernard Wonder

December 2019

Disclaimer

This report has been prepared for the Steering Committee for the National Red Imported Fire Ant Eradication Program. The formal consultancy contract is between the Queensland Department of Agriculture and Fisheries and myself.

The assessment, findings and recommendations presented are based on data, information and advice I have obtained from published information as well as unpublished Program sources. I accept no responsibility for any factual mistakes or opinions which may have incorrectly informed or misguided this report.

The report is advisory. All recommendations are based on the analysis undertaken under the auspices of the Terms of Reference and may need to be further assessed for their wider impacts prior to implementation.

I do not accept liability for any loss or damage caused either directly or indirectly by the contents of this report.

Acknowledgements

I wish to acknowledge the assistance provided by Wendy Craik, Chair, and all members of the Steering Committee for the National Red Imported Fire Ant Eradication Program. I would also like to thank all Program staff who made time available to meet and talk with me about the many issues surrounding the Program. In particular, I am grateful for the significant data, Program information and other assistance provided by Brian Bond, Barry Cooper, Graeme Dudgeon, Julie Fullerton, Sharon Janssen, Jacqui King, Heather Leeson, Sarah Mitchell, Kerrian Nobbs, Mark O'Dwyer, Liz Williams and Ross Wylie. Finally, I would like to thank community stakeholders who I met and spoke with during the course of this Review. Your interest and cooperation are much appreciated.

About the Reviewer

Bernard Wonder is a former Commonwealth Public Servant. Bernard retired from the APS in 2010. Since retiring, Bernard has completed a number of studies and assignments as a consultant to government agencies and the private sector. He is a former Head of Office at the Productivity Commission, Deputy Secretary of the Australian Department of Agriculture, Fisheries and Forestry and Executive Director of the Australian Bureau of Agricultural and Resource Economics. Bernard has served on many boards and committees including the Murray Darling Basin Commission, the Rural Adjustment Scheme Advisory Council, Landcare Australia, and most recently, the Australian Department of Infrastructure and Regional Development Audit Committee. Bernard has an Economics degree from UNSW and postgraduate qualifications in Natural Resources and Environmental Studies from ANU and Management from Harvard University.

Title page photo sourced from the Program.

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List of Abbreviations

AGMIN – Agriculture Ministers’ Forum
AGSOC – Agriculture Senior Officials Committee
ATV – All-Terrain Vehicle
BIP – Biosecurity Instrument Permit
BQ – Biosecurity Queensland
CaSES – Client and Stakeholder Engagement Solution
CRM – Customer Relationship Management
DNI – Direct Nest Injection
FAMS – Fire Ant Management System
FTE – Full-Time Equivalents
GBO – General Biosecurity Obligation
GM – General Manager
HR – Human Relations
IGR – Insect growth regulator
IT – Information technology
NBC – National Biosecurity Committee
NRIFAEP – National Red Imported Fire Ant Eradication Program
POC – Proof of Concept
QA – Quality Assurance
QDAF – Queensland Department of Agriculture and Fisheries
RIFA – Red Imported Fire Ant
RMG – Risk Management Group
RS – Remote sensing
SAG – Scientific Advisory Group
SOA – Standard Operating Arrangement
SOP – Standard Operating Procedures
WH&S – Workplace Health and Safety

Priority Recommendations

- A new set of ‘outcome focused’ Program performance indicators for use by the Steering Committee, funding partners and community stakeholders be finalised as soon as possible with a view to deployment this financial year.
- The Steering Committee, in consultation with the Program, sets out business improvement measures to overcome barriers and impediments to treatment and surveillance identified in this Review.
- The Steering Committee and the Program clarify the nature of the shared public-private responsibility for eradication and suppression of RIFA at the earliest opportunity.
- The Steering Committee guide the Program towards the development of appropriate regulation aimed at internalising the cost to those responsible for the creation of habitat suitable for RIFA infestation.
- The Program, with guidance from the Steering Committee, examine the feasibility of introducing regulation requiring inspection of loads destined to cross the Operating Area boundary and cost recovery of the additional compliance effort.
- The Steering Committee and the Program determine a strategy to urgently bring outstanding reviews concerning human-assisted movement of RIFA to fruition.
- The Steering Committee and the Program initiate more detailed analysis of the efficiency options identified in Section 6 of this report for possible uptake as soon as possible (see also Recommendations 14,15,16,17 and 20).
- The Steering Committee work with the Program to set a planning cycle to be made available to all staff and detailing required timing of workplans, treatment, surveillance and budget plans for approval by the relevant delegate.
- The Steering Committee consider the underlying themes of its communication strategy, particularly in the light of the Program launching the self-management component.
- The Program bring forward for Steering Committee consideration their proposed approach to management information to assist decision making.
- The Steering Committee request out of session monthly updates on progress with actions included in the Business Improvement Plan as well as a quarterly report to the Steering Committee.
- The Steering Committee consider the findings and recommendations of this Review and determine a strategy for how to best address the issues requiring resolution over the next 12-18 months.
- The Steering Committee review the expertise it needs to progress the issues at hand and seek nominations from the jurisdictions to address any identified gaps.
- The Steering Committee establish its own communication strategy complementing the work of the Program, including as soon as possible its own website.

Summary and Recommendations

Having now passed the two year point of the Ten Year Plan to eradicate Red Imported Fire Ant (RIFA) from South East Queensland, it is timely to review progress to date. The current Program is a world-first, being an eradication program over an area exceeding 600 000 ha. This Review has been commissioned by the Program's Steering Committee. It is an opportunity to provide feedback to the Steering Committee, the Program and the funding partners, namely the Commonwealth and State and Territory governments, on efficiency and effectiveness and related issues of interest.

Early in the life of the Program, it was necessary to expand the Operating Area to include the Western Boundary following RIFA detections outside the Operating Area. Being on the western perimeter of the Operating Area, the Steering Committee decided to treat it as soon as possible with a view to halting any further progress westwards of RIFA. This was a significant decision, requiring resources to be brought forward from later years of the Program to fund the proposed higher level of activity than had been planned for the first few years. It was both timely and appropriate as it enabled the Program to keep to its west to east strategy for RIFA eradication. If the Western Boundary had not been added to the Program, the west-east strategy would have become problematic as the RIFA area would have been more difficult to progressively reduce.

By adding the Western Boundary and having a fixed \$411m envelope of total funding, the Steering Committee faced the prospect of having to find savings from later in the Program. It identified several options, although no conclusive work was done to quantify what might be saved. Their decision, while made under significant risk and uncertainty, was a fair judgement under the circumstances they faced.

Prior to the Ten Year Plan commencing, the area containing RIFA had been delimited. This was based on surveillance conducted by the previous South East Queensland Program from 2012 to 2015 as well as modelling undertaken by Monash university researchers. However, between the timing of this work and when the Program commenced in 2017, the expansion in the distribution of RIFA raised the question of whether delimitation remained intact. Examination of Program data from 2017-18 to 2018-19 shows a 21 per cent increase in the land only Operating Area. Program staff have advised that much of this increase already existed but had not been detected in the first year of the Program. In effect, there was a delimitation failure at the start of the Program. The Program's surveillance and detection activities resulted in redrawing the Operating Area boundary in September 2018 to include the significantly larger area. Since then, the Program has continued surveillance and established 350 sentinel sites around the boundary. None of these showed RIFA to be present over June-August 2019, thereby suggesting delimitation is intact.

Notwithstanding the work done by the Program to delimit the infestation, there is a case for ongoing use of the Monash model to help maintain the delimitation. The availability of this framework, as well as new data, should assist the Program to maintain delimitation.

Recommendation 1: The Steering Committee and Program consider commissioning Monash University to repeat its delimitation analysis.

The west to east rolling strategy with four priority areas receiving treatment is a central element of the Program. However, neither it nor any other strategy emerged as a result of scientific analysis of the most effective and efficient course to eradicate RIFA. Rather, it was included in the Ten Year Plan on the basis that the western and south-western perimeter present the greatest risk and the Operating Area could be progressively reduced with the final years focussed on the east coast. In those areas not accorded the highest priority for eradication, suppression treatment was provided for, with particular attention to areas adjoining eradication treatments so as to avoid re-infestation. Overall, the approach seems well reasoned, although in practice it is not clear that suppression zones are always designed to give maximum protection to areas treated for eradication. The Western Suppression zone protecting Area 1 and the Western Boundary is a case in point.

Recommendation 2: The Steering Committee and Program examine the design of suppression zones where they are meant to provide protection to areas treated for eradication against re-infestation.

The Ten Year Plan points out that it is not feasible to apply treatment or surveillance over every hectare of land within the Operating Area. Moreover, the Independent Panel's review prior to the Ten Year Plan noted that treatment or surveillance of the entire delimited area was not required as the actual infested area is only a small fraction of the delimited area. Unfortunately, the Program has not had remote sensing available and has had to blanket treat with 'brute strength' entire priority areas designated for eradication. This is a significant change to what was planned and comes at significant cost in the first two years of the Program. The costings for the Ten Year Plan were prepared knowing that remote sensing may not be available for the first two years but two years has now become three with remote sensing not expected to be operational until 2020-21. This has put added pressure on Program finances and the importance of cost saving measures to be implemented.

Since the Program started there have been three sets of performance indicators. There has been insufficient focus for external reporting purposes on what the Program is achieving. In 2018-19, there were 105 indicators, many of which would be useful for internal management purposes but not very accessible to Program stakeholders seeking information on progress towards eradication of RIFA. In 2019-20, for the first time, the Program looks to be making progress with a small set of 'outcomes-focused' indicators. However, more design work is necessary as is the selection of appropriate variables and data to assist valid measurement. The Steering Committee and Program need to bring this work to an early conclusion so that meaningful and accessible performance indicators are in place for the remainder of the Program. When finalised, the indicators should, where appropriate and possible, be applied using quarterly as well as annual data and made available to the Steering Committee's quarterly meetings. In order to show trends as well as spot observations, the indicators should be populated back to the start of the Program.

Recommendation 3 *Priority*: A new set of 'outcome focused' Program performance indicators for use by the Steering Committee, funding partners and community stakeholders be finalised as soon as possible with a view to deployment this financial year.

Notwithstanding their limitations, this Review chose to use the indicators as they presently stand and, where possible, populated each of them for performance analysis of the Program's first two years. In the first two years of the Program, actual expenditure has been less than planned expenditure. At seven per cent less in 2017-18 and just under 10 per cent less in 2018-19, the differences were small but they mask a more complicated picture. Around 90 per cent of planned Round 1 treatment in Area 1 and the Eastern and Western Suppression zones was completed in 2017-18. The completion rate fell to 68 per cent for Round 2. These aggregate figures exclude the Western Boundary which received virtually no treatment at all in 2017-18. In 2018-19, the pattern was repeated with 93 per cent of Round 3 treatment completed (including the Western Boundary) but only 63 per cent of Round 4 in the same year. These performance data reflect what was achieved with respect to the two rounds of treatment undertaken each year. They do not take account of the Ten Year Plan's intention to have three rounds of eradication treatment in each of two years. Hence, performance is somewhat poorer than indicated in the data reported.

There are numerous reasons put forward to explain the shortfall in treatment. Delays in the availability of funding and the assembly of field teams as well as low labour productivity, the diversion of resources to responsive treatment, less than ideal planning, inclement weather and sub-optimal soil conditions have all played a role.

The surveillance effort in the first two years of the Program has proven to be variable as well. Highlights have included effective public engagement in the reporting of fire ants, a critical and

effective sentinel site system and Area 1 receiving ongoing attention, albeit not always at planned levels. Areas 2, 3 and 4 have received less than planned surveillance, particularly in the first year of the Program.

The Steering Committee and the Program must learn from these experiences early in the Program with a view to completing more of what is scheduled under the Ten Year Plan.

Recommendation 4 *Priority*: The Steering Committee, in consultation with the Program, sets out business improvement measures to overcome barriers and impediments to treatment and surveillance identified in this Review.

There have been 11 significant detections outside the original Operating Area boundary since the Program started. Most have been acted upon swiftly but this has not always been the case.

Recommendation 5: The Program accord a very high priority to necessary treatment and surveillance to deal with significant detections outside the Operating Area boundary.

Other information from available performance indicator data provides mixed evidence on the success in eradicating RIFA. On the one hand, there has been a slight increase in the density of larger RIFA mounds over the two years of the Program. Also, the Operating Area has increased a little (by three per cent) between 2018-19 and 2019-20. On the other hand, the percentage of colonies accounted for by the polygyne social form, which have multiple queens and cause more extensive economic harm and environmental damage than monogyne (single queen) colonies, has declined to 1.03 per cent, down from 30 to 40 per cent recorded over the period 2001-02 to 2003-04.

The Program has established monitoring sites for RIFA in all Priority areas. Since the vast majority of Area 1 has now received four treatments, the 13 sites located there are of particular interest. These sites are designed to generate information having a 90 per cent level of confidence. It is very encouraging that no site has live RIFA present after four rounds of bait treatment and, as mentioned, no RIFA were detected at any sentinel sites. Given the importance of data from both the monitoring and sentinel sites for informing progress with the Ten Year Plan, the Program should have its monitoring and sample selection methodologies independently evaluated with a view to publication as soon as possible.

The compliance activity within the Program operates under the auspices of the *Queensland Biosecurity Act 2014*. No attempt is made to assess the *Act* in this Review but several measures contained in the *Act* are central to the effectiveness and efficiency of the Program. Under the *Act*, all Queenslanders have a General Biosecurity Obligation (GBO) to manage biosecurity risks under their control. Of course, the GBO applies to RIFA as it does to other biosecurity risks. In addition, the *Act* contains provisions for biosecurity orders, biosecurity zones, movement controls, penalty infringement notices and prosecution.

Regardless of whether RIFA may have found their way to a site by natural or human-assisted movement, the GBO places responsibility with individuals and organisations to take reasonable and practical action to avoid a biosecurity event. Just what this action might be in different circumstances is not clear but there is a private responsibility. The NRIFAEP, on the other hand, until very recently, has been advising those affected by RIFA not to self-manage RIFA. Hence, there appears to be some confusion between private and public responsibilities in regard to appropriate RIFA response and the effectiveness and efficiency of the Program. The Program is working towards the introduction of a self-management element focussed on RIFA suppression. This represents an ideal opportunity for the Program to clarify the nature of the shared public-private responsibility for RIFA management and eradication.

Recommendation 6 Priority: The Steering Committee and the Program clarify the nature of the shared public-private responsibility for eradication and suppression of RIFA at the earliest opportunity.

For some time, it has been apparent that RIFA are attracted to land cleared for development. The construction of new suburbs and transport corridors around Brisbane and beyond (for example, the Gold Coast) has meant developers and road builders may be responsible for the creation of suitable RIFA habitat. However, it is not clear under the GBO that developers must take responsibility for their actions. Apart from creating suitable habitat for RIFA infestation, such sites provide a springboard for further natural movement of RIFA. In the meantime, the Program faces a mounting problem that warrants attention at its source. This Review sees merit in additional regulation requiring those creating habitat suitable for RIFA to eradicate the pest.

Recommendation 7 Priority: The Steering Committee guide the Program towards the development of appropriate regulation aimed at internalising the cost to those responsible for the creation of habitat suitable for RIFA infestation.

To minimise the risk of human-assisted movement of RIFA, a system of movement controls and biosecurity zones apply to the transport of RIFA carrier materials from places inside the Operating Area. In 2018-19, some 912 compliance checks were conducted by the Program and nine per cent of those checked were found to be non-compliant with the regulations. Some 30 per cent of cases found to be non-compliant were not resolved within a month, hence leaving open the possibility that businesses of interest continue their non-compliant practices. The Program maintains that most non-compliance is minor in that while complying with requirements, businesses had not acquired necessary Biosecurity Instrument Permits or had not met every prescribed condition. This response is inadequate and fails to properly understand the role of compliance inspection, that is to apply the regulations without further interpretation. Now that penalty infringement notices under the *Act* can be applied, compliance officers should use them accordingly with a view to making it clear that behaviour not meeting the regulations and thereby weakening controls is not acceptable.

Recommendation 8: That compliance officers employed by the Program make effective use of penalty infringement notices and, where appropriate, prosecution provisions, to improve compliance with movement controls.

Recommendation 9: The Program make every effort to meet compliance check targets by keeping compliance staffing at funded staffing levels.

The Program has a specific target that 50 per cent of those holding Biosecurity Instrument Permits be checked for compliance. Other than that, it is not clear what sampling densities apply to movements of carrier materials not requiring Biosecurity Instrument Permits, nor how they are determined. To make matters more complicated, the size of some industries, such as haymaking and other agricultural enterprises, changes from year to year in response to the economic environment. This is further reason to review sampling compliance requirements.

Recommendation 10: The Program seeks advice from appropriate sources with the necessary expertise on appropriate sampling numbers for the range of movements of RIFA carrier materials.

The transport of RIFA carrying materials across the Operating Area boundary is of particular interest in that such movements are a potential vector for enlargement of the zone requiring treatment and surveillance. The same concern applies to interstate movements of carrier materials. Hence, there is a case to examine the feasibility of introducing additional regulation under the *Biosecurity Act* requiring inspection by Program compliance officers of loads specified on Biosecurity Instrument Permits as destined for traveling across the Operating Area boundary or interstate prior to their departure from the place of origin. As they require additional compliance

officer effort, such transport could be levied accordingly so as not to erode the compliance capacity of the Program.

Recommendation 11 *Priority*: The Program, with guidance from the Steering Committee, examine the feasibility of introducing regulation requiring inspection of loads destined to cross the Operating Area boundary and cost recovery of the additional compliance effort.

Throughout the Ten Year Plan, the risks of carrier movements will change as eradication and suppression areas are treated and the distribution of RIFA evolves. In response, it is important that the Program amends biosecurity zones and movement controls to align with changes in the risk environment and to minimise the likelihood of human-assisted infestation and/or re-infestation. Reviews of both the biosecurity zones and movement controls have been scheduled but both are urgently required to bring existing arrangements up to date. In addition, it is understood work has been initiated to establish harmonised movement controls governing interstate movements of RIFA carrier materials but it appears that this has not been finalised despite the importance of avoiding RIFA crossing State and Territory borders.

Recommendation 12 *Priority*: The Steering Committee and the Program determine a strategy to urgently bring outstanding reviews concerning human-assisted movement of RIFA to fruition.

The Terms of Reference for this Review require advice on whether resources can be deployed more cost effectively and any options to enhance efficiency of the Program. These issues are central to whether the community is achieving ‘value for money’ from the use of public funds. Also, a key motivation for the Program to find such efficiencies is that it has transferred \$36.5m from later to earlier years in the funding profile in order to resource treatment and surveillance of the Western Boundary. Hence, there is an imperative for their replacement so no shortfall in funding eventuates from 2021-22.

The assessment of potential efficiency gains undertaken for this Review has identified five prospective areas of interest. These include program operations; improved targeting of treatment and reduced surveillance costs; fewer rounds of treatment; the introduction of self-management; and changes to the regulatory environment. Together, these provide scope for substantial cost savings, although some bring risks requiring careful evaluation before implementation.

Recommendation 13 *Priority*: The Steering Committee and the Program initiate more detailed analysis of the efficiency options identified in this report for possible uptake as soon as possible.

The regulatory reviews referred to in Recommendation 12 not only impact on the effectiveness of the Program, they have the potential to lower Program costs. By containing RIFA to a more restricted area, the Program can avoid unnecessary treatment and surveillance expenses. The same conclusion applies to new regulations proposed in Recommendations 7 and 11 aimed respectively at (a) internalising the costs to risk creating entities responsible for providing suitable habitat for RIFA migration and (b) preventing the spread of RIFA beyond the Operating Area boundary.

In one form or another, Program operations have been conducted since eradication first commenced in 2001-02. Hence, considerable time has elapsed to adopt available improvements aimed at lowering costs while maintaining the efficacy of treatment and surveillance methods. Nevertheless, new technologies and innovation bring fresh opportunities so there is always scope to explore further efficiency gains.

Bait and aerial services rank first and third in the list of Program expenditures. Together they accounted for over 36 per cent of Program expenditure on 2018-19. There is ongoing effort to reduce the cost of bait application. The skip-swath method used successfully in the US looks to be

less prospective in the South East Queensland context due, in particular, to the prevalence in Queensland of monogyne rather than polygyne RIFA colonies. On the other hand, the use of toxicants instead of DNI based on Fipronil looks encouraging, both from a reduced bait cost and labour saving perspectives.

Currently, the Program acquires aerial services and bait using long term contracts. The Program is examining the use of tenders for procuring both inputs in 2020. Given their significance in the Program's cost structure, any reduction in costs could yield significant savings to the Program.

Recommendation 14: That the Steering Committee and Program closely examine the potential for future savings from the use of tenders to procure aerial services and bait.

There are issues surrounding labour productivity levels recorded in the first two years of the Program. First, there is significant variation in the area covered per day by field teams operating from the various Program depots. The Program has responded to this variation by lowering the target rate of hectares covered per day rather than working to raise the level achieved. The planned reduction could cost the Program up to an estimated \$150 000 per month during the treatment season. This response needs to be revisited.

Recommendation 15: That the Steering Committee and Program examine more closely the labour productivity of field teams with a view to raising labour productivity.

A key factor driving labour productivity is how field staff are rewarded for their work. Presently, field staff are remunerated by the hour worked, an incentive that motivates staff to spend more hours rather than less in the field. If field staff were paid for the number of hectares they treat or the amount of ground covered for surveillance, this would provide a different incentive structure and one more attuned to increased labour productivity. An alternative approach yielding similar outcomes would be to seek competitive market tenders from labour hire firms for treatment or surveillance of specified areas.

Recommendation 16: That the Steering Committee and Program examine the introduction of revised remuneration arrangements for field staff based on an output rather than input measure of performance and/or invite tenders for specified areas of treatment or surveillance from labour hire firms.

The overall performance of Program operations and the Program more broadly depend partly on an effective planning cycle for the myriad activities requiring co-ordination and decision making. This is a challenging task because the timing of treatment and surveillance needs doesn't necessarily correspond with workplan and budget preparation. Nevertheless, the challenge needs to be met because budgets cannot be completed without the necessary inputs as demonstrated in the first two years of the Program. The performance in this regard has lifted in 2019-20 after a concerted effort by Program management.

Recommendation 17 *Priority*: The Steering Committee work with the Program to set a planning cycle to be made available to all staff and detailing required timing of workplans, treatment, surveillance and budget plans for approval by the relevant delegate.

Staffing of the Program comprises mainly permanent and contractor personnel, the former employed by the Queensland Department of Agriculture and Fisheries and the latter by labour hire companies that contract to the Program. Contractors account for over half of the Program's workforce, with numbers varying in accordance with seasonal demands. It is an ongoing challenge for the Program to balance a permanent and temporary workforce but the model seems appropriate given fluctuating workloads. With a high turnover of contractor staff, it does put considerable emphasis on the provision of high quality induction training and standard operating procedures, both of which play an important role for personnel to understand quickly how to do their job.

Internal Audit has found that the standard operating procedures need to be reviewed and updated but the Program's response looks to be slow given the significance of the required work.

Recommendation 18: The Program, with guidance from the Steering Committee, should work to revise the set of Standard Operating Procedures as soon as possible.

The Program has recently revised its Management Structure by providing additional senior officer Director resources between section managers and the General Manager. This is a positive development as it will not only provide section managers with the opportunity for additional interaction concerning their respective responsibilities but it will also liberate further time for the General Manager to devote to the strategic direction and overall performance of the Program. There is, however, a significant risk in having the overall perspective for a time bounded Program residing largely with one person. Hence, the Steering Committee should consider its response to this risk, including the possibility of appointing a Deputy General Manager.

Recommendation 19: The Steering Committee consider the benefits and costs of appointing a Deputy General Manager.

In the absence of remote sensing, the Program has had to deploy what it refers to as 'brute strength', blanket bait treatment. Because bait is a very costly Program input, any reduction in the area treated made possible by remote sensing will yield significant benefits. The size of the benefit will depend on whether treatment would have been done by helicopter or ground treatment. In addition, remote sensing would also generate further savings from less ground surveillance that would be done aerially instead. Overall, the estimated savings are substantial.

Notwithstanding the potential importance of remote sensing for Program costs, the technology is yet to be introduced into the Program. Work is advanced with trials of new equipment currently underway. The targeted accuracy for RIFA detection is 50 per cent but this is yet to be confirmed over the range of landscapes remote sensing might cover.

Despite the significance of remote sensing, caution needs to be exercised in regard to its contribution to cost savings for the Program. In particular, the \$411m funding profile for the Program has remote sensing and the targeted treatment it enables built into the costings. This means that delivery of remote sensing will help make feasible treatment and surveillance costs originally budgeted for rather than provide additional savings.

The Ten Year Plan indicates that optimal treatment for RIFA comprises six rounds applied via three rounds in each of two years. The Scientific Advisory Group at its February 2019 meeting confirmed this treatment regime. However, there is interest in the Program regarding whether fewer rounds could be applied without compromising the eradication objective. There is some research suggesting this may be possible but under what circumstances and with what risk remains to be clarified.

The potential cost savings if fewer rounds of treatment are possible without any significant diminution in the prospects for eradication are very significant. One treatment less in Area 1 is estimated to save \$6.4m and two fewer in the Western Boundary could reduce costs by an estimated \$11.3m.

The Scientific Advisory Group has this matter on its agenda for consideration and the outcome of discussions there will presumably be made available to the Steering Committee at the first available opportunity.

Recommendation 20: The Steering Committee and the Program consider the potential cost savings along with the risks for RIFA eradication before deciding whether to proceed with fewer treatments.

The self-management program referred to in the lead up to recommendation 6 above is not only significant for the introduction of shared responsibility for RIFA management between the Program and the wider community but also as a mechanism to reduce Program costs. The Program includes urban and rural community elements as well as an industry element focussed on training pest management technicians to treat RIFA on demand. The Program has the potential to increase the total resource base that can be applied to RIFA suppression and indirectly to eradication by facilitating a pool of community and industry based labour. The Program is also considering the provision of some inputs such as bait which may make self-management more attractive. Cost savings to the Program from self-management could be significant. For example, if the Program were to provide bait as an incentive for south Brisbane landowners to take up self-management, the cost saving to the Program could be in the vicinity of \$6m, although this saving is not an equivalent gain in national efficiency as costs are transferred from the public to the private sector.

The Program has a challenging communications and engagement task made difficult by the diversity of the target audience and the rolling strategy that sees action in some areas while others wait for the Program to reach them. Considerable effort is put into raising awareness about RIFA and the Program as well as obligations under the *Biosecurity Act* and information concerning forthcoming activities (such as treatment and surveillance) using a variety of instruments including print and electronic media. Communication is very much two way with the community contacting the Program about RIFA detections and requests for treatment.

The underlying message the Program uses is evolving. Most recently, the focus has become 'Our treatment plan is delivering' but this looks like it could morph into a shared public-private responsibility that fits better with the nexus between the GBO and the Program.

Recommendation 21 Priority: The Steering Committee consider the underlying themes of its communication strategy, particularly in the light of the Program launching the self-management component.

Many stakeholders turn to the Program's website to access information. While containing extensive information, some Program products, such as fact sheets, cannot be found. Furthermore, the site does not provide the interactive experience many visitors will be seeking, including mapping, questions and answers and opportunities to discuss current issues.

Recommendation 22: The Steering Committee review the content of the Program's website and the Program develop a timetable to implement the Steering Committee's findings.

The NRIFAEP is a national program but badging is Queensland focussed, other than the word 'National' in the Program title. Recognition of the national patronage should be more explicit in public Program documentation and livery.

Recommendation 23: The Steering Committee design and adopt new badging recognising the national character of the Program and its funding by the Commonwealth and the States and Territories.

The Ten Year Plan notes several challenges in the Program's IT environment requiring attention. The Program has introduced a number of improvements, including a client stakeholder engagement solution (CaSES) and changes to the Fire Ant Management System (FAMS). However, significant problems remain, the most concerning of which is the absence of a real-time mobile solution for field staff to download and upload data. This would overcome time intensive manual entry and re-entry of data as presently required and would generate significant cost savings. A proof of concept mobile solution is scheduled for completion this year but real-time, two way data exchange will not be available for eight to twelve months.

Recommendation 24: The Program accord high priority to putting in place as soon as possible a real-time two way mobile data solution.

FAMS itself remains problematic in that it is more a database than a software tool that can be accessed by staff or interrogated for decision-making. Improvements to the performance of FAMS should be an early priority for the new Systems Intelligence manager when appointed.

Recommendation 25: The Steering Committee monitor the adequacy of key Program intelligence systems, particularly FAMS.

Two internal audits of the Program were completed between late 2018 and early 2019. The first addressed operational planning and governance and the second focussed on procurement.

The Operational Planning and Governance audit had six recommendations addressing significant or moderate weaknesses. A three year forward plan was recommended along with the establishment of an Operational Review Committee. The Committee has since been established and the three year forward plan is included in the Business Improvement Plan the Program has prepared. Given the issues this review has suggested the Steering Committee and the Program address over the next 12-18 months, the three year forward plan could be a useful tool to aid future management.

Recommendation 26: The Program bring forward a Three Year Strategic Plan addressing the implications of decisions on key issues identified in this Review for consideration by the Steering Committee as soon as possible.

In addition to the ‘outcome-focussed’ performance indicators proposed for further development in Recommendation 3, improved information to assist management decision making is needed. Management reports were seen by Internal Audit as too infrequent, lacking in necessary detail and not generated from standard information generated by FAMS. The Business Improvement Plan has identified weekly, monthly and quarterly dashboards to remedy this shortcoming and the Program currently has consultants to help work through the problems. Early resolution of the issues is critical for the Program. Where appropriate, existing performance data should be used.

Recommendation 27 Priority: The Program bring forward for Steering Committee consideration their proposed approach to management information to assist decision making.

Internal Audit’s Procurement audit reported five findings assessed to be moderate or minor weaknesses. Those of moderate significance concerned breakdowns in the control environment and inconsistencies between credit card use and policy and procurement objectives. The Program has responded with actions underway to tighten the monitoring of procurement activities and reporting processes as well as procurement training for relevant staff.

The problems regarding credit card use concerned exceeding specified limits and using credit cards when formal procurement processes may have been more appropriate. The Program management response is to review credit card holders and monthly credit card expenditure as well as provide training where relevant.

Internal Audit also reported no Program-wide procurement planning and inadequate procurement reporting. The Program has addressed the finding with a high level procurement roadmap, a procurement pipeline as well as the establishment of a Procurement Review Team who place approved procurements on a Procurement Register. A tracking tool to assist with ‘end to end’ monitoring of contracts is under development.

The contract register was also found to have shortcomings and some contracts were found to be entered into prematurely when they should have been included for tender. The Program has addressed the tender problem with a checklist to assess whether contracts should be included on the tender system and a more detailed contract register is scheduled for completion in December.

Reservations were also expressed by Internal Audit regarding information management and record keeping. The issues raised are currently being addressed as an element of the Program's review of their internal control environment.

Overall, the Program's responses to the two internal audits, as outlined in its Business Improvement Plan, go some way towards addressing the identified weaknesses. Some actions are complete, many are underway and some won't be finished until the new year.

Recommendation 28 *Priority*: The Steering Committee request out of session monthly updates on progress with actions included in the Business Improvement Plan as well as a quarterly report to the Steering Committee.

Recommendation 29: The Steering Committee request a follow up audit of operational planning, governance and procurement to be conducted in April 2020.

The Agriculture Ministers' Forum established a National Steering Committee to oversee the Program. With membership from the Commonwealth, State and Territory funding partners and an independent Chair, the Steering Committee affords jurisdictions the opportunity to ensure their accountability and transparency requirements for the Program are met and that the national interest is paramount. The Steering Committee does not deal with day to day Program management. Rather, it is focussed on overall leadership, guidance and oversight of the Program as well as reporting on progress and national communication. The Steering Committee is accountable to the Agricultural Senior Officials Committee and also provides reports to the National Biosecurity Committee for information purposes.

Earlier this year the Steering Committee conducted an internal review of its first 16 months of operations. It identified a series of significant achievements, including plans, strategies and reporting systems to get the Program underway; the establishment of two sub-committees dealing with science and risk management; and the addition of the Western Boundary to the Operating Area and budget variations required to address the extra work. The Steering Committee also identified a series of challenges which when put together with the findings from this Review make up a challenging agenda for it to address. The recommendations of this report require the Steering Committee to reflect on how to tackle this agenda as much of it requires attention in the next 12 to 18 months to position the Program to successfully implement the Ten Year Plan.

Recommendation 30 *Priority*: The Steering Committee consider the findings and recommendations of this Review and determine a strategy for how to best address the issues requiring resolution over the next 12 -18 months.

As part of this Review, Steering Committee members were given the opportunity to provide their views on the work of the Steering Committee, including how it might improve its contribution and what issues require attention. Four members and the Chair responded.

The members who responded raised some of the strategic issues canvassed elsewhere in this report. Much more time, however, was spent discussing reforms to the Committee's work in light of the many challenges facing the Program. This Review considered the inputs of Steering Committee members and identified six reforms of interest.

The breadth of issues the Steering Committee needs to address calls for broader expertise on the Committee. Presently, there is significant technical expertise but the Committee could benefit from extra governance, finance, communication, IT, regulatory and performance monitoring expertise.

Recommendation 31 *Priority*: The Steering Committee review the expertise it needs to progress the issues at hand and seek nominations from the jurisdictions to address any identified gaps.

It is apparent that while the Steering Committee receives strong administrative support from the Program, it is not well positioned to drive its own agenda and liaise with the Program between meetings on its requirements. Independent support of the Steering Committee would address this problem, possibly by jurisdictions rotating a Project Officer through a posted position working independently but alongside the Program.

Recommendation 32: The Steering Committee consider the appointment of a Project Officer to support their work.

With the volume of work to do over the next year or two, the Steering Committee could be better positioned if it lifted the tempo of its deliberations. Additional and/or longer meetings are necessary in the first instance. Whether or not this requirement continues into the longer term can be monitored and revised according to ongoing assessment by the Committee.

Recommendation 33: The Steering Committee schedule additional and/or longer meetings to address the issues requiring attention over the next 12-18 months.

The Steering Committee's work could be assisted by establishing additional sub-committees drawn from its membership to progress particular areas of concern. This work could draw upon the resources of the Project Officer and continue between scheduled meetings.

Recommendation 34: The Steering Committee form additional sub-committees to help progress its work.

There is much public discourse on RIFA and the Program. There is an opportunity for the Steering Committee (particularly the Chair) and the General Manager to participate in and lead this discussion at key points and be seen to engage more with stakeholders and the broader community. The Steering Committee's contribution in this area would be assisted by having its own nationally badged and housed website signalling its independence and national focus.

Recommendation 35 *Priority*: The Steering Committee establish its own communication strategy complementing the work of the Program, including as soon as possible its own website.

The Scientific Advisory Group provides expert advice to the Steering Committee and Program on a wide range of science based issues. It has Australian and international expertise and is well placed to consider threshold questions such as the number of treatments required for eradication. Several of the issues the Steering Committee faces have important science dimensions. The Science Group therefore needs to consider what its work program will look like in the years ahead. It will also have to consider the working arrangements to address the issues at hand.

Recommendation 36: The Scientific Advisory Group develop a work program responding to science related issues the Steering Committee and Program face and adjust as necessary its working arrangements to address the needs of the Program.

The Risk Management Group has members drawn from the Steering Committee as well as independent experts, one of whom chairs the sub-committee. Its work over the nine months since the Group was established has involved working with the Program to complete a Risk Management Policy and Plan as well as a Risk Register and Issues Register.

Importantly, the Risk Management Group is not an Audit Committee with each jurisdiction assuming responsibility in this regard for their own requirements. The Group could, however, play a useful role initiating any performance management and compliance audits such as the one proposed in Recommendation 29. This new role could also extend to advising the Steering Committee on progress the Program has made with audit recommendations such as those included in the Business Improvement Plan.

Recommendation 37: The Risk Management Group's Terms of Reference be amended to accommodate the initiation of Program related audits and monitoring of progress in management responses for advice to the Steering Committee.

1. Introduction

1.1 Background to the Review

In July 2017 the Agriculture Ministers' Forum agreed to fund an expanded National Red Imported Fire Ant Eradication Program (NRIFAEP), otherwise referred to in this report as the Program or sometimes as the National Program. This decision reflected a national interest to eradicate red imported fire ants (RIFA) in South East Queensland while it was still possible to do so according to advice provided by an independent review commissioned by the Ministers' Forum in 2014.

The nature of RIFA incursions raises concerns across all affected sections of the community. After the initial discovery of RIFA at the port of Brisbane on Fisherman Island in 2001, RIFA today inhabit urban, peri-urban and rural landscapes. Consequently, sections of the farming and grazing community, various rural based businesses such as turf farms and nurseries as well as suburban residents and social facilities (e.g. golf courses, parks and ovals) are all potentially vulnerable to the invasive character of the pest. RIFA are well known internationally for their potential to sting and in a small percentage of cases kill humans and animals, and their negative impact on amenity values in home surrounds and public spaces as well as on agricultural industries and public utilities such as electricity provision.

Two years (2017-18 and 2018-19) have now passed of what is a ten year program funded until 2026-27 by the Commonwealth and the States and Territories. This program was preceded by several others going back to the 2001 outbreak. What is in place now, however, surpasses all previous efforts in terms of its breadth and intensity. Nevertheless, like its predecessors, the ten year program remains an eradication program. With an Operating Area now exceeding 600 000 ha, it is the largest global eradication program for RIFA ever undertaken. It is an area larger than Kangaroo Island, South Australia, over five times the area of King Island, Tasmania, more than three times the area of Fraser Island, Queensland, over twice the size of Bathurst Island, Northern Territory and a little smaller than Perth.

There are triggers in place for the Program Steering Committee to assess whether the National Biosecurity Committee, a sub-committee reporting directly to senior agricultural officials, should be notified of conditions that potentially threaten the success of the Ten Year Program. These include significant infestations outside the Operating Area, evidence that techniques used for eradication are no longer effective, costs exceeding what is provided in the indicative budget over the life of the Program, the timeframe for the Program becomes unachievable and milestones adopted by the Program's response plan are not met. The Steering Committee may require audits into virtually any aspect of the Program. It can, as it sees fit, review implementation of the Program plan or its strategic direction.

Aside from the avenues outlined for the Steering Committee to review progress, an efficiency evaluation and a financial audit of the National Program is scheduled every two years, or as required by the Steering Committee. The focus of this report is an efficiency and effectiveness review of NRIFAEP. It was commissioned by the Steering Committee and commenced in mid-August following a consultancy agreement with the Queensland Department of Agriculture and Fisheries (QDAF).

1.2 Terms of Reference

A key motivation behind this Review, according to the Terms of Reference at Attachment 1, is to provide feedback to the Steering Committee and the Program itself about whether the Ten Year Plan is being correctly implemented. The Commonwealth, States and Territories as parties to the Program have a collective and individual interest in the efficient delivery of an effective Program. Only then can they be satisfied that value for money expended on the Program is being achieved.

There are four main areas requiring attention in the Terms of Reference. These include:

- (a) whether activities detailed in the Ten Year Plan and annual Work Plans are being implemented as described and the basis for any changes to the plans;
- (b) whether the activities of the Program are conducted in an effective and efficient manner including the cost-effectiveness of the Program;
- (c) whether more cost-effective resource deployment options exist and opportunities for efficiencies can be identified; and
- (d) any actions to improve Program delivery and/or the Ten Year Plan where necessary to meet Program objectives.

Against this background, many issues need to be examined. To be effective, the Program must understand the distribution of RIFA. In particular, their boundaries must be known. Otherwise, eradication would become a matter of luck rather than design. Beyond knowing the limits of RIFA's distribution is a strategy to remove them from the landscape as well as the necessary evidence to claim proof of freedom and the ultimate defeat of the incursion.

It is inevitable for a Program of this nature to have to consider changes in strategy during the rollout. To do otherwise and retain in every detail a strategy regardless of lessons learnt and opportunities presented may threaten the success of the Program. That is not to say that any changes in direction do not need to be evidence based to give credence to amendments to both the funding parties and the wider public. Furthermore, there is a Program budget the Steering Committee has at its disposal to implement the Program and any variations it adopts. There is no open ended commitment to spend as necessary on whatever might be thought a good idea. Without triggering a review of the Program, the Steering Committee is obliged to absorb the cost of new tactics from the resources made available by the funding parties.

As the Program is implemented, there is a vast array of management data generated. Much of this data can be collected and incorporated in performance indicators to inform progress to date, assist further analysis and suggest corrective, alternative or complementary actions capable of promoting efficiency and/or increasing effectiveness. In part, lessons learnt can be expected to pertain to the conduct of RIFA treatment, surveillance, efficacy of baits, recruitment and deployment of labour as well as all the other activities directly associated with the eradication program. However, there are many more aspects to this Program which impact effectiveness and efficiency in either the short or long term. There are various treatment and surveillance plans that must be prepared, communications programs implemented, monitoring undertaken, scientific studies done and information services provided. In addition, there are the regulatory, compliance and governance dimensions of the Program, all of which can influence effectiveness and impact the cost of the many activities.

The Ten Year Plan also provides scope to introduce self-managed initiated action to help eradicate and suppress RIFA. Some initial steps have been taken in this regard but it is important to consider the full potential of this option as the Program is implemented in the diversified urban and rural environments where RIFA are found.

1.3 Outline of Report

This report is presented in eight sections. Section 2 outlines the Program including its origins and an overview of the main features. As the Program's staffing is fundamental to ongoing operations, it is also examined in this section.

Delimitation of RIFA is a pre-condition for their eradication. How delimitation has been dealt with is addressed in section 3. Key aspects of the west to east eradication strategy are included in this section as is the process for declaring freedom from fire ant infestation that follows the eradication effort.

Performance data can be very helpful in monitoring outcomes and outputs from the Program to date as well as documenting the level of effort through activities directed towards achieving Program targets and objectives. The key performance indicators used by the Program and their related data are examined in section 4.

Compliance and regulatory arrangements for RIFA eradication are established under the *Queensland Biosecurity Act 2014*. Because the pest can occupy new areas through either natural or human-assisted means, the system of biosecurity zones, movement controls and regulations governing treatment of fire ant carriers play a critical role. The General Biosecurity Obligation (GBO) under the *Act*, together with other regulatory requirements and the Program's compliance regime are discussed in section 5.

Given the significant size of NRIFAEP, the funding partners and the public in general understandably are looking for any opportunities to promote the efficiency of the Program. There are several areas of interest to search for such efficiencies, including treatment and surveillance operations, planning and implementation, the compliance and wider regulatory environment as well as the possibility of harnessing resources outside the Program to accelerate the eradication effort. These issues are dealt with in section 6.

The RIFA incursion has occurred in quite a populous and diverse area of Queensland. Hence, there is a sizeable communication challenge to keep stakeholders and the public well informed of the Program strategy. This operating environment creates the need for a sophisticated information technology (IT) capability as information is often collected in the field and transferred to or integrated with other systems. These communication and IT related issues are dealt with in section 7.

A range of governance, operational planning and procurement issues are appraised in section 8. In addition, the nature and contribution of the Steering Committee and its sub-committees are examined together with their interactions with the Program.

2. The Ten Year Program

2.1 History and Origins of the Program

By any measure, *Solenopsis invicta* (RIFA) certainly makes its way on to a list of super pests. Not only do they impact community health and amenity through their swarming behaviour and sting, fire ants have proven to be problematic for a wide array of industries and the environment. Because of their capacity to spread to suitable habitat, either naturally through flight and rafting in floods or assisted in various ways by humans, and their capacity to quickly reproduce (queens lay up to 1000 eggs per day), fire ants have been targeted for control in many countries.

Australia is one of many countries where RIFA have been found. While native to much of South America, RIFA have established in southern USA, the Caribbean and China. Infestations have also been reported in Macau, Malaysia and the Philippines (Magee et al., 2016). In comparison to the area of the USA impacted by RIFA, the area in South East Queensland is relatively small. RIFA, in the USA, are present in all southern states while in Australia, eradication efforts since 2001 have confined the pest to South East Queensland. Program staff suggest that in the absence of past efforts to eradicate RIFA, they may have spread from Brisbane in a semi-circle extending from Wollongong (NSW) in the south to Bourke (NSW) in the west and Mackay to the north in Queensland, an area roughly equivalent in size to 20 per cent of the Australian mainland.

On a much smaller scale than the present infestation, Australia has shown that RIFA can be eradicated. Successful eradications have included the Port of Brisbane in 2005 and 2019, Yarwun near Gladstone in 2007 and 2016, Port Botany in 2016 and Brisbane Airport in 2019 (www.daf.qld.gov.au; www.invasives.org.au, accessed 8 November 2019). The largest of these eradications was for the Port of Brisbane which extended over 8000 ha.

Notwithstanding past successes and the lessons they undoubtedly provide, the current infestation has grown well beyond what other eradication efforts have had to contend with. Despite eradication of the 2001 incursion at Fisherman Island, RIFA expanded from another detection at around the same time in Richlands to the immediate south west of Brisbane. The details of how RIFA occupied a much larger area have been examined by Keith and Spring (2013). The Monash University based authors examined RIFA nest establishment and concluded that the number of mature nests may have declined to as few as 150 in late 2003. However, they also found that the eradication program at that time never fully delimited the incursion, thereby leaving infested areas outside those searched and treated.

Also central to the extent of the RIFA problem as it exists today is decline in the intensity of the program after 2004-05. In Table 2.1 it can be seen program expenditure declined markedly from 2003-04 such that expenditure in 2008-09 was only 29 per cent of its peak recorded in 2003-04.

In December 2014, the Agricultural Ministers' Forum commissioned an Independent Review of the NRIFAEP South East Queensland Program, (now known as the Independent Panel Report or Magee et al., 2016) which reported to Ministers in May 2016. Over a year passed before the Ministers' Forum signed off on a new national Program. During the intervening year (2016-17) the Queensland Government provided 'ramp up' funding in order to help transit to the new Program and maintain momentum in fire ant treatment. However, this was not on a sufficient scale to arrest the expansion of RIFA infestation. Some of these monies were brought forward from the Ten Year Program pending endorsement by the Ministerial Forum held in July 2017.

Table 2.1 South East Queensland RIFA Funding: 2001-02 to 2015-16

Year	Cost-Shared Funding Expended (\$)	Supplementary Qld Funding (\$)	Total Expenditure (\$)
2001-02	27 878 000		27 878 000
2002-03	37 259 290		37 259 290
2003-04	41 905 680		41 905 680
2004-05	32 273 507		32 273 507
2005-06	23 270 729		23 270 729
2006-07	12 757 033		12 757 033
2007-08	12 609 660		12 609 660
2008-09	12 240 526		12 240 526
2009-10	14 465 546		14 465 546
2010-11	14 688 843	5 908 225	20 597 068
2011-12	15 628 117	5 944 249	21 572 366
2012-13	15 433 708	2 818 816	18 252 524
2013-14	14 923 492	3 000 000	17 923 492
2014-15	14 363 134	3 000 000	17 363 134
2015-16	15 567 000	3 000 000	18 567 000 ^(a)
TOTAL	\$305 264 265	\$23 671 290	\$328 935 555

Notes: (a) Approved Budget for 2015-16

Source: Magee et al., 2016

2.2 Overview of the Ten Year Plan

With the approval of the new program came a renewed vigour to eradicate RIFA. Commonwealth, State and Territory Governments had been advised by the Independent Magee Review that it was still technically feasible to eradicate RIFA but there was only a small window in time to do so. Magee's panel of experts commissioned modelling undertaken by Monash University to determine an optimal RIFA treatment and surveillance budget based on a 95 per cent probability that eradication would be achieved. Their principal finding in this regard was that \$24m per annum for treatment and surveillance would be necessary to achieve the desired outcome. To this a further \$14m was added to cover other eradication activities, including community engagement, science, R & D, compliance and detection dogs as well as the support structures needed to implement a program of this kind (i.e. business support, accommodation, site infrastructure, policy and legislation capability, IT and spatial services). In total, a budget of \$38m per annum was recommended by the Independent Review. When aggregated over ten years and adjusted for inflation, a sum of \$411.4m was approved by Ministers for a program to be conducted between 2017-18 and 2026-27. The shares of total expenditure borne by the Commonwealth, State and Territory funding partners over the life of the Program are provided at Attachment 2. The costs are borne by the Commonwealth (approximately 50 per cent) and the States and Territories as provided for in national cost sharing arrangements.

A key foundation of the decision to proceed with the Ten Year Program was the likely economic return from RIFA eradication. Prior to the Ministerial Forum decision, there were three economic analyses of the benefits and costs of eradicating RIFA (Kompas and Che (2001), Antony et al. (2009) and Hafi et al. (2014)). While the respective reports indicate widely varying benefit-cost ratios from eradicating RIFA, all three show benefit-cost ratios of at least 25:1. Reflecting these results, the White Paper on Agricultural Competitiveness published in 2015 (Commonwealth of Australia, 2015) was in no doubt about the justification for continuing the eradication effort, citing a potential economic loss estimated by Hafi et al. (2014) of \$8.5 billion (in 2012 dollars) over 70 years. If all the benefits from eradication, such as those concerning potential losses from reduced

biodiversity and ecosystem services were included in the assessment, this estimate may have been considerably higher. QDAF (2017a) has compiled a list of some key expected outcomes. These include:

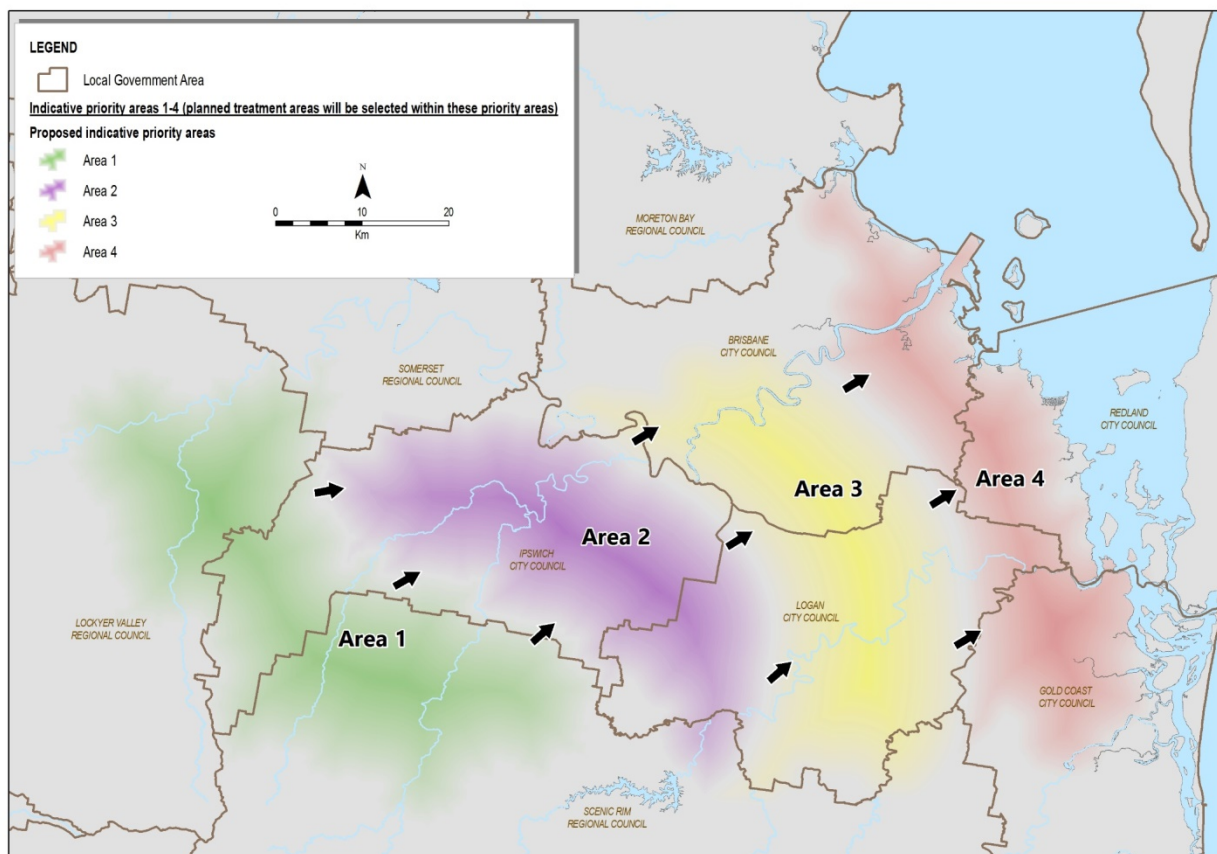
- avoiding the significant financial cost of ongoing management
- not incurring the cost of losses and management in agricultural industries
- avoiding the displacement and potential extinction of native species
- not having to deal with human health impacts due to the painful sting of RIFA, which can induce anaphylactic reactions and have sometimes been fatal
- averting damage to infrastructure, including electrical systems, buildings and roads
- avoiding reduction in tourism and damage to popular recreational facilities.

Some of these additional benefits are discussed in the Independent Review Panel’s report.

The aim of the Ten Year Plan is clear – ‘to provide a comprehensive strategy and plan for the National Program to eradicate red imported fire ants from South East Queensland’ (QDAF 2017b). To fulfil this aim, there are four key objectives as outlined below:

1. Reduce infestation until fire ants are no longer present in South East Queensland and ensure areas remain free from fire ants;
2. Prevent spread of fire ants to non-infested areas;
3. Provide evidence to demonstrate freedom from fire ant infestation in the South East Queensland region; and
4. Help prevent establishment of new incursions of invasive ant species Australia-wide.

Figure 2.1: Indicative map of areas for phased activities



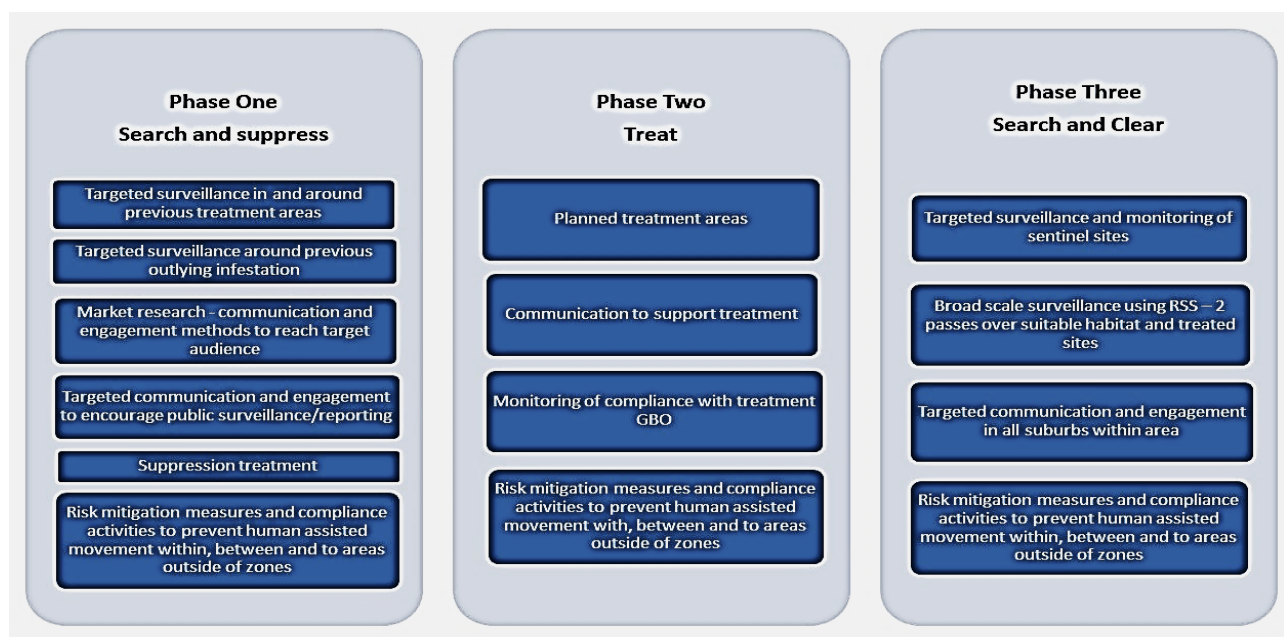
Source: QDAF 2017b

Figure 2.1 provides an indicative map of the original area of focus for the Program in South East Queensland. As the arrows on the map suggest, the intention is to work from west to east of the area. By first eradicating in Area 1 and suppressing fire ants elsewhere, the Program has adopted a rolling strategy with a view to progressively reducing the area occupied by RIFA until, in its final phase, the ants are restricted to Area 4 and by the end of the Program totally removed. To avoid reinfestation of treated areas, there are overlap zones between areas which are treated to retain the integrity of progressive eradication.

Underlying the plan, is a methodical and sophisticated approach to eradication. There does not appear to be anything similar undertaken on a similar scale anywhere else in the world.

The three essential elements are to first search and suppress fire ants, second to conduct planned treatment and third, to search and clear the area of RIFA, as shown in Figure 2.2. At the end of the process, eradication should be complete and freedom from fire ants declared.

Figure 2.2: The Planned Approach for each Area



Source: QDAF 2017b

In addition to what has been outlined above, there are a further five key strategies driving the Program (QDAF 2017b). These include:

1. A significant boost to eradication activities – the area treated each year using broadcast baits and direct nest injection (DNI) has been boosted as have the number of compliance officers to minimise human-assisted movement of RIFA and the science and planning elements to eradication;
2. Eradication to be both planned (as described in Figure 2.2) and responsive in future priority areas known to have high-density infestations;
3. Planning for eradication to be risk based using scientific and mathematical analysis, optimal eradication strategy, land use and habitat modelling and classification to inform the prioritisation of treatment and surveillance areas based on the risk of fire ant spread;
4. Eradication to be co-ordinated and focused with area prioritisation based on where risk areas are located in South East Queensland; and
5. Collaboration promoting shared responsibility between government, industry and the wider community in order to achieve eradication objectives. Shared ownership of the eradication challenge is necessary for public reporting of RIFA, prevention of human-assisted RIFA

movement, and collaboration with industry, other levels of government and landowners for them to undertake surveillance and treatment on their own land.

Even though much effort has gone into preparing the Ten Year Plan and the associated implementation documents detailing treatment, surveillance and a host of support activities involving treatment and surveillance operations, communication, IT, science, compliance, self-management and proof of freedom, the Program cannot be seen as a blueprint of instructions to be followed for the entire ten years. Rather, every step must be monitored and feedback used in a process of continuous improvement to refine the strategy and enhance efficiency and effectiveness.

RIFA treatment and surveillance are of particular interest in this regard as they make up the two most costly and critical elements of the Program. Ultimately, it is the Program's capacity to kill ants faster than they are reproducing, together with a very high level of confidence that no areas of RIFA have escaped attention, that will determine the success of this Program. In part, this means a high level of efficacy of broadcast bait and DNI chemicals. Discussions with Program staff indicate confidence in the products being used but a watching brief is kept on the emergence and availability of new methods and toxins that might be of future use. Similarly, in the case of surveillance, ground based and detector dog activities are highly reliable but they are costly and slow in what is a large eradication area. The Program has a significant investment in remote sensing technology which if successful will make possible aerial surveillance at a considerably lower cost than ground and dog operations. It may also enable better targeting of treatment areas and therefore reduce treatment costs.

To implement the Ten Year Plan, the NRIFAEP Program unit main office is located in the Operating Area south of Brisbane CBD where it houses management, support staff and some field staff. The Program also has depots elsewhere in the Operating Area to assist its operations. Staffing is discussed further in section 2.5.

The Program is accountable to the NRIFAEP Steering Committee. The Steering Committee's Terms of Reference are at Attachment 3. Further discussion of the role of the Steering Committee and its Science and Risk Management sub-committees is presented in Section 8.3.

2.3 The Western Boundary Addendum

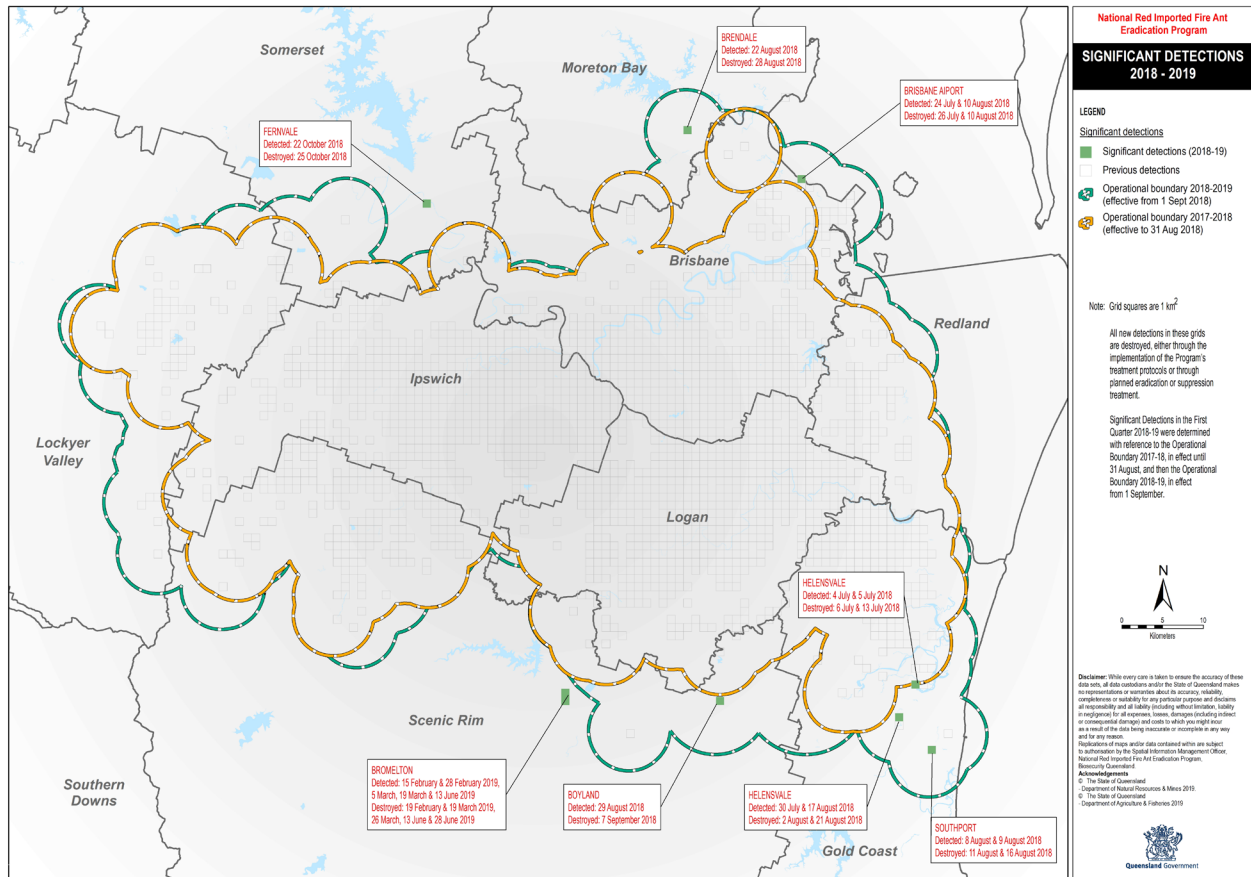
Following publication of the Ten Year Plan, the first internal review was undertaken from January to March 2019. The result of this review was an Addendum to the Ten Year Plan. A draft of the Addendum was recently published (QDAF 2019a).

The major catalyst for the Addendum were significant detections of RIFA outside the Operating Area in 2017-18. There were nine such infestations located mainly to the west but also to the north and south of the Operating Area as it was defined at 1 September 2017. All of these infestations were bothersome but those outside the western boundary were of particular concern. These were around Blenheim, Thornton and Townson, three rural locations adjacent to the Lockyer Valley, a large irrigation district in South East Queensland and not far away from Toowoomba and the grain growing region beyond on the Darling Downs of Queensland. When the operational boundary was amended on 1 September 2018, a new boundary came into effect. This is shown in blue in Figure 2.3 and is mostly outside the previous boundary shown in brown.

While the new infestations were detected at specific locations, the Program chose to expand the treatment area in the Lockyer Valley, Scenic Rim and parts of Somerset local government area. This was because there was at that time no reliable broadscale approach available at an acceptable cost to more precisely define the area of concern. This remains the case today as the new remote sensing program is still to be finalised although the Program now has 350 sentinel sites around the Operating Area boundary to check for the presence of RIFA and assist delimitation.

The inclusion of the Western Boundary area added some 77 713 hectares to the treatment area, around 16 per cent of the Operating Area at the time and about the same size as the existing eradication area prior to the amendment. This is by any measure a significant addition. In fact, it increases the scale and cost of any Program activity whose cost varies with area, thereby leaving the Program with a further challenge to accommodate in its budget.

Figure 2.3: Operational Boundary, 1 September 2018



Source: Program information

Against this background, a workshop was held in August 2018 and the five kilometres extension beyond recorded infestations was endorsed. This was approved by the Steering Committee in December 2018 subject to validation of the proposal by the Scientific Advisory Group (which it subsequently confirmed in February 2019). To reflect this adjustment in the Program budget, a reprofiling which facilitated the necessary treatment and related activities in the Western Boundary area was agreed. In hindsight, the Steering Committee's decision can be seen as a prompt and appropriate response to new circumstances requiring attention.

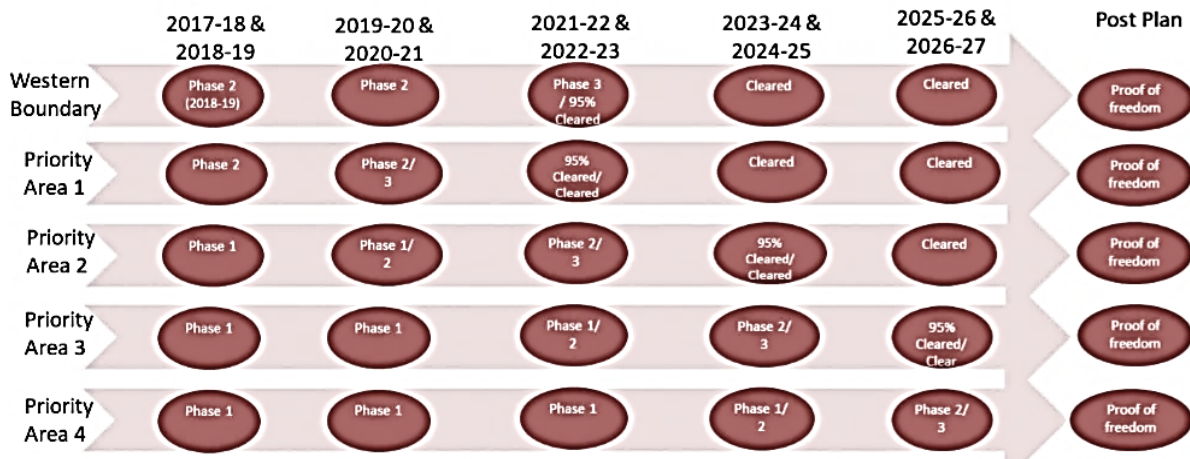
The additional area within the Western Boundary area was assessed to require \$39.1m over three years for the required treatment, surveillance and related activities. The funds were required to access extra field teams, vehicles, field equipment and bait as well as to meet additional costs of accommodation and training. The sum required was reduced to \$36.5m in light of Program funds carried over from 2017-18.

Despite the burden on the budget, the Steering Committee was advised that the Program could remain within its \$41m ten year funding envelope. This could be achieved, according to the advice, by savings of \$6.086m per annum for six years commencing in 2021-22 and as shown in Attachment 2. The sources of these savings are mainly reduced costs generated by targeted treatment made possible by information provided from remote sensing. In addition, savings were seen to accrue from the introduction of self-treatment and community surveillance of RIFA

enabled by active community engagement and participation. Self-treatment could potentially reduce labour costs in particular incurred by the Program as they might be transferred, at least in part, outside the Program.

In Figure 2.4 the new timetable for the Ten Year Program with the Western Boundary incorporated is shown. The illustration shows the timetable is very tight with Area 3 and 4 struggling to be cleared of RIFA by 2026-27. The inclusion of the Western Boundary area has seen a delay of one year in the plan for some other areas, although the timeframe has always been seen as indicative and subject to seasonal risks and fluctuations.

Figure 2.4: Revised Planning Timetable for Priority Areas with Western Boundary



Notes: Phase 1 – Search and suppress; Phase 2 – Treat; Phase 3 – Search and Clear

Source: QDAF 2019a

2.4 Annual Program Budget

At the time of commencing this Review, the Steering Committee was yet to approve a budget for 2019-20. There was a notional budget for the year as shown at Attachment 2 but the detail necessary to fund an operational Program budget had not been provided by the Program for Steering Committee approval. Subsequently, the 2019-20 budget was conditionally approved in October 2019. Hence, the most recent detailed and final annual budget information available to this Review is that for 2018-19, as presented in Table 2.2.

Table 2.2: Financial budget and expenditure, 2018-19

Program Area	Revised Budget (\$)	Actual Expenses (\$)
Directorate	481 151	519 089
Administration, procurement, WH&S, HR	3 152 599	2 944 748
Policy, governance & compliance	2 027 814	1 841 417
Communications & Engagement	1 298 246	1 296 025
Science	1 644 524	1 606 570
Planning & QA	2 568 547	2 584 617
Planned and responsive eradication	24 383 488	26 536 963
Remote Sensing Surveillance R&D	1 059 212	764 354
Information Technology	2 578 186	2 279 507
Contingency	630 803	-
Western Boundary	13 038 976	7 263 987
Total	52 863 546	47 637 277

Source: Program information

Planned and responsive eradication in Areas 1 to 4 accounts for nearly one half of the total 2018-19 budget. Nearly another quarter is accounted for by treatment of the Western Boundary. Other costs are mainly for support activities, including a small Directorate; business support and logistics administration; policy, governance and compliance; science services and eradication assessment; planning and quality assurance; remote sensing related research and development; and information technology.

All costs included in Table 2.2 are fully distributed costs in the sense that they account for all Program expenses for the designated Program area. These include employee related expenses, supplies (such as bait and chemicals) and services (for example, aerial bait distribution), depreciation of capital and other miscellaneous expenses.

A particular area of interest for many Program stakeholders is the proportion of the annual budget accounted for by administration or the corporate overhead rather than on-ground delivery of eradication and suppression of RIFA. Examination of Program cost data indicates that administration costs as a proportion of total actual Program expenses were 8.6 per cent in 2017-18 and 8.7 per cent in 2018-19.

The administration costs reported above cover accommodation, site costs, policy and planning, governance and risk management and the cost of the Directorate. Other services, in particular, HR and finance, are provided from elsewhere in QDAF but are charged back to the Program and included in the calculations above. Overall, while administrative costs need to be monitored and contained so as not to erode the on-ground delivery of RIFA treatment and surveillance, at this point there is no evidence of excessively high administration costs.

2.5 Program Staffing

2.5.1 Staffing Structure

While the Program is national and has a Steering Committee with membership from the States and Territories, the staff are employed by Biosecurity Queensland, one of four service areas in QDAF. The General Manager of the Program reports to the Chief Biosecurity Officer of the Department who in turn reports to the Department’s Director-General. The Program has facilities at several locations around the Operating Area but the main office accommodation is located in Berrinba, south of Brisbane’s CBD.

Staff numbers in the Program are provided in Table 2.3. Staff are either permanent, temporary or contractor based, with the majority of the latter category being field staff.

All categories of personnel fluctuate in numbers through the course of the year. Variations in permanent numbers reflect vacant positions at the time while changes in the temporary head count are due to the arrival and departure of staff on shorter term assignments. Field contractor numbers tend to coincide with the business needs of the Program, in particular the demand for additional labour during the treatment season.

Table 2.3: Number of Personnel in the Program: 2018-19

Personnel type	2018–19			
	Q1	Q2	Q3	Q4
Permanent	97	98	86	87
Temporary	30	25	29	35
Contractor – office	34	34	26	31
Contractor – field	125	122	102	119
Total Staffing	286	279	243	272

Source: Program information

Prior to the start of the 2019-20 treatment season, the Program (at July 2019) had 191 field contractors plus a further 29 full time equivalents (FTE) in the Operations Unit of the Program (personal communication, Program). With approximately 12 members per team (with actual numbers at any time varying for reasons such as sickness for example), this provides for 16 treatment teams plus a consenting team, bookings team and a science team for the treatment season.

There are pros and cons to having a contractor work force. On the one hand, contractor engagement gives flexibility to hire and let go staff in accordance with Program demands. This helps to promote the efficient use of labour and ameliorates the difficulty of attracting permanent staff to work in field locations, some distance away from their homes. On the other hand, contract staff may not be attracted to staying with the Program given the fluctuations in demand and corresponding uncertainty in their ongoing employment. This is an important consideration, particularly for team leaders and other specialists such as scientific staff, given the need to retain skills, maintain working relationships, build and impart knowledge about the Program and the Ten Year Plan as well as deal with workplace health and safety issues in a challenging environment. While the vast majority of contractors undoubtedly want to meet their employer's expectations, their shorter term perspective is unlikely to build the same ownership and commitment as their FTE counterparts.

For the reasons canvassed above, it is not surprising that Program management strive to keep a balance in permanent, temporary and contractor staff driven by business needs. This is a challenging task as seasonal and other conditions such as competition for labour and RIFA behaviour can vary markedly. At the time of preparing this report, the Program was seeking to convert some contractor positions to an FTE footing to better deal with some of the challenges noted above. With only two years of the Program completed, it is not possible to conclude as to whether Program management is getting these decisions right, both in regard to the steps taken and their timing. However, in terms of having an effective and efficient Program, their direction is appropriate and is supported by this Review.

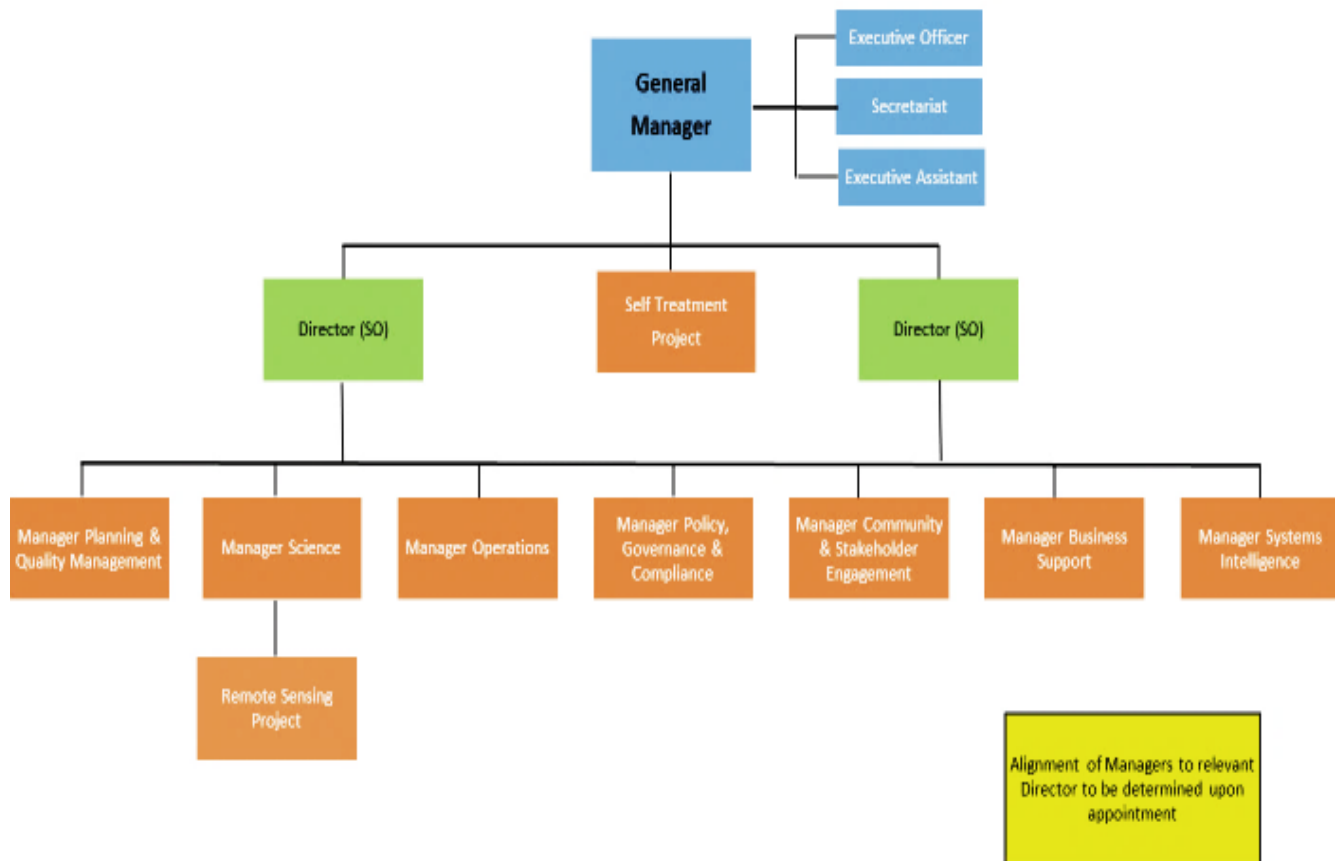
In mid-September 2019, a new management structure for the Program was announced (see Figure 2.5). While yet to be fully introduced, the new structure looks to be balanced in that it has the complement of Program Managers reporting to two Directors who in turn report to the General Manager (GM). In addition, the GM has a Directorate which assists with his/her portfolio of responsibilities as well as providing support to the Steering Committee, the Scientific Advisory Group (SAG) and the Risk Management Group (RMG).

When fully implemented, the new structure should alleviate some pressures experienced over the past two years. In particular, the old structure had six direct reports to the GM, including a Senior Officer Director, Managers for Policy and Compliance, Business Support, Information Services and Communications and Stakeholder Engagement and the Directorate. With much of this business being concerned with important but often not strategic content, the GM had limited time to maintain the helicopter perspective that a complex and busy Program of this nature demands. A decision as to which Managers will report to which Director is yet to be announced but can be expected soon following some current recruitment activity.

The new management structure is a welcome development. However, there is a question as to whether the Program should have a Deputy General Manager. In the absence of this capability, there is a considerable risk to the Program of significant disruption and loss of business continuity should the General Manager be unavailable or vacate the position. One option would be for the new Directors to act in the position when required. Another would be to recruit a Deputy General Manager with a view to the appointee taking responsibility for particular mission critical strategic development tasks needing attention, representing the Program in external collaborations with industry and stakeholders more broadly and acting as General Manager as required. The additional

cost to the Program resulting from appointment of a Deputy General Manager could be offset from adjustments to staffing expenditure elsewhere in the Program. It is proposed that the General Manager, in consultation with the Steering Committee Chair, conduct a review addressing the issues as soon as is practicable.

Figure 2.5: National Red Imported Fire Ant Eradication Program Management Structure (September 2019)



Source: Program Information

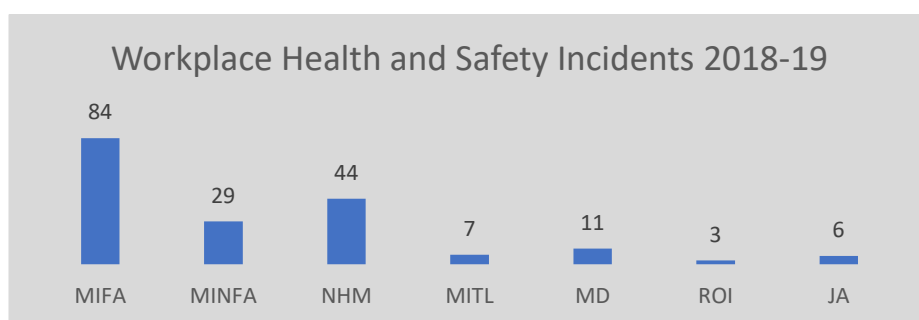
While very much a unit operating in a specific area of interest, the Program does maintain strong links with QDAF. The Department’s organisation chart shows the General Manger’ for the Program reporting to the Chief Biosecurity Officer. Also, as previously mentioned, some functions, including HR and finance are managed outside the Program in the corporate area of QDAF. These links provide for a high level of understanding of RIFA related issues in QDAF. The Program is charged accordingly for the services QDAF provides.

2.5.2 Workplace Health and Safety

In a program of this nature, field staff in particular can be expected to be exposed to many risks in the work environment. In addition to having to work in a RIFA environment, field staff travel rural roads and frequently enter paddocks containing various hazards such as tripping obstacles and snakes. As shown in Figure 2.6, the Program has dealt reasonably well with workplace health and safety risks with the majority of injuries being minor in nature. That is not to say that major injuries did not occur with seven injuries in 2018-19 requiring medical clearance before return to work of those affected.

The limited number of major injuries is most likely a result of the Program employing a designated Workplace Health and Safety Officer. Regular training, risk assessments and monthly updates for management have been built into the Program which should help to build awareness of injury risks and the Program’s safety culture.

Figure 2.6: Workplace Health and Safety: 2018-19



Incident categories:

MIFA	Minor injury – No First Aid	MD	Material damage only
MINFA	Minor injury – First Aid Only	ROI	Recurring/Ongoing injury
NHM	Near Hit/Miss	JA	Journey Accident
MITL	Major injury – time lost		

Source: Program information

2.5.3 Program Recruitment and Training

The Program uses two main forms of recruitment to fill vacant positions. For staff employed by Biosecurity Queensland (BQ), the usual Queensland Public Service procedures are followed. In the case of most field positions, labour hire companies are contracted to employ teams for the treatment and surveillance seasons. The Program is restricted to using hiring companies accredited under a Standard Operating Arrangement (SOA). These arrangements nominate preferred suppliers with a view to promoting cost-effectiveness and efficiency when buying for government. Recently, the Program has been allowed to access additional companies for its contractor needs.

Since the Ten Year Plan started, there have been 53 BQ recruitment actions initiated by Program management. Of course, the current Program was preceded by earlier eradication efforts so many staff were already in place for the start of the Ten Year Plan.

The recruitment actions initiated by BQ have been across the entire organisation. Of particular significance is that 11 actions have been for management positions. Appointments to most vacancies, with the exception of the two Director positions and the Manager for IT Systems have been finalised. The remaining vacancies are expected to be filled soon so that a complete management structure as shown in Figure 2.5 should be in place in the near future.

Despite the recruitment efforts, there have been significant stresses on BQ Program staff. In Public Service terms, the Program comprises a relatively small group of people with ongoing availability of key personnel central to meeting Program targets. Some management positions in this challenging environment have taken several months to fill. This is not surprising given the travel time for many employees to travel to Berrinba and the specialist nature of some roles. Inevitably, lengthy vacant positions can put increased pressure on others and impede the workflow, a problem that has emerged in at least one key area of the Program. Whether or not it is possible to relieve such pressures through the temporary use of staff elsewhere in BQ or through making use of consulting firms is worthy of investigation. Such action could provide a bridge to more permanent arrangements.

In regard to engagement of contract personnel, there are quite different labour market conditions impacting office and field staff. It appears that the Program has not had much difficulty finding contractors for a broad range of office duties despite the distance of the main office in Berrinba from Brisbane CBD. It seems the contracting firms have an available labour pool to draw upon which meets Program needs.

Field staff, however, can be more challenging. The numbers sought, for example, to make up treatment and surveillance teams, are significantly larger and the work required to be performed is usually outside and requires travel and physical capability as well as the ability to follow operating procedures, communicate with landowners and deal with unexpected developments.

The Program's experience with finding suitable field staff has had its challenges but these have not proven to be insurmountable. Certainly, the labour hire firms can more readily provide required numbers the more notice they are given, particularly when work locations are further away from Brisbane's outer suburbs or rural towns and villages. There have been challenges assembling teams with the broad mix of required skills. This may well become less problematic as the Program moves east in the years ahead and is able to draw upon a larger pool of labour.

The skills and knowledge required to implement a Program of this nature cover a range of disciplines and call for expertise from subject specialists as well as people with managerial capabilities and a preparedness to tackle diverse issues in a demanding operating environment. In the Berrinba office, logistics and planning are particularly important because the Program relies on marshalling resources to be in particular places at particular times and to operate with limited funding that cannot be exceeded. It follows that there must be a well-informed system of controls and operating procedures while meeting the broader governance requirements of QDAF and the Queensland Government. Science, information systems, engagement with the public and business support are all strong themes in the Program. So too are policy and compliance with regulations. When put together in one small workforce, this is a formidable pool of talent.

Fortunately, the continuity of eradication programs in varying forms since 2001 has meant that the Program has built up a considerable body of expertise over time. Most office related training can be in-house and on-the job. Nevertheless, the ongoing recruitment indicates significant staff turnover so there is a permanent challenge for management to employ training to spread the risk to the Program of key staff departures.

For field contractor staff, a training module has been developed. This has involved a three-day induction course to train new starters, although there are plans to reduce this to two days and provide additional training as required. Examination of the training materials indicates they are comprehensive and presented in a user-friendly format accessible to most new starters. The topics covered include:

- Program Overview – Ten Year Plan and Strategy
- Role of the field assistant
- Client relations
- Code of conduct
- Self-management
- Workplace health & safety
- Entering private property
- Job documentation
- Bait products used
- General awareness

Field staff have access to their team leaders to address questions as they arise. Also, teams comprise 12 members so while each field contractor has a personal workplan to complete, they interact with other team members to discuss their respective assignments and experiences in the field. The nature of the tasking means the peak period for new starters commences in September for the treatment season and June for the surveillance season.

Notwithstanding the Program's training effort, there have been concerns raised regarding the poor performance of contract field staff. In the Minutes covering the July 2019 meeting of the Risk Management Group it is noted that contractor interaction with clients and other staff has at times been problematic. Moreover, there have been instances of failure to follow Program protocols, either deliberately or through ignorance as well as the provision of false or misleading information

about the Program to clients. These issues are serious for both the efficiency and effectiveness of the Program as they not only damage the Program's reputation but also have the potential to undermine the achievement of Program goals and raise Program costs. There is a need therefore for the Program to work closely with the labour hire companies to ensure the contractors hired can meet Program requirements and for training modules to be amended to stress the importance of the need for employees to meet public service values.

3. Program Delimitation and Strategy

3.1 Delimitation

In any eradication program it is a significant challenge to mount an effective campaign to treat a pest. This is the case even if the geographic distribution of an invasive pest is known with certainty, that is it has been delimited. The challenge becomes too much to address if the geographic distribution of the pest is not known with a very high level of confidence because it suggests that eradication efforts may be leaving unaddressed areas of infestation which remain active while treatment focusses elsewhere. Keith and Spring (2015) from Monash University have suggested without delimitation, infestations continue to spread. This, they point out, is what happened when RIFA colonies were detected in 2007 at Amberley (in Brisbane's southwest), well beyond the operational boundary at that time.

Prior to the current Program commencing, Magee et al. (2016) examined whether any eradication program could proceed with reasonable certainty that containment lines for RIFA had been identified. Their principal finding was that the previous South East Queensland Program did successfully delimit the RIFA infestation following surveillance conducted from 2012 to 2015. Delimitation was aided by aerial remote sensing and ground searches. All colonies detected in the remote sensing zone were treated using direct nest injection (DNI) and/or wider application of insect growth regulator (IGR) bait.

Magee's Independent Panel also made use of research undertaken by Keith and Spring's work referred to above. Their work incorporates the South East Queensland surveillance data and other information into a Bayesian model and shows that the operational boundary, as it existed in 2015, corresponds roughly with the location of the 99 per cent probability boundary inferred from the model. That is, while not claiming to be a perfect detection system, the modellers concluded that there can be 99 per cent confidence that no RIFA are outside the inferred model boundary.

Between the time the South East Queensland surveillance work and Keith and Spring's modelling was completed in 2015 and funding was agreed for the Ten Year Plan in July 2017, further time elapsed and new RIFA outbreaks were detected. The Program did continue into 2016-17 but at a lower level of funding than the following year when resources available to the Program significantly increased.

As a result of the delays in decision making, the Operating Area under the new Ten Year Plan was established five kilometres beyond all known infestation as at 30 June 2017 (QDAF 2018a). In effect, the Operating Area reflected the area of infestation confirmed by delimitation and adjusted for an additional area of known infestation since delimitation plus a further five kilometres to accommodate predicted further areas at risk. This approach appears to be consistent with the Program's operational area protocol requiring that the Operating Area will be defined as five kilometres from all known infestation detected from 1 September five years previous to 31 August of the year to which it will apply.

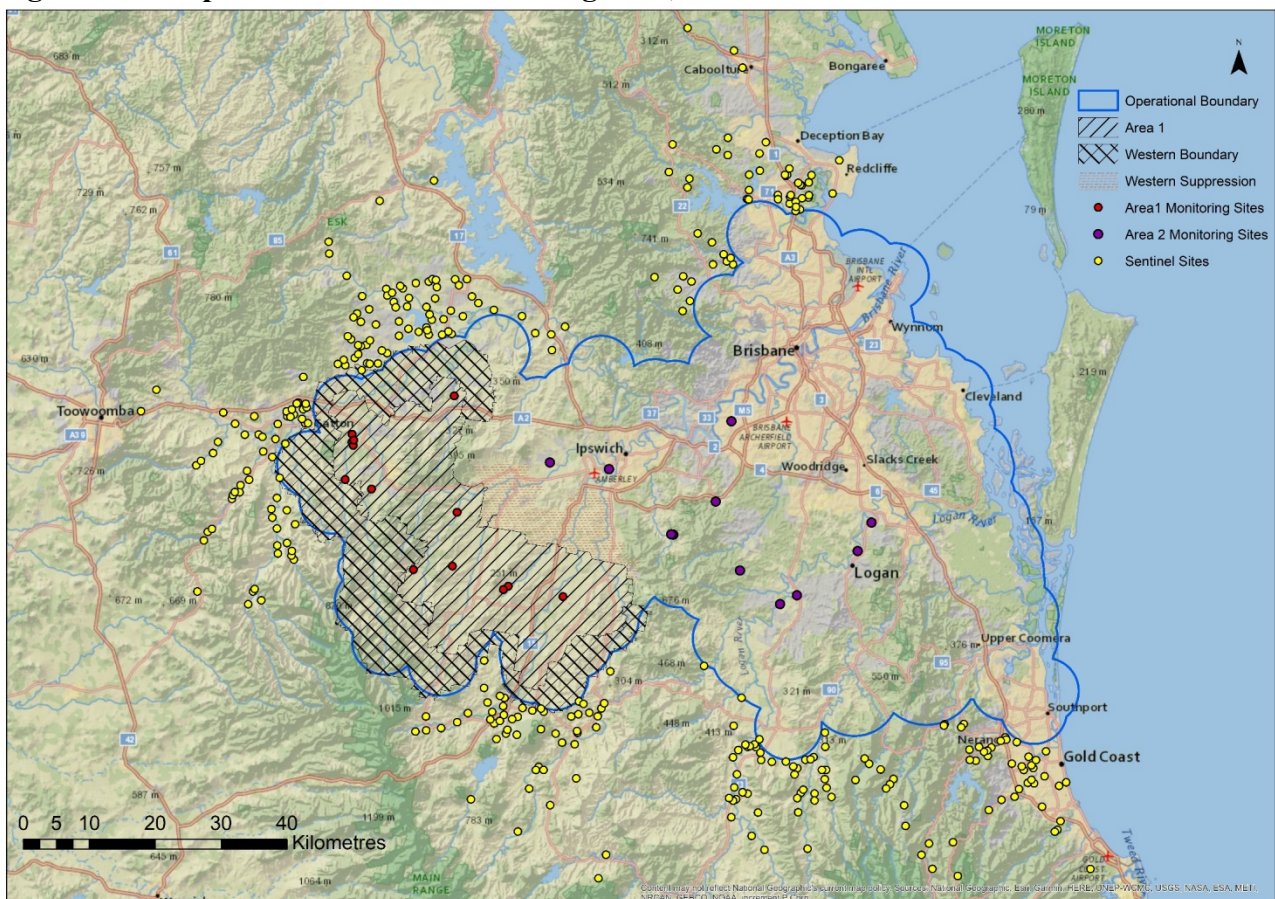
Consistent with the protocol, the significant detections in the Western Boundary area led to the posting of a new operational boundary on 1 September 2018 as shown in Figure 2.3. As discussed in section 2.3, the area added by the Western boundary, at 77 713 ha, was quite large relative to the size of the Operating Area at the time. In 2018-19, a further three significant detections were recorded outside the 1 September 2018 operational boundary. These were at Fernvale in the north and Bromelton and Gleneagle in the south. Fernvale is 1.8 km from the prevailing operational boundary while Bromelton, the southernmost detection, is 3.8 km outside. There were six other significant detections in 2018-19 outside the 2017 but inside the 2018 operational boundary.

The new Operating Area boundary established in September 2018, and covering a total land area of 586 807 ha, was 103 356 ha larger than one year earlier. Most of this increase is attributable to the inclusion of the Western Boundary as well as smaller adjustments elsewhere to the north and

south of the 2017-18 Operation Area. What is not so clear, however, is whether the area added was from infestation detected in 2018-19 but already present in earlier years and belonging, at least in part if not its entirety, to the 2017-18 or possibly early measurements of the Operating Area. Program staff have advised they believe this to be the case which means the Program started in 2017 with a mistaken belief about the size of the Operating Area. In effect, there had been a delimitation failure at the commencement of the Program.

During the preparation of this report, the Operating area was updated for 2019-20. The land area was revised to 605 972 ha, three per cent more than the corresponding figure for 2018-19. The new area would have reflected the protocol requiring the operating area to include five kilometres beyond the area of known infestation. It would also have been determined with the benefit of the Program having access to 350 sentinel sites established for winter surveillance over June to August 2019 (see Figure 3.1). These sites are located beyond the operational boundary on habitat suitable for RIFA and are used to monitor their spread. The number of sentinel sites has increased significantly from 17 in June to August 2017.

Figure 3.1: Map of Sentinel and Monitoring Sites, October 2019



Source: Program information.

Recent examination of the 350 sentinel sites has shown no presence of RIFA. This information, together with the delineation surveillance carried out around significant detections, has given the Program confidence that the Operation Boundary is accurate. It also provides evidence to this Review to conclude that delimitation has now been re-established. This is despite a larger total Operating Area since the Program started. As noted in the Ten Year Plan, intensive surveillance in the early years of the Program may detect additional nests before the total Operating Area reduces as the Program moves east.

Given the critical importance of having comprehensive knowledge of where RIFA are located as well as their density of infestation, it is clear that the investment the Program is making in remote

sensing could be highly productive. All things going well, a new remote sensing capability could be available for deployment by the end of 2019-20. In the meantime, and perhaps in parallel with remote sensing, there may be merit in using the Monash modelling capacity to assist with adjustments to the operational boundary. For example, the Monash model could presumably have been used to help define the edge of the area now known as the Western Boundary. The Monash work to date has shown that it can use infestation data to make inferences about where boundaries should be located. There seems to be an opportunity to make effective use of this expertise and the existing model which could warrant further investment if it can be justified.

3.2 West-East Rolling Strategy

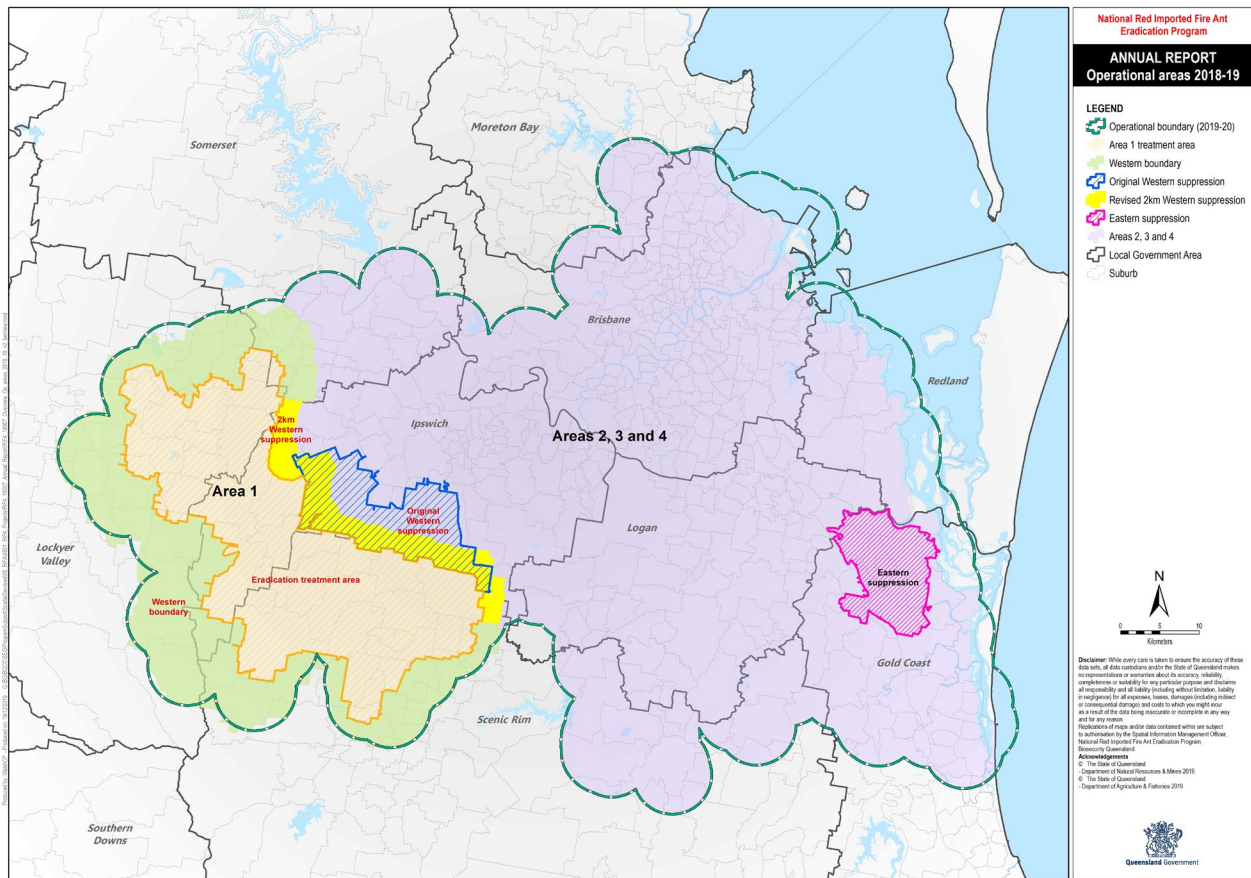
Central to the Ten Year Plan is a rolling RIFA eradication strategy from the west of the Operating Area to the east. The general pattern of the strategy is shown in Figure 2.1. The precise details have undergone some amendment in accordance with amendments to the Operating Area as presented in Figure 2.3 but the thrust of the strategy remains the same.

There is no evidence suggesting that the rolling strategy had to proceed in a west to east or any other fashion. However, there are good reasons to adopt the west to east approach given that the Ten Year Plan regards the outer, western and south-western perimeter of the Operating Area as presenting the greatest risk in terms of suitable habitat for RIFA and preventing RIFA from further penetrating agricultural areas to the west was worthy of attention. Furthermore, the west to east rolling strategy means that the Operating Area can be reduced progressively with the final years of the Program having to eradicate RIFA from a relatively smaller area adjacent to the east coast. As the Program proceeds eastwards, the areas targeted for eradication become more densely populated, necessitating more ground treatment and ultimately very little opportunity to aerially bait which is the dominant treatment method used to date in Area 1 and the Western Boundary. Regardless of the treatment method, the Ten Year Plan says the optimal treatment is three treatments of bait for each of two years.

In addition to prioritising eradication areas (from one to four), the rolling strategy includes suppression treatment. This strategy is to ensure areas not within the current priority area (the Western Boundary and Area 1 in 2017-18, 2018-19 and 2019-20) receive treatment to suppress and contain RIFA spread prior to those areas in turn becoming a priority area for eradication treatment. In some cases, suppression areas are selected adjacent to a priority eradication area in order to guard against re-infestation. This is the case for the western suppression area on the eastern side of Area 1 (see Figure 3.2). Failure to treat such areas can potentially undermine the investment made in eradication as well as disrupt the future rollout of the Program should retreatment be needed. It is also important for areas such as the western suppression to be designed to provide the protection needed to avoid nuptial flights into already treated areas. Generally, it could be expected that any protective suppression zone would extend along the entire boundary of previously treated eradication areas but for the western suppression protecting the Western Boundary and Area 1, this is not the case. On enquiry, the Program advised the design of the protection area is risk based but this Review is not persuaded by the explanation. The issue is significant in that it will recur as the Program moves east.

Once into Brisbane's suburbs and other urban settings, the west to east strategy is likely to be quite different in comparison to earlier years. The details are yet to be developed but eradication will need to take place on many more, albeit smaller, properties housing diverse groups and requiring a highly collaborative and coordinated approach to treatment and surveillance. The Program is actively developing trials to establish 'best practice' procedures in this environment and is looking to partner with Councils and others to determine what might be most effective and efficient with respect to resource utilisation. The Ten Year Plan refers to a 'clearing approach' which will presumably eradicate from suburb to suburb in much the same way as the Priority Areas one to four strategy.

Figure 3.2: Priority Areas 1, 2, 3 and 4 and Suppression Areas



Source: Program information

The vast bulk of the urban environment is not scheduled for eradication treatment until the latter years of the Program. In the meantime, RIFA infestations continue to be of concern and the Program is continuously contacted by householders seeking removal of RIFA nests. From a strategic perspective, this poses a significant problem since Program effort devoted to suppressing RIFA via DNI or baiting in areas not scheduled for eradication compete for resources allocated to eradication in a current priority area. The Program has protocols guiding the treatment response to these contacts. In addition, the Program is examining self-management initiatives to enable private landowners to take action to suppress RIFA. Importantly, self-management is currently restricted to RIFA suppression with eradication remaining the responsibility of the Program itself. It is, however, a significant change in the direction of the Program. Until recently, callers contacting the Program have been advised not to self-manage. Now, self-management looks like becoming an available option using baits purchased from retail outlets.

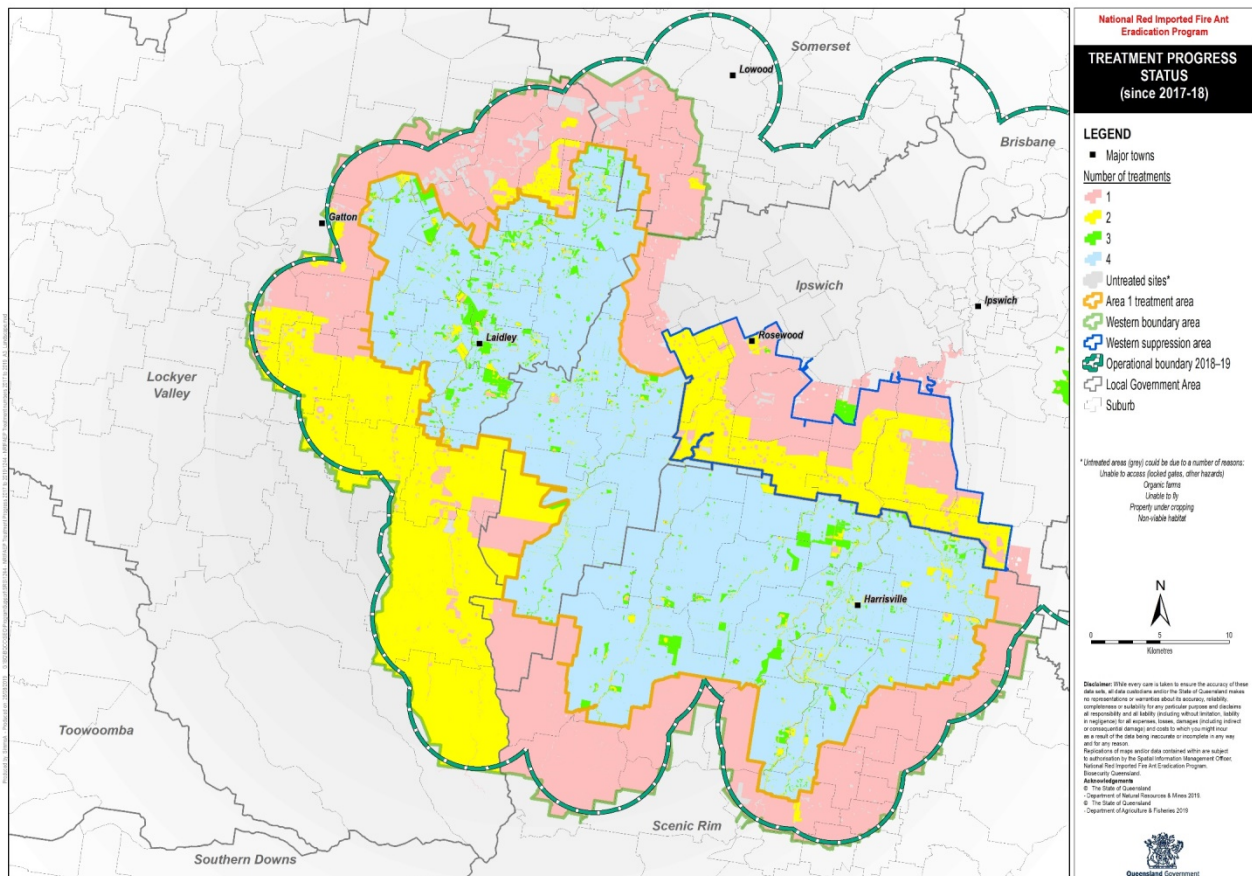
From a strategic perspective, self-management is an important development for two reasons. First, from a practical perspective, self-management means landholders in a rural, peri-urban or urban environment have the opportunity to deal with fire ant concerns ahead of scheduled Program treatment if they so choose. Second, self-management adds to the resources that can be brought to bear on RIFA eradication, suppression and surveillance. This should be able to be done at minimal cost to the Program and is consistent with the approach the community uses to address other pest related problems such as termite infestation.

3.3 Blanket v's Targeted Treatment

As shown in Figure 3.3, the treatment strategy adopted in the Western Boundary and Area 1 has what the Program staff describe as 'brute strength', that is a blanket of bait treatment across the

entire area. The coverage pattern is not what is expected over the life of the Ten Year Plan which is based on Magee’s Independent Panel report that generated a treatment budget based on targeted eradication. As the Ten Year Plan points out on page 8, ‘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.’

Figure 3.3: Treatment Progress, Commencement of Ten Year Plan to 30 June 2019



Source: Program information

In practice, the absence of a remote sensing capability at the commencement of the Program has meant treatment has had to be broadscale as illustrated in Figure 3.3. This in turn translates to significantly higher treatment costs in the early years of the Program and expected reduced costs in later years as targeting is made possible by virtue of remote sensing and the Program transitioning to smaller priority areas to the east.

Interestingly, the Ten Year Plan allocated resources roughly equally across the years. This was amended when the Western Boundary was incorporated into the total Operating Area but this was to reflect a significant increase in hectares to be treated rather than to reflect the application of ‘brute strength’ treatment in the Western Boundary and Area 1. Inevitably, therefore, if planned treatments are completed in the early years of the Plan, there is likely to be overspends against annual budgets. In later years, when remote sensing is hopefully available, there should be underspends against the original budget. The original budget is, however, now only of historical interest with the amended budget included at Attachment 2 in play with less resources available in

the later years of the Plan. Hence, without savings from other sources (an issue dealt with in Section 6) or remote sensing providing more savings than expected (for example due to a much higher level of efficacy than forecast), annual budgets could be overspent. This problem could be exacerbated should blanket treatment again be necessary when the Program is implemented in urban environments.

3.4 Proof of Freedom

The declaration of freedom from RIFA is a two stage process addressing both local and total Operating Area eradication of RIFA. The first stage is continuous throughout the Ten Year Plan. It serves the purpose of confirming the effectiveness of treatment after priority areas are finished. The second stage is to be undertaken following the completion of the Ten Year Plan. It is an overall verification that the Operating Area is entirely free from RIFA and will require that no fire ants have been detected for a period of two years.

The Ten Year Plan provides details of the local clearance process. It involves surveillance, community engagement encouraging public surveillance and ongoing reporting. In addition, the Program is working with the Victorian Government's Arthur Rylah Institute for Environmental Research to use an existing model in conjunction with ground truthing to assist with investigations of area freedom (initially in the Western Boundary and Area 1). While much remains to be done before the details of this approach are bedded down, the initial work looks promising. The Program and the Institute have agreed that while some adaptive work will be necessary, the model is suited for application to assessing progress with RIFA eradication and, in the long term, the success of the Ten Year Plan.

4. Program Performance

While still relatively early in the life of the Ten Year Plan, this Review comes at an important point in the rollout of the Program. At the end of 2018-19, about 20 per cent of the available time and resources had been expended so it is timely to focus on any required corrective action to enhance either the effectiveness and/or efficiency of the Program.

4.1 Program Financial Performance

The Revised Ten Year Program budget at Attachment 2 shows the budget for 2017-18 was \$34.2m. This was not the budget for 2017-18 prior to the reprofiling that occurred after the incorporation of the Western Boundary into the Operating Area. The original budget for 2017-18 was \$38m as reported in the 2017-18 Annual Report (QDAF 2018a, p.23). Actual expenditure for 2017-18 was \$34.2m and the residual funds totalling \$3.8m were carried forward into the following year's budget.

The Program's 2017-18 Annual Report shows the single most important contributor to the underspend in that year was a much lower than expected bait expense due to the completion of two rather than the planned three rounds of eradication treatment in Area 1 as well as one instead of two planned rounds of suppression treatment in Areas two, three and four. Also, staffing vacancies and recruitment delays, due in part to the timing of the Agriculture Ministers' Forum's funding decisions, help explain the underachievement against treatment targets. Inclement weather has also been suggested as contributing to the variance in spending against budget.

The Program in 2018-19 was underspent by \$5.2m. The overall result masks some significant variances for several items as shown in Table 4.1. By far the most significant differences between budgeted and actual expenditure are for planned and responsive treatment and the Western Boundary treatment. The latter area had an underspend of \$5.8m while the former, largely focussed on Area 1 and responsive treatment, overspent against budget by \$2.2m. Details concerning the variations between planned and actual treatment in 2018-19 are provided in section 4.3.5.

Table 4.1: Expenditure against Budget, 2018-19

Program Area	Revised Budget (\$)	Expenses (\$)	Variance (\$)	Variance (%)
Directorate	481 151	519 089	(37 938)	-7.9
Administration, procurement, WH&S, HR	3 152 599	2 944 748	207 852	6.6
Policy, governance & compliance	2 027 814	1 841 417	186 397	9.2
Communications & Engagement	1 298 246	1 296 025	2 221	0.2
Science	1 644 524	1 606 570	37 953	2.3
Planning & QA	2 568 547	2 584 617	(16 070)	-0.6
Planned & responsive eradication	24 383 488	26 536 963	(2 153 476)	-8.8
Remote sensing surveillance R&D	1 059 212	764 354	294 858	27.8
Information Technology	2 578 186	2 279 507	298 679	11.6
Contingency	630 803	-	630 803	-
Western Boundary	13 038 976	7 263 987	5 774 989	44.3
Total	52 863 546	47 637 277	5 226 269	9.9

Source: Program Information

4.2 Performance Indicators

From the outset, the Program has generated a mass of information included in annual and quarterly reports as well as on the QDAF website, www.daf.qld.gov.au. At the time of writing, the most recent quarterly report available on-line was for the 3rd quarter, 2018-19.

In the first three years of the Program the performance indicators have significantly changed. The 2017-18 Annual Report included key achievement information covering area treated, DNI numbers, planned surveillance, compliance, ant sample analysis, presence of polygyne colonies, reports received and referred and response to detections. Some further data were presented in appendices. Unfortunately, however, there was little reported to inform Program stakeholders about outcomes from the Program, that is whether real progress was being made with RIFA eradication. The 2017-18 Annual Report recognised this deficiency and undertook to develop a new system of performance evaluation and a push to ‘shift beyond raw numbers of hectares or nests treated’ (QDAF 2018a).

Six of the nine achievement indicators used in 2017-18 are also included in a draft of the 2018-19 Annual Report. However, in addition, the Program has developed a new set of performance indicators for inclusion in 2018-19. There are 105 indicators covering all those included the previous year but in much more detail for each priority area. Also, many new areas are covered, including areas of continuous improvement, science, strategic policy and management, business activity such as procurement and workplace health and safety. However, the focus on real progress with RIFA eradication remained elusive. Furthermore, in terms of accessibility, the 2018-19 set of performance indicators scores poorly with too many indicators on too many topics and too much to convey quickly to stakeholders interested in vital Program statistics on outcomes to date. That does not mean, however, that much of the data collected does not provide useful management information that might assist the Program.

A third attempt at performance information has been included in the 2019-20 Work Plan. There are nine indicators:

1. Change in the size of the Operating Area as a result of program treatment or new detections. This is a measure of the Program’s progress in reducing the fire ant population.
2. Change in the level of infestation in eradication areas following final treatment. This measure reflects the effectiveness of planned eradication treatment.
3. Number of new infestations detected within eradication areas following completion of treatment. This is a measure of the effectiveness of the Program’s eradication treatment, as well as its effectiveness in preventing fire ants returning to eradication areas after final treatment, either through natural flight or human-assisted movement.
4. Number of new infestations detected outside of the Operating Area (significant detections). This is a measure of the Program’s success in containing the spread of infestation within the Operating Area, through treatment of the border and significant detections and prevention of human-assisted spread.
5. Change in the density of infestation within the Operating Area. This measure reflects the effectiveness of planned and responsive suppression treatment of infestations, including the type of treatment applied.
6. Change in the number of sites confirmed as having polygyne infestation. This measure reflects the effectiveness of planned suppression treatment, including the type of treatment applied, as the polygyne social form is a specific target of suppression treatment.

7. Evidence of reduced genetic fitness of ant colonies. This is a measure of the Program's success in reducing the resilience and robustness of the fire ant population through its treatment efforts.
8. Reduction in the risk of human-assisted spread of fire ants through targeted engagement and compliance activities. This is a measure of the Program's success in encouraging community observance of movement controls and low levels of recidivism.
9. Variation between actual and planned treatment and surveillance activities. This indicator will provide a quick view of the Program's current capability to meet the objectives of the Ten Year Plan.

While far from perfect, the set of performance indicators planned for use in 2019-20 is moving appropriately to focus on what the Program is achieving. Monitoring and reporting on size of the Operating Area infestation levels, densities of RIFA, significant detections, the status of RIFA colonies and risk of human-assisted spread of RIFA all provide insight into what is changing over time with respect to RIFA presence and distribution. However, two of the indicators cannot be measured at this point (Indicators 2 and 3 above) and two more (Indicators 7 and 8) are yet to be defined. Also, Indicator 9 is presented as a single, perhaps composite indicator. It is presumably made up of various components covering treatment and surveillance of different areas. It too would appear to be undefined at this point.

Notwithstanding the difficulties with the 2019-20 indicators, this Review has chosen to use information the Program has supplied to assess Program performance. Where relevant, this indicator set is supplemented with performance information prepared for the 2018-19 Annual Report prior to the development of the 2019-20 Work Plan indicator set. The Program clearly has more work to do to finalise and operationalise a useful set of performance indicators. There are variables and data sets to be chosen and the frequency of reporting needs to be addressed. Quarterly rather than annual observations would prove more useful as a management and reporting tool. Real time updates would be even better providing it can be done at reasonable cost. The most pressing need, however, is a stronger foundation for the suite of indicators. Of critical importance is knowing and explaining what the Program expects by way of changes to intermediate outputs (e.g. RIFA densities, colony health, Operating Area, new infestations, results from monitoring and sentinel sites and so on) between Program actions and ultimately RIFA eradication. A program logic chart showing diagrammatically what physically is expected to change in response to Program inputs would help stakeholders understand what is expected to change prior to removal of RIFA from the landscape altogether.

4.3 Performance Data – 2017-18 and 2018-19

4.3.1 Change in Operating Area size

According to Program data, the Operating Area when the Program commenced in 2017-18 was 483 272 ha (excluding the sea area included on the Program's Operational Area maps). This area increased significantly to 586 808 ha in 2018-19 after the inclusion of the Western Boundary and other smaller areas. This suggests an increase in Operating Area of 21 per cent between the two years. However, as noted in section 3.1, it appears that at least some of the increase evident in 2018-19 should have been recorded in 2017-18 or possibly earlier years. Therefore, the Review has dismissed this increase as unsuitable data for informing any change in the size of the Operating Area. Rather, the more relevant comparison is between 2018-19 and 2019-20. Between these two years, the size of the land only Operating Area grew from 586 808 ha in 2018-19 to 605 972 ha in 2019-20, a three per cent year on year increase.

While the community is looking to see a progressive reduction in the size of the Operating Area, examination of the data shows a slight increase in the Operating Area over the past two years. The Ten Year Plan (QDAF 2017b) did, however, foreshadow an initial expansion of the Operating

Area due to intensive surveillance around the boundary. Against this background, the information to date, despite not showing what stakeholders are waiting to see, should not be regarded with great concern at this point in the Program.

4.3.2 Number of new significant infestations detected outside of the Operating Area

In 2017-18, there were nine significant detections of RIFA outside the Operating Area boundary (QDAF 2018a). Most were to the west but several were north and south of the area. Two of the nine were suspected to be due to human-assisted movement while most others were attributed to likely flights of RIFA. The significant detection data for 2017-18 may, however, suffer from similar limitations as those discussed for the Operating Area size data. That is, it is unclear whether what was detected in 2017-18 was new and attributable to that year or, alternatively, was already present before 2017-18 and not detected at that time.

For 2018-19, Program information refers to eight significant detections. However, only two of the identified sites (Bromelton and Fernvale) are in fact outside the new operational boundary posted in September 2018. Adjacent to Bromelton is a third site known as Gleneagle which was detected during delimitation surveillance around Bromelton.

It is apparent that while the Operating Area has grown slightly since the commencement of the Program, the number of significant detections in the one year for which there is reliable data is quite small. That said, it is not helpful from a Program effectiveness standpoint, to be seeing additional detections on a larger Operating Area, albeit at a relatively small scale in both cases. In practice, the Program has not always followed protocol to ensure rigorous management of significant detections. One particular instance that came to the attention of this Review was the Bromelton infestation where despite immediate initial treatment in February 2019, there was no clearance of the site to ensure RIFA had been removed until the following June. Prompt treatment and follow up in accordance with Program protocols are critical if the Program is to avoid further expansions in the Operating Area.

4.3.3 Change in the density of infestation within the Operating Area

In Table 4.2 data are presented for 2017-18 and 2018-19 on the density of mounds per one square kilometre grids in the Operating Area. By far the largest percentage of mounds are in the two smaller intervals (88 and 81 per cent in 2017-18 and 2018-19 respectively). There does, however, appear to be a slight drift towards the denser categories evident in the latter year. This observation is consistent with responsive treatment data which shows a similar increase in the number of mounds per site. Unfortunately, however, the data presented in Table 4.2 must be interpreted with caution as they are drawn from information collected by field teams anywhere in the Operating Area when conducting responsive treatment and/or surveillance. That is, the information is not drawn from a statistically valid sample suitable for use as a performance indicator. The Program will need to ensure information collected to monitor and evaluate progress with the Program is based on adequate data.

Table 4.2: Operating Area Mound Densities – 2017-18 and 2018-19

Mounds per sq. km grid	2017-18 Number of grids	2017-18 %	2018-19 Number of grids	2018-19 %
1-25	720	75	729	68
26-50	122	13	143	13
51-75	42	4	59	6
76-100	17	2	41	4
>100	60	6	96	9

Source: Program information

4.3.4 Change in the number of sites confirmed as having polygyne infestation

Two types of colonies occupy RIFA nests. The first, and by far the most common in South East Queensland, is the monogyne social form where each colony consists of a single queen and her offspring. The second is a polygyne social form where a colony may contain multiple queens and their offspring.

The polygyne social form is of particular concern as they tend to have a higher density of nests, can cause more economic and environmental harm and are difficult to destroy as multiple queens can establish new colonies should they disperse. In the USA, according to the Ten Year Plan, polygyne RIFA colonies account for up to 40 per cent of infestations. In Australia, the corresponding estimate was 1.2 per cent in 2017-18 and 1.03 per cent in 2018-19. This represents a much reduced level from earlier years following the RIFA incursion. From 2001-02 to 2003-04, polygyne social form were an estimated 30-40 per cent of colonisation. The Ten Year Plan suggests this may be due to the constant treatment pressure throughout the past 17 years of eradication efforts.

4.3.5 Variation between actual and planned treatment and surveillance activities

The treatment of RIFA is undertaken using an insect growth regulator (IGR) bait distributed aerially by helicopter or on the ground using an all-terrain vehicle (ATV) and hand-held spreader or blower. An alternative measure for spot site treatment is direct nest injection (DNI) using Fipronil, a chemical insecticide.

Eradication treatment involves consecutive applications of bait. The optimal regime is six treatments and gives 99.994 per cent probability average efficacy. Suppression of RIFA can be achieved with fewer treatments and is a key element of the Ten Year Plan in non-eradication areas prior to their scheduling for eradication. DNI is particularly useful where there is a risk to human or animal health and safety.

In Tables 4.3 and 4.4, Rounds one to four, planned and actual eradication and suppression data for 2017-18 and 2018-19 are presented. Several areas are covered, including Priority Area one, the Western and Eastern Suppression and the Western Boundary.

Table 4.3: Eradication and Suppression Treatment, 2017-18, Rounds 1 & 2

Rounds 1 & 2 Treatment	2017-18 planned Round 1 (ha)	2017-18 actual to planned, R1 (%)	2017-18 planned Round 2 (ha)	2017-18 actual to planned, R2 (%)
Eradication Area 1	87 589	95.9	87 589	97.0
Eastern Suppression	11 651	83.4	11 651	0.0
Western Suppression	26 408	70.1	26 408	0.0
Total	125 648	89.3	125 648	67.6

Source: Program Information

Examination of Round 1 data in Table 4.3 indicates that the Program achieved nearly 90 per cent of what was planned in aggregate in 2017-18 for the first round of treatment. However, individual areas, notably the Eastern Suppression and the Western Suppression lagged behind Area 1 with lower actual compared to planned areas completed. The situation deteriorated somewhat for Round 2 in 2017-18 as only Area 1 was anywhere near completion at year end. Perhaps, also, the aggregate achievement is overstated in that no data is included for a third round in 2017-18 because it was not undertaken, yet the Ten Year Plan had suggested and the Scientific Advisory Group unanimously supported three rounds of treatment per year for each of two years.

The following year, 2018-19, commenced much like 2017-18 with much of the first round (Round 3) completed, albeit significantly less so for the Western Suppression zone. The Western Boundary

came into the Program and most of the planned area received treatment. Again, the achievement level fell away for the second round of 2018-19 (Round 4) with only Area 1 and, to a lesser extent, the Eastern Suppression zone recording more than 85 per cent of planned treatment (see Table 4.4). And again, the level of achievement in 2018-19 falls short of the optimal treatment goal, as outlined in the Ten Year Plan, of three treatments per season as the third was not undertaken.

In regard to surveillance, the Program relies on field staff, odour detection dogs and community engagement and support. A remote sensing, aerial-based capability continues to be developed but has been delayed with testing of new equipment and software now to be completed in 2019-20, one year behind schedule. A positive RIFA detection rate of at least 50 per cent is the aim for the project.

Table 4.4: Eradication and Suppression Treatment, 2018-19, Rounds 3 & 4

Rounds 3 & 4 Treatment	2018-19 planned Round 3 (ha)	2018-19 actual to planned, R3 (%)	2018-19 planned Round 4 (ha)	2018-19 actual to planned, R4 (%)
Eradication Area 1	87 583	98.1	87 583	97.5
Eastern Suppression	13 577	91.1	13 577	86.1
Western Suppression	19 181	55.7	19 181	0.6
Western Boundary	77 713	96.2	77 713	35.4
Total	198 054	92.8	198 054	62.9

Source: Program Information

There are several types of surveillance with different aims in mind. First, planned and targeted surveillance is undertaken to protect the operational boundary and areas treated for eradication. Performance outcomes for boundary surveillance have varied significantly with Area 1 exceeding planned levels by 50 per cent in 2017-18 but falling short by over 50 per cent in 2018-19. Areas 2, 3 and 4 failed to meet planned targets for boundary surveillance in 2017-18 and 2018-19 with end of year results respectively at 29 per cent and 84 per cent.

Second, sentinel sites have been established as early indicators of infestation further afield and outside the boundary. Of the 17 sites in 2017-18, all were surveyed. Around the Operating Area boundary, there are now 350 sentinel sites, all of which were found in June to August 2019 to have no RIFA present.

Third, any new detection has delimitation surveillance conducted to determine the extent of the infestation. This is essentially responsive surveillance carried out as required and hence does not have a planned level of activity.

Fourth, post treatment validation surveillance is undertaken to confirm the removal of infestation and is also responsive in nature. Again, no targets come into play but like delimitation, validation surveillance is a critical element of the Program.

Finally, the public play an invaluable role in reporting the presence of fire ants. For example, Program information indicates that in the fourth quarter of 2018-19, 83 per cent of 3 090 reports were found to be positive for RIFA identification. The Program has stimulated very active public participation in fire ant notification with 9380 reports for the year compared to a total expected notification level of 5000.

The treatment program has had a mixed record in the first two years of the Program. What began reasonably well in both years could not be sustained with Area 1 a notable exception. Area 1 is the sole part of the Operating Area with a continuous record of actual treatment close to meeting planned targets, although that assessment rests on two rather than three eradication treatments

planned per year. Area 1 aside, the Eastern Suppression area fared significantly better than other areas planned for treatment in 2018-19.

There are several reasons explaining the inability of the Program to meet treatment targets in 2018-19. First, the Program assumed higher planned levels of labour productivity (hectares covered per day by contractors) than could be realised (see section 6.1.1 for further details), thereby reducing the area of ground treated and the proportion of the treatment plan completed. Second, Program staff have advised that the treatment plan did not allow for sufficient resources to meet responsive treatment demands. Once available resources were fully utilised, additional responsive treatment compromised the extent to which planned treatment could be undertaken and a shortfall was the inevitable result. In addition, responsive treatment has been increasing over time and has therefore had an increasing impact on the planned treatment program. Third, the exact date treatment starts in any season depends on a protocol concerning soil temperature and the Program in 2018 decided to postpone the commencement of aerial treatment until November. Also relevant in this regard was a departmental delay in obtaining Specific Task Analysis and Risk Assessment (STARA) approval which is required before aerial operations can commence. Fourth, for the Western Boundary, delays in funding approvals and therefore assembly of field teams and other critical inputs, resulted in delays in commencement of treatment. Finally, inclement weather conditions impacted the Program's ability to achieve treatment targets.

The surveillance effort in the first two years of the Program has proven to be variable as well. Highlights have included effective public engagement in the reporting of fire ants, a critical and effective sentinel site system and Area 1 receiving ongoing attention, albeit not always at planned levels. Areas 2, 3 and 4 have received less than planned surveillance, particularly in the first year of the Program. These data perhaps reflect a little harshly on surveillance achieved as they do not capture on-demand delineation and validation related surveillance which play a crucial role in identifying areas for treatment and whether or not infestation has been destroyed.

4.4 Performance Assessment

4.4.1 Overview of Performance Results

The overall message conveyed by the limited available performance indicator information is that it is too early in the life of the Program to conclude that it is effective or otherwise. Of the five indicators examined, only one (extent of polygyne infestation) provides clear evidence of progress with eradication. Two others (change in Operating Area and number of new significant infestations) point to a slight but perhaps not unexpected deterioration. One (variation between actual and planned treatment and surveillance) is pointing to a shortfall in work completed to achieve eradication and the other is inconclusive. The scorecard, at this stage contains only two annual data points, thereby making continuous assessment very difficult.

The fact that the Operating Area is increasing a little, while concerning, needs to be seen in the context that this is not entirely unexpected as surveillance delves deeper into infestations around the boundary. There are further significant detections but they are few in number. The presence of the polygyne social form has been waning for many years so the Program can claim to have kept this achievement intact and to have progressed it a little further. It is significant in that it points to a fire ant population under some pressure but by itself is not cause for celebration.

Of the indicators examined, the most comprehensive data are presented for planned versus actual areas of treatment and surveillance. Both are central to achieving eradication in the Ten Year Plan timeframe. Unfortunately, both show less than desired progress with the key exception being Area 1, particularly for treatment and to some extent for surveillance. However, this assessment is based on the Program conducting two rather than the three eradication treatments proposed in the Ten Year Plan and confirmed by the Scientific Advisory Group.

It may seem surprising the Western Boundary was unable to achieve full treatment (only 35 per cent coverage for Round 4 that was the second round in the Western Boundary) in 2018-19 as its location on the western edge of the Operating Area makes it particularly significant for a strategy driving the RIFA infestation eastwards. Examination of this issue has revealed that of the many factors responsible for lack of progress, funding delays were particularly important. It seems the necessary discussions between the funding partners were not held early enough to enable the necessary action. An alternative course would have been to divert resources from elsewhere but the Western Boundary is so large that only Area 1 being compromised would have generated enough funding to complete the necessary treatment.

From an operational perspective, perhaps the early years of the Program will have provided lessons that when acted upon will enable improved performance. That said, this Program has been preceded by others so lessons to be learnt should be readily available. However, the Ten Year Plan is on a scale not seen before so there will be new experiences to learn from and mistakes to avoid.

4.4.2 Further Program Information

There are two further relevant areas worth canvassing that reflect on progress to date with the Program. The first concerns the number of treatments applied for eradication purposes as notwithstanding the six included and funded in the Ten Year Plan, there is some indication that as few as four may be under consideration. The second is the monitoring site data available after four rounds of treatment in Area 1 and what they indicate with respect to prospects for eradication.

(a) Number of treatments

To date, Area 1 has mostly received three to four planned eradication treatments and the Western Boundary one to two treatments (see Figure 3.3). There is some suggestion that not all six treatments as provided for in the Ten Year Plan may be necessary. For example, the 2019-20 Work Plan, presented to the August 2019 Steering Committee meeting, states 'In 2019-20, eradication treatment will continue in Area 1 and the Western Boundary area. Area 1 (approx. 86 700 ha) will receive one more round of treatment and the Western Boundary area (approx. 77 700 ha) will receive up to three more rounds. It is anticipated that this will complete the treatment of Area 1 and the Western Boundary area.' If so, Area 1 and the Western Boundary will have both had 4-5 treatments at the end of 2019-20.

The final number of treatments needed for RIFA eradication has been the subject of much research. As mentioned, the Ten Year Plan maintains six treatments is optimal and the SAG agreed unanimously in February 2019 that this is the appropriate number of repetitions. The Program, on the other hand, regards six treatments as a 'rule of thumb' and that, in practice, it is also necessary to consider how many rounds of bait are feasible, the timing between treatments and specific risks inherent to the area of interest.

The situation is complicated by the finding that while six rounds of treatment provides 99.994 per cent confidence of treatment success, there is only a 0.026 per cent reduction in confidence with one less round (i.e. five) and a further 0.128 per cent reduction (i.e. to 99.840 per cent) should four rounds be completed. Each additional round of treatment is calculated to destroy 80 per cent of remaining RIFA (QDAF 2017b). The Steering Committee, as far as this Review is aware, is yet to adopt a final decision on this matter. It is a critical issue with implications for both the time in which the Program can be completed and the final cost and therefore its effectiveness and efficiency.

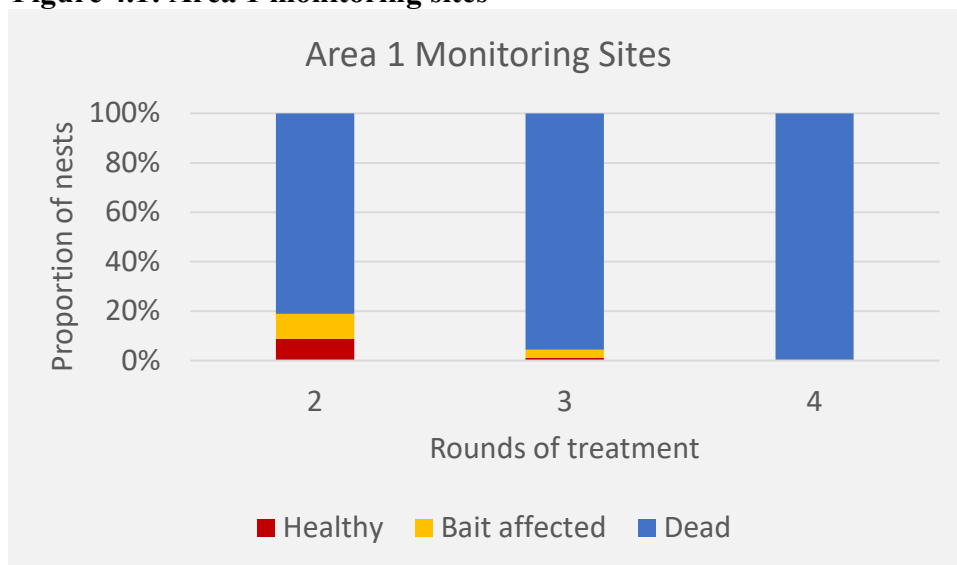
(b) Monitoring Site Data

One area of data not included in the performance indicators discussed in section 4.3 is information collected from monitoring sites. There are 13 such sites in Area 1 and a further 10 sites in Areas 2-4, as shown in Figure 3.1.

The Program has advised that the Area 1 sites represent a range of land use types, including the five largest land uses within Area 1 as well as land surrounding reservoirs and new urban developments. The Program also has unpublished and undated statistical advice from QDAF (personal communication, Program) suggesting a 90 per cent confidence interval for the sample results they obtain. The sample selection, while appearing to satisfy the ‘good sampling protocol’ outlined by QDAF, does not, however, appear to be stratified for land types or other conditions such as soil type, elevation and aspect.

Unfortunately, observations were not collected before the Area 1 sites were established in July 2018 and treatment commenced. In fact, treatment had already commenced and on first inspection following two rounds of treatment, 90 nests on the 13 sites were found. At seven sites, all nests were dead. The remaining six sites contained 35 nests and these were observed after subsequent treatments. The results are presented in Figure 4.1.

Figure 4.1: Area 1 monitoring sites



Source: Program Information

After two rounds of treatment, over 80 per cent of nests were dead and a further 10 per cent were bait affected. After four rounds of treatment, all nests were dead.

Unlike the sites in Area 1, the sites in Areas 2-4 are not in a zone designated currently for eradication. There are 10 sites with 104 nests. Observations began prior to site establishment in March 2019 so both baseline measurements and observations after treatments are available. After one round of treatment, 41 per cent of nests were dead, with a further 14 per cent bait affected and 39 per cent still healthy. It will be interesting to watch the progress of this monitoring, the next round of which follows the second round of 2019-20 treatment.

The results to date from the Area 1 monitoring sites in particular, and to a lesser extent Areas 2-4, give reason to be optimistic that eradication remains a real possibility. These monitoring stations are in effect a type of surveillance. The data generated has the potential to provide some useful insights over time into the level of success with treatment. It would be productive for the sites discussed here or others under consideration for establishment to be included as a performance indicator. Given the potential significance of the monitoring site data for informing the Steering Committee about the effectiveness of the strategy, it would also be helpful for the Program to have its monitoring and sample selection methodologies independently evaluated with a view to publication as soon as possible.

The Program also has approximately 350 sentinel sites at varying distances from the operational boundary that were recently completed (shown in Figure 3.1). RIFA have not been detected at any

of these sites which lends support to the accuracy of the boundary for strategic purposes and containment of the pest within the operational area. That said, it would be helpful for the Program to also have the methodology for selecting sentinel sites, and their statistical validity, independently peer reviewed.

5. Compliance and Regulatory Framework

5.1 Background

Behind the Program and supporting biosecurity operations in Queensland is the *Queensland Biosecurity Act 2014*. The *Act* commenced operation in July 2016 and provides for a range of measures, including regulatory arrangements central to supporting the eradication program. The legislative requirements cannot be seen in isolation from the Program and its expenditure. They are an essential element of eradicating RIFA and impact the Program's efficiency and effectiveness in various ways. Key aspects of the *Act* relevant to the Program are examined below. The discussion does not purport to be an assessment of the *Act*. Rather, it is concerned with those areas the *Act* overlaps with the Program and where there may be scope to enhance its utility.

Under the *Act*, all Queenslanders have a 'general biosecurity obligation' (GBO). This requires everyone to manage biosecurity risks that are under their control and that they know about, or should reasonably be expected to know about (QDAF, www.daf.qld.gov.au, accessed 28/9/19). Under the GBO, individuals and organisations must:

- take all reasonable and practical steps to prevent or
- minimise the likelihood of causing a biosecurity event, and limit the consequences if such an event is caused
- prevent or minimise the harmful effects a risk could have, and not do anything that might make any harmful effects worse.

Complementing the GBO are several additional features in the *Act* central to supporting the Ten Year Plan. These include regulatory provisions for biosecurity zones, movement control orders and Biosecurity instrument permits.

In the Program's Operating Area, there are three biosecurity zones as shown in Figure 5.1. These zones exist for the purpose of restricting the movement of carrier materials that might spread RIFA. Of particular interest are land development and farming activities as both can potentially cause human-assisted movement of RIFA in suitable carrier material. Working in tandem with the biosecurity zones are prescribed procedures included in regulations to the *Act* which must be followed when moving or storing a fire ant carrier. Each movement has conditions commensurate with the relevant risks for the carrier of concern. Most carriers (for example hay, nursery products and turf) have specific movement and storage procedures to follow and if that is not possible, a biosecurity instrument permit (BIP) must be sought from an inspector. The exception is soil for which movement requires a BIP unless particular, less risky movements defined in the regulation are planned. In the latter case, the GBO must still be observed.

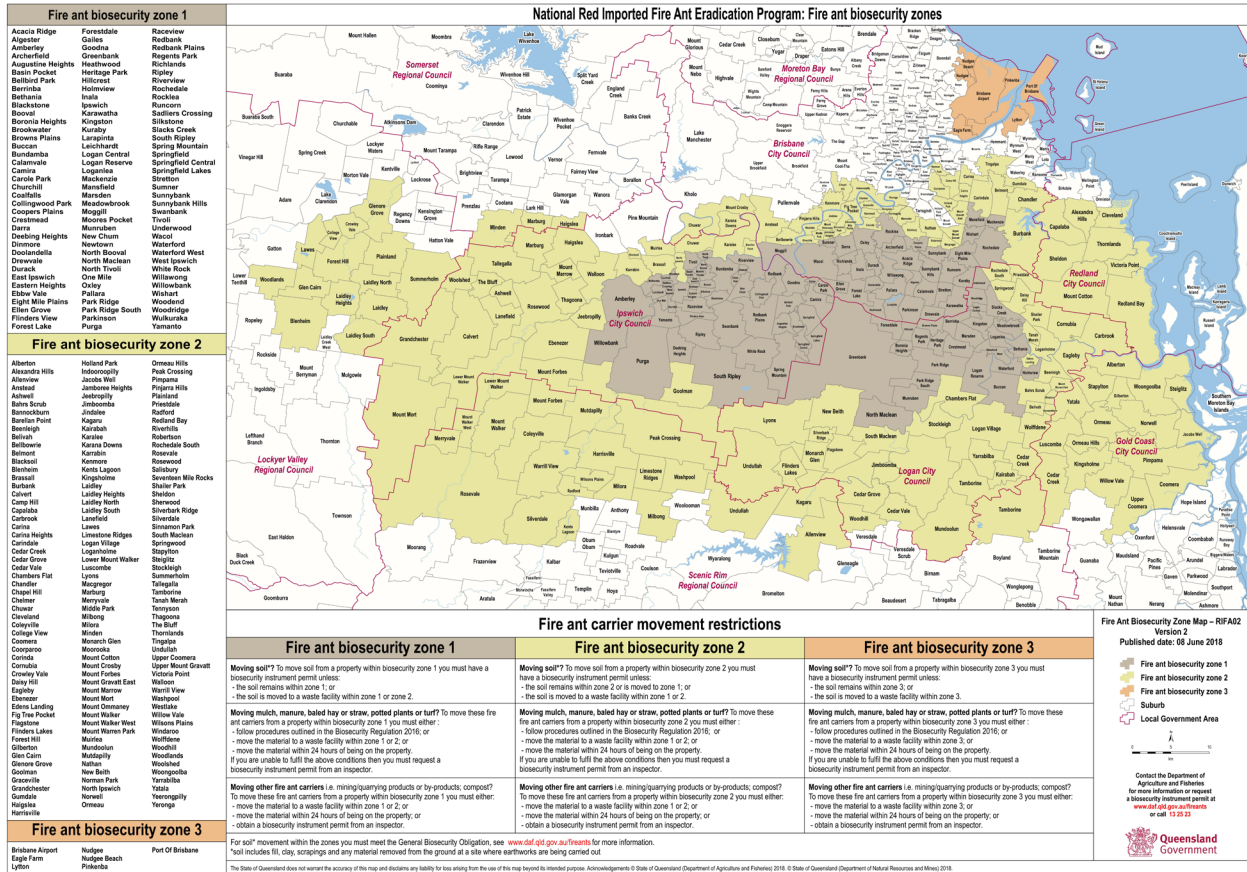
The Queensland Government gives emphasis to educating Queenslanders about biosecurity and encouraging voluntary compliance with the GBO. The *Act* includes provisions for penalty infringement notices as well as biosecurity orders should they be needed.

The 2017-18 NRIFAEP Annual Report (QDAF 2018a) identified a more assertive compliance posture as an area worthy of attention in future Program work plans. The legislated fire ant carrier movement controls and fire ant biosecurity zones will both be reviewed to ensure they continue to adequately address the risk of inadvertent transfer of RIFA and alignment with the current extent of infestation. In addition, two further compliance related areas are identified for future action. These include the pursuit of a harmonised approach to intra - and interstate risk mitigation measures to ensure consistent controls, messaging and enforcement; and incorporating fire ant risk management practices into development approvals.

At the time of writing, none of these projects had been completed despite at least some appearing to be needed with some urgency. For example, it is apparent that the biosecurity zones which are

used to define movement controls are misaligned with the risk of moving carrier materials and changes in the Operating Area. Similarly, there have been ongoing discussions between the States and Territories and the Commonwealth in relation to coherent interjurisdictional risk mitigation measures preventing RIFA in agricultural product movement across borders but it is understood these are yet to be successfully brought to conclusion.

Figure 5.1: Fire Ant Biosecurity Zones



Source: Program Information

5.2 General Biosecurity Obligation (GBO)

The GBO plays a critical role in the Ten Year Plan. Of particular significance is that the GBO, as it affects fire ant responsiveness, applies regardless of whether ants are present due to human-assisted movement or natural flight. That is, the responsibility for dealing with RIFA lies with the impacted individual, industry or the organisation of interest regardless of the source of infestation.

What is less clear to the impacted party is exactly what should be done, according to the GBO, following discovery of RIFA. In a paper brought to the August meeting of the NRIFAEP Steering Committee (NRIFAEP 2019), the options a landholder has to respond to RIFA are identified as including: (a) no immediate action; (b) purchase bait from a retail outlet and apply without notifying the Program; (c) advise the Program through the call centre and wait for treatment from Biosecurity Queensland. At the time the paper was prepared, landholders pursuing option (c) were advised not to self-manage and informed of the likely waitlist time for treatment to occur.

Of course, landholders are legally obliged to have regard to the GBO, and hence need to address the question as to which of the above options is ‘reasonable and practical’, will minimise risk or ‘minimise the risk of causing a biosecurity event’. The answer for many is most likely not readily

apparent and may vary depending upon the particular circumstances of the infestation and the timing and nature of the treatment program in the particular location. For example, it may be reasonable and practical for a landholder not in a current priority area for eradication to apply bait if RIFA are causing significant economic damage to crops or animals but if the costs to the landholder of such action exceed the benefits, the appropriate action is not so clear. Furthermore, taking action may be problematic if the benefits are temporary with reinfestation likely in the absence of landholders more broadly in the area taking coordinated action. Equally, some landholders in such circumstances may feel that responsive eradication is immediately needed due to safety related issues. There are many scenarios that may call for a spectrum of responses.

The diversity in landholder circumstances through the Operating Area has implications for the effectiveness of the Program. If landholders with fire ants present on their properties take no immediate action and happen to be located in an infested district, their choice may be of little significance. If, on the other hand, the affected landholders are in a priority area already cleared of RIFA, then the absence of immediate action could undermine progress, threaten the value of past investment and pose a significant problem for the Program. It is these situations where the Program needs to have effective arrangements, possibly including further regulations, and communication explaining more clearly the GBO requirements.

The direction the Program is currently taking has the potential to resolve the confusion over private and public responsibility for RIFA eradication and suppression. Until recently, the GBO, while uncertain itself in providing definitive guidance as to appropriate RIFA response, has charged landholders with a general responsibility to address the presence of RIFA. The Program, on the other hand, has been advising callers to hold off on treatment and wait for the Program to assist. These positions are clearly inconsistent.

More recently, however, the Program, with the support of the Ten Year Plan, has developed a RIFA self-management theme. The self-management element of the Program is a significant addition to Program capacity but is reserved for the purpose of suppression, not eradication treatment of RIFA.

What might emerge from these developments is clearer advice to the public that their RIFA responsibility is for suppression treatment but presumably this will be restricted to circumstances where it is practical and economic to do so (as the GBO appears to require) and can be undertaken in light of planned Program suppression treatment that will aid future eradication efforts. Eradication treatment, however would remain solely a Program responsibility as does responsive treatment dealing with public safety issues. There may be variations to this division of responsibilities but importantly the Program looks to be headed (and if it isn't, it should be) towards a clear articulation of public (Program) and private (industry and community) responsibilities. Any remaining doubts about what the GBO requires of those with RIFA infestation could be addressed in a code of practice under the Queensland Biosecurity legislation.

A further area concerning the GBO is the responsibility of landholders who by their actions create habitat attractive to RIFA. Such entities are what Magee's Independent Panel Report referred to as 'risk creating entities'. Their behaviour has the potential to create costs borne by the broader community as illustrated by two examples in Box 1.

Both examples are instructive in that they show that regulation by movement controls, while addressing carrier movement, fails to deal with RIFA movement from natural flight. More direct regulation of RIFA risk creating behaviour, in this case creating suitable habitat, is required. In both cases as well, there is the question of why wouldn't a risk creator voluntarily take action to remove fire ants. The answer may be a commercial risk of not being able to pass that cost on to a final consumer (i.e. a house-buyer or road user), particularly if all market participants are not required to treat RIFA.

Box 1: Illustrative Examples of Risk Creating Behaviour

1. A land developer clears six ha of forest and/or bush in peri-urban Brisbane to provide for suburban development and creates attractive habitat for RIFA. Not long thereafter, RIFA have flown to the site, never having been present in the area before. A year later, another land developer, in response to continued growth in housing demand, also clears land and RIFA also fly to this site. Both developers are compliant with movement controls but contact the Program requesting treatment to remove RIFA from their site which has become less attractive to potential house buyers. One of the developers had considered a treatment regime to remove RIFA but found it unattractive from an economic standpoint as his competitors would not incur this cost.
2. A contractor has been engaged by public authorities to establish 50 km of new highway linking the eastern side of the Operating Area to the west. The highway passes through RIFA infested areas before entering a zone eradicated from RIFA two years ago. The highway is built in several stages with the contractor meeting movement controls. However, clearing land has created attractive habitat and successive stages of the highway are all followed by RIFA flight and occupation. The presence of RIFA proves to be a workplace health and safety issue, resulting in requests to the Program for urgent treatment.

It could be argued that the GBO already requires land developers, roadbuilders and others creating suitable RIFA habitat to treat regularly and keep areas they are responsible for free from RIFA. However, the GBO is not clear in this regard and given the nature of the problem, there is a case for examining the inclusion of a specific regulation in the relevant legislation. Discussions with Program staff indicated two possibilities in this regard. The first would be to include treatment of fire ant risk as a condition of Development Approval under relevant Queensland legislation. The second would be to include adequate treatment as a requirement of regulation under the *Queensland Biosecurity Act 2014*, the *Act* governing fire ant and other biosecurity risks. These options need to be appraised but one advantage of the latter route may be for the regulation to have force until the land changes ownership rather than being focussed solely on the initial approval to proceed. Either way, the objective would be to internalise the cost of creating habitat conducive to RIFA infestation and thereby internalise the costs of control to those responsible.

5.3 Movement Controls and Biosecurity Zones

RIFA can be readily moved over long distances in carrier materials such as soil, hay, turf and nursery plants or can be transferred via machinery or other means (such as shipping containers). To combat RIFA movement in South East Queensland there is a system of movement controls and biosecurity zones regulated under the *Biosecurity Act* and aimed at preventing human-assisted spread of RIFA.

Within the fire ant biosecurity zones, the movement of most fire ant carriers is controlled from a place. For example, for hay/straw, potted plants, animal manures, mulch and turf, regulations under the *Act* prescribe treatment measures that must be followed prior to movement of the carrier

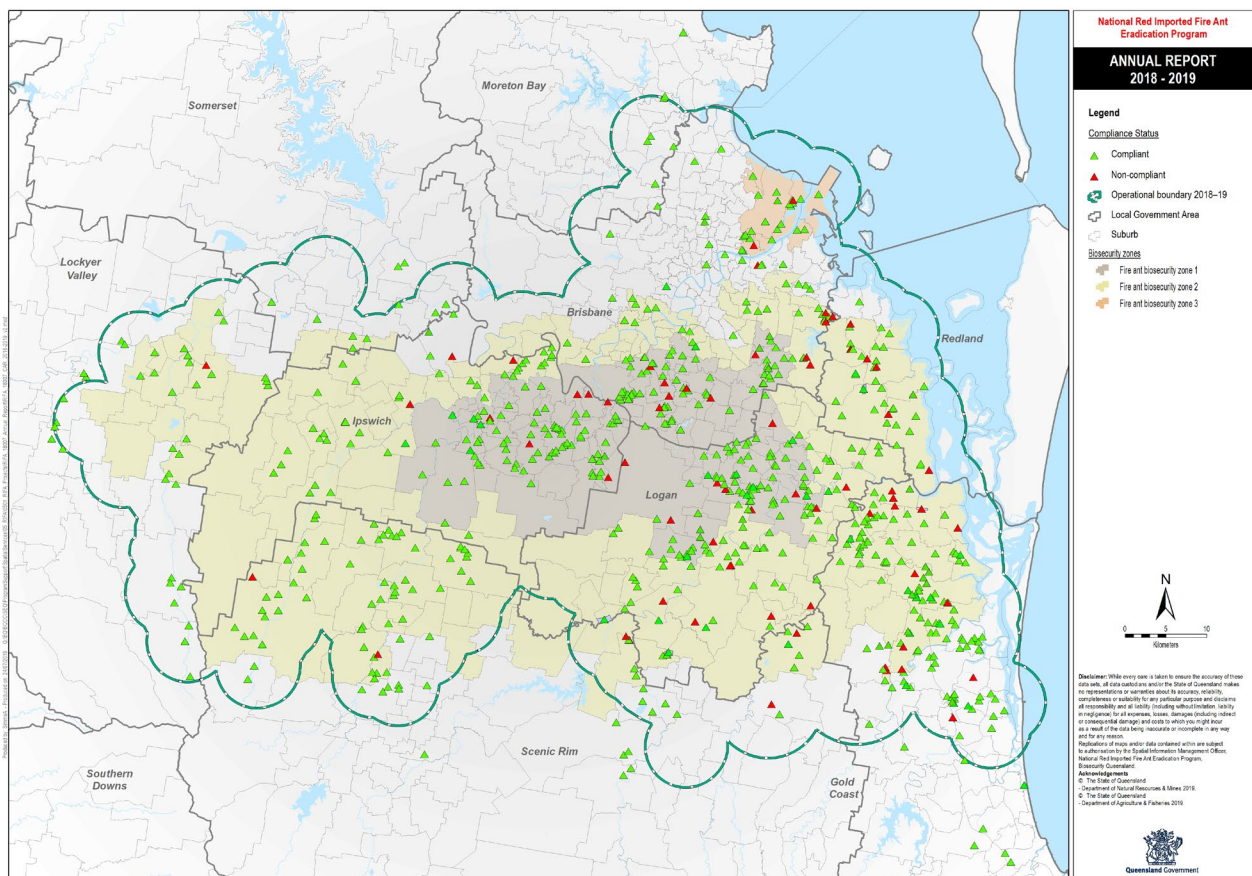
material from the place. The only alternative to following the requirements is to apply for a Biosecurity Instrument Permit (BIP), which when issued, will require that conditions relating to risk mitigation be complied with prior to movement.

For the movement of soil there is a different regulatory regime, also under the *Act*, but in many cases requiring a BIP. In Biosecurity zones 1 and 3, soil movement requires a BIP unless the soil remains within the zone of origin, in which case the movement must meet the requirements of the GBO. To move soil from a property in zone 2 a BIP is required unless the soil remains within zone 2 or is being moved to zone 1, in which case the GBO applies. Full details of the requirements are provided at www.business.qld.gov.au.

In 2018-19, the Program conducted 912 compliance checks concerning human-assisted movement throughout the Operating Area as shown in Figure 5.2. This represents a marked increase on the 534 checks completed in 2017-18 so there has been a scaling up of compliance activity. Some 116 or 13 per cent of checks in 2018-19 were BIP related.

Of the checks undertaken in 2018-19, eighty-two were non-compliant with required treatments and protocols for carrier materials. At nine per cent, non-compliance, while a small proportion of total checks, remains a significant issue (the corresponding figure for 2017-18 was six per cent). In response to what the Program regarded as serious non-compliance findings, six biosecurity orders were issued in 2018-19.

Figure 5.2: Compliance Checks – 2018-19



Source: Program Information

Many cases of non-compliance are not quickly resolved. According to Program information, around 30 per cent of these cases in 2018-19 could not be resolved within the one month the Program targets as the period for resolution. The main concern, while these cases remain

unresolved, is the ongoing biosecurity risk should businesses continue with non-compliant practices.

Reasons for non-compliance appear to vary by industry. In development related industries, the Program reports high levels of compliance amongst the more established operators but ongoing challenges in regard to small scale operators. There have also been clear cases where businesses are operating without a permit or were not complying with conditions of a permit. This problem would extend also to households who may not be aware of their obligations. Elsewhere, for example in the nursery industry, there has been concern over the required measures and the Program has worked with the industry to develop a self-assessment regulatory tool capable of assessing a range of regulatory options.

Since penalty infringement notices have only been available from 2018, many cases of non-compliance would not have been considered for such response. However, Program staff have suggested that most non-compliance is minor in that those failing to meet prescribed conditions or hold necessary permits usually do not present a significant risk to the Program. This attitude is not acceptable because RIFA can spread quickly and threaten the integrity of costly treatment efforts. In these circumstances, penalty infringement notices are a useful instrument and should be deployed to enforce the regulations and deter non-compliance. The Program may be moving in this direction as the Review was advised that at the end of the first week of November 2019, three notices had been finalised.

At the time of writing, there have been no prosecutions against offenders for non-compliance. This may be because Biosecurity Orders have been issued to ensure compliance and prevent biosecurity risk as required. Nevertheless, this Review supports using the full range of instruments available under the *Act* to maximise the likelihood of future compliance with movement controls and minimise human-assisted spread of RIFA.

A key issue is whether non-compliance with movement controls could result in the movement of RIFA beyond the Operating Area boundary. Depending on transport patterns, this could potentially extend well beyond the present distribution of RIFA to other parts of Queensland or possibly interstate, particularly across the New South Wales border but also including other States and Territories. In effect, the compliance system serves Australia-wide and therefore warrants close scrutiny.

Information presented in the 2017-18 NRIFAEP Annual Report, shows nine significant detections for the year, two of which (Beaudesert and Labrador) were attributed to likely movement (as opposed to likely flight) of RIFA (QDAF 2018a, p.13). Similar information made available by the Program for 2018-19 shows that significant detections at Bromelton/Gleneagle and Fernvale also had inbound carrier movement as did a number of other detections in the same year.

Program information also confirms that all detections made outside biosecurity zones in 2017-18 and 2018-19 were followed by compliance monitoring within the five days from notification protocol. Part of this follow up activity involves tracing whether human-assisted movement or natural flight is responsible for the movement outside the Operating Area. Unfortunately, while the follow up has occurred and inbound carrier movement has been identified, it is difficult to narrow down potential human-assisted movement to one particular source, as these sites can receive multiple carriers over time, sometimes from unknown sources. In addition, natural spread through flight cannot be ruled out as the source of new detections outside the Operating Area in many instances. The Program does conduct genetic testing to assist with their investigations but the techniques have not proven to be sufficiently powerful to reach definitive conclusions. This is so even for cases such as Fernvale where the nearest nest is reported as being 8.9 km away, further than the known flight of RIFA queens. However, the Program advises that there may be undiscovered nests that were the source of the Fernvale infestation.

Unlawful and human-assisted movements of RIFA beyond the Operating Area boundary look to be worthy of special attention as they have the potential to compromise the Program's objectives. Even though the currently available technologies have not been capable of unambiguously determining whether an infestation is human-assisted or due to natural flight, there is a case for considering more onerous regulation for carrier movements across the Operating Area boundary prior to them departing their point of origin. In particular, there may be merit in inspection of carrier materials prior to loading to be reasonably sure no carrier material containing RIFA is transported. The principal benefit of such regulation would be to contain the Operating Area which is arguably a particularly serious risk impacting on the feasibility of RIFA eradication. The costs of such regulation would also be significant, including the compliance officer time required and the impost on affected businesses. However, such costs may be small relative to the cost of eradicating over a larger Operating Area.

There is a case for the Program to recover the costs of compliance checks for movements of carrier materials across the Operating Area boundary. Because such movements have the potential for the introduction of such hazardous risk (i.e. expansion of the infestation and the Operating Area), those creating the risk should bear the cost of their actions. This could be achieved through a levy imposed on intended movements paid at the time of BIP application. A similar regime could be considered for the interstate movement of carrier materials. Both measures warrant further examination.

5.4 Compliance Capacity, Targeting and Awareness

The Magee Independent Panel report recommended an additional five compliance officers for the Ten Year Plan in light of the fully utilised staff capacity in earlier RIFA programs and an expanded Operating Area. The Compliance team was assigned 13 full time staff. Currently, there are six (under the establishment this should be 11) compliance/senior compliance officers as well as a team co-ordinator and a Principal Compliance Officer providing strategic oversight. Five vacant positions are currently advertised and management hope to fill these positions with contract staff over a six month period.

Risk profiles across a range of industries were developed at the beginning of 2018-19 and took into account both carrier risk and operator risk, with risk scores assigned to all known industries. This profiling formed the basis for Program compliance activity over the year and resulted in several industries, including civil construction, builders, earthmoving and haulage companies, landscaping supply yards, nurseries, and haymaking being targeted. There is always going to be fluctuations in size of some industries, especially those made up of large numbers of small-scale operators (for example, haymaking, earthmovers and builders) as these operators enter and leave production in response to changes in relative prices or perceived opportunity. Despite this, programs of compliance activity must have a firm and objective basis and aim to detect those movements most at risk of spreading the pest. The number of businesses assessed must also be drawn from a sufficiently large sample, so that results are representative as opposed to indicative. Compliance resourcing must be such that these levels of assessment can be achieved.

Program compliance officers put significant effort into discussing RIFA risk mitigation measures with businesses to assist their compliance with movement control requirements. Generally, this is done while officers are on-site inspecting and conducting compliance assessment. While a worthwhile activity, awareness raising is best undertaken using public fora and staff especially skilled for this purpose. This would leave Compliance officers to focus on what they can best contribute, that is compliance with legislative requirements.

Compliance officers, like their treatment and surveillance counterparts, conduct much of their work in the field using hard copy forms involving manual and time intensive data entry. Against this background, a mobile computing solution that enables officers to enter data using partly prepopulated electronic forms with drop down menus would increase efficiency and enhance

consistency of responses in systems such as the Fire Ant Management System (FAMS) in real time. Several compliance related enhancements to FAMS have been identified, including changes to reporting capabilities but are yet to be progressed. Consequently, compliance staff rely on 'workarounds' with limited functionality which have proven difficult to maintain. These issues are addressed further in Section 7.

6. Program Efficiency

For an eradication program, efficiency means achieving the complete removal of RIFA from the landscape at the lowest possible cost. Unavoidably, the cost will be significant even if every element of the Program could not have been done at lower unit cost. This is because the two most significant inputs to the Program, treatment and surveillance, need continuous repetition over 10 years to be confident that eradication of not only the first 90 per cent of RIFA are eliminated but the remaining 10 per cent are also removed. Failure to eradicate the last vestiges of RIFA, as has happened before, inevitably results in the problem returning.

The search for opportunities to increase efficiency is ongoing throughout the life of the Program. The Ten Year Plan has recognised that practices may change as new technologies such as remote sensing, better baits and more powerful information systems become available. In addition, the early years of the Program provide critical feedback to managers about what works best in alternative circumstances, thereby opening new pathways to both improved Program efficiency and effectiveness.

There is also further impetus for efficiencies in the case of the Ten Year Plan. In particular, early in the life of the Program, the task became significantly larger than expected with the addition of the Western Boundary to the Operating Area. At nearly 80 000 ha and requiring multiple rounds of treatment and surveillance, the Western Boundary significantly increased the Operating Area. In response the NRIFAEP Steering Committee opted to bring forward \$36.5m from later years in the Program to give priority to this area early in the Program. This is equivalent to nearly \$500 per hectare after allowing for an additional \$2.6m carried over from earlier years and made available for the Western Boundary area.

6.1 Potential Areas for Efficiency Gains

At the time of bringing forward funds to treat the Western Boundary and therefore reducing funds available in later years of the Program, some possible sources of efficiency gains were canvassed in the draft Addendum to the Ten Year Plan outlined in section 2.3. Two suggestions identified at the time included more targeted treatment of RIFA made possible by remote sensing capability and the introduction of a self-management element to the Program. Both are discussed below. In addition, several other potential areas for efficiency gains are discussed. These include more efficient Program operations, less rounds of RIFA treatment than included in the Ten Year Plan and changes to the regulatory environment for RIFA that may bring lower Program costs than otherwise expected.

6.1.1 Program Operations

The inputs to Program operations in the field can be divided into two groups. First, there is aerial treatment, including the cost of bait and helicopter use. These are shown separately in Table 6.1 as the first and third most costly inputs to the Program respectively with reported bait costs covering both aerial and field treatment. Aerial treatment for the Western Boundary is accounted for separately in Table 6.1 as it includes the cost of bait as well as helicopter use in the one item. It is the fourth most significant input in 2018-19 Program expenditure.

With aerial costs accounting for a significant proportion of Program expenditure, any opportunity to lower this burden is of interest. One idea in this regard is skip-swath application of bait. This method of bait application has the potential to reduce the costs of both bait and helicopter flight time by baiting every second length of ground, thus reducing the area treated (QDAF 2018b). Using this method, RIFA must forage further for food. The method has been used with success in the USA but bait distribution there has been by ground based machinery rather than aerial methods and the target RIFA populations have been polygyne rather than the monogyne colonies prevalent in South East Queensland. Hence, the method needs to be appraised in the Australian context in a low risk suppression environment before being adopted more widely. Program staff are currently

considering whether trialling skip-swath is worthwhile but initial indications are that it is unlikely to be adopted in the foreseeable future.

Table 6.1: Program Expenditure ranked by Percentage of Total Actual Costs, 2018-19

Item	Cost ('000 \$)	% of Total Costs	Rank
Bait Usage	10 886 ^(a)	22.8	1
Field Operations	9 168	19.3	2
Aerial Application	6 249	13.1	3
Western Boundary Aerial	5 848 ^(b)	12.3	4
Admin, Accom & Depots	2 911	6.1	5
Operations and Planning	2 634	5.5	6
Comms and Compliance	2 378	5.0	7
Information Services	2 324	4.9	8
Scientific Services	1 903	4.0	9
Western Boundary Field	1 242 ^(b)	2.6	10
Policy & Directorate	1 235	2.6	11
Other	88	0.2	12
Total Costs	47 637 ^(c)	100.0 ^(d)	13

Notes: (a) Bait usage for all areas except Western Boundary; (b) Western Boundary aerial and field include bait expense; (c) Actual costs incurred; (d) Does not add exactly to 100% due to rounding.

Source: Program information

Second, there is field treatment of RIFA, and bait costs are also of interest here, not only from the perspective of lowering the cost of bait but also with respect to the cost of its distribution that is very labour intensive. One encouraging idea in this regard is the use of toxicant baits for responsive RIFA treatment instead of DNI with Fipronil. Like Fipronil, toxicants quickly kill RIFA but require much less labour per 100 nests destroyed. With a significant backlog of responsive treatment requests, toxicants could also help reduce waiting times of affected households.

Under current arrangements the Program acquires both aerial services and bait on a long term contract basis. The initial contract for bait expires in April 2021 while the contract for aerial services runs to November 2020.

At the time of writing, the Program was considering its future procurement arrangements for both bait and aerial service inputs. Tender arrangements will be examined in 2020 with a view to assessing whether product and service requirements can be met at lower cost. Presently, the Program acquires bait in 25kg bags due to storage requirements. Bulk purchase may be an option worthy of examination if suitable storage can be arranged.

Given the Program's scale of bait usage, interest in future tenders may attract local as well as wider national and international interest. In the first instance, the Program intends to put its procurement process on QTenders ahead of an industry briefing early in 2020.

With a minor adjustment to responsive treatment procedures, the Program could achieve significant gains by combining RIFA inspection and treatment. Presently, landowners concerned about ant infestations can send a sample of ants they have discovered to the Program for identification or join a queue for Program staff to visit their property to confirm (or otherwise) the presence of RIFA. Using the latter route will see the Program respond with a property visit (the length of time depending on the backlog of requests) and in the event that RIFA are confirmed to be present, a second visit for treatment will be arranged. This appears to be an unnecessary duplication of effort as staff incur additional costs to revisit the property when one visit could have both identified and treated RIFA.

It is understood changes to remedy this duplication are presently in train. In particular, the Program plans to treat RIFA if found at the time of inspection. Program staff advise treatment will use mostly toxicant bait rather than DNI with Fipronil as has been past practice. Together these changes can be expected to enhance Program efficiency and labour productivity.

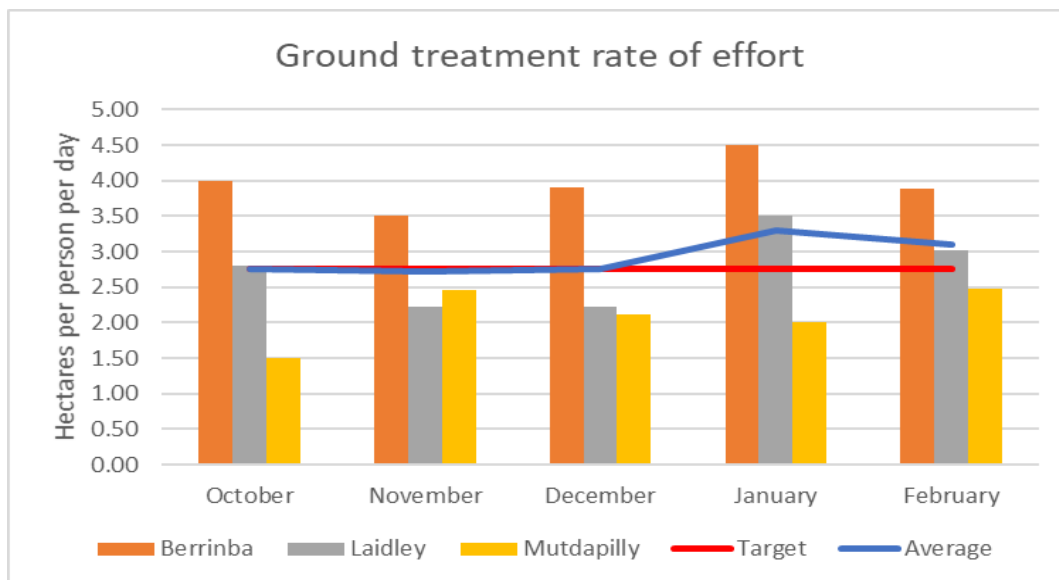
Labour productivity is generally important to the efficiency of Program operations. There are two key considerations worthy of examination. First is the manner in which Program field labour is employed because this determines the number of hours paid by the Program. Second, there is the issue of output per unit of labour, that is the amount of work field staff can safely complete after allowing for unexpected disruptions such as vehicle breakdowns.

The Program advised that field staff are paid by the hour and payment is made only for completed contracted work. With changing conditions such as rain or adverse temperatures affecting treatment, contractor hours can be varied accordingly. Decisions about treatment are made as early as possible on the day and there is a minimum payment should contractors arrive for work and are then sent home. During the minimum payment period (generally two hours), if conditions are not conducive to baiting, contractors are given meaningful work or undertake training.

There is flexibility in the size of the field workforce both in regard to daily requirements and seasonal demands which differ between treatment and surveillance periods of the year. The surveillance season (in the cooler months) sees fewer teams compared to the treatment season which extends from September to June.

Regarding how much work is completed by field staff, Figure 6.1 provides information for the number of hectares treated by contractors operating out of various Program depots. The targeted rate of 2.75 ha per worker per day is, on average, met or exceeded throughout the season, although there is significant variation in productivity between depots. Only one depot (Berrinba) exceeds the average throughout the season while at the other end of the spectrum, Mutdapilly has been unable to achieve the average performance.

Figure 6.1: Field Contractor Productivity



Source: Program information

There may be local factors explaining these variations in labour productivity between depots. These are worthy of investigation. The Program response has been to lower the expected rate of coverage from 3.0 to 2.5 ha per worker as the assumption used in treatment plans. This is below the average achieved in the past and looks to be an inappropriate response to adjusting expected performance levels.

By lowering the number of hectares covered by each worker from their average performance of 2.75 ha/day to 2.50 ha/day, the average team of 12 will complete three hectares less work per day or nearly 100 ha/month (the Program hires for both weekends and Monday-Friday). In order to complete the same total area in the same time as previously, the Program would need to acquire additional staff to make up the shortfall due to lower productivity. At 100 ha/month per team and 16 treatment teams in 2018-19 (Personal communication, Program staff), this translates to 1 600 ha per month in total to be made up or 640 additional field contractor days which is in the estimated range of \$75-150 000/month additional labour cost, depending on the contractor rate.

A significant issue behind the performance of field contractors is the basis for their remuneration by the Program. By paying field contractors on an hourly basis, their incentive is to work as many hours as possible with a view to maximising their remuneration. The problem from an efficiency perspective with this approach is that the payment incentive is geared to the input (hours worked) rather than hectares of treatment or surveillance completed (an output measure). If payment was for hectares completed, field contractors would have an incentive to complete as many hectares as possible, thereby raising labour productivity and helping the Program to complete treatment and surveillance plans on a more timely basis. The number of hectares completed by contractors is already collected by the Program in order to keep track of progress with the treatment or surveillance schedule. This information could be used to determine contractor payment.

An alternative approach to achieving increased efficiency in the use of contractors would be to seek competitive market tenders for areas designated by the Program for treatment or surveillance. Using this approach, interested labour hire firms could quote against specified job requirements with Program staff remaining responsible for organisation of teams and supervision of operations. This approach would enable Program officers to retain control over the quality of operations while harvesting the efficiency benefits of payment for outputs.

A further factor affecting the costs of operations will be the timeliness of planning treatment and surveillance activities. With good planning ahead of rolling out treatment and surveillance, adjustments can be made to operations often without incurring significant additional expense. Late plans however, tend to compromise efficiency as it is much more difficult to respond to inevitable unexpected developments and may frequently result in added Program costs.

Treatment and surveillance are the mainstays of Program activities and account for the majority of Program expenditure. Hence, the plans for treatment and surveillance must be available for Program budget planning purposes which in turn are organised around the financial year. Both surveillance and treatment do not align perfectly with the financial year but their respective starts in June and September should fit in reasonably well with the budget planning horizon.

Unfortunately, the Program appears to have a mixed record for completing key plans. In Table 6.2, approval dates for major Program documents are provided. Only in 2019-20 have the Work Plan, Treatment Plan and Surveillance Plan all been approved close to the start of the year, although in this year too, there remains scope for improvement. The 2019-20 Budget was approved conditionally by the Steering Committee in early October.

Table 6.2 Approval Dates for Key Program Planning Documents

Year	Work Plan	Treatment Plan	Surveillance Plan	Budget
2017-18	November 2017	August 2017	Not Prepared ^(a)	NA ^(b)
2018-19	December 2018	December 2018	Not Prepared ^(a)	NA ^(b)
2019-20	August 2019	September 2019	July 2019	October 2019 ^(c)

Notes: (a) Staff advised no surveillance plan in that year. (b) No record of approval could be found by the Program. (c) Conditionally approved by Steering Committee.

Source: Program information

6.1.2 Improved Targeting of Treatment and Reduced Surveillance Costs

The Program’s project to develop a remote sensing solution to RIFA detection with improved accuracy is behind schedule but is now well advanced. If successful in its final stages of development this year, the new remote sensing capacity will be deployed in 2020-21 and could potentially yield significant benefits. The principal benefit is that remote sensing could enable the Program to move away from their ‘brute force’, blanket coverage of priority areas towards a much more selective treatment regime focussing on where RIFA have been found to be present.

Just what landscapes the remote sensing will cover effectively is not known at this stage. This is an important issue because if the technology can achieve the target 50 per cent accuracy in rural settings, it does not mean the same accuracy will be achieved in peri-urban or urban areas. Hence, the proportion of the total Operating Area suitable for remote sensing and the likely accuracy is yet to be determined and will most likely emerge from the research and trials currently underway.

In areas where remote sensing does prove to be suitable for targeting RIFA, the benefits will be twofold. First, there will be a surveillance benefit for those areas where remote sensing is conducted instead of ground surveillance. From Table 6.3 below, this benefit is estimated to be around \$235 per hectare. Hence, for 1000 ha that would otherwise require ground surveillance and assuming cost relativities remain as outlined in Table 6.3, remote sensing saves around \$0.24m. Second, there is a significant treatment benefit since remote sensing could reduce significantly the area requiring treatment. Depending on how treatment was to be done, the cost saving would be in the range of \$69 to \$260 per hectare for those areas no longer needing treatment (see Table 6.3) multiplied by the number of treatments that are avoided. For each 1000 ha that would have been treated in the absence of remote sensing the benefit would be in the range of \$69 000 to \$260 000 times six recommended treatments which yields a total estimated saving of \$414 000 to \$1.56m.

Table 6.3: Treatment and Surveillance Costs, 2019

Treatment	Unit	Cost
Ground	Hectares	\$260
All-Terrain Vehicle	Hectares	\$158
Aerial	Hectares	\$69
Direct Nest Injection	Nest	\$36
Surveillance		
Remote Sensing	Hectares	\$72
Ground	Hectares	\$307

Source: Program information, and Remote sensing cost from Keith, Jennings and Spring (2013)

In any individual year the potential surveillance and treatment savings from using remote sensing compared to more expensive alternatives could be very significant. However, whether these savings would be realised is unclear. In the calculations above the savings identified are derived from comparisons between current practices and those that would be adopted with the availability of remote sensing. While relevant, this is not the appropriate comparison to make to derive the savings to the budget attributable to remote sensing in the context of the Program. This is because the \$411m Program budget already has remote sensing built into the funding profile and the treatments included are based on remote sensing coming into play after the first two years. In effect, the benefits of remote sensing are already contained in the base case for comparison, although they may be understated in the event that remote sensing accuracy proves to be better than the 50 per cent expected.

To make the point another way, the implications of not seeing active remote sensing may be quite profound for it would mean that the Program will overspend its budget if it continues with ‘brute force’ blanket treatment. That, it seems, is what has happened in 2018-19 in those areas that were treated but the Program’s inability to complete the Western Boundary treatment has meant a net

underspend overall. Therefore, it is very important to the Program that remote sensing achieves the expected level of accuracy in as many landscapes, urban and rural, as possible.

6.1.3 Reduced Treatments

The Ten Year Plan makes clear that six rounds of treatment are optimal for RIFA eradication. Providing bait is correctly applied, six rounds yields a 99.994 per cent efficacy rate and is regarded as the optimal treatment regime. Average efficacy falls by small decrements to 99.840 and 99.968 per cent for four and five rounds of bait respectively.

Whether or not the Program retains six rounds of bait treatment in the future is at this stage not clear. The 2019-20 Work Plan presented to the August 2019 Steering Committee advised that ‘In 2019-20, eradication treatment will continue in Area 1 and the Western Boundary area. Area 1 will receive one more treatment and the Western Boundary area will receive up to three more treatments. It is anticipated that this will complete the treatment of Area 1 and the Western Boundary area.’ Since then, Program staff have confirmed that this would mean four to five rounds of eradication treatment in Area 1 and the Western Boundary by the end of the 2019-20 season.

Given the financial challenges facing the Program following the transfer of \$36.5m from later to earlier years of the Program for the Western Boundary, a reduction in the number of eradication treatment rounds may represent an opportunity for significant savings. For example, in Area 1 which is nearly 88 000 ha, a reduction in one round of treatment would see an estimated \$6.4m saving (at an aerial baiting cost and average ground treatment cost of \$69 per ha and \$209 per ha respectively). A further two round reduction in the Western Boundary would yield an estimated saving of \$11.3m. Together, these savings represent nearly half the sum necessary to fully offset the funding brought forward for the Western Boundary. Further, possibly more significant savings may be achievable in Priority Areas 2-4 given that they are a larger area in aggregate than Area 1 and the Western Boundary, although significant sections are urban and peri-urban which may complicate the situation.

Notwithstanding the sizeable savings possibly on offer from reducing the number of treatments, a critical question is whether it has scientific merit. SAG has stated (most recently at its February 2019 meeting) it unanimously supports six rounds of treatment. The issue was further considered at SAG’s most recent meeting held on 29-31 October 2019 but the Minutes from that meeting were not completed in the final weeks of this Review.

There is some evidence to assist a discussion of the relevant issues. In a paper published nine years ago, McNaught, Jennings and Wylie (2010) reported the results of monitoring 70 treated RIFA sites which were subjected to alternative treatment regimes. On all 70 sites, RIFA were totally removed but the number of treatments and the time taken to achieve zero RIFA presence both varied considerably. The authors note for sites that were broadcast baited, an average of 3.3-4.3 treatment rounds over 8.5-11.0 months proved necessary before RIFA were totally absent. However, some sites required many more rounds before RIFA were removed. This variation in efficacy rates, according to McNaught et al.(2010), is due to several factors, including weather, timing between treatments and application methods.

From the available evidence, this Review remains to be convinced that four or five rounds of bait treatment is sufficient to eradicate RIFA. Program management and the SAG may wish to consider an alternative that brings a risk management approach to the proposal. That is, to only consider fewer rounds of treatment in Areas 2-4 and, in those areas, to do so away from the Operating Area boundary. The principal advantage of this approach would be to not introduce fewer treatments in areas where failure of the strategy would potentially jeopardise the integrity of the campaign to date as well as risk growth in the Operating Area. A further consideration is to what extent remote sensing (assuming it is operational with acceptable accuracy) would be needed to confirm eradication in areas receiving fewer treatments. It is unclear how many flyovers would be needed

to confirm eradication, with a remote sensing detection rate of 50 per cent. At \$72 per ha (2013 estimate) and possibly requiring multiple passes, remote sensing to validate the removal of RIFA would incur a significant cost to be factored into expected savings.

6.1.4 Self-Management

The Ten Year Plan identified the significance of 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. The Agriculture Ministers' Forum noted and the Ten Year Plan mentions that the Steering Committee will oversee further work exploring alternative funding models, including contributions from private beneficiaries as well as risk creators and mitigators. Prior to the Ten Year Plan and the Agriculture Ministers' Forum, the Magee Independent Panel Report had called for further consideration of funding options with a view to a more appropriate balance between risk creators and risk beneficiaries.

While not pretending to be a comprehensive response to calls for a shared funding framework, the Program has developed a Self-management Action Plan focussed at this stage on suppression and surveillance of RIFA (NRIFAEP 2019). Self-management is seen by the Program to benefit in four respects, including the community bearing some proportion of the costs of eradicating RIFA; possibly bringing forward the target eradication date; increasing community confidence in the Ten Year Plan; and enhancing the overall chance of success of the Program. Self-management is an opportunity to increase the resources focussed on RIFA treatment as it harnesses the interest of the community and thereby expands the pool of labour available to assist the Program. Fewer Program resources will be necessary for suppression treatment as a result of self-management and affected landowners will be able to address RIFA problems earlier instead of waiting for Program suppression assistance or possibly longer when the area of interest becomes part of a new eradication treatment area.

There are four principal areas of self-management under development. These include intensive self-management, community self-management, rural self-management and an industry focused management theme. The intensive self-management element focuses on all households in a selected area (e.g. a suburb) self-treating RIFA. Community self-management is much the same as intensive self-management except that it does not necessarily involve as high a proportion of landholder participation. A pilot project is planned for 2020. It will invite landholders from a selected area to attend a community evening to learn how they can treat RIFA on their land. The Program expects that 20 to 30 per cent of landholders might be attracted to attend but this figure could increase significantly, in line with USA experience, if awareness raising media activities undertaken beforehand prove successful.

The extent of landholder interest in self-management will also depend on the expected cost of self-treatment. The main costs incurred by landholders would be the cost of bait and the cost of either their own time or what is paid to someone else to distribute the bait. One possibility is that the Program assists with the cost of bait but any such proposals would need to be fully evaluated.

To illustrate the significance of potential savings from self-management, a hypothetical community example is helpful. The Program has estimated that for 2000 interested landholders, bait costs would amount to an estimated \$60 000. If scaled up to 30 per cent of the 400 000 residences and commercial properties south of Brisbane not likely to be subject to aerial baiting, the cost would be an estimated \$3.6m. This cost is only for the bait and a bait shaker. If the Program were to service the 120 000 affected landowners, the cost would also need to include vehicle and travel costs by Program staff and the time taken to treat the property. This could be in the vicinity of \$50 per property which suggests an estimated total cost to the Program of \$9.6m. If, on the other hand, the Program bears the cost of bait, costs would be restricted to an estimated \$3.6m with remaining costs for distribution borne by the community, that is a \$6m saving to the Program.

The rural self-management program aims to assist farmers undertake self-management of RIFA. Infested rural properties are of particular concern as transport of farm produce can be accompanied with the risk of carrying the pest elsewhere. Farmers are well placed to assist in RIFA control as with some limited training, they would have the requisite skills and experience, as well as much of the equipment, to perform the required work.

Like the community program example above, rural self-management could also involve the free of charge supply of bait and farmers undertaking distribution on their properties. For the Program, this would mean a bait cost of around \$42 per ha. The area of land likely to be included in such an initiative needs to be further examined but could well include 10 000 ha and possibly much more. At that scale, Program costs would amount to an estimated \$0.4m which compares favourably with an estimated cost of \$1.6m if undertaken with an all-terrain-vehicle paid for by the Program.

At this stage, the rural component of self-management does not appear to have a broader community focus that would bring a landscape rather than individual property perspective. Unlike community self-management discussed above, there is no attempt at this stage to integrate individual farmer suppression of RIFA treatment with a view to achieving a wider local or district outcome covering multiple properties. One means of delivering suppression treatment independently of where farm property boundaries are located would be to engage community Landcare Groups in self-management. Landcare groups are well represented in rural Queensland with a number of groups throughout the Operating Area. These groups are familiar with undertaking projects to maximise the utility of land management initiatives, including pest control.

The third element of self-management is the focus on training of pest management technicians to assist any industry sector self-manage RIFA. The aim is to enable any industry (for example, land development, road construction, waste management and landscape services) to treat RIFA using employed personnel or contractors who are trained and accredited to use chemicals such as Fipronil for DNI or distribute bait as required. In addition, the Program is building the capacity of a technician industry by providing training that will enable endorsement to operate under the direction of the Program. The first such courses have already been completed.

Further details concerning how the Program plans to communicate, monitor and schedule the implementation of self-management are provided in NRIFAEP (2019). It is a significant development for the Program as it engages the broader community in RIFA treatment. While the initiative should see savings to the Program and is therefore likely to be cost effective, the gains in national efficiency may be limited as significant costs are transferred to the community and private sector. However, there may also be positive implications of self-management for national efficiency because increased suppression prior to eradication may be less costly than eradication alone. Also, it is possible the community and private sector can suppress more efficiently than the Program. These issues are not addressed any further in this Review.

6.1.5 Regulatory Environment

A key aspect of the operating environment for the Program that impacts on its efficiency is the system of regulations contained in the *Queensland Biosecurity Act 2014*. These include the various measures discussed in Section 5 of this report. In general terms, the *Act* seeks to minimise the biosecurity risk in Queensland and in the case of RIFA, it uses the GBO to galvanise action by land and property owners to address the risk of the pest causing widespread and diverse problems for a broad section of the community. To a significant extent, the Program has not recognised this GBO responsibility as it has only recently initiated development of a self-management element and signalled a future sharing of costs between the public and private sectors. This should lower costs for the Program but at least in part that will be achieved via an additional burden placed on the community and industry.

Regulations under the *Biosecurity Act* are central to keeping RIFA in as small an area as possible while the Program is implemented from 2017-18 to 2026-27. In particular, the biosecurity zones and the system of movement controls are there to minimise risk of inadvertent transport of RIFA which would result in a larger and more difficult eradication task. How well this challenge is met depends on whether the biosecurity zones and movement controls are well aligned with the risks as the distribution and density of RIFA change in response to natural and human-assisted movement.

The biosecurity zones are known to be outdated. The Program is nearing completion of the Western Boundary and Area 1 eradication treatment and the implications of what this and the present and likely future distribution of RIFA in Areas 2-4 mean for the biosecurity zones needs to be reviewed. Failure to achieve revised and relevant zones will mean that transport movement patterns are not geared to current risks and may raise the cost of eradication.

The movement controls are also due for review. Some aspects of their present design are known to be in need of revision. One example brought to the attention of this Review is the differential treatment of soil compared to other carrier products in that it is not controlled from the place of origin by prescribed measures but depends entirely on BIPs to regulate its movement.

The review of movement controls may be a suitable opportunity to look further at a new regulation discussed in Section 5 to avoid transfer of RIFA across the Operating Area Boundary and possibly interstate. Again, this needs to be done urgently so as to minimise what is a significant risk for the success of the Program. Both the reviews of biosecurity zones and movement controls should be undertaken independently with opportunities for engagement with key parties, including the regulator, business and the community.

An additional regulation that may assist with the containment of Program costs is action to address the costs imposed by risk creating entities as outlined in Section 5. The natural movement of RIFA to suitable habitat created by industries clearing land looks to be fuelling the movement of RIFA and creating additional Program and broader community costs. Internalising the costs of this problem to those responsible via suitable regulation requiring habitat created to be kept free of RIFA will ensure cleared land is not the springboard for ongoing infestation.

The Compliance area of the Program is now recruiting additional compliance officers which will enhance the capacity to identify and address high risk activities as well as to minimise non-compliance with movement controls and make use of, where appropriate, the recently available penalty infringement notices. Together, these actions should reduce Program costs by keeping RIFA confined for treatment in line with the west-east strategy.

Finally, if RIFA were to find their way across the border into New South Wales or into other States and Territories, the entire Program would need to be reviewed because the feasibility of eradication and the risk environment would have changed considerably. Unless RIFA migrate naturally out of the current Operating Area and continue their movement into New South Wales, the only means for this to occur is human-assisted movement. The magnitude of this risk will depend on the volume and pattern of vehicular journeys across the border and the extent carrier materials are the freight of interest. This is why the States and Territories must have protocols that provide a national system for transporting RIFA carriers. Discussions with officials indicate that a review of this nature was initiated but has not yet brought forward recommendations for consideration. This matter needs to be taken forward to the Agriculture Senior Officials Committee and then Agriculture Ministers' Forum with a view to early resolution.

6.2 Overview of Potential Program Efficiency Gains

From the discussion above it is clear there is a range of opportunities to enhance efficiency of the Program. More targeted and less rounds of treatment; operations that utilise lower cost treatment application methods, promote labour productivity and competitively source inputs; moves to a

public-private sector shared responsibility to manage RIFA; and regulatory review, reform and enforcement all have the potential to significantly reduce Program costs.

Whether these cost savings can be achieved without any diminution in the effectiveness of the Program is critically important. There would be little point in a less costly Program if it comes at the price of eradication failure. The area of most concern in this regard is fewer treatment rounds. There needs to be a high level of confidence in the integrity of this strategy because, if it fails, residual RIFA will prosper accordingly. The outcome would be much like a delimitation failure as areas thought to be clear once again required a program of treatment. However, the opportunity is too attractive not to warrant close consideration and careful sifting through the evidence and issues as well as considering introduction of the proposal in less risky environments.

Some savings depend on the success or otherwise of technology currently under development. In particular, the new variant of remote sensing for the Program is entering its final stages of development. Depending on the final outcome, the Program may be able to move away from the more expensive 'brute force', blanket coverage adopted so far and instead be much more clinical and strategic about which parts of the Operating Area require more targeted treatment. If all goes well, significant savings compared to what treatment has cost per hectare in Area 1 and the Western Boundary should be realised. However, the benefits, while real, will not do much to help offset the budgetary issues surrounding the bringing forward of \$36.5m of Program Funds outlined in the Ten Year Plan Addendum. This is because the Program funding profile already has remote sensing, including its various benefits and costs, included in the \$411m funding envelope.

Program operations now have the benefit of many years' experience to learn from. What works well can be more widely adopted and what hasn't worked so well can be dropped. There appear to be opportunities to improve labour productivity, both across the spectrum of locations and activities as well as for particular groups who lag behind the performance of their counterparts elsewhere. At the same time the Program can lift its performance by having operational plans completed, approved and in place earlier than what has been achieved in the past. Some improvement in this regard is already apparent. These changes, together with the adoption of any opportunities to lower the cost of bait and aerial services could potentially yield material reductions in Program costs as well as higher productivity.

Self-management is an early but significant step towards ramping up Program capability. If successful, it brings into play a new pool of labour which adds to existing Program resources. It will mean that the Program can use resources that would otherwise be deployed for what is to be covered by self-management for other purposes which should make possible a higher level of achievement. Net savings in Program costs could be significant.

The results and implications of future regulatory review identified here cannot be quantified at this stage but there is enough already known to be confident that continuous improvement is needed. Program effectiveness is likely to be promoted and efficiencies will follow confinement of RIFA made possible by new and improved regulation.

Overall, the Program and its Steering Committee have a lengthy agenda to consider. The next 12-18 months will prove critical as the Program enters its third year. Many of the potential efficiencies discussed here require further analysis and pending the outcome of future work, the benefits could be substantial and sufficient to address any shortfalls in the budget due to the Western Boundary addition.

7. Communications, Engagement and Information Systems

Two way communication and engagement between the Program and the public is an important element of the Ten Year Plan. The Program has diverse information to distribute as well as interaction it seeks with stakeholders and the broader community. Similarly, the public has much to tell the Program about RIFA infestation and impacts of the Program and can assist with surveillance of the effectiveness of both eradication and suppression treatments. The main methods the Program uses to communicate and engage target audiences and their effectiveness are outlined below. Particular attention is given to current Program thinking about future communication plans.

As well as communications and engagement, the information systems the Program relies on are critical to effective management. There is a vast array of data concerning the distribution of RIFA, planned and responsive treatment priorities and surveillance requiring analysis as well as scientific, planning, governance, communication, compliance and business systems to support. In addition, stakeholder interaction requires systems that are accessible, both in terms of user friendliness and availability. This area has proved challenging for the Program. Information systems are no longer solely office based with mobile hardware and applications changing significantly what staff can do in the field in real time as they interact with other systems either in their own organisation and/or possibly elsewhere. They are central to the productivity of the Program.

7.1 Communications and Engagement

The role of the Communications and Engagement team is multifaceted. Key responsibilities include raising awareness of the Program, educating the public about RIFA and keeping stakeholders informed of planned and current treatments and surveillance as well as their obligations through the GBO and regulations under the *Act* such as movement controls and biosecurity zones which may change over the life of the Program. Furthermore, communication plays a vital role in assisting public debate of issues by debunking myths, allaying misconceptions and grounding discussion around an evidence base. The team also engages directly with stakeholders impacted by the Program and who are critical to its success, including local government, industry and the wider public. In the digital environment we all now live in, there are high community expectations concerning ready access to Program information and interactive experiences that are made possible by sophisticated, relatively low cost software developed for an endless range of applications.

The Program has a range of communication devices it employs to make contact with and hear from stakeholders. The client and stakeholder engagement solution (CaSES) is a customer relationship management (CRM) system used to manage customer interactions. Like other CRMs, CaSES is intended to give the Program a complete view of an individual customer's experience of the Program. It is also used as a portal to receive much of what the public wish to bring to the attention of the Program, including RIFA identifications and is able to convey related follow-up action. CaSES is also used as a platform for booking on-line training and has proved very useful for notification about Program activities as well as direct conversation on wide ranging topics of interest. Nevertheless, stakeholder feedback has suggested several improvements that may aid functionality and a number of these are being embraced in module redesign.

To a significant extent, the Program relies on print, social and radio media to pick up on releases it makes via media statements, fact sheets, updates, e-mail, SMS and podcasts. Advertising is generally not used due to its prohibitive cost. There is virtually no limit to the issues to cover. Topics extend from the Program's strategy to treatment and surveillance seasons, ant behaviour, first aid in the event of stings, controls and compliance, the role of detection dogs and maintaining the integrity of the Operational Area boundary. Some media products, such as fact sheets, that the Program relies on to communicate as widely as possible are very suitable for posting but are not

included on the website. This deficiency needs to be rectified as messages are failing to reach some of the potential audience.

It is not always necessary for media products to have a spokesperson as often they can be accessed by various means and can include digital addresses for those in the audience wanting further information. However, on occasions, particularly for media releases and in circumstances where the facts on progress or the extent of the problem are contested, there is a need for authoritative advice to be available to address any issues in question. Where and when this responsibility should fall to the Program or the Steering Committee is worthy of clarification so that the Program's communication resources can be used to best effect.

The Program is best placed to communicate on its ongoing operations. Much of the material of interest (for example, treatment and surveillance dates, Program resources, movement controls and details about baits and aerial operations) will not require a spokesperson as the messages are straightforward and of a factual nature. Some messages, however, concern explanations of Program data or tactical responses by the Program to changes in the operating environment. These are best provided by the Program. Other messages may be more strategic. For example, the Program entering a new phase such as the introduction of self-management or how it is responding to funding and resourcing constraints are questions the Steering Committee is best placed to address.

In August 2019, in a presentation to the Steering Committee, the Program suggested that the overarching key message should be 'Our fire ant eradication plan is delivering'. Unfortunately, for many this is a difficult message to accept as the nature of the strategy requires many of those affected by RIFA to wait years before they can expect eradication in their local area. It would appear, therefore, that the message may need breaking down into more identifiable milestones of progress such as what is happening in and around towns in Area 1 where real progress is apparent. Accompanying this positive advice could be the timetable for future expected progress with eradication.

The introduction of self-management may be an important opportunity to renew the main communication themes underlying the Program. For the first time, RIFA management is to be presented as a shared public-private responsibility. Given landholder responsibilities under the *Act*, this seems to be an accurate reflection of what governments are doing to achieve eradication at the same time as the community meet their GBO. It is, however, a quite complicated message to deliver, particularly when self-management is to be used for suppression only in the first instance. The implication appears to be that the Program will be focussing on eradication and, to the extent it aids future eradication, will also be suppressing RIFA in priority areas. If the landowner, in the meantime, has a business need or a lifestyle preference that requires suppression or the GBO demands immediate action, self-management is the course to pursue.

The message as presented above is not, of course in an acceptable marketing form. However, it provides a first step of what it is the Program might be trying to communicate in the years ahead.

There is an ongoing challenge to shape key messages to the Program's target audiences. During the conduct of this Review it was apparent there may not always be broad understanding of the west to east strategy and what can be done before particular locations are to be treated for eradication. The situation may, however, be changing with the west to east strategy appearing more often in Program media products.

Many stakeholders will turn to the Program's website as a source of information for much of what they want to know. The site, located at

<https://www.daf.qld.gov.au/business-priorities/biosecurity/invasive-plants-animals/ants/fire-ants>, contains comprehensive information about the Program but lacks the experience many visitors might be seeking. In particular, a more interactive engagement with visitors to the site may prove

useful as they interrogate spatial data and maps that could be posted to aid understanding of how the problem has changed over time and how it is expected to look in the future. Furthermore, the website could include a chat line facility for stakeholders to raise issues and for the Program to provide advice. Posted frequently asked questions and answers would also assist as is the practice on many other websites. The Program does have access to a community consultation platform known as eHub which is being trialled within QDAF. Some of the suggested web site functionality may be provided by this facility.

As the Program is implemented, the content on the website needs to change to address new issues attracting stakeholder interest as well as developments in the Program and forward plans. Program staff advise a review of the Program's website is presently underway.

Presently, the website includes a tab for visitors to look into Steering Committee activities. This may not be the most appropriate arrangement as the Steering Committee is a national body and might be better served by a separate website reflecting a national focus. In a similar vein, Program badging is very much Queensland focussed and rarely is there indication of national partners owning and funding the Program other than for the word 'National' in the Program's title. While this reflects BQ administration of the Program, more should be done to recognise the involvement of the Commonwealth and all States and Territories in what is a nationally significant Program addressing a national biosecurity risk that happens to be located in Queensland.

In addition to the annual stakeholder forum (last held in August 2019), there is ongoing engagement with industry and community groups as issues arise during the course of the Program. Most recently, in July 2019, the Program hosted a Workshop to engage the building and development industry where there was a two way exchange concerning shared responsibilities and latest developments regarding compliance obligations. The industry, for its part, provided feedback to the Program, particularly in regard to their communication needs and what it could do to assist progress. Other engagements with industry have included the development of a risk management tool to help the nursery industry identify acceptable measures to meet movement controls and suitable chemical application in the turf industry to address the risk of RIFA transfer.

The Program is currently finalising a Strategic Communications and Engagement Plan for 2019-21. At this stage, it is envisaged it will cover factual information addressing treatment and surveillance schedules and significant detections; Program developments such as those concerning self-management and changes to the biosecurity zones; and what will be the main focus of Program activities in each of the Priority areas. In practice, the Communications and Engagement team relies on the detailed information made available by other Program areas. This is because much of what the team does is in a supporting role and depends on timely availability of other products such as treatment and surveillance plans.

7.2 Information Systems

At first glance, the IT systems used by the Program appear to be working well. In one sense, they are with existing systems exceeding their target of 95 per cent availability in 2018-19. However, this measure, while indicating that the Program has been able to make good use of what they have available, says little about the capability of the systems, nor, what improvements are needed to boost efficiency and effectiveness and how much progress has been made towards a more productive IT environment.

Before the commencement of the Ten Year Plan, there were significant concerns about the IT systems serving the Program prior to 2017-18. Deloitte (2013), in an efficiency audit of the Red Imported Fire Ant Eradication Program over 2009-13 undertaken for QDAF, raised concerns about the manual documentation of treatment and surveillance results and the double handling of paperwork practised at the time. Interest was expressed in automated data capture and upload with

a view to reducing the risk of transcription errors and recording inaccurate data as well as lower costs of information management.

Problems within the IT environment and suggested system enhancements were recognised in the Ten Year Plan published at the start of the new Program. A shortened version of the key points made at the time is provided below:

- improved capacity to extract operational data to aid decision making and accountability
- mobile functionality to enable real-time data capture and reporting
- improvements to spatial systems, including upgrades to data servers and automated mapping portals
- a Customer Relations Management information database, including seamless integration with other databases used by the National Program
- 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.

Shortly after commencement of the current Program, the Program's Risk Management Group (RMG) in May 2018 identified Program IT as an ongoing risk and even with resources allocated to develop the Program's systems rated the ongoing risk to be high.

The current configuration of IT includes two main systems, the Fire Ant Management System (FAMS) and the recently released client and stakeholder engagement solution (CaSES). Both systems have benefited from ongoing improvements including, for example, enhancements to the planning and job processing functions (QDAF 2019b). In addition, the CaSES system can now be used for email and SMS purposes to advise the community about impending Program activities and other notifications. These changes should all help to improve operational efficiency.

Notwithstanding the progress made, much remains to be done. Feedback from Program staff makes it clear that some system features, such as the reporting capabilities of FAMS as well as data access, are inadequate and have resulted in shadow systems being developed and used with their own limitations in respect of maintenance and functionality. Some proposed changes, such as those put forward by Compliance staff, have a history going back prior to the Ten Year Plan but are yet to be addressed.

An assessment of FAM's capabilities as a management tool warrants a high priority. While individual data records may be accessible, users have great difficulty interrogating data or obtaining summaries needed to aid decision making. In effect, FAMS is seen by Program management as a database and rather than being accessible by those wanting particular information, requires a third party specialist to produce a report. There would be significant advantages to management and the Program if FAMS can be made more accessible as an investigatory tool for those interested in analysing the data it contains.

Perhaps the most widely raised IT concern is the absence of a mobile solution to enable real-time data capture and reporting. Again, this proposal has quite a history. Most recently, the 2018-19 Work Plan set out to have treatment and surveillance undertaken by the Program recorded through a mobile, digital solution by the end of the year. Based on progress to date, Program management have advised they anticipate that the Proof of Concept (POC) project will be completed and the first version of the mobile platform and related application will be built and implemented this financial year. Real-time and full two way data exchange between the mobile digital solution and key systems such as FAMS is expected in the next eight to twelve months.

If current management expectations for the mobile solution can be realised, this will be a significant achievement for the Program. According to Program quarterly reports (QDAF 2019b),

the project has suffered in the past from insufficient resources being made available. For now, the Program continues to use an outmoded system and the general view appears to be that delivery of a mobile digital solution cannot come soon enough. A digital solution, once available, should enable field staff to capture and record relevant data electronically in the field. Paperwork in the field should no longer be necessary. Nor should re-entry of data in the office as presently is the case. This can all potentially be achieved without transcription errors and double handling of data at a significantly lower ongoing cost. Furthermore, the time liberated by more efficient data entry and capture should make productivity gains possible as field and office staff can achieve additional Program outcomes. In the case of field staff, for example, more time can be spent on treatment, surveillance and compliance and thereby assist the achievement of the Program's performance targets in these areas. Alternatively, Program targets might be realised with less labour and the consequential efficiency and productivity gains could be translated into budget savings.

The final point made in the Ten Year Plan on IT concerns system integration. Already, there has been some focus on integrating FAMS and CaSES and Program staff advise there are plans to integrate CaSES and the digital mobility solution when the latter is installed. There is also a bigger information systems agenda which goes to integration of Program systems with those elsewhere in BQ. After all, RIFA is one of many biosecurity issues receiving attention and there could be significant advantage to the Program and more broadly if data could be exchanged readily and inexpensively between BQ systems. For example, understanding farm property production could be useful when determining the timing of RIFA treatment as could the impact of the NRIFAEP on farm related activities. Further examination of these issues is beyond the scope of this Review.

The Program has a Business Systems and Intelligence unit taking responsibility for daily systems availability and development projects such as the Mobile digital solution POC and further development of FAMS and CaSES. The unit has six personnel on its establishment. Currently, there are recruitment actions in train for one vacant section position as well as the vacant team manager. Not having these positions filled has proven to be quite costly for the effectiveness of the Program as projects are delayed and staff make do with less productive platforms connected to out-of-date procedures and practices. There is a case for considering temporary external help to make faster progress. Whether this might come from elsewhere in BQ or other external sources is worthy of examination.

8. Program Governance

The Terms of Reference for this Review state there is no need to examine the Program’s procurement function and governance arrangements. However, recommendations from recent reviews undertaken for both areas are in scope for consideration. These include first, an internal audit report addressing the Program’s governance and operational planning (QDAF 2018c) and second, an internal audit report reviewing the Program’s procurement function (QDAF 2018d).

In order to take forward the recommendations of both the abovementioned reviews, the Program has prepared a Business Improvement Plan. The Plan is updated in response to Program business needs. The latest version presented to the August 2019 meeting of the Steering Committee, addresses the findings and recommendations of both audits. It is examined in section 8.1 below. Section 8.2 examines the role of the Steering Committee. It draws upon interviews of Steering Committee members regarding its operations and effectiveness as well as a review of the Steering Committee undertaken in early 2019. In section 8.3, the supporting committees for the Steering Committee, namely the Science Advisory Group (SAG) and Risk Management Group (RMG) are discussed.

8.1 Governance and Procurement Reforms

8.1.1 Governance and Operational Planning

A little over a year after the Program commenced in the latter half of 2017, QDAF initiated a review of governance and operational planning in the Program. The review was approved by the Department in March this year. In addition to operational planning, the review also considered the effectiveness of governance and organisational structures in overseeing delivery of the Program.

Table 8.1: Governance and Operational Planning Review Recommendations – 2018-19

	Recommendation	Priority
1	Strengthen strategic and operational planning	1
2	Enhance operational decision making arrangements	2
3	Define and strengthen monitoring and reporting arrangements	2
4	Conduct costs v benefits assessments of system needs	2
5	Review and develop Standard Operating Procedures for core Program activities	2
6	Review and confirm accountabilities and responsibilities for key functions	2

Source: QDAF 2018c

The priorities assigned to the recommendations by the 2018 review (see Table 8.1) are on a scale from 1 to 3 which also includes a further level of business process improvement. All recommendations are either Priority 1 or 2, which are defined respectively as a significant or moderate weakness which ‘exposes the agency to....a material or moderate extent.... in terms of achievement of corporate objectives, financial results or impairment of the agency’s reputation.’

Examination of the Business Improvement Plan indicates that notwithstanding their significance, the review’s recommendations have not had a rapid response, although more recently there appears to have been many initiatives put in train according to advice received from the Program. The discussion below provides some insight into work completed or currently underway.

Recommendation 1 was given the highest priority in the Internal Audit review. Strategic and operational planning is central to effective rollout of any program, particularly one as complex as the NRIFAEP that requires many inputs, co-ordination and monitoring as well as a capacity to adjust within budget constraints to unforeseen developments. It is already clear from the dates included in Table 6.2 that planning has improved for 2019-20, although the budget for the year was not approved (and then with conditions) until October.

The Business Improvement Plan identifies an intention to have a three year forward plan for the Program, thereby providing a link between annual plans and the Ten Year Plan and providing management with a device to adjust strategy in response to changes in the operating environment. These could be for a variety of reasons, including, for example, weather conditions, technology development (e.g. remote sensing) or a response to new compliance or regulatory arrangements. Initial work has been completed on forward annual planning charts that can be shared with staff which should help improved alignment of plans at section level with strategic decision making. However, at the time of writing, section plans for 2019-20 had not been completed.

Recommendation 2 was made to improve the quality, regularity and adherence to decision making. It provides for both an Operational Review Committee which meets monthly to focus on treatment outcomes against planned achievements and available budget as well as weekly management meetings structured formally with an agenda, actions arising and Minutes. A cycling agenda was proposed to ensure coverage of all business elements.

An Operational Review Committee known as the Planning Review Group and involving relevant managers is now in place. Their main focus in recent months has been on treatment planning and budget matters. Weekly management meetings have also recommenced and provide a basis for a weekly 'snapshot' made available to Program staff and the Steering Committee. Program management have advised that both initiatives are helping to keep key activities 'on track'. It was too early in the financial year for this Review to assess the impact.

Recommendation 3 concerns monitoring and reporting requirements. It was made with regard to both external reporting obligations as well as internal management needs to support informed decisions on the prioritisation and planning of activities. The former was addressed in some detail in Section 4 of this report. It was found that while some progress has been made this year, there remains much to be done before the Program has a set of performance indicators that will provide relevant information on whether eradication is being achieved.

In regard to monitoring information to aid management decision making, the Internal Audit report was critical of arrangements in place at the time. Management reports were seen as too infrequent, lacking in necessary detail, and not generated from standard reports easily accessible from FAMS. To some extent, these problems are now being addressed with a consultant currently working with the Program to identify a suitable list of performance indicators. The intention is to have weekly, monthly and quarterly reporting dashboards and to assign responsibility and accountability for data collection to ensure data availability. It is likely that at least some of what is needed is already collected for the 105 performance indicators populated for the 2018-19 Annual Report. Early resolution of these issues is critical to the integrity of the Program.

Recommendation 4 was brought forward to overcome concerns with system functionality by considering the adoption of alternative system solutions. At the time, FAMS was seen as inadequate for fieldwork needs and requiring excessive manual manipulation of data. Scheduling of field work using FAMS was seen as difficult and too much work needed to be performed outside the main system on separately prepared spreadsheets. A search of software used in similar circumstances elsewhere in BQ and externally was seen as the way forward before preparing an investment pathway to better meet future needs.

In recent months Program management has considered whether to retain FAMS and work to improve its functionality or opt to search, consider and possibly acquire alternative systems. A decision has been taken to retain and, where possible, continue to develop FAMS. The newly appointed manager (when the position is filled following current recruitment activity) will develop an investment 'roadmap' to further boost system functionality and productivity. In addition, the Program has made significant progress, as noted in Section 7, with a mobile digital solution to aid fieldwork which should raise productivity above levels achieved to date with the current system.

For a Program such as the NRIFAEP which is centred on the effectiveness of treatment and surveillance regimes, standard operating procedures (SOPs) are critical. Consistency in the Program is essential and can be challenging, particularly for a contract workforce with a high turnover. Program efficiency and workplace safety also depend on the widespread adoption of SOPs. Recommendation 5 calls for review and development of SOPs as they were seen to be in need of revision and updating on a regular basis.

In the absence of clearly established SOPs, the Internal Audit report suggests that the Program relies on induction, training and supervision to maintain required standards of treatment and other field activities. The Program has accepted, however, that SOP development work is required and has action in train or planned for SOPs covering treatment, surveillance, property entry and compliance enforcement. Managers responsible for each of these areas in the Program have been assigned the responsibility for the necessary work. Notwithstanding their plans, the SOPs are not scheduled for completion until February 2020, nearly 12 months after the audit was concluded.

Partly in response to the prior recommendations, the final recommendation of Internal Audit proposes a restructure of Program teams with a view to providing stronger support for key functions as well as improved transparency and co-ordination. The Business Improvement Plan does not appear to explain what the Program is doing in response to this recommendation. However, during the current Review, the Program advised of a new structure shown at Figure 2.5. As discussed, in Section 2, this Review sees significant advantages in the current proposal as it should provide for a stronger management framework while not having to introduce major structural changes to the team structure.

8.1.2 Procurement

In parallel with the Governance and Operational Planning review, Internal Audit also undertook a review of Program Procurement in late 2018. The motivation to look at procurement was that the Program engages in several high value contracts for program inputs, such as bait, and services, including those provided for aerial treatment and field contractor labour hire. Against this background, QDAF management initiated an internal audit review of the Program’s control environment for procurement and contract management.

The main findings of the Internal Audit Procurement review are presented in Table 8.2. The findings are either Priority 2 or 3, which are defined respectively as a moderate or minor weakness. A moderate weakness, is seen to expose the agency to a moderate extent in terms of achievement of corporate objectives, financial results or impairment of the agency’s reputation. A minor weakness, on the other hand, is not seen to seriously expose the agency to a material extent.

Table 8.2: Procurement Review Findings: 2018-19

Finding Number	Finding	Priority
1	Lack of adherence to Program purchasing controls	2
2	Corporate card usage not aligned with Program’s policy and procurement objective	2
3	Insufficient procurement and contract management planning, reporting, and oversight	3
4	Inconsistent adherence to contract management framework	3
5	Inadequate information management and record keeping	3

Source: QDAF 2018d

Finding 1 captures several breakdowns in the control environment, including expenditure exceeding approved orders, purchases without delegate authority, purchase order dates prior to approval dates and missing purchase order documentation. According to the Business Improvement Plan, actions underway to address these shortcomings include implementation of

internal control systems within the Business Services team to tighten the monitoring of procurement activities, purchase orders and record keeping processes as well as weekly reporting to managers on purchase orders and procurement related training for relevant staff. Program management advise this work is scheduled to be completed by December 2019 which means that weaknesses in the control environment may have continued for much of the year.

Corporate credit card use is widespread in the Program as it is in many government agencies. The control environment specifies conditions governing credit card use to minimise risk, avoid fraud and obtain the best value for money for purchased goods. Finding 2 found inconsistencies between credit card use and policy and procurement objectives. In particular, there were instances of excess credit card use relative to specified limits as well as reliance on credit cards when formal procurement may have been more appropriate. In response, the Business Improvement Plan lists several actions to address the findings. These include ongoing review of credit card holders with required training for relevant staff as well as monthly review of credit card expenditure.

Procuring inputs to the Program, particularly for RIFA treatment is a key activity. Procurement activity is overseen from within the Program by Business Support staff. Finding 3 raises several concerns. According to Internal Audit, there was no Program-wide procurement planning at the time of the audit. Nor was there periodic reporting in place for overall procurement and contract management activity or reporting for the contract life of individual procurements. A forward schedule of procurement activities was seen as appropriate as was identification of a contract management skillset as a resource to implement reviews, prepare contract management plans and oversee procurement processes.

In response, the Program has completed a high level procurement road map for the period September 2019 to December 2020 as well as a procurement pipeline aligned with the road map and QDAF's contract register. Procurement schedules are now to be considered by a Procurement Review Team and approved procurements included on a Procurement Register. The Program has also decided to develop a tracking tool to assist with end to end monitoring of procurement, contract management, compliance, performance and reporting. This work is yet to be completed.

The Program's contract management framework is the focus of attention in Finding 4 of Internal Audit. In particular, the Procurement review found that there is no complete and consolidated contract register and contracts greater than \$10 000 were frequently not listed on QTenders as required. Also, the review expressed concern over inconsistent contract management. Program management have responded to these findings, although not all of the actions taken meet the target dates put forward by Internal Audit. A more detailed contract register meeting contract disclosure requirements and synchronising with BQ's register is to be developed and is due for completion in December 2019. Processes to periodically assess contract management are also being established. While some progress has been made, this work is yet to be completed. The Program has completed a checklist for assessing whether contracts should be included on QTenders.

The last finding of the Procurement review concerns inadequate information management and record-keeping by the Program. Internal Audit found contract management information to be incomplete and a lack of access controls restricting who could see procurement and contract files. These issues are currently being addressed by the Program as part of reviewing their internal control environment. December 2019 is the targeted completion date for this work.

Across the two Internal Audit reviews on Governance and Operational Planning and Procurement, there are many findings and recommendations that were seen to require a response earlier this year. While some actions appear to be well advanced, many have substantial work yet to be completed. The Business Improvement Plan indicates that many completion dates are either late 2019 or, in some cases, carry over into 2020. The issues are significant and impact across much of the Program. They warrant continuing attention to ensure that reforms are brought to fruition. It would be helpful to audit Program governance, operational planning and procurement again around April

2020 in order to assess what progress has been made since 2018. In the period before then, there may be merit in seeking additional help, either from within QDAF or from elsewhere, to work with Program management and staff to finalise the recommended actions.

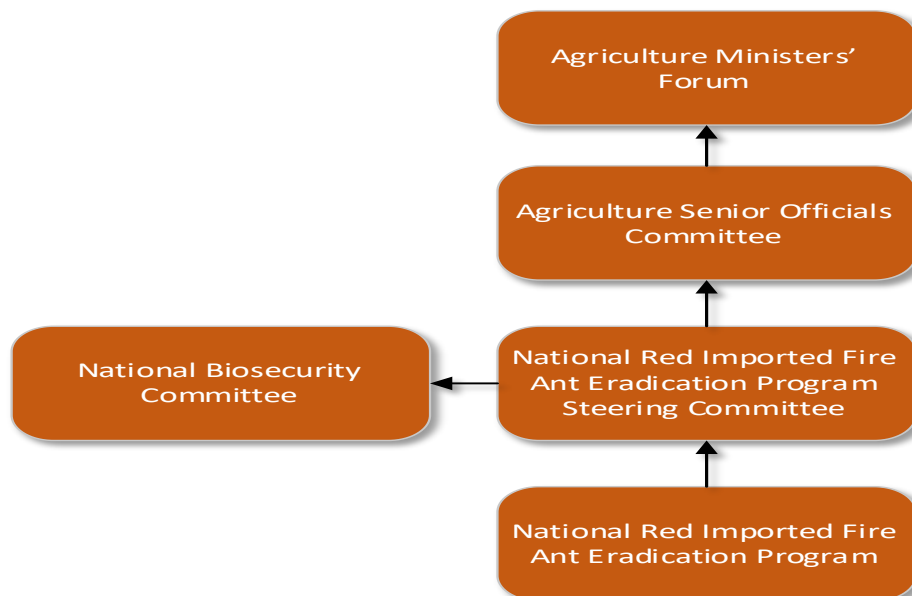
8.2 Role of the Steering Committee

8.2.1 Background

Given the national focus of the Ten Year Program, it is not surprising that the Agriculture Ministers' Forum chose to have a national Steering Committee overseeing its implementation. Under this arrangement it could be expected that all jurisdictions would have ownership of the Program, not only from a funding perspective but also in a strategic management sense. With a national Committee consisting of the funding partners and an Independent Chair, the members should be able to ensure that their respective accountability and transparency requirements are satisfied.

The Terms of Reference for the Steering Committee (at Attachment 3) require membership to be drawn from the Commonwealth and the States and Territories except for the Independent Chair (presently Dr Wendy Craik) who was nominated by the National Biosecurity Committee (NBC), a sub-committee of the Agriculture Senior Officials Committee (AGSOC). Membership is expertise based to ensure the required skills and knowledge for overseeing the Ten Year Program are readily available. As shown in Figure 8.1 below, the Steering Committee is accountable to the AGSOC to which it reports annually. The Independent Chair also provides reports to NBC for information and can also seek advice from NBC in the event that it is needed.

Figure 8.1: NRIFAEP Reporting and Accountability Structure



Source: QDAF 2017a

The Steering Committee is not involved at all with day to day delivery of the Program but does provide leadership and guidance to the Program's operational team. Nor does the Committee prepare detailed treatment, surveillance and operational work plans but it does approve the Ten Year Plan and any amendments as well as the annual work plan. In addition, the Steering Committee approves the annual budget for the Program and makes any needed adjustments and then monitors and evaluates actual against planned expenditure as well as Program risks and related mitigation strategies and performance against targets and milestones. The Steering Committee is also charged with the responsibility for reporting on progress of the Program and approves any national communication activities.

The Steering Committee plays a pivotal role not only with respect to Program oversight, leadership and guidance, but also in relation to activating the triggers in place to review the future of the Program. That is, should the risk profile of the Program become sufficiently problematic that realisation of the Program's objectives is no longer likely, the Steering Committee will review the Program. The Program will be discontinued if that is the course of action recommended unless AGSOC decides otherwise.

8.2.2 Steering Committee Performance and Challenges

As required by its Terms of Reference, the Steering Committee considered an internal review of its own operations in May 2019 for the period November 2017 to February 2019. The purpose of the review was to assess the Committee's effectiveness in supporting delivery of the NRIFAEP. Some of the key outputs include the Ten Year Plan and related work plans; budgets and annual and quarterly reports from November 2017; communication, compliance and information management strategies for the Program; protocols for self-treatment of RIFA; modifications to the Ten Year Plan to respond to significant RIFA detections to the west and outside the initial operational boundary; and the establishment of a Risk Management Sub Committee and a Scientific Advisory Group to provide it with appropriate advice on risks and scientific aspects of the Program.

At least as important as the abovementioned outputs of the Steering Committee is the oversight it provided as the Program transitioned from a legacy program with short term funding to a long term and larger scale commitment. Moreover, the inclusion of the Western Boundary was a very significant decision as it was central to delimitation in 2018 and avoided jeopardising the west to east strategy. That said, the Committee acknowledged that it continued to face significant challenges, including:

- the need for a modern mobile digital timely data entry and retrieval system
- the lack of timely quarterly reports and other documents
- the difficulty of dealing with eradication of RIFA in development areas
- security of the operational boundary
- scaling up the Program and dealing effectively with legacy issues.

It is apparent from earlier sections of this Review that the Steering Committee continues to face all of these issues, although it seems that there has been some significant progress over the past six months. The mobile digital solution looks closer to final delivery, the Operating Area, while expanded, does appear more secure and the Program is building some important partnerships with industry and the community. Notwithstanding the progress made, there are some major issues requiring attention. These include:

- performance indicators suitable for external communication and internal management purposes;
- regulatory reform that helps to address the progression of RIFA into development areas and beyond the Operating Area boundary and amends movement controls to reflect contemporary risks in the operating environment;
- Program productivity, particularly in the field but also with respect to support arrangements which have struggled in certain areas such as governance, operational planning and procurement;
- expansion of the Program into self-management, a significant development because it should better align the GBO under the *Act* with the Program;
- a potential budget shortfall in the outyears of the Program due to the movement of resources to fund additional effort in the Western Boundary;

- uncertainty surrounding how well remote sensing will perform and related implications for treatment surveillance and budget strategies;
- the responsiveness of the program to what the Steering Committee needs in respect to timely papers and reports to discharge its role;
- an information technology capability that provides for better uploading and downloading of data in accessible formats;
- how the strategy will change as it enters peri-urban and urban landscapes.

8.2.3 Steering Committee Reforms

In addition to examining the Steering Committee's review of its operations, the Terms of Reference for this Review require consideration of feedback from Committee members. Against this background, the Review contacted members with a view to discussing the performance of the Steering Committee, its relationship with the Program, the balance of expertise on the Committee, Secretariat support, the quality and timeliness of papers, the profile of the Committee and any issues of concern in regard to the positioning of a national program in the Queensland government. In addition, members were given the opportunity to advise of any particular issues they would like to see addressed in order to improve Program efficiency and effectiveness. Of the seven members and the Chair contacted by email, five responses were received, four via phone conversations and one via an email response.

In general, the members who responded indicated that the Steering Committee is having mixed success. Working relationships, between members as well as between the Committee and the Program, are good but progress is seen by some to be slow, somewhat reactionary and not helped by difficulties with continuity of membership for some jurisdictions. When asked for their views on whether responsibilities are being met, members responses ranged from 'yes, we are getting the job done' to 'we are struggling and need to get more involved' and 'it isn't always easy to have new ideas taken forward'. Everyone who responded advised that there needed to be a better balance in the expertise on the Steering Committee. Areas identified as needing more input included governance, finance, communications and IT skills and in one case, deeper technical skills were also suggested for inclusion.

Secretariat support was seen positively as responsive and showing commitment. However, there was concern expressed as to whether the Committee is too dependent on the Program for support and broad interest in access to independent advice. All members of the Committee have full time commitments in their jurisdictions, thereby making their involvement restricted and dependent on Committee support. Some members advised that dealing with the quantity of paperwork in the time available prior to meetings is a considerable challenge and suggested that more concise papers focussing on the Committee's interests would be helpful.

Members feel that the Committee needs to have a higher public profile. A significant issue has been no website facility for the Committee other than a presence on the BQ site. This site is not regarded as national and members would like to see this deficiency addressed. Some members advised that this could help achieve a national focus and, together with more media focus, could see improved communication of key messages.

There were mixed views among members about having a national Program housed in the Queensland government. On the one hand, the argument was put that a lead agency model is appropriate and is frequently adopted. On the other, there is a view that while this might be appropriate for a bilateral Commonwealth-single State/Territory program, it is less suitable for a program having a national focus. All members agreed, however, that there is no tension in the Committee in this regard and that it was critical to work with the framework they have been given.

Members all expressed views regarding suggestions to improve the efficiency and effectiveness of the Program. Some saw potential to add to Program resources by involving voluntary groups in surveillance and treatment and a need to address regulatory issues more comprehensively, including interstate transport of carrier materials and the movement of RIFA into development sites. Others suggested a need to focus more on alternative sources of cost savings and the budget for the Program, more attention by staff on the Committee's requirements and a stronger, more functional IT environment.

The feedback provided by members, when considered in conjunction with the issues noted above that the Committee faces, does raise some reforms for consideration that may assist the Committee's work. There are six suggestions outlined below.

First, given the breadth of issues the Steering Committee faces, there is a strong case to broaden the expertise on the Committee. While the Committee has significant technical expertise, it is deficient in skills and knowledge to drive the governance, finance, communication, IT, regulatory and monitoring and performance issues it needs to deal with. The Terms of Reference for the Committee recognise the need for a breadth of skills and provide flexibility to vary jurisdiction membership in response to Committee needs.

Second, the Committee's work would benefit significantly from having independent staff support. In particular, a Project Officer at a senior officer level could be dedicated to work exclusively for the Steering Committee. The person appointed could be located in the NRIFAEP office and work closely with the Program but be accountable to the Committee Chair. He/she would advise the Committee on the future agenda as well as follow through on tasks initiated by the Committee. There would be ongoing advice on progress of the Committee's work and liaison with the Program on an ongoing basis. An option worthy of consideration to implement this initiative would be to rotate officers from each jurisdiction though this position every two-three years or more frequently if the Committee so desired.

Third, the next 12-24 months will prove very important for the Program as it passes through the first third of its lifespan and addresses a range of mission critical issues. During this period, the Steering Committee needs to function more along the lines of a Board of Management, working more intensively with the Program in order to make more progress. In turn, this will mean increasing the tempo of its deliberations. More meetings should be scheduled or alternatively, existing meetings could be held over a longer period. Furthermore, it would be advantageous for the Chair to be allocated more time by the National Biosecurity Committee and for the proposed Project Officer to work alongside.

To assist the Committee's work, a fourth proposal is to make use of sub-committees focused on guiding strategic areas of concern the Committee identifies. These sub-committees could meet and progress their work out-of-session and also utilise the proposed Project Officer.

Fifth, the Steering Committee should consider raising its public profile and communicating strategically about progress of the Program and its future directions. Currently, there is little the Steering Committee does with respect to communication other than issue a communique after each quarterly meeting as required by its Terms of Reference. Benefits for the Program could be expected from the Steering Committee's Chair leading public discussion of strategic issues while the General Manager maintains communication responsibilities for ongoing and tactical implementation of the Program.

Finally, it is imperative for the Steering Committee to have an independent website with the functionality and interfaces it sees necessary to advance the work of the Program. This issue has been discussed by the Committee but an outcome is yet to be achieved.

8.3 Supporting Groups

In the first year of the Program, the Steering Committee established two sub-committees, the National Exotic Invasive Ant Scientific Advisory Group (SAG) and the National Red Imported Fire Ant Eradication Program Risk Management Sub-Committee (referred to in this report as the Risk Management Group (RMG)). The Terms of Reference for the SAG and RMG are at Attachments 4 and 5 respectively.

While accountable to the Steering Committee, the SAG is able to provide advice to both the Committee and the Program. SAG has a membership consisting of Australian and international experts and is well placed to provide scientific input, either at its own initiation or in response to requests from the Steering Committee. The Group includes ant experts from Australia, New Zealand and the US and is chaired by Mr Bill Magee who was the Chair of the Independent Panel Review that recommended the current Program. Ongoing administrative support to SAG is provided by the same Secretariat that serves the Steering Committee. The Program has a science capability of its own and there appears to be a good working relationship between SAG and the Program scientists.

The Program has science related issues permeating many of its activities. Detection, treatment, surveillance, proof of freedom and understanding the behaviour of RIFA all have science related issues requiring attention. Furthermore, management and monitoring of RIFA as well as controlling their human-assisted movement require significant scientific input for an effective and efficient program.

SAG's Terms of Reference direct the Group to work across all of these issues when required. For example, at their February 2019 meeting, SAG examined and endorsed treatment protocols, considered alternative treatment regimes, discussed and extended principles for RIFA carrier movement control, considered science related issues underlying risk assessment of nursery products and self-treatment by landowners and provided feedback to Program staff on the remote sensing project.

While SAG has been productive, there is much to cover, thereby raising the question of whether it too may need to meet more often as suggested for the Steering Committee in section 8.2 above. In the first instance, SAG should develop a Work Program containing an inventory of topics central to the success of the Ten Year Plan and organise sufficient meetings to deal with relevant issues according to priority of their importance. Three issues for possible inclusion that have emerged from this Review that SAG might consider examining are (1) the confidence surrounding results generated from monitoring sites for RIFA eradication and suppression; (2) the set of performance indicators that are relevant for determining whether eradication is 'on track' as the Program is rolled out; and (3) testing at 'significant detection' sites to distinguish between natural and human-assisted movement of RIFA. These issues go to the heart of whether eradication efforts are successful and the effectiveness of movement controls aimed at confining the spread of RIFA.

The RMG's Terms of Reference require it to meet at least twice each year. In 2019, meetings have been held in February and July and a third meeting is under consideration before the end of the year. Membership of the Group includes four members of the Steering Committee, including the Chair, Dr Wendy Craik. In addition, there are two expert members, one of whom (Mr Allan Millis) chairs the RMG. The Group is supported by the Program Directorate.

Since the Group was formed in December 2018, their main focus has been the appropriateness of the Program's risk management arrangements. The Group's work to date with the Program has seen a Risk Management Policy and Plan as well as a Risk Register and Issues Register developed and completed in July 2019. These foundation documents will be updated by RMG in the future so they remain relevant to the risk environment and the Steering Committee's attitude to risk that evolves over time. They will also form the basis against which the Program provides Quarterly

Risk Reports and Risk Exception reports informing the effectiveness of risk management measures, compliance and risk controls. Program staff have advised that the first Quarterly Risk Reports will be provided to the next meeting of the RMG.

Examination of the set of risk governance documents the Program has developed for RMG and Steering Committee approval indicates a comprehensive approach which should assist management's response to significant risk and uncertainty surrounding the Program. The risk appetite for the Program is described in the Risk Policy and Management Plan as moderate overall with some areas designated a low or very low risk appetite rating. These include financial, environmental, reputation damage, contravening protocols and procedures, industry non-compliance with biosecurity regulations and imposing unnecessary costs on industry.

Once risks are identified they are assigned a likelihood of occurrence together with a consequences rating. Risk mitigation measures are specified for each risk included in the Risk Register and the residual risk following treatment is assessed.

The Risk Management Policy and Plan identifies governance arrangements to handle operational responsibility for managing and implementing the risk framework. The Program's Business Manager is nominated as the Risk Coordinator and is accountable for and authorised to manage the Program's operational risks. Extreme or high rated operational risks having manifest implications outside risk tolerance limits are escalated to the Risk Steward (Program General Manager) for attention. All management personnel of the Program are responsible for assisting and empowering the Risk Steward and Risk Coordinator with risk management and all staff also have an ongoing role to play.

The RMG is positioned usefully between the Program and Steering Committee. It provides guidance to the Program concerning risk mitigation as well as recommendations to the Steering Committee regarding developments in the risk environment and possible treatments that may warrant their attention. The Steering Committee has an additional role in the event of threats to realising the Program's objectives emerging via the designated triggers included in the Ten Year Plan. In these circumstances the Steering Committee can consider notifying the NBC of concerns they have that may warrant discontinuation of the Program.

The RMG's Terms of Reference do not require it to perform the tasks of an Audit Committee. Presumably, each of the agencies representing the funding partners to the Program are accountable to their respective governments for their respective contributions to the Program. If so, the Commonwealth, with approximately a 50 per cent share of total funding, would have the most funds to account for while Queensland is responsible for \$43.2m or 10.5 per cent of total Program funds over the life of the Program. Queensland's share of funding would be audited in accordance with the State's requirements through QDAF, the responsible agency.

A further task normally falling to an Audit Committee to perform is the initiation and follow up of audits examining risks of concern to agencies responsible for risk management. In the case of the NRIFAEP, that responsibility lies with the Steering Committee who are well represented on the RMG. It appears, therefore, that the RMG is in a strong position to assume responsibility for a Program risk management and compliance audit activity.

For the two most recent audits (Governance and Operational Planning and Procurement) the initiating party, according to Program staff advice, was the Department rather than the RMG or Steering Committee. This is not inappropriate providing that the Steering Committee was supportive of the action taken but it does raise the question of who more generally should be responsible for initiating audits. The answer to this question should not be the Program as it has a conflict of interest in deciding what might be audited. A similar conflict would prevail in regard to evaluation of progress made with implementation of findings.

The Steering Committee's Terms of Reference specify the Committee take responsibility for monitoring Program risks and mitigation strategies and determining risk appetites and tolerances. Against this background, changes to arrangements for initiating and follow up of audits are proposed. The Steering Committee has established the RMG to deal with risk management. An audit program should be developed by the RMG after inviting input from the Program in regard to what it sees as worthy priorities for attention. With strong representation of the Steering Committee on the RMG, including the Chair, RMG could be the decision maker on which, if any, audits are initiated and what follow up activity is appropriate, including approving (or otherwise) the Program's proposed responses to audit findings and, if seen necessary, initiating further audits into the area as required. The Steering Committee may want to consider whether it should ratify the RMG's recommendations in this regard or alternatively delegate the entire process, including all relevant decision making to the RMG. Pending the detail of decisions taken on these matters, the Terms of Reference for the RMG should be amended accordingly.

Attachments

Attachment 1: Terms of Reference - Efficiency and Effectiveness Review of the National Red Imported Fire Ant Eradication Program

1. Background

The National Red Imported Fire Ant Eradication Program (the 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.

An independent review in 2016 and 2017 found that the implementation of the Program has prevented the widespread environmental, social, health and economic impacts seen in other countries where fire ants have invaded. Based on the review recommendations, funding of \$411.4 million over ten years was approved and a [Ten Year Eradication Plan 2017–18 to 2026–27 \(PDF, 2.2MB\)](#) (Ten Year Plan) was developed which outlines the Program's objectives and high-level strategy, actions and milestones.

Section 7.3.2 of the Ten Year Plan stipulates that an efficiency evaluation of the Program will be scheduled every two years, or as required by the Steering Committee. The intent was that an external consultant or similar would provide feedback to the Steering Committee and Program in regards to whether the approved Ten Year Plan is being implemented correctly. The efficiency audit is intended to provide evidence and assurance to the cost-share parties that the Program is being conducted in an effective and efficient manner and delivering value for money to the parties contributing to the cost-sharing.

An internal review of the Ten Year Plan was undertaken from January to March 2019 and an Addendum to the Ten Year Plan has been drafted outlining the outcomes and required amendments to the plan.

2. Terms of Reference

The review will evaluate Program efficiency and effectiveness, and whether implementation of the plan using current methods and approach are meeting targets to achieve the Program's objectives, including:

- evaluate whether activities detailed in the Ten Year Plan and annual Work Plans are being implemented as described and basis for any changes that have occurred to the plans
- assess whether the activities of the Program are conducted in an effective and efficient manner including the cost-effectiveness of the Program
- assess whether more cost-effective resource deployment options exist and identify opportunities for efficiencies
- recommend actions to improve Program delivery and/or the Ten Year Plan where necessary to meet Program objectives
- prepare and present a report on the efficiency and effectiveness of the Program since 1 July 2017.

Review of the Program's procurement function and governance arrangements are not required as a part of this review. However, recommendations made from the recent procurement and governance audits undertaken for the Program should be considered.

Program activities which are detailed in the Ten Year Plan and annual Work Plans include (but are not limited to):

- treatment, surveillance and monitoring activities

- prevention of human-assisted movement
- community and stakeholder engagement
- science approach and methods including basis for Program protocols
- systems, processes and support functions
- budget and resourcing requirements
- governance
- targets and timeframes for achievement of eradication.

In making recommendations, the review will consider:

- the Program's quarterly and annual reports since 1 July 2017
- the Program's [Ten Year Plan \(PDF, 2.2MB\)](#), Addendum and annual [work plans \(PDF, 1.4MB\)](#) since 1 July 2017
- Steering Committee minutes and [reports](#)
- relevant previous reviews and audits of the Program including the procurement and governance audits undertaken during 2018-19 and the [Independent Review undertaken 2016–2017](#)
- feedback from Steering Committee members on its operations and the review of the Steering Committee operations and terms of reference undertaken in early 2019
- consultation with Program staff, stakeholders and Steering Committee members and other cost-share partners not represented on the committee
- actions in the plans, including observation of current operations in and off the field
- current and proposed technologies and methods and their effectiveness and efficacy in delivering Program outcomes
- the risks to the Program achieving its objectives as outlined in the Program's Risk Management Plan and Risk Register (however, noting that a Risk Management Sub-Committee is in place to monitor Program risks)
- the Annual Community and Industry Stakeholder meeting in August 2019.

3. Timeframes

It is estimated that the review will take approximately 20–25 consultancy days from commencement date to complete.

4. Cost

Final cost of the review is dependent on the consultant appointed. Funding for the review will be provided by the Program.

¹Buren, W.F. (1972), 'Revisionary studies on the taxonomy of the imported fire ants', *Journal of the Georgia Entomological Society*, 7: 1–26.

Attachment 2: Ten Year Eradication Plan Cost Sharing and Revised Budget

Jurisdiction	2017-18 BUDGET \$	2018-19 BUDGET \$	2019-20 BUDGET \$	2020-21 BUDGET \$	2021-22 BUDGET \$	2022-23 BUDGET \$	2023-24 BUDGET \$	2024-25 BUDGET \$	2025-26 BUDGET \$	2026-27 BUDGET \$	TOTAL BUDGET \$
Commonwealth	19 000 000	19 468 730	19 949 024	20 441 166	20 945 450	21 462 174	21 991 646	22 534 180	23 090 098	23 659 730	212 542 195
New South Wales	6 137 000	6 137 000	6 137 000	6 137 000	6 137 000	6 137 000	6 137 000	6 137 000	6 137 000	6 137 000	61 370 000
Victoria	4 788 000	4 788 000	4 788 000	4 788 000	4 788 000	4 788 000	4 788 000	4 788 000	4 788 000	4 788 000	47 880 000
Queensland	3 864 600	3 959 940	4 057 631	4 157 733	4 260 304	4 365 406	4 473 101	4 583 452	4 696 526	4 812 389	43 231 082
Western Australia	2 093 800	2 145 454	2 198 382	2 252 616	2 308 189	2 365 132	2 423 479	2 483 267	2 544 529	2 607 302	23 422 150
South Australia	1 368 000	1 401 749	1 436 330	1 471 764	1 508 072	1 545 276	1 583 398	1 622 461	1 662 487	1 703 501	15 303 038
Australian Capital Territory	300 200	300 200	300 200	300 200	300 200	300 200	300 200	300 200	300 200	300 200	3 002 000
Tasmania	220 400	225 837	231 409	237 118	242 967	248 961	255 103	261 396	267 845	274 453	2 465 489
Northern Territory	197 600	202 475	207 470	212 588	217 833	223 207	228 713	234 355	240 137	246 061	2 210 439
Total	37 969 600	38 629 384	39 305 445	39 998 185	40 708 015	41 435 355	42 180 640	42 944 311	43 726 821	44 528 636	411 426 394
Funds moved from 2017-18 to 2018-19	-3 796 031	3 796 031									
Western Boundary Funding Requirement		10 438 130	13 038 976	13 038 976							36 516 082
Savings provision from increasing targeted and self-treatment					-6 086 014	-6 086 014	-6 086 014	-6 086 014	-6 086 014	-6 086 014	36 516 082
Proposed Total	34 173 569^(a)	52 863 545	52 344 422	53 037 161	34 622 001	35 349 342	36 094 626	36 858 297	37 640 808	38 442 622	411 426 396

Source : QDAF (2019a)

Note: (a) 2017-18 reflects actual expenditure.

Attachment 3: Steering Committee Terms of Reference

Authority

The National Red Imported Fire Ant Eradication Program – South East Queensland Steering Committee (the Steering Committee) was established by the Agriculture Ministers' Forum in July 2017 to provide strategic oversight to the ten year National Red Imported Fire Ant (RIFA) Eradication Program in South East Queensland (the Program).

The Steering Committee will provide guidance and support to the Program's operational team on all aspects of the Program's delivery to ensure that it has the best chance of achieving its objectives.

The Steering Committee is ultimately accountable to the Agriculture Senior Officials Committee (AGSOC).

Responsibilities

The Steering Committee will have responsibility for:

- providing leadership and guidance to the Program's operational team
- approving the RIFA Ten Year Eradication Plan 2017-18 to 2026-27 and detailed annual work plans
- overseeing the implementation of the RIFA Ten Year Eradication Plan, and providing direction on issues arising as deemed necessary
- making decisions in relation to Program budget matters (within the agreed Program budget)
- monitoring and evaluating Program performance and progress
- monitoring Program risks and mitigation strategies and determining risk appetites and tolerances
- approving national communication activities e.g. national talking points
- guiding the investigation of additional sources of Program funding and/or delivery
- commissioning scientific work and seeking advice
- receiving and approving reports on Program progress
- reporting on the progress of the Program

In fulfilling its responsibilities, the Steering Committee will seek expert advice from third parties as required. The Steering Committee has established a National Exotic Invasive Ant Scientific Advisory Group to provide specialist scientific advice and a Risk Management Sub-Committee to provide advice on the Program risks and mitigation strategies.

Reporting

The Steering Committee will:

- receive weekly snapshot progress reports provided by the Program
- receive and approve quarterly performance reports provided by the Program
- provide updates on Program progress and performance to each meeting of the National Biosecurity Committee (NBC)
- approve annual progress and performance reports and provide to AGSOC and AGMIN.

Sunset

The Steering Committee has been established for a period of ten years until 30 June 2027. Any decision to extend the committee beyond this time will be the responsibility of the Agricultural Ministers' Forum (AGMIN).

Review

The Terms of Reference will be reviewed every 12 months.

The Steering Committee will also conduct an evaluation of its own operations annually to consider its effectiveness in supporting delivery of the RIFA eradication Program.

Members

The Steering Committee will be chaired by an Independent Chair. The membership comprises senior officials from the Australian, state and territory governments. The NBC will nominate the Independent Chair.

Jurisdictions may have up to two representatives.

The Steering Committee will have expertise in the following subject areas:

- scientific and technical matters as they relate to the implementation of the eradication plan
- financial management
- project management
- risk management
- compliance
- research and development
- communications
- technology
- governance.

The skills composition will be reviewed every 12 months as part of the annual review of the Steering Committee operations. If it is necessary to replace a member of the Steering Committee, the need to retain any specific required skills brought to the Steering Committee by the member being replaced should be considered in choosing the new member. Where the replacement of a member results in a jurisdiction no longer having a representative on the Steering Committee, that jurisdiction should be given an opportunity to nominate a new member, if it so chooses.

Proxies

Members may appoint a person as the member's proxy to attend and vote for the member at meetings. The chair may deputise the chairing of a meeting.

Other attendees

Other officers may be invited to attend meetings at the discretion of the Chair to provide information and advice to the committee.

Officers participating as presenters or observers are to ensure that discussions remain confidential.

Changes to Steering Committee Membership

The Steering Committee may approve changes to membership.

An existing Steering Committee member must formally advise the Chair of their intention to withdraw from the Committee's membership. The jurisdiction of the departing Steering Committee member may nominate a replacement for consideration by the Steering Committee. The Steering Committee will consider the credentials of the nominated replacement and determine whether to accept the nomination.

The Steering Committee must advise the National Biosecurity Committee of any changes to the Steering Committee membership.

Meetings

The Steering Committee will meet quarterly. However, the Steering Committee can be reconvened for additional meetings if required.

The Steering Committee will convene a forum with critical stakeholders on an annual basis. This forum will give the Steering Committee opportunity to provide updates, answer questions and receive advice and feedback from industry, environmental and community groups.

Decision Making

Decisions will be made by consensus.

Quorum

A quorum for a Steering Committee meeting will include:

- the chair, and
- more than half the number of members.

Administration

Secretariat support is provided by the Program through the Queensland Government.

Each member is responsible for meeting their own costs of participation in the Steering Committee.

The costs of participation for the Independent Chair will be met by the Program.

A draft agenda for each scheduled meeting will be prepared by the secretariat. The agenda will be approved by the chair.

The final agenda and papers will be circulated to all members by the secretariat at least two weeks prior to the meeting.

The secretariat will prepare a summary record of each meeting, including action items. The draft record will be circulated to the Chair within one week and to members for comment and approval within two weeks following the meeting. A communique will also be prepared by the secretariat for publication on the Program website. The draft communique will be circulated to members for comment and approval following the meeting.

Attachment 4: Terms of Reference National Exotic Invasive Ant Scientific Advisory Group

Purpose

The aim of the National Exotic Invasive Ant Scientific Advisory Group is to provide specialist scientific advice on *Solenopsis invicta* commonly known as red imported fire ant (fire ant). Advice may also be given on other exotic invasive ant eradication matters as required.

The National Red Imported Fire Ant Eradication Program Steering Committee (Steering Committee) and the National Red Imported Fire Ant Eradication Program in South East Queensland (the Program) can seek specialist advice from the Scientific Advisory Group and vice versa. The National Biosecurity Management Consultative Committee (NBMCC) and other Australian exotic invasive ant programs may also seek advice from the Scientific Advisory Group but the priority focus for the group is on fire ant. The Scientific Advisory Group may also assist the committee responsible for the National Exotic Invasive Ant Plan.

This will ensure the Program receives consistent, high-quality support and expert guidance required to increase its likelihood for eradication success.

Authority

The Scientific Advisory Group will report directly to the Steering Committee.

The Steering Committee is responsible for providing leadership, guidance and strategic oversight to the Program.

There have also been, from time to time as required, external reviews of the Program, including scientific, technical and operational reviews, efficiency and financial audits, and a Senate Inquiry. The Scientific Advisory Group, through the Steering Committee, may be called upon to provide reports for and input into future reviews across the scope of the Program.

Terms of Reference

- To consider and advise on the scientific basis of the tools, techniques, products and strategies used by the Program.
- Monitor invasive ant and incursion response research and development and advise the Steering Committee on research and strategies relevant to the Program.
- Agree on scientific principles for different elements of the Program's Ten Year Eradication Plan; including: Movement controls, Risk Mitigation, Treatment, and Surveillance (including proof of freedom).
- Oversee and advise on the scientific direction of the Program and when requested make recommendations to the Steering Committee on essential research to be undertaken.
- Ongoing consultation with overseas and domestic experts on the behavioural biology of fire ant, eradication strategies, control methods and practical implementation.
- Engagement with industry and other relevant stakeholders as required to provide pragmatic, practical and implementable recommendations to identified and referred issues.
- Other activities as requested with respect to other exotic invasive ant species.

Membership

Members should be comprised of a specialist group of local, interstate and international representatives chosen for their expertise and knowledge of fire ant eradication. These representatives will collectively have expertise and experience in a range of scientific areas.

Scientific expertise will include but should not be limited to entomologists with exotic invasive ant eradication knowledge and scientists with eradication expertise for other taxa.

To ensure an independent view, members will need to declare potential conflicts of interest in specific work projects.

Members must be able to commit the time and resources needed to make meaningful contributions to this activity.

Jurisdictions are invited to suggest members. Members may not necessarily be from their jurisdiction but should have relevant expertise.

If it is necessary to replace a member of the Scientific Advisory Group, advertised expressions of interest for experts will be placed. The need to retain any specific required scientific expertise brought to the Scientific Advisory Group should be considered in choosing the new member.

Duties and Responsibilities of a Member

- Continuity of guidance and exotic invasive ant and other specialist knowledge is required and can only be provided by consistency of membership. The Scientific Advisory Group nominees will be offered only to those who can, barring unforeseen circumstances, commit to a two-year appointment. Ideally the membership will remain stable through several renewals of these appointments.
- Members must be active participants in the discussion and resolution of any items that come before the group. They must provide advice on any issues arising from an unbiased, scientific or technical perspective.
- Members are required to disclose any conflict of interest and to recuse themselves from any decision on which they have a conflict of interest. A conflict of interest includes, but is not limited to, proposals from individuals with whom the member:
 1. has a personal relationship beyond that of a scientific colleague
 2. has conducted joint work, published papers, or shared grants
 3. has a mentor-mentee relationship.

Chairperson

The Chair will have suitable experience as a committee chairperson and demonstrated eradication expertise and may be a current member of the Steering Committee. The Chair will be chosen by the Steering Committee.

Proxies

Members may not appoint a person as the member's proxy to attend and vote for the member at meetings.

Other Attendees

Should expert advice be required for more detailed consideration of specific matters or to fill a gap created by a member recusing themselves due to a conflict of interest, other attendees may be invited to Scientific Advisory Group meetings at the discretion of the Chair, to provide information and advice to the group.

In addition, separate advisory groups or sub-committees may be convened as necessary to provide specific advice in relation to certain technical matters (e.g. spatial analysis, biometric/statistical analysis, mathematical modelling, remote sensing and population (genetic) analysis).

Other attendees participating as presenters or observers are to ensure that discussions remain confidential. If the attendee is not a state or territory government employee (and therefore covered

by standard code of conduct provisions) an agreement will be negotiated which includes a confidentiality clause.

Review

The terms of reference will be reviewed every 12 months by the Steering Committee.

Meetings

The Scientific Advisory Group will meet as required or as directed by the Steering Committee. There will be a minimum of one face to face meeting per year with additional meetings via skype and teleconference, which may occur out of session depending on member availability.

The Scientific Advisory Group may choose to establish sub-committees, from within its own membership or including external experts, should more detailed consideration need to be given to specific matters.

Decision making

Decisions will be made by consensus.

Quorum

A quorum for the Scientific Advisory Group meeting will include:

- the chair, and
- more than half the number of ordinary/regular members.

Administration

Initially the costs of participation for the Chair and one independent expert as paid members on the Group, will be funded by the Program under the direction of the Steering Committee.

A sitting fee, travel, accommodation, and meal costs will be paid to the Chair and an independent paid member of the Scientific Advisory Group.

Secretariat support will be funded by the Program in 2018-19.

A draft agenda for each scheduled meeting will be prepared by the Secretariat. The agenda will be approved by the Chair.

The final agenda and papers will be circulated to all members by the Secretariat at last one week prior to the meeting.

Agenda items may be suggested/led by Scientific Advisory Group members, the Steering Committee or the Program.

Attachment 5: Terms of Reference - National Red Imported Fire Ant Eradication Program Risk Management Sub-Committee

1. Purpose

1.1 The Risk Sub-Committee has been established to provide assurance to the Steering Committee and cost-share partners about the suitability and relevance of the Program's risk management structures and arrangements. In doing so, the Risk Sub-Committee will: (i) discharge its primary responsibilities as specified in Section 8 (ii) act on those matters for which it has been delegated responsibility by the Steering Committee (iii) provide advice to the Steering Committee on all other matters within its scope of influence as referred to it by the Steering Committee, or as it deems appropriate.

2. Accountabilities

2.1 The Risk Sub-Committee is accountable to the Program Steering Committee. In discharging its accountabilities the Risk Sub-Committee has the authority to: (i) request the attendance of any Program personnel, excluding field contractors, at Sub-Committee meetings (ii) access information that is created, collected, stored, and managed by the Program with respect to workplace health and safety data, budget and expenditure, scientific trials, community engagement, treatment, surveillance, eradication, internal and external correspondence, policy and strategy documents, and statutory reporting information (iii) seek advice from external parties including subject matter experts, as deemed necessary, by agreement between the Chair and members (iv) conduct meetings with any State Government agencies, and divisions within the Queensland Department of Agriculture and Fisheries as required (v) consult directly with relevant Program officer(s) as required.

3. Appointment of committee members

3.1 The Risk Sub-Committee comprises the following representatives : (i) Appointed members: the Program Steering Committee shall appoint up to three of its members to the Risk Sub-Committee. Program Steering Committee members may be appointed via self-nomination given the appropriateness of their skills and/or experience in relation to the business conducted by the Risk Sub-Committee. (ii) Self-nominated member: the Chair of the Program Steering Committee is entitled to self-nominate as a member of the Risk Sub-Committee. Where the Chair does not self-nominate as a member, the Chair may nominate an additional external government representative who is suitably qualified; alternatively, the membership role can elapse until the appropriate time when all Risk Sub-Committee membership is renewed on a biennial basis. (iii) Expert advisor members: the Program Steering Committee has the authority to nominate and appoint two additional members external to the Program: one that is external to government to act in a specialist risk advisory role to the Risk Sub-Committee, and one that is external to the Program and to the Department that has specialist skills and/or experience in risk management of publicly funded programs.

3.2 The Chair of the Risk Sub-Committee will be appointed by the Program Steering Committee from the two external members of the Risk Sub-Committee.

4. Appointment, rights and entitlements

4.1 Appointment of membership to the Risk Sub-Committee will be for a period of up to two years. Members are to remain until such time as a successor is appointed if this subsequent appointment is the result of a sitting member's job transfer or retirement. Exceptions to this requirement will occur in instances where a member sustains traumatic injury, or serious illness / health complications, upon which time the affected party shall be immediately retired from membership. At such time the Program Steering Committee will decide whether to seek nominations from Steering Committee

members to fill the vacancy, or retain a membership vacancy until such time as the retired member's term of appointment is complete.

4.2 The appointment of a successor is not required where membership has ceased due to an unresolved dispute or breach of funding agreement, and voluntary termination of the funding agreement. Under these conditions, it is at the discretion of the Program Steering Committee to decide to fill or maintain the vacancy.

4.3 All members have the right to vote with regard to the Risk Sub-Committee's decisions. Non-members who attend meetings by invitation of the Chair are entitled to observe and participate in deliberations at all Risk Sub-Committee meetings, although are not entitled to vote on decisions or the selection of members to the Risk Sub-Committee.

4.4 A proxy assuming a member's role as a consequence of that member's absence due to temporary secondment or leave arrangements is to consult and report through to that member who is absent.

4.5 Out-of-pocket expenses for flights and accommodation, which are incurred by the external experts to the Risk Sub-Committee in the course of attending meetings, will be reimbursed at economy class fares and standard Queensland Government hospitality and accommodation allowances. Out-of-pocket expenses for flights, accommodation, and meal costs incurred by Program Steering Committee members appointed to the Risk Sub-Committee will not be reimbursed by the Program. Out-of-pocket expenses for flights and accommodation incurred by the Steering Committee Chair in the course of attending meetings will be reimbursed in accordance with contractual obligations.

4.6 Eligible external experts will be entitled to receive remuneration for time spent and expertise applied in preparing for and attending meetings of the Risk Sub-Committee. External experts will be engaged as consultants under a contract for services over a two year term. Remuneration for each external expert will be negotiated with guidance taken from the remuneration procedures for part-time chairs and members of Queensland Government bodies.

5. Meetings

5.1 The Risk Sub-Committee will meet no less than twice per year with the meeting schedule to be agreed upon at its first meeting following its appointment by the Steering Committee. Thereafter, the schedule of meetings is to be set at least 12 months in advance.

5.2 All notices of meetings shall be despatched by the Secretariat with the meeting agenda to be agreed upon between the Risk Sub-Committee Chair and the Secretariat. Proposals for agenda items from members are to be submitted to the Secretariat, in the first instance, at least six weeks prior to the meeting date.

5.3 The Chair may invite relevant external individuals, and Program personnel to attend meetings in an advisory or observational capacity only.

5.4 The meeting agenda and accompanying papers shall be distributed to the members at least five full working days prior to the meeting.

5.5 A quorum is constituted by a simple majority of Risk Sub-Committee members, and the Chair will preside over all meetings.

6. Secretariat

6.1 The Secretariat to the Risk Sub-Committee will be provided by the Program. The Program will ensure all necessary resources are available for performance of the Secretariat function.

6.2 In consultation with the Chair, the Secretariat shall prepare and despatch notices of meetings, agendas, papers, and table relevant correspondence, reports and other information deemed necessary by the Risk Sub-Committee.

6.3 The Secretariat is responsible for the accurate transcription and despatch of all minutes and decisions arising from the Risk Sub-Committee's deliberations. Draft minutes are to be provided to the Chair no more than 10 business days following a meeting of the Risk Sub-Committee.

6.4 The Chair is required to provide feedback on draft minutes within 5 business days to ensure a final version of the minutes is despatched no more than 20 business days from the date of the meeting.

7. Primary Responsibilities

7.1 The Risk Sub-Committee will provide assurance to the Program Steering Committee on the appropriateness of the Program's risk management arrangements. The Program Steering Committee has therefore delegated the Risk Sub-Committee with responsibility to: (i) oversee the development, subsequent review, and implementation of the Program's Enterprise Risk Management Plan and Risk Register (ii) review and consider the effectiveness of the Program's risk governance structures, namely the Program's Enterprise Risk Management Policy (every two years) the Program's Enterprise Risk Management Plan (annually) the Program's Risk Register (ongoing) (iii) consider the Program's Quarterly Risk Reports and Risk Exception Reports from time to time regarding: the relevance and effectiveness of the Program's risk management practices, compliance activities, and risk controls the appropriateness of existing compliance activities and risk controls in relation to the Program's risk profile and appetite.

7.2 The Risk Sub-Committee shall provide advice and make recommendations to the Program Steering Committee.

7.3 The matters addressed in 7.1 above are not intended to limit the scope of advice the Risk Sub-Committee is to provide. Where necessary, the Risk Sub-Committee shall first seek approval from the Steering Committee if it foresees a necessity to act outside of these terms of reference for any reason.

8. Review and amendment

8.1 These Terms of Reference will be reviewed annually by the National Program Steering Committee to ensure that Risk Sub-Committee's activities are aligned with its primary objectives and responsibilities.

8.2 Amendments to these Terms of Reference may be proposed by the Chair and members of the Risk Sub-Committee, and are to be submitted to the Steering Committee for its approval. Proposed amendments may be incorporated following the annual review of this Terms of Reference.

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