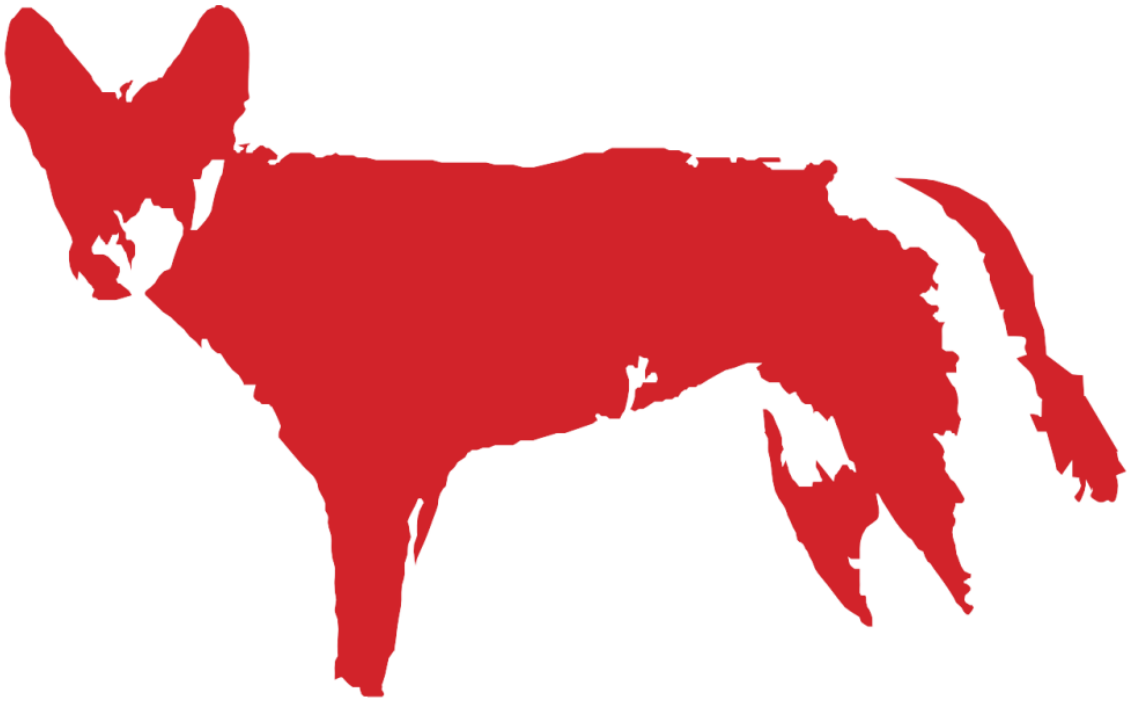
NATIONAL WILD DOG ACTION PLAN



A Review and Impact Assessment of the National Wild Dog Action Plan (Stage 3)

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Executive Summary

The NWDAP 2014-2019 was approaching the end of its original five-year term (due to end 30 June 2019). The NWDAP Coordination Committee commissioned a final review (including an updated benefit-cost analysis (BCA)) of the NWDAP to determine whether the objectives of the NWDAP had been fully met and to investigate the implications for structuring a continuing NWDAP covering the next 10 years.

Agtrans Research was contracted by AWI (on behalf of the Commonwealth and industry funding) to complete the end of term NWDAP review and deliver both an assessment of the performance of the NWDAP Stage 3 and a combined assessment of the overall impacts of the NWDAP 2014-2019.

The 2019 NWDAP Stage 3 Review and Impact Assessment was conducted in three main parts. The first component was an assessment of the achievements of Stage 3 of the NWDAP (1 July 2018 to 30 June 2019) against the objectives and goals identified under Section 6.3.3 of the NWDAP 2014-2019. The second part of the Stage 3 Review and Impact Assessment was to identify and report the actual and potential impacts of investment in the particular activities undertaken as part of Stages 1, 2 and 3 of the current NWDAP 2014-2019 (including a BCA). The third and final component was a qualitative assessment of the relevance of the NWDAP vision and mission and a SWOT analysis to guide any future NWDAP post-2019.

The review found that, over the whole of the five-year period of the current NWDAP, the Plan had achieved or partially achieved 94% of the Action Implementation Requirements described in Section 6.3.3. Further, the NWDAP Vision and Mission statements remain highly relevant and stakeholders are positive about the NWDAP's performance indicating that they rate the Plan's overall progress toward its objectives and goals as good to very good for the 2014-2019 period.

Total investment in the NWDAP 2014-2019 (Stage 1 to 3 activities only) was $2.62 million (present value terms). The investment was estimated to produce total benefits between $15.93 million and $43.30 million with a net present value between $13.31 million and $40.68 million and a benefit-cost ratio between 6.1 and 16.5 to 1.

The direct, primary benefits of the NWDAP investment came from more efficient expenditure (both public and private) on wild dog management, more efficient resource allocation for RD&E investment associated with wild dog management and maintained and/or enhanced social licence to undertake wild dog control. However, the NWDAP also has contributed significant value through other key outcomes including improved leadership and increased capacity, increased government and industry confidence, and increased leverage and investment for wild dog management at all levels throughout Australia.

Several recommendations to amend and/or improve the Plan post-2019 were made as a result of the Stage 3 Review and Impact Assessment. The 2019 NWDAP Stage 3 Review and Impact assessment found that the NWDAP has been highly successful and should continue to be supported by all stakeholders beyond 2019.

Recommendations

At the conclusion of the 2019 assessment, the following items were recommended for consideration by the NWDAPCC:

1. All stakeholders to support continuation of the NWDAP post-2019. The future Plan should be simplified to improve clarity and reduce duplication and include a greater focus on coordination, collaboration and communication, the environmental aspects of wild dog management, and development of Integrated Multiple Vertebrate Pest Management strategies.
2. Commonwealth Department of Agriculture (DoAG), formerly the Department of Agriculture and Water Resources (DAWR), leadership, support (in terms of funding and representation on the NWDAPCC), and coordination for the NWDAP should continue. However, to promote greater stakeholder engagement and adoption, the NWDAP should consider pursuing increased industry and state government-based funding for future Plan activities.
3. In line with the 2017 GHD Mid-Term Review recommendations, a future NWDAP (post-2019) should adopt a planning process that includes an over-arching strategic plan (preferably a 5-year rolling plan that is updated annually) complemented by more detailed annual operating plans. These plans should include responsibility and accountability parameters for each of the stakeholders to be endorsed by the NWDAPCC, including regular two-way reporting and communication of activities and outcomes.
4. Succession and continuity planning for key NWDAP roles (such as the NWDMC, state wild dog coordinators, the APIM and the Communications Coordinator) is required to ensure the continued delivery and success of Plan activities.
5. Continue to pursue and develop consistent, national reporting of wild dog impacts and the benefits of wild dog management programs through nationally-consistent and agreed metrics. Demonstrating the benefits of wild dog management, particularly in the face of increasing wild dog pressure in some regions, is particularly important to ensure ongoing industry support for the Plan and coordinated wild dog management programs in general.
6. Any future NWDAP (post-2019) needs to clearly define its purpose and target audience to improve communication and engagement with stakeholders and the broader community. The Plan should consider amending the current Goal 3 (mitigate the negative impacts caused by wild dogs) to reduce the possibility of misinterpretation/miscommunication of the Plan's purpose and goals. Consistent messaging about the Plan's high-level, strategic purpose and goals (e.g. improved coordination and collaboration for wild dog management and policy across Australia) will be key in any future Plan.

1. Introduction

1.1 Background: The National Wild Dog Action Plan

The National Wild Dog Action Plan (NWDAP) is an industry-driven initiative developed in response to the increasing number of wild dogs[1] throughout Australia. The NWDAP aims to guide the implementation of a nationally-agreed framework for a strategic and risk-based approach to wild dog management; emphasising humane, safe and effective management techniques and appropriate scales for mitigating the negative impacts of wild dogs on primary production, the environment and social assets (WoolProducers Australia, 2014).

The origins of the NWDAP can be traced back to 2006/07 with the funding of the National Wild Dog Facilitator (NWDF) project through the Invasive Animals Cooperative Research Centre (IACRC) and its partners. The initial IACRC NWDF project was conducted in two phases from 2006/07 to 2011/12. Greg Mifsud was appointed to the role of National Wild Dog Facilitator in 2010 and now coordinates the NWDAP as the National Wild Dog Management Coordinator (NWDMC) through the Centre for Invasive Species Solutions (CISS).

The current NWDAP was published in May of 2014 and covers the period 2013/14 to 2018/19. The NWDAP had four overarching goals (WoolProducers Australia, 2014):

Goal 1: Provide leadership and coordination for the management of wild dogs.
Goal 2: Increase awareness, understanding and capacity building with regard to wild dog management.
Goal 3: Mitigate the negative impacts caused by wild dogs.
Goal 4: Monitor, evaluate and report to inform and continuously improve wild dog management.

At the broadest level, all investment and activity associated with wild dog management in Australia, from on the ground control funded by local landholders to state cluster fencing initiatives and national wild dog RD&E and policy, falls under the strategic umbrella of the NWDAP.

Specific projects/activities that require particular collaboration under the NWDAP 2014-2019 were funded by both public and industry (private) resources. Key funding partners have included the DoAG, Australian Wool Innovation Limited (AWI), Meat & Livestock Australia (MLA) and State and Territory Government Departments.

Project activities funded under the NWDAP 2014-2019 have been conducted in three stages (Stages 1, 2 and 3). Stage 1 projects occurred between 2013/14 and 2014/15, Stage 2 projects between 2014/15 and 2016/17, with Stage 3 projects commencing in July 2018 and due to be completed by 30 June 2019.

[1] Each Australian State and Territory has its own legal definition of 'wild dogs'. Within the NWDAP, wild dogs are defined as: "all wild-living dogs which include dingoes, feral dogs and their hybrids" (Flemming, Corbett, Harden, & Thomson, 2001).

1.2 Rationale

The NWDAP was approaching the end of its original five-year term (due to end 30 June 2019). The NWDAP Coordination Committee commissioned a final review (including an updated benefit-cost analysis (BCA)) of the NWDAP to determine whether the objectives of the NWDAP had been fully met and to investigate the implications for structuring a continuing NWDAP covering the next 10 years.

Agtrans Research (hereafter referred to as Agtrans) was contracted by AWI (on behalf of the Commonwealth and industry funding) to complete the end of term NWDAP review and deliver both an assessment of the NWDAP Stage 3 impacts and a combined assessment of the NWDAP 2014-2019 impacts (Project ON-00501: *National Wild Dog Action Plan Stage 3*).

1.3 Terms of Reference

The original Terms of Reference for project ON-00501 were as follows:

1. Assemble and undertake literature familiarisation by 15th April 2019. Review the literature relevant to the economic, environmental and social impact of wild dogs and past delivery of the NWDAP in line with objectives and performance measures identified under section 6.3.3 of the NWDAP. This initial scanning and familiarisation will apply (as a minimum) to the key elements of the documented 2017 GHD NWDAP Mid-Term review of NWDAP up to 2017 and previous economic impact assessments undertaken for wild dog management through the Invasive Animals Ltd, the Invasive Animals Cooperative Research Centre, the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) and industry (e.g. AWI). Particular emphasis should be given to the GHD review.
2. Engage via teleconference organised by AWI by 15th April 2019, with a Sub Committee (the Sub Committee) of the NWDAP Coordination Committee in order to confirm the objectives of the review, the Terms of Reference, and Task Specifications planned for the assessment, as well as other matters that might be raised by the Sub Committee. The meeting also will provide an opportunity to identify other personnel and information sources from which relevant information may be available.
3. Deliver to AWI in writing by the 30th April 2019, post the teleconference in point 2 above, an updated planned approach and task definition as required; clear definitions of the expected deliverables, key contacts and additional sources of information identified.
4. Develop and delivery to AWI by 15th May 2019 a conceptual triple bottom line impact assessment and evaluation framework for the NWDAP review and BCA from 2014-2019. This will be a broad logical framework that traces the NWDAP outputs through to target audiences, how the outputs have been used to date (management outcomes), and how they are likely to be further developed and used in future. The set of impacts associated with these outcomes also will be identified and described in qualitative terms. The framework will include assessment of leveraging additional resources, improvements in resource efficiency in managing and controlling wild dogs and reductions in the negative impact on agriculture, biodiversity and social assets. The framework will be populated as far as possible from existing reports and analyses, including data

supporting outcomes and impacts, such as case studies undertaken under Stage 2 of the Plan https://www.pestsmart.org/national-wild-dog-action-plan/case-studies/, surveys undertaken by ABARES, community engagement literature developed through the IACRC, survey information from industry groups and relevant information collected from state government agencies to assess delivery of the objectives under the NWDAP Stage 3 operational plan and to inform a BCA of the NWDAP over its five-year term. The framework will be discussed and further developed through consultation with Greg Mifsud, National Wild Dog Management Coordinator.

5. By 30th May 2019 discuss with the National Wild Dog Management Coordinator and AWI preliminary results of NWDAP Stage 3 assessment and triple bottom line impacts of NWDAP 2014-2019. The overall assessment and judgement of the NWDAP Stage 3 and NWDAP 2014-2019 is in terms of overall achievement against stated goals, objectives, outputs and outcomes and expected impacts. Triple bottom line estimates of impacts driven by investment in the NWDAP by industry, government and in-kind contributions from stakeholders will be described. An overall estimation of the benefit-cost performance of the NWDAP to date will be made. And advise the National Wild Dog Management Coordinator and AWI in writing the relevance and currency of the NWDAP vision, mission, goals and objectives of NWDAP, and the implications and any recommended changes for structuring a continuing NWDAP covering the next 10 years.

6. By 15th June 2019, prepare a first draft report including Executive Summary for consideration by the NWDAP Coordination Committee's Review subcommittee (the Sub Committee), to a standard that enables the Sub Committee to review the results and for that Sub Committee to incorporate any recommendations in the next NWDAP operational plan and funding application (if any). Attend a meeting of the NWDAP Coordination Committee to present the draft report and receive feedback. Note that flights and accommodation will be approved and booked directly by AWI staff using details provided by Agtrans.

7. By 29 June 2019, submit the electronic copy of the final report in WORD format that complies with the Centre for Invasive Species Solutions (CISS) style guide, taking into account feedback on the draft report. The final report should contain:

    a) An assessment of the achievements of the 3rd Stage of the NWDAP.
    b) An estimate of the benefits and costs and resulting return on investment in the 3rd Stage Plan, and the NWDAP 2014-2019.
    c) Recommendations on the implications for the preparation of a new 10-year Plan, including specific reference to the elements of the current plan that should be carried forward, amended or not incorporated into such a Plan.

1.4 Scope of the NWDAP & Report Context

1.4.1 Scope of the NWDAP

The NWDAP guides the implementation of a nationally-agreed framework for a strategic and risk-based approach to wild dog management across Australia (WoolProducers Australia, 2014). Therefore, all investments and activities within the wild dog management space since 2013/14 fall within the scope of the NWDAP 2014-2019. The NWDAP 2014-2019 encompasses RD&E, investment in direct wild dog control tools and methods (e.g. exclusion fencing, aerial baiting, trapping, etc.), communication about the impacts of wild dogs, best practice management of wild dogs and the benefits of effective management, leadership and capacity building, and government policy and legislation associated with wild dog management and related issues (such as biodiversity protection).

1.4.2 Context of the 2019 NWDAP Stage 3 Review & Impact Assessment

It is important to recognise that the NWDAP represents a high-level strategy and framework for all wild dog management Australia wide. A comprehensive, national-level review and impact assessment for the NWDAP would require (at a minimum) a comprehensive set of current data on all public and private wild dog management investments (at all levels, across all jurisdictions and including both cash and in-kind resources) and a detailed description of the objectives, activities, outputs and outcomes of all such investments. Further, such an assessment also would require current, consistent data on the impact costs of wild dogs by state/region and the benefits of each individual wild dog management initiative and/or program Australia wide.

The current, 2019 NWDAP Review & Impact Assessment focused on the particular investments and activities (projects) that were not already occurring and/or required government funding to occur (Jane Littlejohn, pers. comm., 2019). These activities were undertaken in three investment stages and funded largely through grants from DoAG between 2013/14 and 2018/19.

The current review component assessed the activities and outputs of the Stage investment 3 (2017/18 to 2018/19) to evaluate the Plan's performance against the outcomes and strategies reported in the NWDAP Stage 3 monitoring, evaluation, reporting and improvement (MERI) plan. This assessment was then combined with a previous assessment of the Stage 1 and 2 investment, conducted by GHD in 2017, to provide an assessment of the overall progress of the NWDAP (Stages 1, 2 and 3) toward its objectives and goals for the 2014-2019 period, as described in the NWDAP 2014-2019 Section 6.3.3[2].

The current impact assessment component (including benefit-cost analysis) focused on the actual and potential direct (primary) and indirect (secondary) impacts from the

[2] see: https://www.pestsmart.org.au/wp-content/uploads/2018/10/NWDAP_FINAL_Revision-Aug-2018-1.pdf

activities undertaken through the specific grant investments for Stages 1, 2 and 3 of the NWDAP, but excluded all other investment and associated impacts.

A comprehensive review/assessment/evaluation of the NWDAP in its entirety (encompassing all wild dog management investment) in the future would be valuable to provide a complete picture of the activities, outcomes, and economic, environmental and social impacts (and benefits) of wild dog management in Australia. However, this level of assessment would require significant time and resources and was beyond the scope of the current 2019 NWDAP Stage 3 Review & Impact Assessment.

1.5 General Method

The NWDAP Stage 3 Review and Impact Assessment 2014-2019 (Project ON-00501: *National Wild Dog Action Plan Stage 3*) was conducted in three main parts. The general methods for each part are described below.

1.5.1 Part A: Review of the NWDAP Stage 3

The first component of the NWDAP Stage 3 Review and Impact Assessment 2014-2019 was to assess the achievements of Stage 3 of the NWDAP (1 July 2018 to 30 June 2019) against the objectives and performance measures identified under section 6.3.3 of the Plan.

The review of Stage 3 commenced with a desktop review. The review included documentation associated with delivery of the NWDAP Stage 3 including the Stage 3 MERI plan, milestone/progress reports for Stage 3 activities, project reports from the National Wild Dog Management Coordinator (NWDMC), the GHD NWDAP Mid-Term Review (GHD, 2017) and other published and un-published NWDAP documentation.

Particular emphasis was given to the 2017 GHD NWDAP Mid-Term Review which included an assessment of the NWDAP's progress toward outcomes and an impact assessment (including BCA) for Stages 1 and 2.

Following the document review, a representative of the Agtrans review team attended the NWDAP Stakeholder Forum and Coordination Committee meeting on 2-3 May 2019. At the forum, Agtrans presented the NWDAP Stage 3 Review and Impact Assessment process and engaged with NWDAP stakeholders to obtain further information about the activities, outcomes, and actual and potential impacts of the NWDAP from industry, government and other representatives.

Information obtained through the document review and stakeholder consultations then was assembled and a preliminary, qualitative assessment of the outcomes of the NWDAP Stage 3 activities were assessed against the objectives and performance measures outlined in section 6.3.3 of the NWDAP (WoolProducers Australia, 2014). The preliminary assessment was used to identify any remaining information/data gaps and was sent to the NWDMC, Greg Mifsud, for comment and to obtain additional information where required.

Feedback and additional information then were incorporated into the Stage 3 review, and a complete draft of the Stage 3 review was then compiled and entered into the NWDAP Stage 3 Review and Impact Assessment 2014-2019 report (see Section 2. Part A: Review of the NWDAP Stage 3).

1.5.2 Part B: NWDAP Impact Assessment 2014-2019

The second part of the NWDAP Stage 3 Review and Impact Assessment 2014-2019 was to identify and report the actual and potential impacts of the investment in the current NWDAP 2014-2019, including a quantitative, BCA of key impacts.

The impact assessment was conducted using a logical framework approach. The evaluation process involved identifying and briefly describing project objectives, activities and outputs, outcomes, and impacts. The principal economic, environmental and social impacts were then summarised in a triple bottom line framework. The information used

to develop the NWDAP 2014-2019 logical framework was obtained through the desktop document review and stakeholder consultation carried out for Part A (the NWDAP Stage 3 review) and follow up email and telephone contact with key NWDAP personnel.

Following identification and categorisation of the impacts of the NWDAP investment, some, but not all, of the impacts identified were then valued in monetary terms. Where impact valuation was exercised, the impact assessment uses BCA as its principal tool. The decision not to value certain impacts was due either to a shortage of necessary evidence/data, a high degree of uncertainty surrounding the potential impact, the likely low relative significance of the impact compared to those that were valued, or the difficulties in linking impacts to the original NWDAP investment and activities.

A draft of the NWDAP 2014-2019 logical framework and BCA was sent to AWI for comment. Following receipt of comments on the draft, the NWDAP 2014-2019 impact assessment was amended and incorporated into the broader NWDAP Stage 3 Review and Impact Assessment 2014-2019 report.

1.5.3 Part C: The Future of the NWDAP

The third and final component was a qualitative assessment of the relevance of the NWDAP vision and mission and a SWOT analysis to guide any future NWDAP post-2019.

Information for the assessment was obtained through the stakeholder consultations and an online survey carried out during Part A and B of the review process. In addition to information about the activities, outcomes and impacts of the NWDAP, stakeholders were asked to provide feedback on the strengths, weaknesses, threats and opportunities (both internal and external) that may affect the future performance of the NWDAP and what changes could be made to improve the NWDAP post-2019.

Findings from the Stage 3 Review (Part A), the NWDAP Impact Assessment 2014-2019 (Part B), were considered in conjunction with the information received through the stakeholder consultations and survey to complete a draft assessment of the relevance and currency of the NWDAP's vision and mission, and to provide recommendations regarding how the current Plan potentially could be improved for the future.

The draft assessment was sent to Greg Mifsud and AWI for comment. Feedback was then incorporated, and the assessment was integrated into the overarching 2019 NWDAP Stage 3 Review and Impact Assessment report.

1.6 Report Overview

This report presents the independent review findings of the NWDAP Stage 3 Review and Impact Assessment 2014-2019. The report has the following sections:

Chapter 2 – Part A: A Review of the NWDAP Stage 3

Chapter 3 – Part B: NWDAP Impact Assessment 2014-2019

Chapter 4 – Part C: The Future of the NWDAP

Chapter 5 – NWDAP Stage 3 Review and Impact Assessment: Summary & Discussion

Chapter 6 – Recommendations

Chapter 7 – Conclusions

Appendix A – NWDAP Action Implementation Requirements (NWDAP Section 6.3.3) - Reproduced

Appendix B – NWDAP Stakeholder Survey (Online Questionnaire)

Appendix C – Record of Documentation Reviewed

Appendix D – Summary of NWDAP Stage 3 Review & Impact Assessment Consultation Respondents

Appendix E – NWDAP – Assessment of Achievement Against Stage 3 MERI Plan Activities and Overarching Goals (Assessment Matrix)

Appendix F – Summary Table of GHD Mid-Term NWDAP Assessment (Reproduced)

Appendix G – WoolProducers Australia – Response to NWDAP Review Information Request 2019

2. Part A: Review of the NWDAP Stage 3

2.1 Introduction

All Australian wild dog management activities are guided by the NWDAP. However, the current review focused on the particular investments and activities (projects) that were not already occurring and/or required government funding to occur (Jane Littlejohn, pers. comm., 2019).

The first, five-year iteration of the NWDAP (2014-2019) was conducted in three stages:

- Stage 1: 2013/14 and 2014/15
- Stage 2: 2014/15 and 2016/17
- Stage 3: 2017/18 and 2018/19

An assessment of the activities, outcomes and impacts of Stages 1 and 2 was conducted by GHD[3] in 2017 as part of a Mid-Term review of the NWDAP investment.

Activities undertaken during Stage 3 of the NWDAP were due to be completed by 30 June 2019 and, as part of the current NWDAP Stage 3 Review and Impact Assessment 2014-2019, the NWDAP Coordination Committee (NWDAPCC) required an updated assessment regarding delivery of the NWDAP in line with objectives and performance measures identified under section 6.3.3 of the NWDAP (WoolProducers Australia, 2014).

Part A describes the findings of the previous, GHD NWDAP Mid-Term review, the goals and objectives of the NWDAP with a particular focus on Stage 3 objectives, an update of the activities, outputs and outcomes achieved to date under Stage 3 of the NWDAP, progress toward any outstanding goals and objectives, and a summary of the current assessment's findings.

2.2 The GHD Mid-Term Review

2.2.1 Overview

In April 2017, GHD completed a Mid-Term Review (3-year) of the NWDAP, including Stage 1 and Stage 2 projects, for Invasive Animals Ltd. The Terms of Reference for the GHD review required that the report address 11 components of the NWDAP's performance under four main headings as follows (GHD, 2017):

a) Progress towards outcomes,
b) The impact of outcomes,
c) The quality of governance and project management, and
d) Recommendations for the future.

The review was completed in two phases: (1) a document review and analysis, and (2) consultation that included face-to-face interviews with participants of the NWDAP Stakeholder Consultative Group, an online survey, and follow-up phone interviews with stakeholders.

[3] For more information, see: https://www.ghd.com/en-au/index.aspx

2.2.2 Key Findings

Similar to the current review, the 2017 Mid-Term Review of the NWDAP (Stages 1 and 2) found that the NWDAP was seen as the appropriate mechanism for delivering a coordinated national approach for wild dog management and that the vision and mission of the NWDAP were appropriate in setting direction for its activities and stakeholders.

In terms of progress toward NWDAP goals and objectives, the 2017 review found that, of the 32 actions listed in the NWDAP, 15 were assessed as being achieved, 14 as partially achieved, and 3 as not achieved. **Figure 1** shows the findings of the GHD assessment. A summary of the specific assessment findings, as reported by GHD in 2017, are reproduced in **Appendix F:** Summary Table of GHD Mid-Term NWDAP Assessment (Reproduced).

Figure 1: GHD Assessment of NWDAP Actions Achieved (Stage 1 and 2) - 2017 Mid-Term Review

Goal	Achieved ✓✓✓	Partially achieved ✓✓	Not achieved ✓
Goal 1: Leadership and coordination	5	4	0
Goal 2: Increase awareness, understanding and capacity building	6	3	0
Goal 3: Mitigate the negative impacts caused by wild dogs	3	5	0
Goal 4: Monitor, evaluate and report	0	2	3
Total	15	14	3

Source: Table 7, NWDAP Mid-Term Review, Final Report (GHD, 2017)

Based on the assessment of achievement of NWDAP actions, the review also stated that the majority of Goal 1 and Goal 2 actions had been achieved, while the majority of Goal 4 actions had not been achieved, largely due to delays associated with a metrics project.

Also, a BCA was completed as part of the Mid-Term review process to estimate the expected value of the impacts stemming from the Stage 1 and 2 NWDAP investment. The BCA estimated that the NWDAP Stage 1 and 2 investment had a benefit-cost ratio (BCR) in the range of 8.7 to 13.8 to 1. The benefits attributable to the NWDAP resulted mainly from an increase in leveraging of resources and improvements in resource efficiency in managing and controlling wild dogs.

2.2.3 Recommendations for the future of the NWDAP

At the conclusion of the NWDAP Mid-Term review, the following six key recommendations were made by the GHD review team:

1. Stakeholders to support the continuation of NWDAP both in the short term (Stage 3) and into the future (beyond 2019) with consideration for the future program to include management of other invasive pests. Before 2019, NWDAP to be involved, via the Invasive Plants and Animals Committee (IPAC), in

discussions to identify opportunities to work together on other national pest strategies (e.g. rabbits and carp) and the national Feral Cat Taskforce.

2. Funding for Stage 3 to be based on a similar funding formula for Stage 2, assuming an agreed operational plan of activities and performance measures are adopted. This means a continuation of DoAG funds for leadership and coordination activities which have been critical to the success of the NWDAP to date. However, continued reliance on DoAG funding is not wise and therefore, during Stage 3, funding opportunities should be investigated through relevant organisations such as MLA's advisory committees.

3. Continually explore two-way communication opportunities between the Implementation Steering Committee (ISC) and IPAC through the ISC's IPAC representative with the aim of achieving increased harmonisation of wild dog management approaches between the states. This increased harmonisation could be measured via the successful implementation of recommendations 4 and 5 following.

4. A future NWDAP (i.e. commencing in 2019) should adopt a planning process that includes an over-arching strategic plan (preferably a 5-year rolling plan that is updated annually) complemented by more detailed annual operating plans. These plans to include responsibility and accountability parameters for each of the stakeholders to be endorsed by IPAC, including regular two-way communication of activities and outcomes.

5. Continue to work towards a nationally-consistent approach to all aspects of wild dog management that would result in more effective and efficient messaging to all stakeholders and the community. This includes adoption of standardised, pragmatic metrics to monitor and report on outcomes. Reporting should be the responsibility of salaried staff in recognition of the limited time available to most landholders and volunteers. Where data collection is primarily through producers' voluntary contributions, explore processes whereby funding recipients are required to make data recording a condition of funding, with NWDAP/ISC/Stakeholder Consultative Group (SCG) promoting this approach.

6. Continuity planning is required particularly in relation to key staff to ensure that activities can be progressed as staff inevitably move to alternative employment.

2.3 NWDAP: Stage 3

2.3.1 Overview

NWDAP Stage 3 activities that required particular collaboration and/or would not have occurred by default (Jane Littlejohn, pers. comm., 2019) were funded through a $312,000 grant (inc. GST) from the Commonwealth Government through a contract between DoAG and AWI. Stage 3 was funded for the period November 2017 to 30 June 2019.

According to the contract agreement, the purpose of Stage 3 of the NWDAP was to undertake activities in four broad areas as follows:

- Effective national leadership and coordination,
- Awareness, understanding and capacity in wild dog management,
- Wild dog control tools and methods, and
- Monitoring, evaluation and reporting.

Also, the Stage 3 NWDAP agreement required development of a monitoring, evaluation, reporting and improvement (MERI) plan. The purpose of the MERI plan was to:

a) Ensure the objectives of the funded project and the processes for achieving them were clear, and
b) Identify data and information that could feasibly be collected as evidence of project delivery and outcomes.

Throughout the NWDAP Stage 3 investment period, half yearly and yearly progress reports were produced to track and assess achievement of project outcomes against a range of specific MERI activities.

2.3.2 The Purpose and Intended Outcomes of Stage 3

The overarching purpose of the NWDAP Stage 3 investment (project) was to support the implementation of the NWDAP by focussing on four key activities of national interest, listed as Goals 1 to 4 within the Plan (see Section 1.1).

The NWDAP Stage 3 MERI Plan described 20 specific activities nested within a series of eight, high-level 'intended outcomes' associated with achievement of the each of the four NWDAP goals. The outcomes were as follows:

Goal 1: *Provide leadership and coordination for the management of wild dogs*

Outcome A: Leadership capacity to transition NWDAP beyond its 2019 end
Outcome B: NWDAP leadership in community landscape management

Goal 2: *Increase awareness, understanding and capacity building in wild dog management*

Outcome C: A public voice for wild dog management
Outcome D: Capacity in pest animal controllers (PAC)
Outcome E: Capacity in coordinators

Goal 3: *Mitigate negative impacts caused by wild dogs*

Outcome F: Reduce constraints to effective programs

Goal 4: *Monitor, evaluate and report to inform and continuously improve wild dog management*

Outcome G: Minimum national measures of impact and investment
Outcome H: Stakeholder and independent input

2.3.3 Activities and Outputs of Stage 3

Through the MERI plan, the indented NWDAP Stage 3 outcomes were linked to a series of specific activities to facilitate delivery of the Plan's objectives. The following section briefly describes the activities undertaken as part of the NWDAP Stage 3.

- Transition of the ISC to NWDAP Stage 3 oversight and promotion structure:
  The project oversight and promotion structure was finalised in June 2018. The NWDAPCC that replaced the Stage 2 ISC was formally established and had its initial meeting on the 26-27 July 2018. The NWDAPCC nominated a number of NWDAP 'Champions' to promote the NWDAP and champion Stage 3 initiatives for the duration of the project. Champions were representatives from each of the NWDAP supporting livestock industries for each state/territory.

- Stage 3 staff resourcing:
  Once the Stage 3 project agreement with funders was executed, AWI was contracted to provide grant administration. Project administration, communications coordination and administration, and digital services were then subcontracted as per the NWDAP grant agreement for Stage 3. Invasive Animals Limited (IAL) was contracted to provide digital services.

- NWDAP 2020 strategic planning:
  Consultation with the SCG and NWDAPCC (as well as broader stakeholder groups) was conducted on 2-3 May 2019. It was decided that a writing group would be set up to review and redraft the NWDAP goals/objectives/actions framework incorporating the findings of the NWDAP final review to be completed 29 July 2019.

- Promote integrated multiple vertebrate pest management (IMVPM):
  The actions within the NWDAP were updated to include IMVPM and the revised document was uploaded to the PestSmart website in June 2018. Further promotion of IMVPM and development of extension materials has been planned. Livestock representatives on the NWDAPCC plan to promote IMVPM to the Livestock Production Assurance Program in MLA and the NWDMC (Greg Mifsud) will brief the Executive Officer of NRM Regions Australia. Further, to ensure content is informed by current research, AWI has contracted with NSW Department of Primary Industries (NSW DPI) to write up the findings of previous research where data was collected under the IA CRC (Jane Littlejohn, pers. comm., 2019).

- Collaborate with community biosecurity and landcare leadership:
  The NWDAPCC collaborated with Animal Health Australia (AHA) to enable promotion of PestSmart links on the AHA website under biosecurity pages. The NWDAP text was submitted to AHA for approval and AHA launched the online

pages on 28 May 2019[4]. Further, several new relationships were formed including an alliance between the NWDAP (through its national and state coordinators) and Natural Resources Northern and Yorke (South Australia), ongoing liaison with the Institute for Environmental Research (VIC) on 1080 and quoll research, and preliminary discussions with Bush Heritage Australia on ecological research findings. Promotion of the NWDAP to biosecurity and landcare leadership is ongoing.

- Scope future alliances for national coordination of wild dog management:
  The Cattle Council of Australia (CCA), WoolProducers Australia and Sheep Producers Australia were approached by the NWDMC and have collectively agreed to fund (through AHA) a quarter of the cost of the NWDMC (salary and on costs) through to 2021/22. The NWDAP continues to seek out potential alliances through active membership of biosecurity and landcare organisations of the NWDAP SCG.

- Promote best practice through communications:
  Best practice wild dog management was promoted through a number of e-updates (NWDAP communiques that stakeholders may subscribe to) that were published on the PestSmart website[5] during the Stage 3 investment period. There were 1,690 e-update subscribers as of 31 March 2019. Digital and traditional media (such as the PestSmart NWDAP website, print copies of the Glovebox Guide for Managing Wild Dogs, Facebook, YouTube, and Twitter) were also used to promote the NWDAP, up to date wild dog management resources, and adoption of best practice wild dog management across regions and different stakeholder groups.

- Identify and include missing stakeholders in activities:
  Stakeholder groups missing in previous stages of the NWDAP (identified by the SCG through a facilitated workshop in July 2016) were targeted using specific NWDAP communiques. For example, e-updates and videos were created that featured information specifically relevant to cattle producers and landcare groups. Further the NWDMC, state coordinators and other agency staff utilised their networks to promote the NWDAP to local governments resulting in at least seven applications for wild dog control funding across NSW, WA and VIC local government areas (LGAs). Also, the NWDMC was accepted as a member of MLA's Southern Australia Livestock Research Council and successfully engaged a number of new livestock productivity stakeholders in wild dog management.

- Proactivity on threats to social licence:
  Threats to social licence (e.g. negative public attitudes toward 1080 baiting of wild dogs) has been proactively addressed through the promotion of factual wild dog management information via digital media such as facebook, twitter and the NWDAP/PestSmart websites. Also, the NWDMC has prepared submissions to various levels of government to inform decision makers about wild dog issues and the implementation of best practice wild dog management across Australia.

[4] See: https://www.farmbiosecurity.com.au/essentials-toolkit/ferals-weeds/wild-dog-biosecurity/

[5] See: https://www.pestsmart.org.au/national-wild-dog-action-plan/e-updates/

Further, given that the Australian government's proposed dingo conservation plan was identified as a risk for the NWDAP, proactive efforts have been made to better inform stakeholders of the nature of the wild dog versus dingo issue. For example, research was shared on the PestSmart website that supports the idea that dingoes are not actually a native Australian animal[6].

- Evaluate communications effectiveness:
  IAL provides ongoing media monitoring of online news. Also, a survey was conducted in May 2019 to evaluate the NWDAP's communications activities. Eighty respondents completed the survey. Of the 80 respondents, 77 had heard of the NWDAP. Information regarding the NWDAP was primarily sourced from local industry groups, government agencies (or similar), and the PestSmart website. Over 80% of respondents stated that they felt moderately to highly confident that they could find expert information on wild dog control and close to 90% indicated that they were moderately to highly likely to pass this information on to other livestock producers. Further, the survey found that fact sheets, videos and case studies (developed under Stages 1 and 2), and research findings were the most useful wild dog control resources available on the PestSmart website. Finally, over 50% of respondents indicated that they had used NWDAP information to manage wild dogs on their properties and/or to assist their local wild dog control program or group.

- Minimum national measures for PAC certificate assessment:
  On 12 September 2018, the Australian Industry and Skills Committee (AISC) approved the 'Case for Endorsement' for the updated and revised qualifications, skill sets and units of competency, along with a 'Companion Volume Implementation Guide' for the AHC30318 Certificate III in Rural and Environmental Pest Management for Registered Training Organisations (RTOs). Australian RTOs may now apply to have the updated qualifications, skill sets and units added to their scope of registration. Also, the QLD and VIC state governments are looking into incorporating aspects of the competencies into their training programs and NSW local land services (LLS) are piloting the course for new employees through TAFE.

- Continuing professional development for coordinator roles:
  A National Wild Dog Coordinators Workshop was held in Toowoomba (QLD) from the 19th to the 21st of September in 2018. Also, an online forum was created to replace face to face (F2F) meetings between all coordinators (the NWDMC and state/territory coordinators). The forum acts as a line of communication where information and resources can be shared. The forum has been in operation since March 2019. The state/territory coordinators also have been embedded into a CISS project called "Behaviourally Effective Communication and Engagement in the Management of Wild Dogs" co-funded by AWI.

- Promote best practice tool and plan method:
  The NWDMC met with MLA and AWI extension staff in April 2019 to discuss how to integrate predator management best practice into current industry adoption

[6] For further information see: http://www.pestsmart.org.au/is-the-dingo-a-tru-blue-native-australian-species/

and extension programs. Personnel from AHA, CISS, and NSW DPI as well as the chair of the northern NSW Southern Australia Livestock Research Council also participated in the discussion. The NWDMC now is working with MLA to identify producer demonstration sites.

- Promote participation to those on ground:
  Ongoing NWDAP communiques continue to be produced to inform and promote the latest research and best practice management tools for wild dog control on the ground. The NWDMC has participated in all state stakeholder forums for wild dog strategic planning and has given presentations to Northern and Yorke NRM's "Living Flinders" group. The NWDMC also continues to work with organic primary producers to investigate how 1080 could be effectively utilised for wild dog management on/near organic certified land resources.

- National report to stakeholders:
  The NWDAPCC has been collecting data on national wild dog metrics. However, there has been concern over the lack of response and lack of data for some national metrics from some states. Jurisdictional differences make collation and subsequent analysis of the national data difficult. The NWDAP put a paper to the Environment and Invasives Committee (EIC) in August 2018. The Manager of the Pests and Weeds Unit from the NSW Office of Environment and Heritage agreed to identify the key contact person for each State's Department of Agriculture who then will supply data to the NWDAP for annual metrics reporting. This activity is ongoing.

- Stakeholder reports and consultation:
  The SCG met on 2-3 May 2019 for consultation associated with the final review of the NWDAP 2014-2019 and the NWDAP post-2019. A writing group also was formed to progress any revisions for the future NWDAP.

2.3.4 Progress Toward Stage 3 Objectives: Assessment

Based on available NWDAP Stage 3 milestone reports and other project documentation, interviews with NWDAP personnel (including some members of the NWDAPCC), the GHD Mid-Term review findings, and information collected from other NWDAP documentation and stakeholders, an assessment was made regarding the NWDAP's progress toward achieving the 35 strategies/activities (Outcomes A through H) listed under each of the NWDAP's four overarching Goals in the NWDAP Stage 3 MERI Plan.

A detailed list of documentation reviewed and stakeholders consulted can be found in **Appendix C:** Record of Documentation Reviewed and **Appendix D:** Summary of NWDAP Stage 3 Review & Impact Assessment Consultation Respondents. The assessment matrix used as input to **Table 2** and **Table 2** (below) can be found in **Appendix E:** NWDAP – Assessment of Achievement Against Stage 3 MERI Plan Activities and Overarching Goals (Assessment Matrix). Based on the assessment of progress against the NWDAP Stage 3 outcomes, the review team found that 80% of planned outcomes had been achieved or partially achieved over the 2017/18 to 2018/19 period.

Table 1: Assessment of Achievement Against NWDAP Stage 3 Strategies/Activities (2017/18 and 2018/19)

NWDAP Goal	Stage 3 Outcome	Achieved (✓✓✓)	Partially Achieved (✓✓)	Not Achieved (✓)	Total (no. of activities)
Goal 1: Provide leadership and coordination for the management of wild dogs	**Outcome A:** Leadership capacity to transition NWDAP beyond its 2019 end	3	0	1	4
	Outcome B: NWDAP leadership in community landscape management	0	4	0	4
Goal 2: Increase awareness, understanding and capacity building in wild dog management	**Outcome C:** A public voice for wild dog management	3	4	0	7
	Outcome D: Capacity in pest animal controllers (PAC)	2	0	1	3
Goal 3: Mitigate negative impacts caused by wild dogs	**Outcome E:** Capacity in coordinators	0	1	2	3
	Outcome F: Reduce constraints to effective programs	0	5	1	6
Goal 4: Monitor, evaluate and report to inform and continuously improve wild dog management	**Outcome G:** Minimum national measures of impact and investment	1	1	2	4
	Outcome H: Stakeholder and independent input	3	1	0	4
Totals		12	16	7	35

Following the Stage 3 Outcome assessment (**Table 1**), and based on information provided by AWI as to the alignment of Stage 3 activities and outcomes against the broader NWDAP actions and objectives, achievements against the Stage 3 MERI Plan were mapped to the 35 Actions listed under the Action Implementation Requirements set out in Section 6.3.3[7] of the NWDAP 2014-2019.

Table 2 shows the findings of the high-level assessment, undertaken by Agtrans, of the NWDAP's progress towards achievement of each of the four overarching goals for the activities undertaken through the Stage 3 grant only.

Table 2: Assessment of Achievement Against NWDAP Activities (NWDAP Stage 3 only)

Goal	Achieved (✓✓✓)	Partially Achieved (✓✓)	Not Achieved (✓)	Not Rated[(a)]	Total (no. of activities)
Goal 1: Provide leadership and coordination for the management of wild dogs	1	3	0	5	9
Goal 2: Increase awareness, understanding and capacity with regard to wild dog management	0	3	0	6	9
Goal 3: Mitigate the negative impacts caused by wild dogs	0	2	0	6	8
Goal 4: Monitor, evaluate and report to inform and continuously improve wild dog management	2	6	0	1	9
Totals	3	14	0	18	35

(a) Where a NWDAP activity (under Section 6.3.3 of the 2014 Plan) was described as 'not rated' for Stage 3, this was because there were no specific Stage 3 activities undertaken in 2017/18 and 2018/19 that were aligned with the particular NWDAP Action Implementation Requirement activities in the NWDAP 2014-2019, based on the NWDAP Stage 3 MERI Plan and milestone reports. These data were included so that an overall assessment could be made as to the NWDAP's progress against its goals across all three stages.

[7] The prevailing NWDAP 2014-2019 described 35 actions nested within 12 objectives under the four overarching NWDAP goals under the Action Implementation Requirements (Section 6.3.3 pg. 38 – 48). The actions were updated based on the recommendations of the GHD Mid-Term review (2017).

2.4 Progress Toward NWDAP Goals: Overall Assessment

The assessment of progress for Stage 3 was combined with the findings of the GHD Mid-Term Review (2017) that covered NWDAP Stage 1 and 2 progress toward NWDAP goals and objectives to provide an overall assessment of the NWDAP's progress towards its four overarching goals for the 2014-2019 period. The results are shown in **Table 3** below.

Table 3: Assessment of NWDAP 2014-2019: Progress Toward Objectives

Goal	Achieved (✓✓✓)	Partially Achieved (✓✓)	Not Achieved (✓)	Total (no. of activities)
Goal 1: Provide leadership and coordination for the management of wild dogs	3	6	0	9
Goal 2: Increase awareness, understanding and capacity with regard to wild dog management	4	5	0	9
Goal 3: Mitigate the negative impacts caused by wild dogs	3	5	0	8
Goal 4: Monitor, evaluate and report to inform and continuously improve wild dog management	2	5	2	9
Totals	12	21	2	35
Proportion of Total (%)	34%	60%	6%	100%

Many of the activities assessed as 'Partially Achieved' were ongoing activities. Where this was the case, a note/comment was made within the assessment matrix (see **Appendix E:** NWDAP – Assessment of Achievement Against Stage 3 MERI Plan Activities and Overarching Goals (Assessment Matrix)).

Overall, over the five-year period of the current NWDAP, 94% of the NWDAP Action Implementation Requirements were assessed as 'Achieved' or 'Partially Achieved', indicating a high level of success and achievement of progress towards the NWDAP's goals and objectives.

2.5 NWDAP Stakeholder Survey

2.5.1 Overview

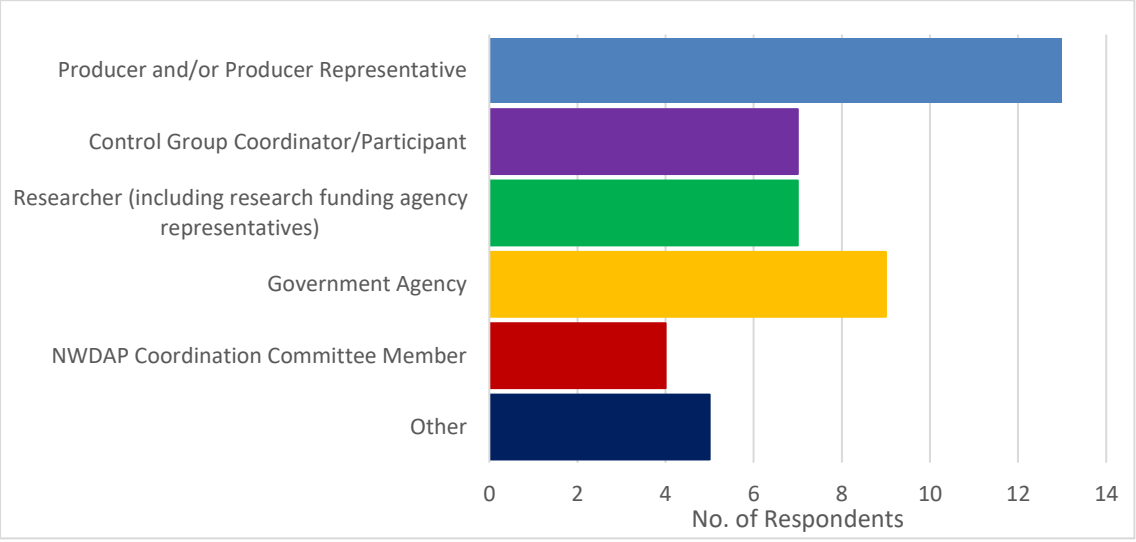
To obtain additional evidence, feedback and supporting information associated with the NWDAP's progress toward achieving its objectives and goals, and in line with the GHD Mid-Term Review (2017), an online survey was developed with the help of the NWDMC and APIM. A copy of the survey questionnaire can be found in Appendix B: NWDAP Stakeholder Survey (Online Questionnaire).

Initially, the online survey was sent to over 55 NWDAP stakeholders via email, including representatives from state government agencies, control group participants, RD&E representatives, NWDAPCC members and producers/producer representatives. However, only 10 of the original stakeholders contacted responded to the survey and some of the original survey respondents forwarded the questionnaire on to other NWDAP stakeholders, beyond the initial respondent list.

By the end of the survey period, 56 survey responses were received and recorded by the review team. After analysis of the individual responses, the review team identified 45 viable and/or credible stakeholder responses (n = 45) that were then used in the assessment. However, it should be noted that the responses were highly subjective and likely to be biased both regionally and by stakeholder group depending on prevailing conditions in terms of wild dog management (e.g. current wild dog pressure) and the directness of each respondent's link with NWDAP activities.

Survey respondents were first asked to identify a primary category of stakeholder that best described their involvement with the NWDAP. Respondents could select multiple categories, however only the primary category selected was recorded for the analysis. Survey respondents largely identified as producers/producer representatives (13 of 45), representatives of Government agencies (9 of 45), or researchers and control group participants (14 of 45). The number of respondents by primary stakeholder category is shown in **Figure 2**.

Figure 2: Proportion of Respondents by Stakeholder Category



2.5.1 Relevance of the NWDAP Vision & Mission Statement

Respondents were asked initially to assess how relevant the current NWDAP vision and mission statements were. The NWDAP vision statement states:

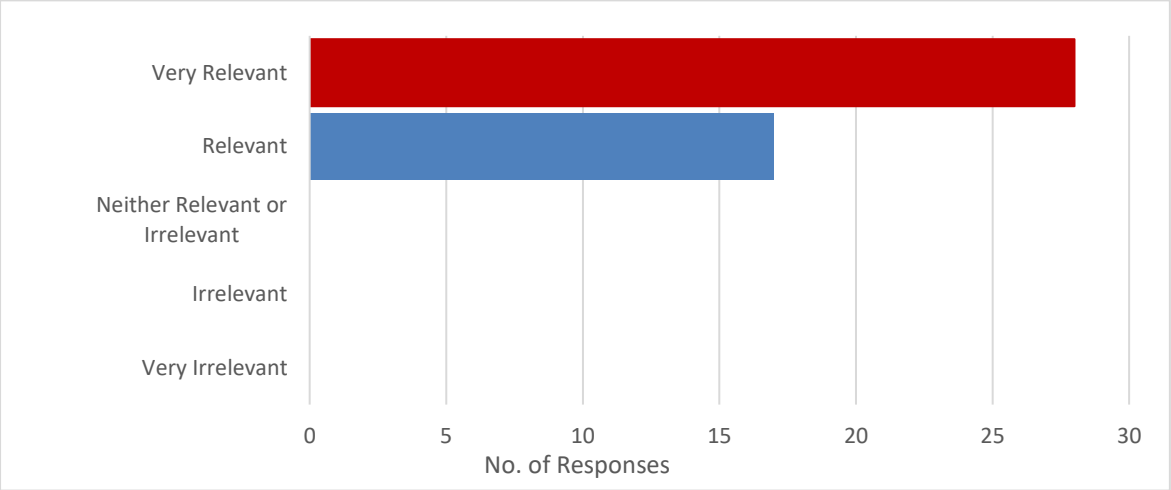
> *"Stakeholders work together to deliver effective, coordinated and humane management of wild dogs."*

The NWDAP mission statement says:

> *"The Plan provides direction for the national management of wild dogs to minimise their negative impacts on agriculture, biodiversity and social assets."*

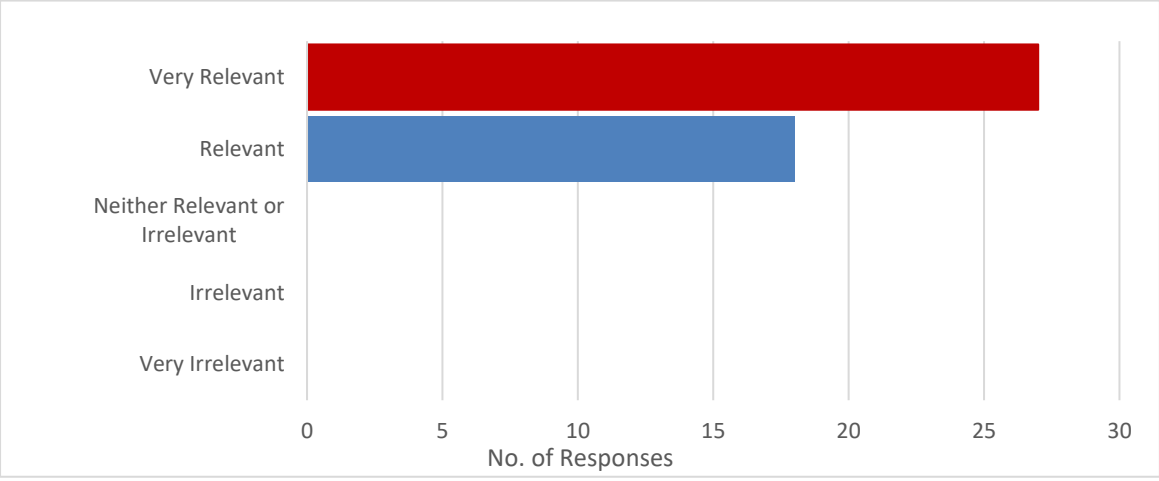
62.2% of respondents (28 of 45) indicated that the NWDAP vision statement is very relevant and all respondents (100%) rated the NWDAP vision statement as relevant or very relevant. **Figure 3** shows the NWDAP vision statement survey question results.

Figure 3: Assessment of Relevance of NWDAP Vision Statement



60.0% of respondents (27 of 45) indicated that the NWDAP mission statement is very relevant and all respondents (100%) rated the NWDAP mission statement as relevant or very relevant. **Figure 4** shows the NWDAP mission statement survey question results.

Figure 4: Assessment of Relevance of NWDAP Mission Statement



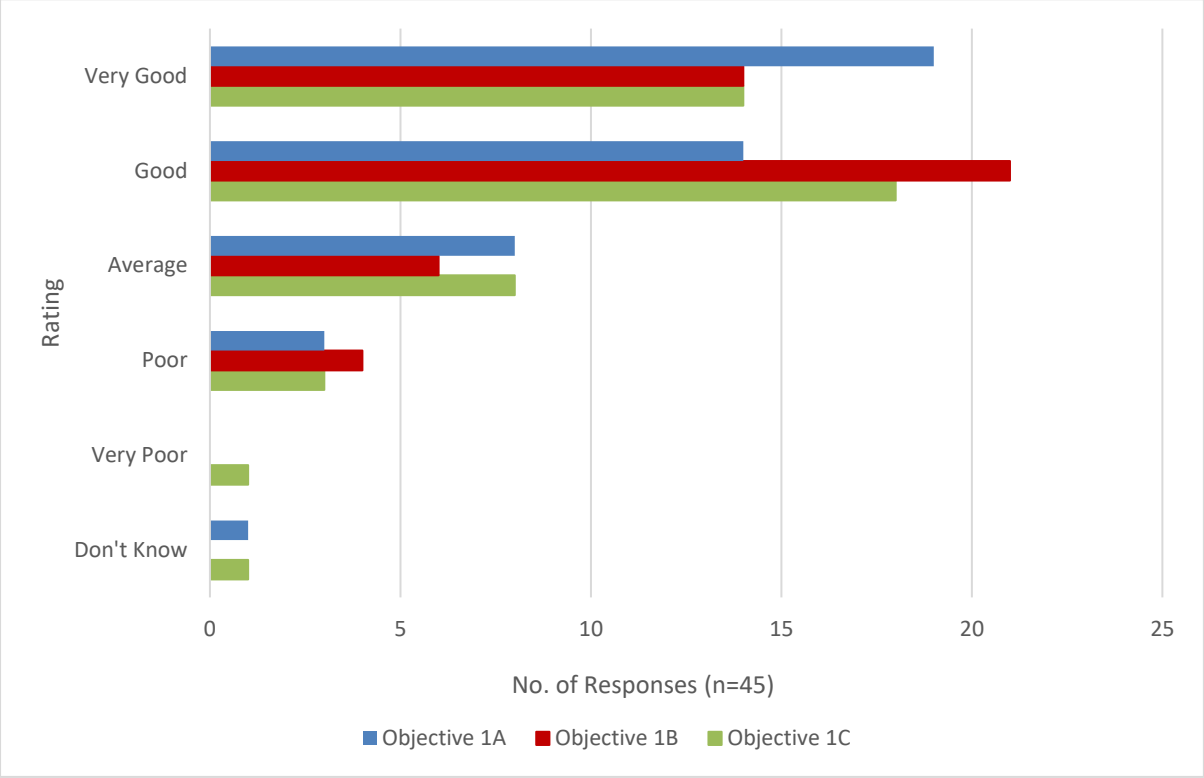
2.5.2 Rating of the Performance of the NWDAP against its Goals and Objectives

Survey respondents were then asked to rate the performance of the NWDAP's actions/activities against its four goals and underlying objectives (12 objectives[8]). Respondents were asked to select a performance rating for each item on a five-point scale from 'very poor' to 'very good'.

Goal 1: Provide leadership and coordination for the management of wild dogs.

Results for stakeholder ratings of the performance of the NWDAP against Goal 1 (Objectives 1A to 1C) are shown below.

Figure 5: Goal 1: Rating of NWDAP Achievement Against Objectives[(a)]



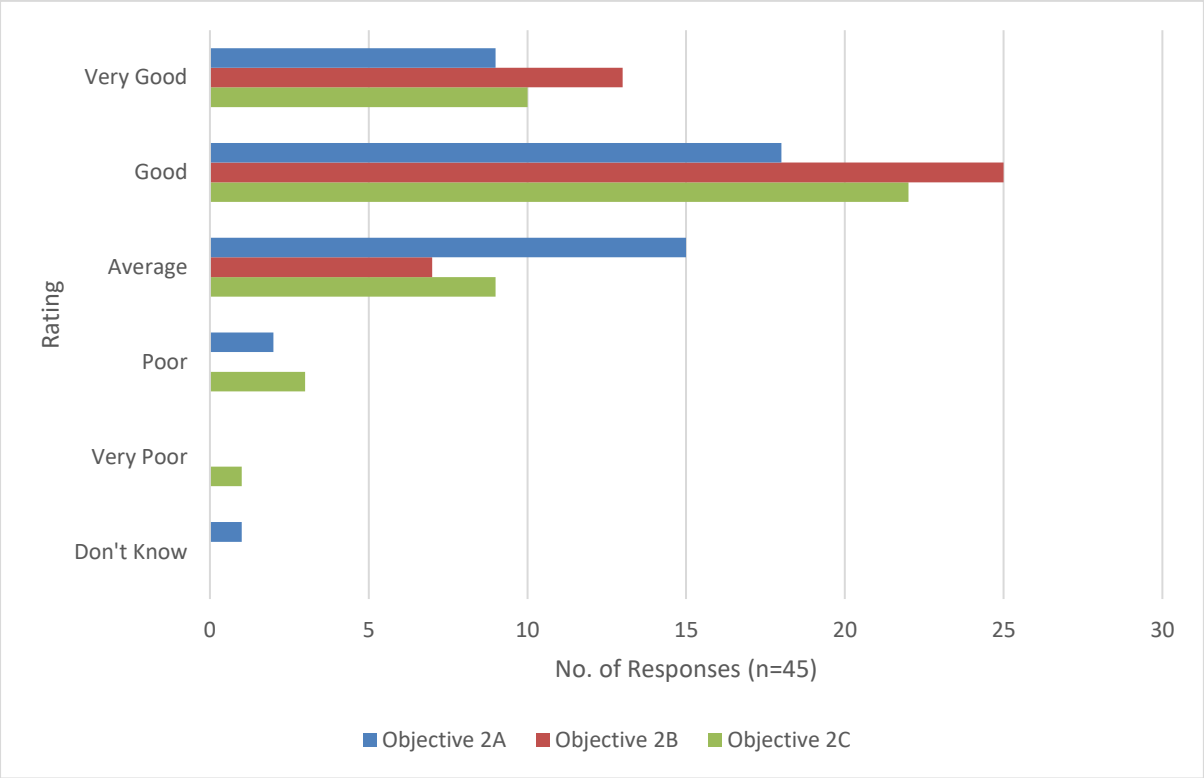
(a) The objectives listed under Goal 1 of the NWDAP are:
Objective 1A: Clarify roles and accountabilities of all relevant parties.
Objective 1B: Promote adoption of nationally-consistent approaches to wild dog management.
Objective 1C: Promote, enhance and implement collaborative best practice management systems.

[8] For specific detail, see Section 6.3.3 of the NWDAP (2014).

Goal 2: Increase awareness, understanding and capacity building with regard to wild dog management.

For Goal 2 (Objectives 2A to 2C), survey respondents were asked to select a performance rating for each item on a five-point scale from 'very poor' to 'very good'. Results for Goal 2 are shown below.

Figure 6: Goal 2: Rating of NWDAP Achievement Against Objectives[(a)]

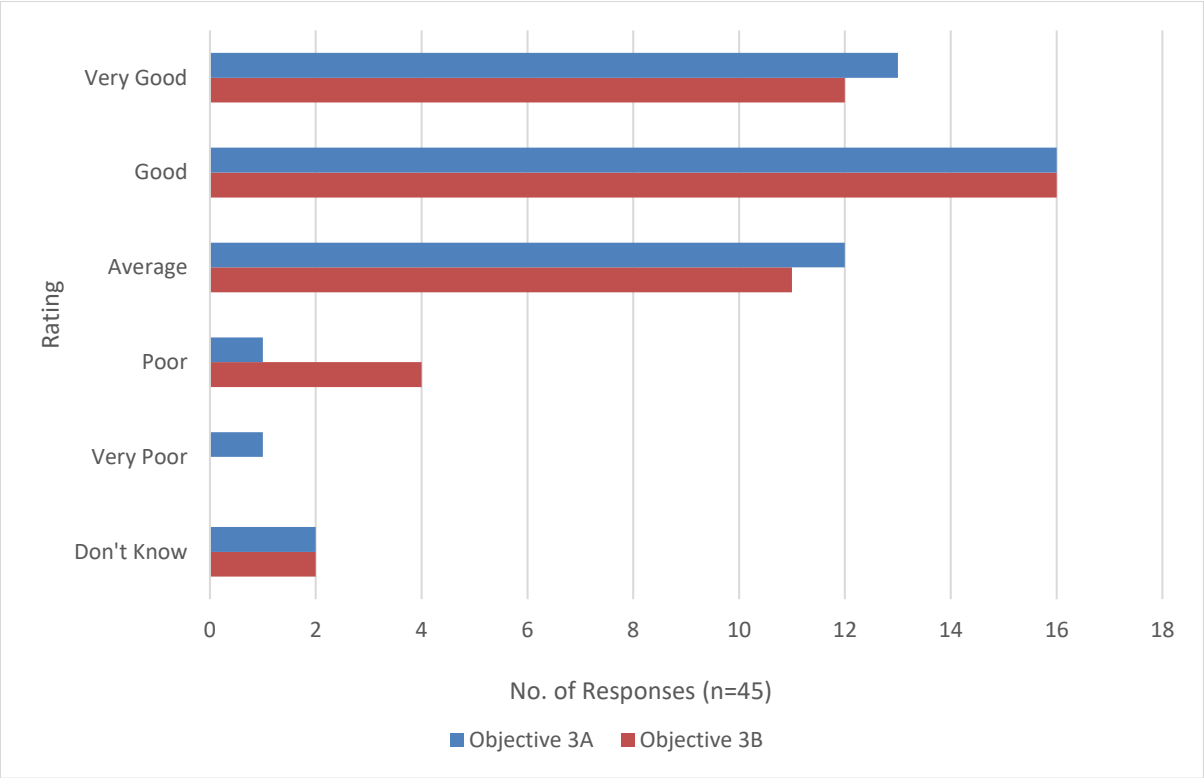


(a) The objectives listed under Goal 2 of the NWDAP are:
Objective 2A: Maximise public and community support for wild dog management.
Objective 2B: Ensure a comprehensive suite of extension materials is available.
Objective 2C: Improve adoption of wild dog best practice management through effective communication, education and training.

Goal 3: Mitigate the negative impacts caused by wild dogs.

For Goal 3 (Objectives 3A and 3B), survey respondents were asked to select a performance rating for each item on a five-point scale from 'very poor' to 'very good'. Results for Goal 3 are shown below.

Figure 7: Goal 3: Rating of NWDAP Achievement Against Objectives[(a)]

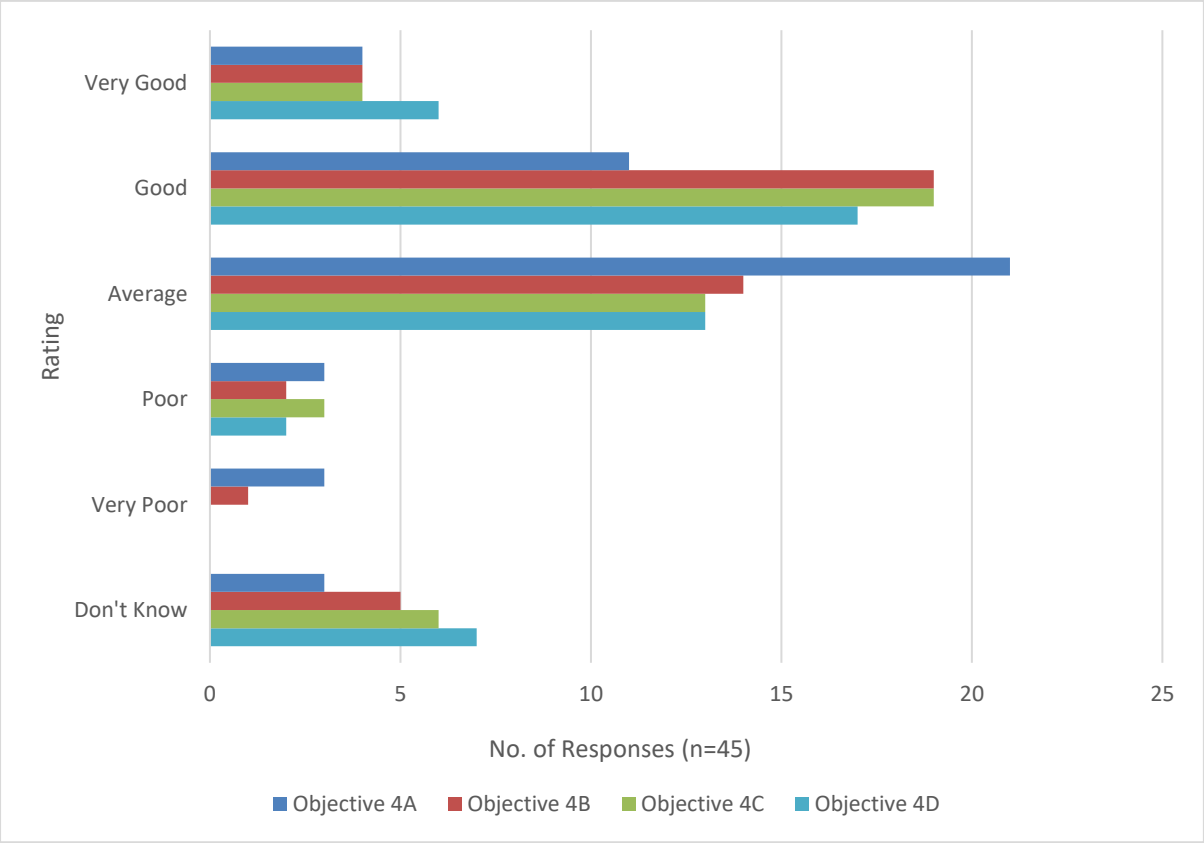


(a) The objectives listed under Goal 3 of the NWDAP are:
Objective 3A: Adopt a strategic, consistent, scientific, risk-based humane approach to managing the impacts of wild dogs.
Objective 3B: Promote adoption of best practice in plans at all scales.

Goal 4: Monitor, evaluate and report to inform and continuously improve wild dog management.

For Goal 4 (Objectives 4A to 4D), survey respondents were asked to select a performance rating for each item on a five-point scale from 'very poor' to 'very good'. Results for Goal 4 are shown below.

Figure 8: Goal 4: Rating of NWDAP Achievement Against Objectives[(a)]



(a) The objectives listed under Goal 4 of the NWDAP are:
Objective 4A: Develop nationally-consistent metrics for assessment of wild dog impacts and management efficacy.
Objective 4B: Develop and adopt processes for evaluating implementation outcomes of the Plan.
Objective 4C: Develop and adopt reporting processes and structures.
Objective 4D: Undertake continuity planning.

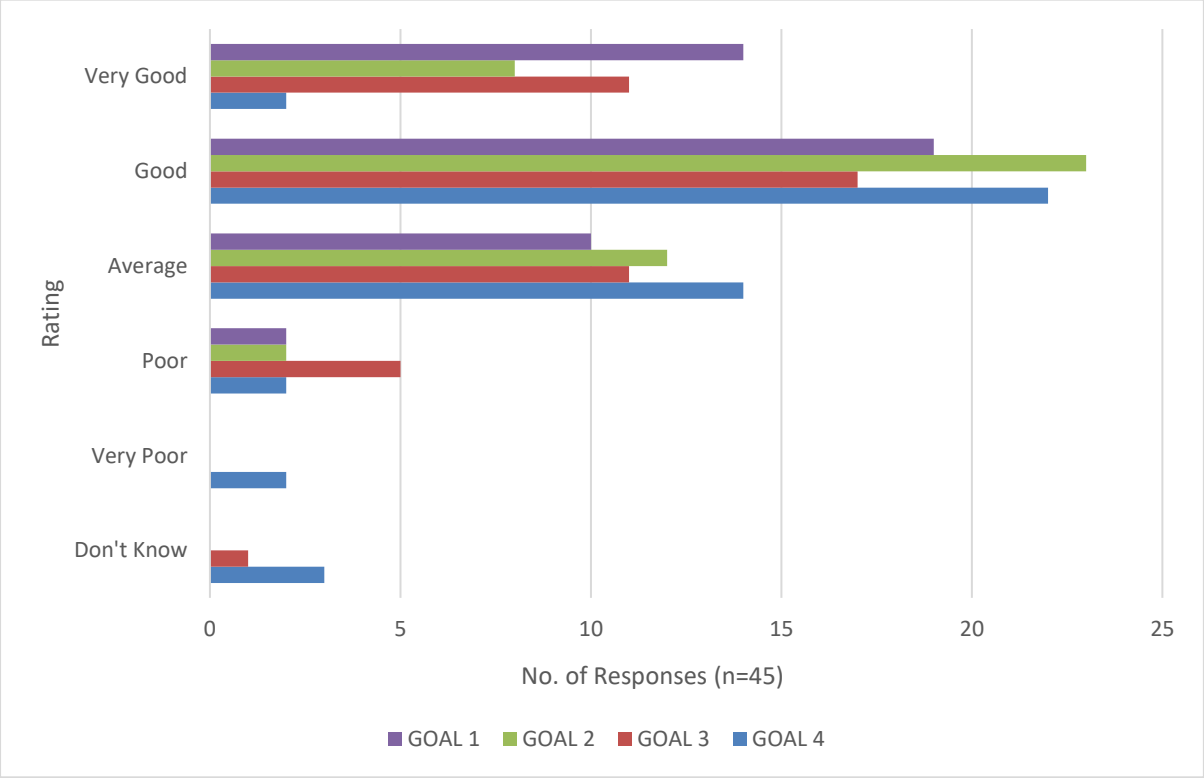
2.5.3 Overall Rating of Achievement of NWDAP Goals (Survey Assessment)

Overall, survey data indicated that 73.3% of the respondents (33 of 45) felt that the NWDAP's performance against Goal 1 was good or very good, 68.9% (31 of 45) believed performance against Goal 2 was good to very good, and 62.2% (28 of 45) responded that performance against Goal 3 was good to very good, and 53.3% (24 of 45) responded that performance against Goal 4 was good to very good.

At the individual Stage 3 objective level, the highest proportions of 'poor' or 'very poor' performance ratings were recorded against NWDAP Stage 3 objectives 1B (4 of 45 responses). At the Goal level, Goal 4 received the highest uncertain response (survey participants responding with a selection of 'Don't Know'). **Figure 9** shows the overall NWDAP performance rating at Goal level.

However, it is important to note that responses to the survey are highly subjective. Further, no control was in place to account for regional bias in the responses so the survey results should be viewed with some caution.

Figure 9: Overall Rating of NWDAP Achievement of Goals (Survey Assessment)[(a)]



(b) The Goals of the NWDAP are:
Goal 1: Provide leadership and coordination for the management of wild dogs.
Goal 2: Increase awareness, understanding and capacity building with regard to wild dog management.
Goal 3: Mitigate the negative impacts caused by wild dogs.
Goal 4: Monitor, evaluate and report to inform and continuously improve wild dog management.

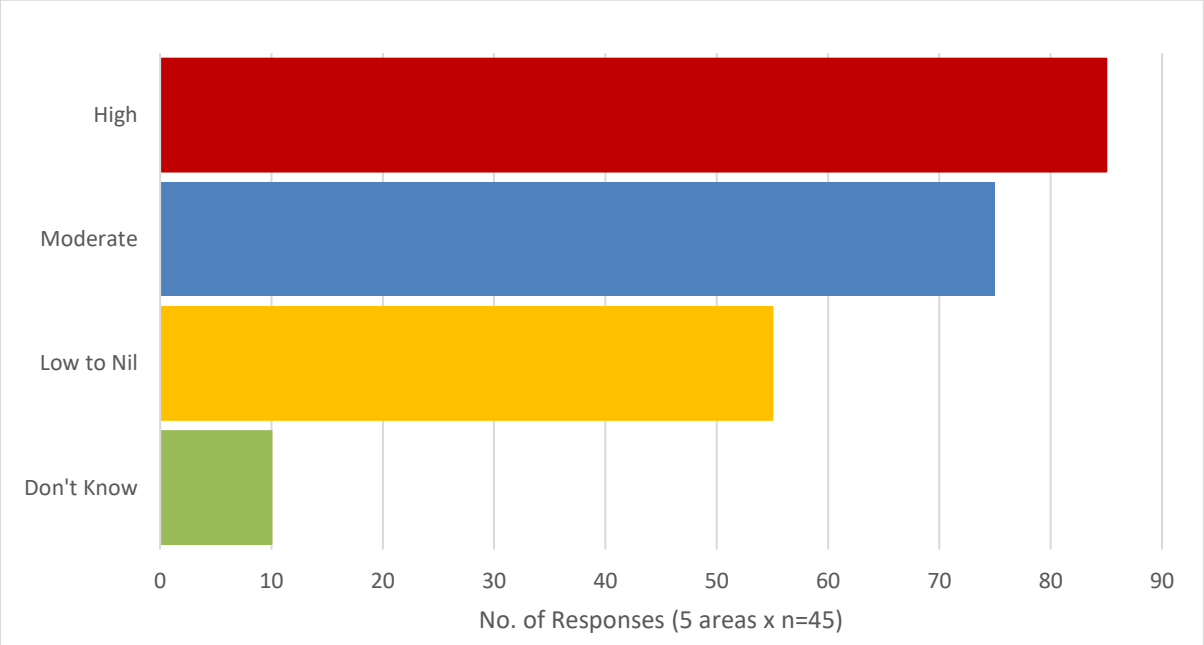
2.5.4 Other Findings

In line with the GHD Mid-Term Review (2017), the NWDAP stakeholder survey conducted as part of the current review and impact assessment also investigated the influence of the NWDAP on several priority areas including:

- Alignment of state/regional/local wild dog management plans with the NWDAP.
- Increased support (financial, human resources, information, etc.) for the formation of groups for wild dog management.
- Increased RD&E to identify and implement tools leading to more effective, coordinated and humane management of wild dogs.
- Increased willingness to provide resources (staff, funding, etc.) for wild dog management.
- Identification of priorities for investment in wild dog control activities and/or wild dog management RD&E.

Survey data showed that, overall, the NWDAP has had a moderate to high influence with respect to the key areas listed above (71.1% of responses). In particular, the NWDAP was rated as having had a moderate to high influence on the alignment of state, regional and local dog management plans (35 of 45 responses). **Figure 10** shows the results.

Figure 10: Overall Rating of the Influence of the NWDAP Against Priority Areas

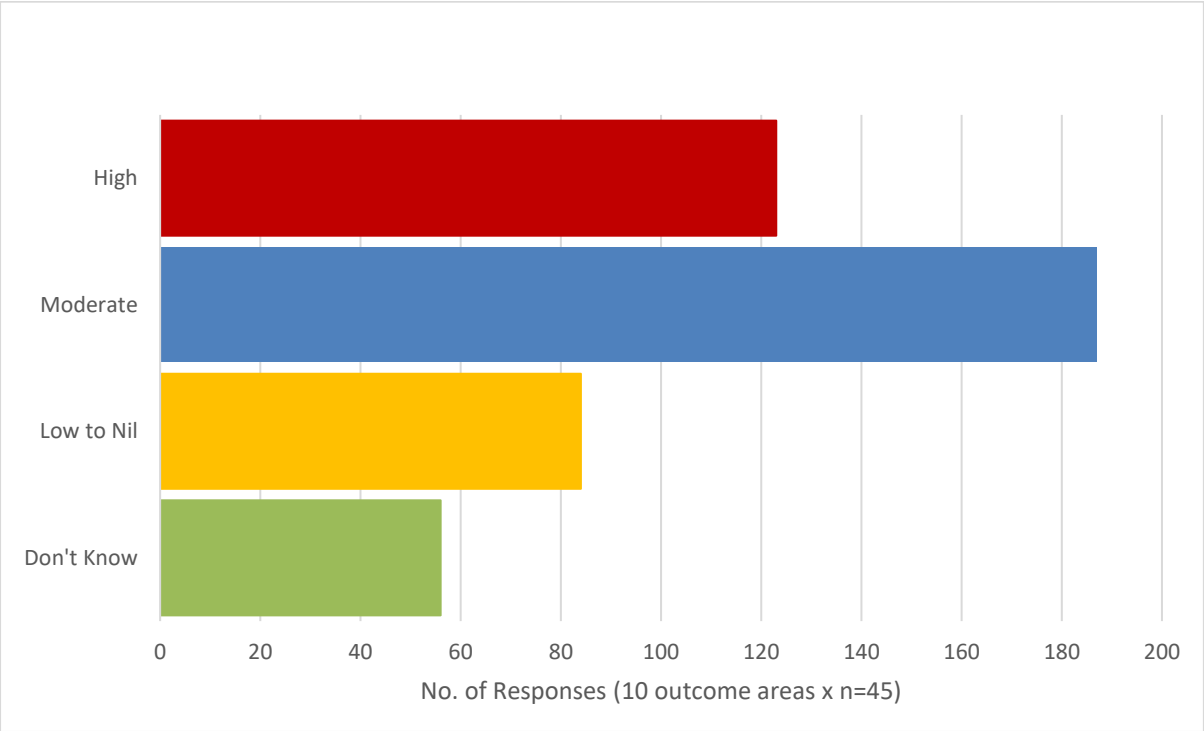


Respondents also were asked to rate the NWDAP's performance against a suite of broad outcomes related to the Plan and its activities. The outcomes included:

- Increased awareness of wild dog impacts (among landholders).
- Increased awareness of wild dog impacts (in the broader community).
- Increased acceptance of a 'nil-tenure' approach to wild dog management.
- Increased acceptance of a coordinated, community-led approach to wild dog management.
- Increased adoption of wild dog control best management practice.
- Increased adoption of integrated pest animal management.
- More effective implementation of appropriate tools and strategies for wild dog management.
- Reduced number of wild dog attacks over the past 12 months.
- Improved protection of wildlife (non-livestock).
- Improved emotional/psychological state of landholders in regions affected by wild dogs.

The survey data showed that, overall, the NWDAP was rated as having a moderate to high achievement for the broad outcome areas listed (68.9% of responses). More specifically, survey respondents indicated that increased awareness of wild dog impacts (among landholders and the broader community) had been achieved (24 and 26 responses respectively **Figure 11** shows the results.

Figure 11: Overall Rating of the NWDAP's Achievement of Broad Outcomes



2.5.5 Discussion – Survey Results

The NWDAP online stakeholder survey was conducted in line with the original survey conducted as part of the GHD Mid-Term Review (2017). The overall results of the NWDAP stakeholder survey were positive, with respondents rating the NWDAP's performance against its four goals as good to very good, and achievement of NWDAP outcomes as moderate to high.

Responses were varied and this is likely due to regionality and/or stakeholder group depending on prevailing conditions in terms of wild dog management (e.g. current wild dog pressure) and the directness of each respondent's link with NWDAP activities.

For example, on average, respondents categorised as government agency representatives or NWDAPCC members tended to report good to very good performance ratings for NWDAP objectives. Such respondents are familiar with the purpose of the Plan and the activities conducted through collaborative and coordinated initiatives under the Plan. On the other hand, producer/producer representative respondents tended to report average performance ratings, such respondents were further removed from the purpose of the Plan (that is, as a high-level strategic framework) and therefore less likely to be able to identify specific activities and outcomes linking directly to the Plan.

The survey results clearly indicate that there is disconnect between the purpose of a high level document such as the NWDAP and expectations of landholders directly impacted or involved in wild dog management. Communication of the purpose and value of the Plan going forward post 2020 will be key to ensuring ongoing support and understanding of the Plan across all stakeholder groups. The Plan provides significant support for on ground management activities through its influence on state and regional wild dog management plans and policy that promote community led wild dog initiatives giving landholders a greater say in how control occurs within their local area. However, at ground level, there has been a misconception that the Plan should somehow be directly responsible for 'more dogs being killed'. Investment in the NWDAP and the activities of the NWDMC have contributed to additional federal and state government funding of wild dog management and control initiatives that support coordinated management and adoption of best practice through training and capacity building (discussed in later section of the review) as well as direct control activities, such as funding for aerial baiting programs and cluster fencing. The influence of the plan and the linkages between these control initiatives and support for wild dog management are often not apparent to landholders and stakeholder groups involved in on ground control programs.

3. Part B: NWDAP Impact Assessment 2014-2019

3.1 Introduction

It is important to recognise that the NWDAP represents a strategy and framework for all wild dog management investment and activities Australia wide. Thus, at the broadest level, all impacts resulting from investment in wild dog management, from on the ground control funded by local landholders to state cluster fencing initiatives and national wild dog RD&E and policy, could be attributed, at least in part, to the NWDAP. However, as described previously (Section 1.4.2) the scope of the current assessment was limited to the outcomes and impacts associated with the particular investment and activities in Stages 1, 2 and 3 of the NWDAP (2014-2019).

The impact assessment followed general evaluation guidelines that are now well entrenched within the Australian primary industry research sector including RDCs, Cooperative Research Centres (CRCs), State Departments of Agriculture, and some universities. The approach includes both qualitative and quantitative descriptions that are in accord with the impact assessment guidelines of the CRRDC (CRRDC, 2018).

The evaluation process involved identifying and describing the NWDAP's objectives, investment inputs, activities and known outputs. Key outcomes of the NWDAP then were described, and actual and potential impacts identified. The principal economic, environmental and social impacts were then summarised in a triple bottom line framework.

Some, but not all, of the impacts identified were then valued in monetary terms. Where impact valuation was exercised, the impact assessment used BCA as its primary tool. The decision not to value certain impacts was due either to a shortage of necessary evidence/data, a high degree of uncertainty surrounding the potential impact, the difficulty linking the impact pathway to the original NWDAP investment, or the likely low relative significance of the impact compared to those impacts that were valued. The impacts valued are therefore deemed to represent the principal benefits delivered by the Plan. However, as not all impacts were valued, the investment criteria reported potentially represent an underestimate of the performance of the investment.

3.2 NWDAP Investment 2014-2019 (Stage 1, 2 & 3)

Table 4 shows the annual investment (cash and in-kind) in the NWDAP 2014-2019 by DoAG and others for the Stage 1, 2 and 3 project activities.

Table 4: Annual Investment in the NWDAP 2014-2019 (nominal dollars)

Year ended 30 June	2015	2016	2017	2018	2019	Totals
DoAG	280,000	801,442	648,558	56,399	195,100	1,981,499
Others[(a)]	0	100,000	102,550	0	13,442	215,992
Total	280,000	901,442	751,108	56,399	208,542	2,197,491

Source: GHD (2017), NWDAP Stage 2 Final Report, and NWDAP Stage 3 Progress Reports

(a) Some minor co-contributions through funding partners such as AWI and MLA.

Project Management and Extension Costs

Project management, administration and extension costs must be accounted for within the impact assessment (CRRDC, 2018). Based on NWDAP project documentation including project agreements, progress reports and final repots, no additional costs for management and extension were added to the investment costs shown in **Table 4**. This is because the NWDAP expenditure (**Table 4**) included funding allocated to project management, administrative roles and a wide range of communication and extension activities.

Real Investment

For the purposes of the investment analysis, investment costs of all parties were expressed in 2018/19 dollar terms using the Gross Domestic Product implicit price deflator index (ABS, 2019).

3.3 Logical Framework

A logical framework, briefly describing the objectives, activities and outputs, outcomes and likely impacts of the NWDAP, is shown in **Table 5**.

Table 5: Logical Framework for the NWDAP 2014-2019

Objectives	The Plan's four goals (objectives) were: 1. Provide leadership and coordination for the management of wild dogs. The Plan promotes the adoption of nationally-consistent approaches to integrated and strategic wild dog management supported by a scientific and risk-based approach. 2. Increase awareness, understanding and capacity building with regard to wild dog management. The Plan improves the adoption of wild dog management practices through maximising public, government and community support, based on effective communication, education and training processes. 3. Mitigate the negative impacts caused by wild dogs. The Plan promotes the use of best practice wild dog control at appropriate scales and in all planning, operations and evaluation activities. 4. Monitor, evaluate and report to inform and continuously improve wild dog management. The Plan supports the establishment of nationally-consistent metrics for assessing wild dog impacts as a basis for monitoring the effectiveness of actions and the efficiency of resource use under the Plan and reporting to stakeholders.
Activities & Outputs	[Note: the following section provides a brief overview of the activities and outputs of the NWDAP Stage 1, 2 and 3 investment. Further detail about the activities and outputs of the investments in Stage 1 and 2 can be found in the GHD Mid-Term Review (2017). Also, further detail about the activities and outputs of the Stage 3 investment can be found in the current report in Section 2.3.3 above.]

	Goal 1: • According the 2017 GHD Midterm Review of the NWDAP, up to the end of Stage 2 of the NWDAP, the Plan had provided leadership in the management of wild dogs and this has had a positive impact on achieving collaboration between the many stakeholders involved in managing wild dogs. All state jurisdictions cite the NWDAP in the development of their respective plans and endeavour to align plans with key components of the NWDAP. This in turn has instilled increased confidence in a range of funding agencies and promoted leveraging of resources for wild dog management. • Under Stage 3 funding, the NWDAP has continued to provide leadership for best practice wild dog management and, through the NWDMC, played a significant role in the coordination of wild dog control using nationally-consistent, nil-tenure approaches. ***Goal 2:*** • Under Stages 1 and 2, the NWDAP developed a national Communication and Engagement Strategy and Action Plan. This included development of press releases and communication through traditional and digital media to ensure ongoing public approval for wild dog management in Australia. In addition, a comprehensive suite of extension materials was made available via the PestSmart website, and such material continues to be updated and further developed. • For direct NWDAP stakeholders (especially SCG participants) regular communiques were delivered to assist communication. The communication team, through IAL, tracks and regularly reports on its various activities (including media monitoring). • With respect to capacity building, training and development for state coordinators has been ongoing throughout the NWDAP and the successful development of the Certificate III in Rural and Environmental Pest Management will contribute to continued capacity building in effective wild dog management. ***Goal 3:*** • Direct, on the ground wild dog control activities (e.g. baiting) are largely beyond the scope of the Stage 1, 2 and 3 activities funded directly under the NWDAP. However, the framework established by the NWDAP, the resources made available, and the coordination and collaboration facilitated by the NWDAPCC, NWDMC, and NWDAP SCG contributes to the mitigation of negative impacts of wild dogs through facilitation and support activities leading to more effective and efficient wild dog management. The Plan also contributes to the effective and efficient implementation of wild dog control through State and Regional wild dog strategies (see Section 3.4.5 for further information) and through the State and National wild dog coordinator roles.

	Goal 4: • Some progress has been made toward the development of nationally-consistent metrics for assessing wild dog impacts as a basis for monitoring and evaluating the effectiveness of control programs. However, data have not been forthcoming from most state jurisdictions (with the exceptions of South Australia and Victoria) and differences between data gathering and reporting methods has made progress toward Goal 4 difficult. This is an ongoing issue and one that needs to be addressed by any future iteration of the NWDAP post-2019. This is because nationally-consistent metrics that are regularly reported to stakeholders are essential for effective communication and prioritisation of wild dog management activities and continuous improvement of wild dog control programs across Australia. For further information on the activities and outputs of the NWDAP (particularly with respect to Stage 3) see Section 2.4.1 above.
Outcomes	• The NWDAP has been used to inform and guide a more cohesive and collaborative approach to wild dog management across Australia. • The NWDAP has informed and provided input to a number of State and regional level wild dog management plans. • The investment in the NWDAP and the activities of the NWDMC have contributed to additional federal and state government funding of wild dog management and control initiatives. • The NWDAP framework has provided confidence for funding bodies (e.g. government, industry groups, RD&E providers, etc.) to provide new and ongoing resources for wild dog management. • Collaboration and coordination guided by the Plan has facilitated information sharing, particularly with respect to best management practices for wild dog management, across different jurisdictions and environments. • The NWDAP has contributed to increased community awareness of wild dog impacts and the importance of science-based, humane wild dog control.
Impacts	• Increased investment (enhanced leveraging of resources, cash and in-kind) in wild dog management because of the availability of a national framework to guide the coordination and implementation of wild dog management activities. • More efficient expenditure (both public and private) on wild dog management due to improved coordination and prioritisation of effort. • More efficient resource allocation for RD&E investment associated with wild dog management through improved communication, collaboration and prioritisation. • Increased capacity within agricultural industries (particularly livestock industries) in wild dog management through training, improved communication and understanding, and collaboration.

	• Increased leadership capacity for wild dog management because of ongoing training, mentorship, and the existence of an information and participatory framework. • Reduced risk of additional production losses through maintained and/or enhanced social licence to undertake wild dog control. • Potentially, facilitation of reduced future impact costs of wild dogs on economic, social and environmental assets through enhanced effectiveness of wild dog management in Australia.

3.4 Key Outcomes of the NWDAP (Stages 1, 2 & 3)

Significant value has been delivered through the various outcomes of Stages 1, 2 and 3 of the NWDAP (2014-2019). Although some of the outcomes and impacts identified were quantified through the NWDAP BCA (see Sections 3.6 to 3.10 below), it was important that key outcomes be described as part of the 2019 NWDAP Stage 3 Review and Impact Assessment process to highlight the contribution that the Plan and its stakeholders have made to wild dog management in Australia over the past five years.

3.4.1 Leadership and capacity building

Goal 1 of the NWDAP states:

"Provide leadership and coordination for the management of wild dogs."

The national wild dog management framework provided by the Plan and the platform that the Plan has created for the sharing of knowledge and other resources associated with best practice wild dog management has been instrumental in building capacity in wild dog management across Australian jurisdictions.

Through the collaborative efforts of NWDAP stakeholders, the Certificate III in Rural and Environmental Pest Management was developed and has been approved by the Australian Industry and Skills Committee. The course includes 29 agreed units of competency across a range of pest management areas and is available for RTOs to provide to the public (as of September 2018) (Skills Impact Ltd, 2019). The QLD and VIC state governments currently are looking at incorporating aspects of the competencies into their internal training programs and NSW LLS are piloting the course at local TAFEs for new employees.

Also, training and extension for best practice wild dog management has been regularly provided to landholders and various industry groups by the state and national coordinators. The state coordinators, in turn, have been trained and mentored by the highly experienced NWDMC.

Further, the NWDAPCC and industry stakeholders have been able to engage with State Department and research personnel through NWDAP workshops and stakeholder consultation forums. This has enabled sharing of information and continuous feedback between high-level strategic planning activities and research priorities for wild dog management and on-the-ground wild dog control.

The cooperation, collaboration, training and mentoring in wild dog management afforded by the NWDAP (and associated initiatives) has significantly increased leadership capacity in wild dog management, and capacity of industry and all levels of government in wild dog management and planning.

3.4.2 Promoting awareness and adoption of best practice

The NWDPACC, NWDMC, APIM, NWDAP communications coordinator and other NWDAP stakeholders have proactively promoted the messages of the NWDAP to landholders affected by wild dogs and the broader Australian community through a range of interactions.

Engagement with the NWDAP stakeholder base has increased through face to face conversations, newsletters and email communication, as well as new, digital engagement platforms such as Facebook and Twitter. This is demonstrated by the increased interest and activity on the NWDAP and associated digital platforms. For example, visits to the NWDAP website (https://www.pestsmart.org.au/national-wild-dog-action-plan) increased 2.5x from 2,487 visits in 2015/16 to 6,127 visit in 2017/18. Further, in 2017/18 the NWDAP sent out 31 posts via the PestSmart social media accounts. These posts created 40,469 impressions, 563 engagements and 483 clicks (Ian McDonald, CISS 2019).

This engagement has been of particular importance to disseminating accurate, up-to-date information about wild dog control and has contributed to mitigating negative and incorrect information being shared about wild dog management (e.g. the use of 1080 baiting). From April to June 2019 alone the NWDAP and/or wild dogs was mentioned in 200 online articles and there were 21 social media posts related to the NWDAP and/or promotion of NWDAP activities.

Further, the NWDAPCC champions, NWDMC and state wild dog coordinators actively promote current best practice wild dog management and the nil-tenure approach across jurisdictions throughout Australia. Knowledge sharing between the state coordinators is facilitated and supported by NWDAP funding through development of an online forum that acts as a line of communication where information and resources can be shared.

Evidence of the numerous promotion and engagement activities undertaken by NWDAP members and other stakeholders can be found in the NWDMC's project reports. For example, between 1 January and 31 August 2018, the NWDMC:

- Presented a paper at the ABARES Outlook Conference entitled "Maintaining credibility with stakeholders for wild dog management in Australia",
- Attended four meetings of the QLD dog offensive group to provide advice on the QLD wild dog strategy,
- Was invited to sit on the SA Wild Dog Advisory Group by the Minister for Environment and Water,
- Attended the Broken Hill AGFAIR,
- Presented to the Animal Health, Welfare and Biosecurity Committee of the Cattle Council of Australia annual forum,
- Was invited to attend MLA's southern Australia meat research council regional meeting,
- Was invited to participate in the NSW pest animal round table forum,
- Attended all meetings of the VIC Wild Dog Management Advisory Committee,
- Undertook talks with Organic Certifiers to investigate options for the use of 1080 products on certified properties, and
- Provided ongoing support and mentoring to a range of industry and agency wild dog coordinators distributed across Australia.

Also, further promotion and engagement with stakeholders and the community has been achieved through new collaborations such as the promotion of PestSmart links on the AHA website, the development of a new alliance between the NWDAP and Natural Resources Northern and Yorke, SA, and the integration of predator management best practice information into MLA's adoption and industry extension programs from 2018/19.

3.4.3 Enhanced leverage (increased investment in wild dog management)

As a result of the projects and activities undertaken under the strategic umbrella of the NWDAP, there has been a noticeable increase in investment in wild dog management across Australia over the past five years. In the 2017 Mid-Term Review, GHD estimated that Stages 1 and 2 of the NWDAP generated between $0.14 million and $2.6 million each year in additional, leveraged contributions from funding partners such as the State Governments and RDCs for wild dog management.

Continued support and investment for wild dog management during Stage 3 of the NWDAP was evident through new contributions from industry from the Cattle Council of Australia, WoolProducers Australia and Sheep Producers Australia (through AHA). These new contributions now fund 25% of the cost of the NWDMC salary and on-costs. Some examples of the NWDAP's contribution to increased leverage/co-funding (cash and in-kind contributions) during Stage 3 in particular but are not limited to:

- NSW Farmers' Association, the NSW Livestock Health and Pest Authority, and AWI jointly funding the NSW State wild dog coordinator roles since 2013/14 (Luke Messer, pers. comm., 2019).
- DoAG and PIRSA co-contributing to wild dog policy and management support in SA (through a SA wild dog coordinator appointed in 2016/17) (Brad Page, pers. comm., 2019).
- AgForce, AWI, MLA, DAF QLD, RAPAD, and the South West Regional Economic Development Remote Area Board of QLD jointly funding the QLD state wild dog coordination projects from 2017/18 (Michael Allpass, pers. comm., 2019)

Other recent government and industry investments in wild dog management, influenced and/or supported by the existence of the NWDAP, include:

- A commitment by the NSW Labor Government to invest $37.5 million for wild dog exclusion fencing in western NSW (Hawker Britton Group Pty Ltd, 2019).
- The rebuilding of the SA dog fence funded by the Commonwealth Government ($10 million), the SA State Government ($10 million) and the livestock industry ($5 million) over 3-5 years commencing in 2020 (PIRSA, 2019).
- Approximately $8.3 million invested in wild dog fencing through DoAG's Communities Combating Pests and Weed Impacts During Drought Program 2018/19 (Department of Agriculture, 2019).
- Over $12 million invested through the Agricultural Competitive White Paper Established Pests and Weeds measure for Drought Affected Areas (Heath Molloy, pers. comm., 2019).
- All wild dog management applications under the QLD Feral Pest Initiative. This has included $24 million since 2015 for cluster fencing and $1.25 million for direct wild dog control activities (QLD DAF, 2019).
- $1 million provided by DoAG to WA for the WA State Barrier Fence Esperance Extension program (Heath Molloy, pers. comm., 2019).

3.4.4 Increased government and industry confidence

The Plan is an accord between a range of stakeholders including industry and government. The broad intention of the Plan is to provide private and public sector investors with confidence that their investments in wild dog control are consistent with a national, agreed framework to deliver long-term solutions for wild dog management (WoolProducers Australia, 2014).

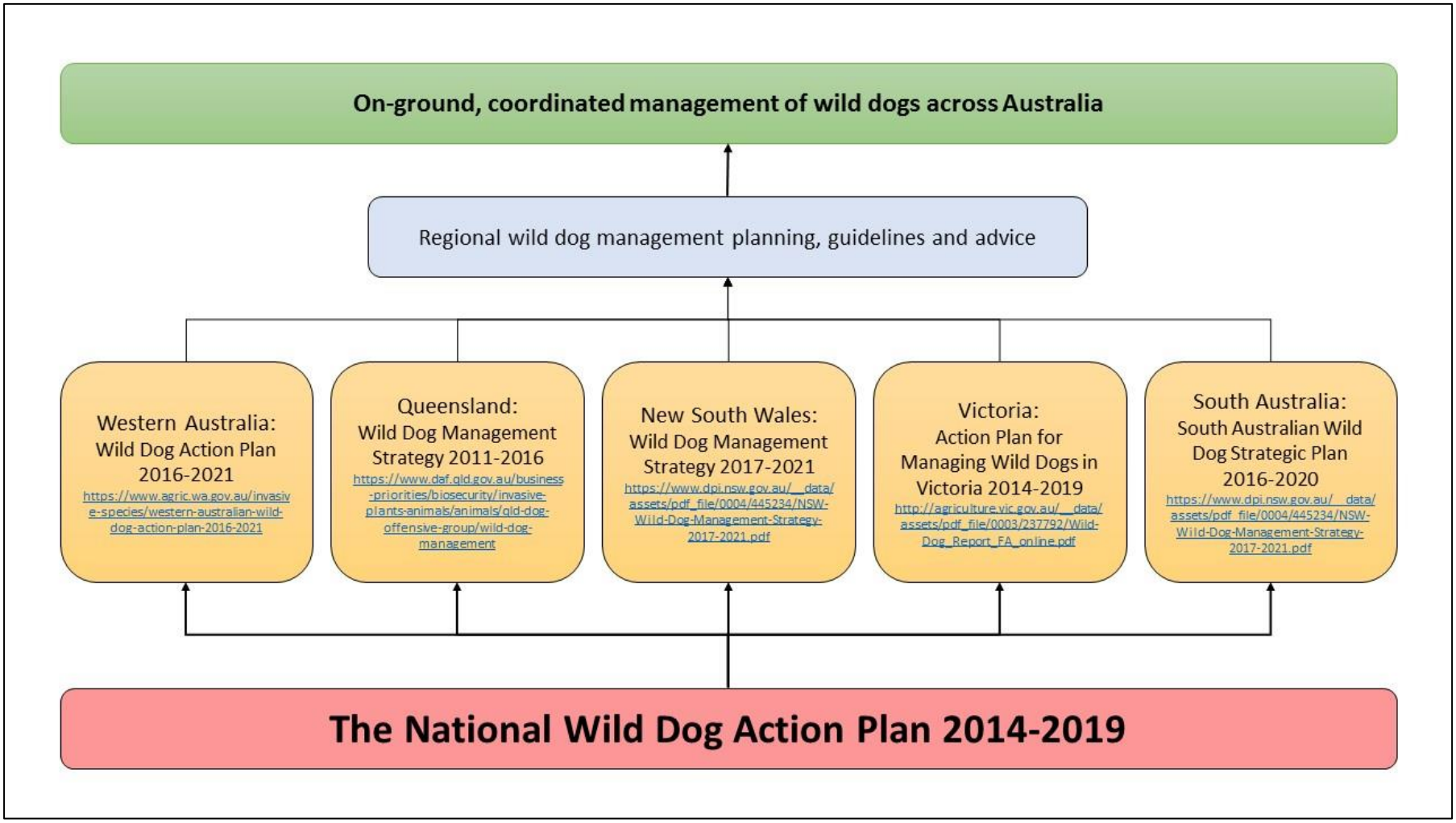
This confidence is evident through the increased investment in wild dog management over the past five years (see Section 3.4.3) and the commitment of NWDAP funding partners (DoAG and AWI) to continue investing in the NWDMC, APIM and wild dog Communications Coordinator roles to 2021/22.

3.4.5 Development of State and Regional wild dog management plans

Almost every Australian State and Territory has a wild dog management plan or strategy. Current and new iterations of each of the state strategies is underpinned by the NWDAP. The state strategies then feed into regional and local wild dog management planning and, eventually, to on-the-ground wild dog control activities by landholders.

The NWDAP provides the foundation for coordinated wild dog management at all levels. **Figure 12** shows the flow of the NWDAP's influence from a high-level, national strategy to on-the-ground control of wild dog impacts.

Figure 12: Flow Chart of the Influence of the NWDAP 2014-2019[(a)]



(a) Note: The ACT and NT do not yet have a formal wild dog management plan/strategy. However, various information and guidelines are in place.

3.4.6 Other outcomes

During the consultation phase of the 2019 NWDAP Stage 3 Review process, the review team asked key NWDAP stakeholders to provide a description of how the NWDAP had influenced, or provided support for, ongoing wild dog management across Australia. The question was asked at an organisational level and the following section summarises the responses received.

Cattle Council of Australia Ltd

In a trial disease-surveillance project (funded by DoAG and overseen by AHA), DoAG accepted the need to include hide/carcase damage from wild dogs as one of the 'disease' conditions surveyed at abattoirs. The project is due to be completed in December 2019 and likely will yield basic data on the potential cost of wild dogs through bite damage for the cattle industry.

Also, the CCA and Sheep Producers Australia both include 'wild dog control' as a priority for their input to the draft Meat Industry Strategic Plan 2020-30 (co-ordinated and compiled by the Red Meat Advisory Council Ltd). If adopted, additional cattle and sheep meat industry funds will likely be directed toward wild dog management.

Acknowledgement: Animal Health, CCA

Centre for Invasive Species Solutions

The NWDAP has had a direct but hidden impact in that it established a model for bringing RD&E, management coordination, on ground action, communication and policy influence together in a way that provides critical mass of effort behind a national issue while still being sensitive to local needs. This model is one that CISS proposes to replicate, to the extent it can, for other feral species, for example, deer in the first instance.

Essentially, the NWDAP provides a readily transferable model that will save time, effort and resources in the preparation of plans and systems elsewhere in the invasive pest space.

Acknowledgment: CISS

Department of Environment, Land, Water and Planning (Victoria)

Victoria's 'Action Plan for Managing Wild Dogs 2014-2019' was developed around the same time as the NWDAP. Collaboration was a key part in its formulation in developing the framework relevant to Victoria and Nationally. The two plans are very similar and complement each other well. The Victorian Plan is more credible, valuable, and easier to advocate given the existence of the NWDAP.

Further, Victoria has three part-time community wild dog coordinators and the state action plan, along with the NWDMC, has been very valuable in guiding, supporting and informing the coordinators to navigate the difficulties associated with community-led wild dog control programs.

The Victorian wild dog program has benefited from the NWDAP in the knowledge that there are science-based best practice management techniques to follow that are based on a strategic approach, with a national framework and guidance and support available.

Acknowledgment: DELWP

WoolProducers Australia

WoolProducers Australia initiated the development of the NWDAP in February of 2013 with the aim of bringing together peak livestock councils, research organisations and Australian governments to form a collaborative approach to wild dog management. WoolProducers has remained significantly engaged in the NWDAP not only as the initiating organisation and as a peak industry body, but as a funding partner and stakeholder. The NWDAP remains a priority focus area for our vertebrate pest management portfolio as we continue to work with industry and governments to control pests that cause adverse outcomes to wool growing enterprises throughout Australia.

The NWDAP has proven instrumental in providing several positive outcomes in the fight against wild dogs, which include (and are not limited to):

- Aiding the development of regional and state wild dog control strategies/plans, for example the South Australian Wild Dog Action Plan and the Western Australian Wild Dog Action Plan 2016-2021;
- Facilitating the employment of wild dog coordinators/officers in strategic locations, for example the Wild Dog Coordinators funded by AWI-managed producer levies in Queensland, New South Wales, South Australia, Victoria and Western Australia;
- Facilitating co-investment between industry, state/territory and Commonwealth governments for wild dog fences and/or wild dog programs, for example the NWDAP, the AWI 'Community Wild Dog Control Initiative', 1600 kilometres of new dog fence in South Australia, and trapping programmes;
- Facilitating collaborative approaches to wild dog management, for example cluster fences in smaller regional areas, group baiting programmes, and the development of the FeralScan 'WildDogScan' application; and
- Advocacy by the National Wild Dog Coordinator to retain the right to use 1080 baits to control wild dogs.

From meetings with producers, the NWDMC and other Wild Dog Coordinators have driven control of wild dogs in many areas across Australia. However, increasing anecdotal evidence that wild dog numbers are increasing means there is more work to be undertaken to achieve adequate control. Data needs to be collected that demonstrates reduced impacts from wild dogs to support ongoing investment in the NWDAP and associated activities.

[The full version of WoolProducers Australia's input to the 2019 NWDAP Stage 3 Review & Impact Assessment can be found in Appendix G: WoolProducers Australia – Response to NWDAP Stage 3 Review Information Request 2019]

Acknowledgment: WoolProducers Australia

Department of Agriculture (Commonwealth)

1) *Framework, collaboration and coordination enabling development of a state or regional wild dog action plan*

The NWDAP, since its launch in 2014, has shown how the Australian Government can work with and assist state and territory governments, industry and landholders to set up

an effective, financially sustainable national framework for delivering a coordinated and effective response to established pest animals of national significance. The initiative has been very effective in providing an overarching national framework for state and territory governments to develop and align their state-based wild dog management plans with the national approach.

The NWDAP has:

a) assisted with developing closer state and territory government collaborations on managing wild dogs in border areas e.g. Northern NSW and South Western Queensland.
b) shown how the revisions to the NWDAP initiative's operational structure for Stage 3, with the National Wild Dog Management Coordinator (NWDMC) role now overseeing the two NWDAP administrative positions (Action Plan Implementation Manager and Communications Coordinator), increased the efficiency and effectiveness of the initiative, maximising the on-ground impacts. This shift, and the role of the NWDMC, has been key to identifying synergies across the wild dog management space i.e. Centre for Invasive Species Solutions, the state wild dog advisory groups, the primary industry council network, and has been successful in encouraging multi-stakeholder collaboration and coordination which has driven best practice wild dog management and community involvement in a number of regional and peri-urban areas.

2) Mechanism to facilitate investment and co-investment in wild dog management

The NWDAP is an industry-driven initiative, led by AWI and WoolProducers Australia, which has been a great success, particularly in its funding progression from Australian government seed funding to an ongoing tripartite funding model. The success of the model means it would be a good option to consider and adopt for other Australian, state and territory government and industry co-funded initiatives.

The NWDAP has been able to leverage further co-investment in the initiative, and other wild dog management activities, on top of the Australian Government investment in wild dog management research, development and extension activities such as the Wild Dog Alert system and e-Tech Hub projects.

3) Information and resources that were disseminated to those actively involved in the coordination and control of wild dogs resulting in improved control

The NWDAP has played a key role in wild dog management knowledge and capacity building, with its strategic steering committee successfully lobbying for the vocation, education and training (VET) review and the development of an updated, more industry-focussed '*Certificate III in Rural and Environmental Pest Management*' qualification (released December 2018). The revised qualification includes a new unit of competency on preparing pest animal baiting programs covering the safe preparation and distribution of poison baits for the control of vertebrate pest animals affecting the rural and natural environment.

The impact of this work will lead to more nationally-accredited RTOs delivering nationally-recognised pest management training, and qualified pest animal management pest technicians, using best practice management methods and current control methodologies on the ground.

The flow-on effects of this NWDAP project are clearly displayed with:

a) Biosecurity QLD adopting the new qualification for their local government authorized officer training;
b) NSW Local Land Services (LLS) piloting the new course for new employees at local TAFEs, with the course to be considered for adoption post pilot; and
c) the Victorian government also looking at incorporating aspects of the competencies into their training.

The NWDAP has helped improve and extend the reach of wild dog management communication networks which now flow across all relevant primary industry sectors including MLA. The identification and use of these new cross-industry networks can provide additional potential funding streams, as well as additional networks for broader NWDAP messaging distribution, which can assist with community engagement and gaining social licence for undertaking pest management activities.

Through Stages 2 and 3, work has been undertaken on developing a national wild dog metrics system; an important deliverable for the future of the initiative beyond 2020. Although there has been delays in progressing this activity, the metrics system is designed to establish an important, and much needed, baseline for national wild dog management data. For ongoing investment in wild dog management activities, future investors will need evidence that the activities being undertaken are effective in managing the wild dog problem. The Australian Government looks forward to this work being progressed and finalised, with annual national wild dog management data reporting commencing in 2019-20.

The national wild dog metrics system attempts to:

a) assess the scale of economic, social and environmental impacts of wild dog predation across the country, and
b) measure the effectiveness of all facets of wild dog management activities i.e. baiting, trapping, shooting, fencing and livestock guardian animals.

Acknowledgment: Commonwealth Department of Agriculture

3.5 Impacts

3.5.1 Overview

The current impact assessment focused on actual and potential direct (primary) and indirect (secondary) impacts from the activities undertaken through the specific grant investments for Stages 1, 2 and 3 of the NWDAP. A similar approach was taken in the 2017 GHD Mid-Term Review of the NWDAP (Stages 1 and 2).

The following sections (Sections 3.5 to 3.9) describe the impacts of the NWDAP (Stages 1 to 3), the pathways to impacts, and the valuation of the principal economic impacts of the NWDAP 2014-2019 investment.

3.5.2 Triple Bottom Line Summary of Impacts (NWDAP Stages 1, 2 & 3)

The principal impacts identified for the NWDAP through the review and impact assessment process are summarised according to their triple bottom line classification in **Table 6**.

Table 6: Triple Bottom Line Classification of Principal Primary and Potential Secondary Impacts of the NWDAP Stages 1, 2 & 3 (2014-2019)

Impact Category	Primary Impacts	Potential Secondary Impacts[(a)]
Economic	• Increased investment in wild dog management (increased leverage). • More efficient expenditure on wild dog management. • More efficient resource allocation for wild dog management RD&E. • Reduced risk of additional production losses through maintained and/or enhanced social licence to undertake wild dog control.	• Reduced future production losses from wild dogs. • Reduced future wild dog management costs.
Environmental	• Nil	• Reduced impacts of wild dogs on native Australian fauna. • Reduced impacts of wild dog management on non-target species. • Increased animal welfare for Australian livestock through reduce injury and death from wild dog attacks.
Social	• Increased industry capacity in wild dog management through	• Increased producer wellbeing associated with reduced stress

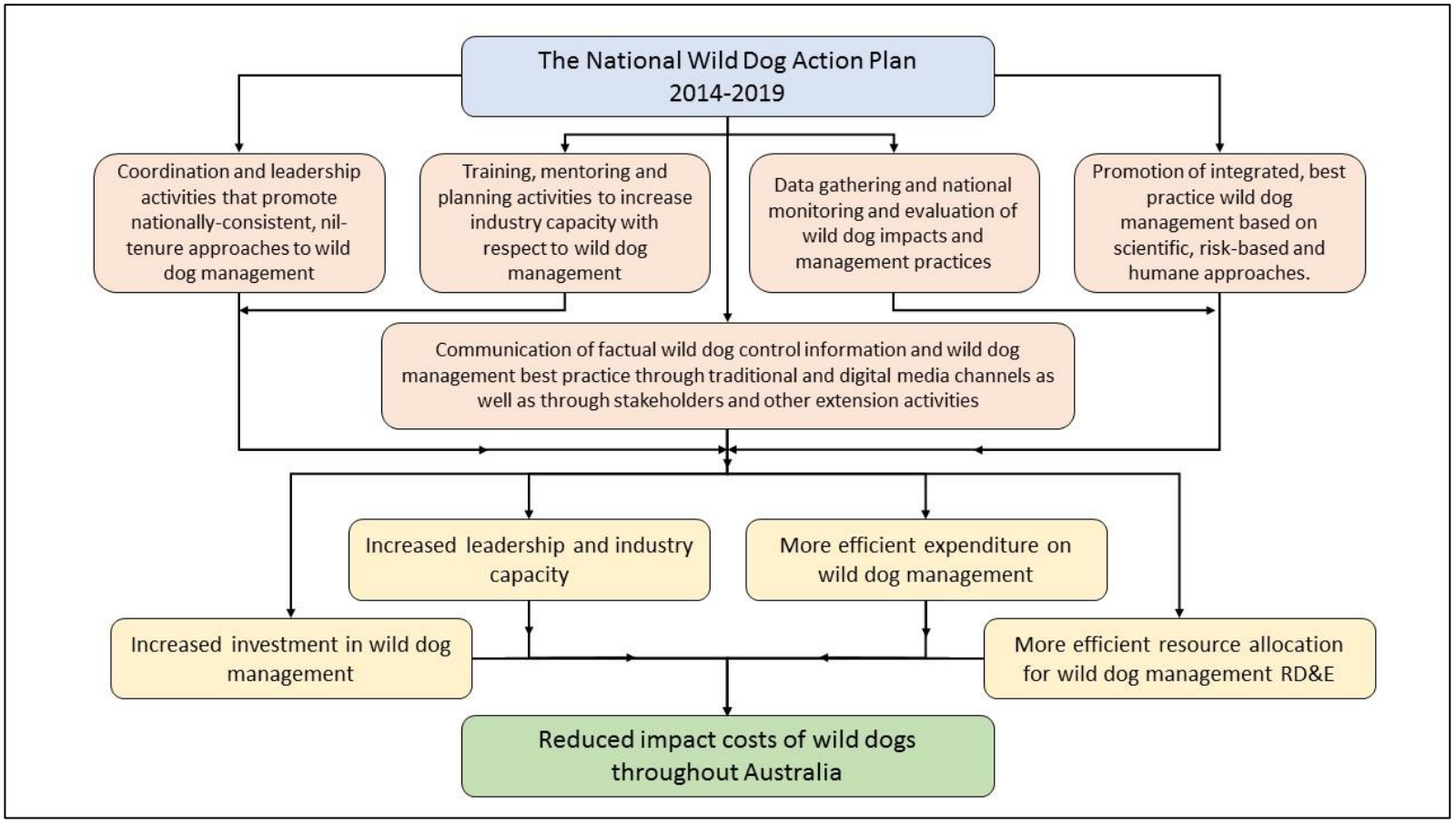
	training, improved communication and understanding, and collaboration. • Increased leadership capacity for wild dog management because of ongoing training, mentorship, and the existence of an information and participation framework.	and increased productivity through improved wild dog management. • Enhanced regional community wellbeing through spillover benefits from more productive primary producers and increased animal welfare.

(a) Secondary impacts were derived from the broad impact of potentially reduced future impact costs of wild dogs.

3.5.3 Pathways to Impacts

Figure 13 demonstrates the likely pathways to impacts for the NWDAP Stage 1, 2 and 3 investment.

Figure 13: Flow Diagram Describing the NWDAP's Pathways to Impacts



3.5.4 Impacts Not Valued

Not all impacts identified in **Table 6** could be valued in the assessment.

The economic impacts identified but not valued included:

- Increased investment (enhanced leveraging of resources, cash and in-kind) in wild dog management because of the availability of a national framework to guide the coordination and implementation of wild dog management.

The environmental impacts identified but not valued included:

- Secondary environmental impacts (reduced impact of wild dogs on native fauna and reduced impact of wild dog management on non-target species).

The social impacts identified but not valued included:

- Increased industry capacity in wild dog management through training, improved communication and understanding, and collaboration.
- Increased leadership capacity for wild dog management because of ongoing training, mentorship, and the existence of an information and participation framework.
- Secondary social impacts (increased producer and regional community wellbeing).

A brief description of the impacts not valued and the reasons for not valuing them are provided below.

Increased investment in wild dog management (enhanced leveraging of resources)

An important outcome of the NWDAP has been increased investment in wild dog management by industry and all levels of government. This has been a significant, positive outcome for wild dog control however, from a BCA perspective, cannot be considered a benefit in itself.

It is likely that increased investment in wild dog management through the facilitation, coordination and confidence provided by the NWDAP has led to improved management of wild dogs contributing to reduced wild dog impact costs (in terms of production losses and control costs). However, the additional investments (particularly those from government) would likely have been directed to other purposes had they not been directed to wild dog management.

Estimating the value of the impact of the additional investment would require assumptions to be made about the magnitude and value of the impact from the resources spent on wild dog management as well as estimates of the value and magnitude of the impacts from the most likely alternative use of the funds (the opportunity cost). Given the uncertain nature of the range of potential alternative uses for the additional investment, a lack of credible information/data on which to base such assumptions, the impact of the additional investment attributed to the NWDAP was not valued in the current assessment.

Secondary environmental impacts

Improved management of wild dogs, partially attributable to the NWDAP investment, may contribute to reduced predation of Australian native fauna, increased wellbeing for livestock animals, and reduced impacts of wild dog control on non-target species.

Difficulties exist in quantifying the value of such environmental benefits and also in linking the investment in the analysis to the extent of such impacts.

Increased industry and leadership capacity

The NWDAP investment supported collaboration, cooperation and extension (including on the ground training) that has likely contributed to an increase in capacity for landholders involved in wild dog management as well as wild dog management coordinators.

It is difficult to quantify the magnitude of such capacity enhancement because the initial level of capacity was unknown and placing a monetary value on human capacity could require the application of non-market valuation techniques that were beyond the scope of the current impact assessment. However, some of this capacity increase is captured by the valuation of potentially reduced impact costs of wild dogs through increased adoption and/or effectiveness of wild dog management (see Section 3.7.4 below).

Increased grower and community well-being

Reduced wild dog impacts (e.g. reduced livestock losses and/or decreased costs of control in terms of time and physical/financial resources) may contribute to increased grower and community well-being through reduced stress for landholders and increased productivity and profitability that also benefits regional communities. Estimating the value of such impacts requires complex economic modelling, often involving non-market valuation methods.

Within the scope of the current assessment, it was not possible to estimate the potential change to well-being and its associated value.

3.5.5 Impacts Valued

Investment in the NWDAP has resulted in increased cooperation, coordination and collaboration for people and organisation involved in the management of wild dogs across Australia.

Three primary impacts of the NWDAP investment were valued:

1. More efficient expenditure (both public and private) on wild dog management due to improved coordination and prioritisation of effort.
2. More efficient resource allocation for RD&E investment associated with wild dog management through improved communication, collaboration and prioritisation.
3. Reduced risk of additional production losses through maintained and/or enhanced social licence to undertake wild dog control.

Further, a secondary impact associated with the investment's contribution to reduced impact costs of wild dogs (e.g. reduced production losses for Australian livestock industries) through the facilitation of improved wild dog control was valued to demonstrate the relative significance of the NWDAP's vision and mission statements.

The context for each impact valuation is described in the following sections.

3.6 Valuation of Impacts

Analyses were undertaken for total benefits that included future expected benefits. A degree of conservatism was used when finalising assumptions, particularly when some uncertainty was involved. Sensitivity analyses were undertaken for those variables where there was greatest uncertainty or for those that were identified as key drivers of the investment criteria.

3.6.1 Primary Impact 1: More efficient expenditure on wild dog management

Management of wild dogs is largely conducted by landholders. In some regions, wild dog control also is supported by state and local governments. Data on actual, total annual wild dog management costs are difficult to obtain. A report by ABARES on the impact of wild dogs in Australia (ABARES, 2014) noted that, whlie estimates were available for some specific regions and scenarios, it was not possible to accurately separate out data on the costs of wild dog control more generally and so a threshold approach was used in the associated BCA.

Total expenditure by governments and landholders on the management of key pest animal species (including wild dogs) Australia-wide was estimated to be between $138.6 million p.a. and $185.2 million p.a. (an average of $150.1 million p.a.) in 2013/14 dollar terms (eSYS Development Pty Ltd, 2016). In the same report, the cost of production losses attributed to wild dogs was estimated at between 18.2% and 23.2% (average of 20.0%) of total annual production losses.

The valuation of increased efficiency of expenditure on wild dog management in the current analysis is founded on the assumption that, without the coordination, collaboration, and best practice framework and extension provided by the NWDAP and NWDMC investment, funding of wild dog control would be less efficient. That is, without the Plan, the people and organisations involved in direct, on-the-ground control of wild dogs would have to spend more to achieve the same outcomes in terms of wild dog management.

It was assumed that, with the investment in the NWDAP and NWDMC, landholders and government make a more efficient allocation of resources with regard to expenditure on wild dog management. Further, it was assumed that the investment would provide a 10% resource efficiency gain to wild dog management expenditure.

Specific assumptions for valuing Impact 1 are provided in **Table 9**.

3.6.2 Primary Impact 2: More efficient resource allocation for wild dog management RD&E expenditure

Over the past five years, research funding bodies (including AWI, MLA, CISS, various State Departments and some peak industry bodies) have spent, on average, an estimated total of $5.5 million p.a. on wild dog RD&E (including coordination, strategic R&D, and training and extension). Similar to the valuation for Impact 1, it was assumed that the coordination and collaboration provided by the NWDAP and NWDMC investment, particularly with industry and between states, would improve the prioritisation of future wild dog management RD&E expenditure, resulting in a more efficient allocation of RD&E resources. An efficiency dividend of 5% for wild dog management RD&E expenditure was assumed.

Specific assumptions for valuing Impact 2 are provided in **Table 9**.

3.6.3 Primary Impact 3: Reduced risk of additional production losses through maintained and/or enhanced social licence to undertake wild dog control

The total annual value of production losses in Australia attributable to wild dogs was estimated, with current wild dog management in place, to be between $64.4 million p.a. and $111.2 million p.a. ($89.33 million p.a. average) (eSYS Development Pty Ltd, 2016) in 2013/14 dollar terms. **Table 7** shows the estimated, average annual production losses for the Australian wool, sheep-meat and beef cattle industries by state/territory.

Table 7: Estimated Average Annual Production Losses from Wild Dogs by State/Territory

State	NSW[(a)]	VIC	QLD	SA	WA	NT	Total
Average, annual production losses[(b)] due to wild dogs ($m)	17.16	2.57	44.71	3.44	15.48	5.98	89.34
State losses as a proportion of total	19.2%	2.9%	50.0%	3.9%	17.3%	6.7%	100.0%

Source: eSYS Development Pty Ltd (2016)

(b) Includes the region of the ACT.

(c) Includes estimated production losses to the wool, sheep-meat, and beef cattle industries through wild dog predation activity.

Risks that may affect the social licence of Australian primary producers and governments to undertake wild dog management activities include community concerns about the use of lethal control methods (e.g. 1080 baiting) and animal welfare, dingo conservation, and broader environmental concerns associated with agriculture (e.g. grazing pressure).

The NWDAP and NWDMC investment has provided Australian primary industries and governments with a proactive approach to address threats to social licence (for wild dog management activities) through the promotion of factual wild dog management information via digital media such as Facebook, twitter and the NWDAP/PestSmart websites. Also, the NWDMC has prepared submissions to various levels of government to inform decision makers about wild dog issues and the implementation of best practice wild dog management across Australia.

Further, given that the Australian government's proposed dingo conservation plan was identified as a risk for the NWDAP, proactive efforts have been made to better inform stakeholders of the nature of the wild dog versus dingo issue. For example, research was shared on the PestSmart website that supports the idea that dingoes are not actually a native Australian animal.

Therefore, the investment has contributed to the maintenance and/or enhancement of the social licence to undertake wild dog management activities for a proportion of Australia's primary industries. This, in turn, has reduced the risk of potential, additional production losses attributable to wild dogs because of continued ability of landholders and governments to undertake control activities.

Based on significant urbanisation and conflicting legislation around the status of wild dogs versus dingoes (see Appendix A of the current NWDAP[9]), NSW, QLD, VIC and SA were considered most at risk of a loss of social licence for wild dog management activities.

It was assumed that the risk of a loss of social licence was approximately 10% with the NWDAP and NWDMC investment, and 20% without the investment (a risk reduction of 10%), each year. Further, without adequate and/or effective wild dog control, it was assumed that the production losses attributed to wild dog activity in NSW, QLD, VIC and SA (estimated average of $67.88 million p.a.) would increase by 10%.

Specific assumptions for valuing Impact 3 are provided in **Table 9**.

3.6.4 Secondary Impact 1: Facilitation of reduced future impact costs of wild dogs

The vision and mission of the NWDAP investment is for "stakeholders to work together to deliver effective, coordinated and humane management of wild dogs" and to "provide direction for the national management of wild dogs to minimise their negative impacts on agriculture, biodiversity and social assets".

Previous evaluations of the NWDMC investments showed that national coordination of wild dog control activities, broad stakeholder engagement, and increased collaboration and information sharing improved adoption and efficacy of wild dog management. However, achievement of impact was dependent on continued support and funding of national coordination activities and the national and state wild dog coordinator roles.

It was assumed that the NWDAP and NWDMC investment has contributed to reduced future impact costs of wild dogs (including both production losses and control costs) through increased adoption and efficacy of wild dog management practices in Australia.

Specific assumptions for valuing Secondary Impact 1 are provided in **Table 10**.

[9] https://www.pestsmart.org.au/wp-content/uploads/2018/10/NWDAP_FINAL_Revision-Aug-2018-1.pdf

3.6.5 Additional Costs

The NWDMC role has existed, in some form, since 2006 and was instrumental in the planning and development of the original NWDAP (published in May 2014). Successful delivery of many of the activities and objectives under the NWDAP has been highly dependent on the activities of the NWDMC. Further, delivery of the impacts identified in **Table 6** was thought to be highly dependent on continued investment in the NWDMC and state wild dog coordinator roles.

Based on consultation with state government representatives and data supplied by AWI, it was estimated that the average, total actual and projected annual expenditure on the current state wild dog coordinator roles (QLD, NSW, VIC, SA and WA) was $1.5 million p.a. Also, **Table 8** shows the total investment (cash and in-kind) from all sources in the specific NWDMC projects from 2013/14 to 2021/22.

Table 8: Annual Investment in the NWDMC Projects (nominal dollars)

Funding Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	Totals	Annual Average
Cash	158,000	164,000	170,000	176,000	178,559	182,059	185,559	188,809	192,559	1,747,545	
In-kind	240,500	240,500	198,500	198,500	285,075	285,075	285,075	285,075	285,075	2,543,875	
Total	398,500	404,500	368,500	374,500	463,634	467,134	470,634	473,884	477,634	4,291,420	433,213

Source: Greg Mifsud and AWI 2019.

3.6.6 Counterfactual

For all impacts valued, it was assumed that, without the investment in the NWDAP and NWDMC, wild dog management would have continued but would have been less coordinated (likely coordinated at a state or regional level only), carried out on an 'ad hoc' basis, and would have been largely reactive (as opposed to proactive). Further, ABARES (2014) noted that, in the absence of a coordinated approach to wild dog management, there was likely to be significant under-investment to control the pest species. Therefore, it was assumed that, without the NWDAP investment, wild dog management in all states would have been less efficient and/or effective and so the magnitude of benefits estimated would also have been reduced.

Also, it was assumed that, given past success, some form of the NWDMC and state coordinator roles would have continued to be funded but that the level of funding would have reduced, and the positions supported would have been much less effective at achieving broadscale, cooperative nil-tenure management of wild dogs.

Specific assumptions regarding the counterfactual for each impact valued are provided in **Table 9** and **Table 10**, as referred to previously.

3.6.7 Valuation Assumptions

The specific assumptions used to estimate the value of the three primary impacts are shown in **Table 9**. The specific assumptions used to estimate the value of the one secondary impact are described in **Table 10**.

Table 9: Summary of Assumptions (Primary Impacts)

Variable	Assumption	Source
Primary Impact 1: More efficient expenditure on wild dog management		
Baseline Data		
Average, total annual expenditure on major pest species management (all Australia)	$159.7 million p.a.	$150.1 million p.a. based on eSYS Development Pty Ltd (2016) multiplied by x1.064 (GDP implicit price deflator index to convert to 2018/19 dollar terms),
Proportion of total production losses from pest species attributed to wild dogs	20.0% p.a.	$89.33m/$446.46m (Australian average) – based on data from eSYS Development Pty Ltd (2016)
Estimated average expenditure on wild dog management by landholders and government	$31.94 million p.a.	20% x $159.7m
Valuation Assumptions – WITH NWDAP Investment		
Maximum efficiency dividend achieved through investment in the NWDAP	10%	Analyst assumption - based on: • Results from the 2019 NWDAP stakeholder survey, • Publication of the NWDAP in May 2014

Period of impact	8 years from 2014/15 to 2021/22 then declining to 5% by 2026/27	• An assumption of no additional funding for specific NWDAP projects post-2019[(a)], and • Funding commitments to the NWDMC to 2021/22
Counterfactual – WITHOUT NWDAP Investment		
Efficiency dividend achieved without the NWDAP	5% from 2014/15 onwards	Analyst assumption - half of benefit 'with' NWDAP. Assumes continuation of funding for some form of state and national coordinator roles (see additional costs section below).
Risk Factors		
Probability of output and outcome	100%	Based on the successful development and implementation of the NWDAP 2014-2019
Probability of impact	90%	Analyst assumption – allows for exogenous factors that may affect achievement of increase in efficiency dividend
Primary Impact 2: More efficient wild dog management RD&E expenditure		
Baseline Data		
Average, total annual expenditure on wild dog management RD&E	$5.5 million p.a.	Based on wild dog RD&E project budget data supplied by AWI 2019
Valuation Assumptions – WITH NWDAP Investment		
Maximum efficiency dividend achieved through investment in the NWDAP	5.0%	Analyst assumption - based on: • Results from the 2019 NWDAP stakeholder survey, • Publication of the NWDAP in May 2014 • An assumption of no additional funding for specific NWDAP projects post-2019[(a)], and • Existing funding commitments to the NWDMC to 2021/22
Period of impact	8 years from 2014/15 to 2021/22 then declining to 2.5% by 2026/27	
Counterfactual – WITHOUT NWDAP Investment		
Efficiency dividend achieved without the NWDAP	2.5% from 2014/15 onwards	Analyst assumption – 50% of benefit 'with' NWDAP. Assumes continuation of funding for some form of state and national coordinator roles (see additional costs assumptions section below).
Risk Factors		

Probability of output and outcome	100%	Based on the successful development and implementation of the NWDAP 2014-2019
Probability of impact	90%	Analyst assumption – allows for exogenous factors that may affect achievement of increase in efficiency dividend
Primary Impact 3: Reduced risk of additional future production losses (social licence)		
Baseline Data		
Total, average annual value of production losses due to wild dogs – with control (all Australia)	$95.1 million p.a.	$89.33 million p.a. based on eSYS Development Pty Ltd (2016) multiplied by x1.064 (GDP implicit price deflator index to convert to 2018/19 dollar terms)
Proportion of industry at risk of loss of social licence to undertake adequate/effective wild dog management	75% (QLD, NSW, VIC and SA) representing current production losses of $67.88 million p.a.	Approximately $67.88m/$89.33m See **Table 7**
Increase in average, annual production losses for affected landholders if social licence to manage wild dogs is lost	+10% (= $9.51 million p.a.)	Analyst assumption
Valuation Assumptions – WITH NWDAP Investment		
Risk of loss of social licence leading to inability to undertake adequate and/or effective management of wild dogs	10% each year	Analyst assumption
Period of impact	8 years from 2014/15 to 2021/22 then increasing to a risk of 20% each year by 2026/27	Analyst assumption - based on: • Publication of the NWDAP in May 2014 • An assumption of no additional funding for specific NWDAP projects post-2019[(a)], and • Funding commitments to the NWDMC to 2021/22
Counterfactual – WITHOUT NWDAP Investment		
Risk of loss of social licence leading to inability to undertake adequate and/or effective management of wild dogs	20% each year from 2014/15 onwards	Analyst assumption
Risk Factors		
Probability of output and outcome	100%	Based on the successful development and implementation of the NWDAP 2014-2019
Probability of impact	75%	Analyst assumption – allows for exogenous factors that may affect achievement of actual impact

Other Valuation Considerations		
Additional Costs		
NWDMC with NWDAP	$433,213 p.a. from 2013/14 to 2021/22	Average annual investment See **Table 8**
State coordinators – with NWDAP	$1.5 million p.a. from 2013/14 to 2021/22	State government and AWI. See above
NWDMC and State coordinator funding post-2022[(a)] (also applicable in the 'without' NWDAP scenario)	60% of 2013/14 annual funding level	Based on average annual funding for the NWDF from 2007 to 2012 (Chudleigh, Simpson, & Lai, 2011)
(a) Note: average, annual coordinator costs (state and national) assumed to be equal to 60% of current average, annual costs 'with' the NWDAP from 2014/15 (see **Table 8**). This includes the additional funding committed by DoAG for the continuation of the NWDAP APIM and Communications Coordinator to 2020/21. The CBA assumes no further funding of the core NWDAP post-2019, that is no additional, specific NWDAP projects such as those undertaken through Stage 1, 2 and 3 funding.		

Table 10: Summary of Assumptions (Secondary Impact)

Variable	Assumption	Source
Secondary Impact 1: Facilitation of reduced future impact costs of wild dogs		
Baseline Data		
Average, annual impact costs of wild dogs – production losses only (all Australia)	$95.1 million p.a.	$89.33 million p.a. based on eSYS Development Pty Ltd (2016) multiplied by x1.064 (GDP implicit price deflator index to convert to 2018/19 dollar terms)
Estimated average expenditure on wild dog management by landholders and government (all Australia)	$31.94 million p.a.	20% x $159.7m (as for Primary Impact 1, see **Table 9**)
Total, average annual wild dog impact costs (production loss and control costs)	$127.0 million p.a.	$95.1m + $31.9m
Valuation Assumptions – WITH NWDAP Investment		
Reduction in average annual wild dog impact costs through increased adoption and efficacy of wild dog management	Increasing from a base of 2.5% (given the pre-existing national coordinator activities) to a maximum of 7.5% p.a.	Analyst assumption
First year of impact	2014/15	Based on publication of the NWDAP in May 2014
Year of maximum impact	2016/17	3-years after first year of impact. Based on the positive findings from the GHD Mid-Term review (2017)

Period of maximum impact	6 years (2016/17 to 2021/22)	Based on commitment of funds for the NWDMC to 2021/22
Residual impact	Reduction in average annual wild dog impact costs from 7.5% to 2.5% by 2026/27	5-years after 2021/22 – assumes no additional funding for the NWDAP post-2019[(a)] but continuation of some coordination (e.g. ad hoc state level activities)
Counterfactual – WITHOUT NWDAP Investment		
Reduction in average annual wild dog impact costs through increased adoption and efficacy of wild dog management	2.5% p.a.	Analyst assumption – supported by results from AWI's Community Wild Dog Control Initiative survey 2019
Period of impact	From 2014/15 onward	
Risk Factors		
Probability of output and outcome	100%	Based on the successful development and implementation of the NWDAP 2014-2019
Probability of impact	50%	Analyst assumption – allows for exogenous factors that may affect achievement of actual impact

(a) Note: average, annual coordinator costs (state and national) assumed to be equal to 60% of current average, annual costs 'with' the NWDAP from 2014/15 (see **Table 8**). This includes the additional funding committed by DoAG for the continuation of the NWDAP APIM and Communications Coordinator to 2020/21. The CBA assumes no further funding of the core NWDAP post-2019, that is no additional, specific NWDAP projects such as those undertaken through Stage 1, 2 and 3 funding.

3.7 Results

All past costs were expressed in 2018/19 dollar terms using the Implicit Price Deflator for GDP. All benefits after 2018/19 were expressed in 2018/19 dollar terms. All costs and benefits were discounted to 2018/19 (year of analysis) using a discount rate of 5%. A reinvestment rate of 5% was used for estimating the Modified Internal Rate of Return (MIRR). The base analysis used the best available estimates for each variable, notwithstanding a level of uncertainty for many of the estimates. All analyses ran for the length of the investment period plus 30 years from the last year of investment in the NWDAP (2018/19).

3.7.1 Investment Criteria – Primary Impacts Only

Table 11 shows the investment criteria estimated for different periods of benefits for the total investment in the NWDAP 2014-2019. The present value of benefits (PVB) represents the total PVB for the three Primary Impacts valued only to demonstrate the investment criteria for the set of benefits that were considered to be most directly linked to the investment in the NWDPA.

Table 11: Investment Criteria for Total Investment including Primary Impacts Only (5% Discount Rate)

Investment criteria	**Number of from last year of investment**						
	0	**5**	**10**	**15**	**20**	**25**	**30**
Present value of benefits ($m)	8.55	15.11	15.93	15.93	15.93	15.93	15.93
Present value of costs ($m)	2.62	2.62	2.62	2.62	2.62	2.62	2.62
Net present value ($m)	5.93	12.50	13.31	13.31	13.31	13.31	13.31
Benefit-cost ratio	3.26	5.77	6.08	6.08	6.08	6.08	6.08
Internal rate of return (%)	NC	NC	NC	NC	NC	NC	NC
MIRR (%)	Negative	606.45	166.17	93.00	63.16	50.80	39.55

NC: Not calculable. Non-normal cash flows can create problems with calculating the IRR due to the polynomial nature of the underlying function .The net cash flow for the NWDAP CBA was positive from the first year of investment (2014/15) (See **Figure 14** below). This meant that there were no values of the discount rate that would give an NPV of zero. Thus, a unique IRR was not able to be calculated. However, the MIRR does not have this problem as the calculation treats the positive and negative cash flows differently and a solution was able to be estimated.

3.7.2 Investment Criteria – Primary and Secondary Impacts

Table 12 shows the investment criteria the total PVB including the three Primary Impacts valued and the Secondary Impact (facilitation of reduced future impact costs of wild dogs) to demonstrate the potential significance of the NWDAP's secondary impacts through improved management of wild dogs.

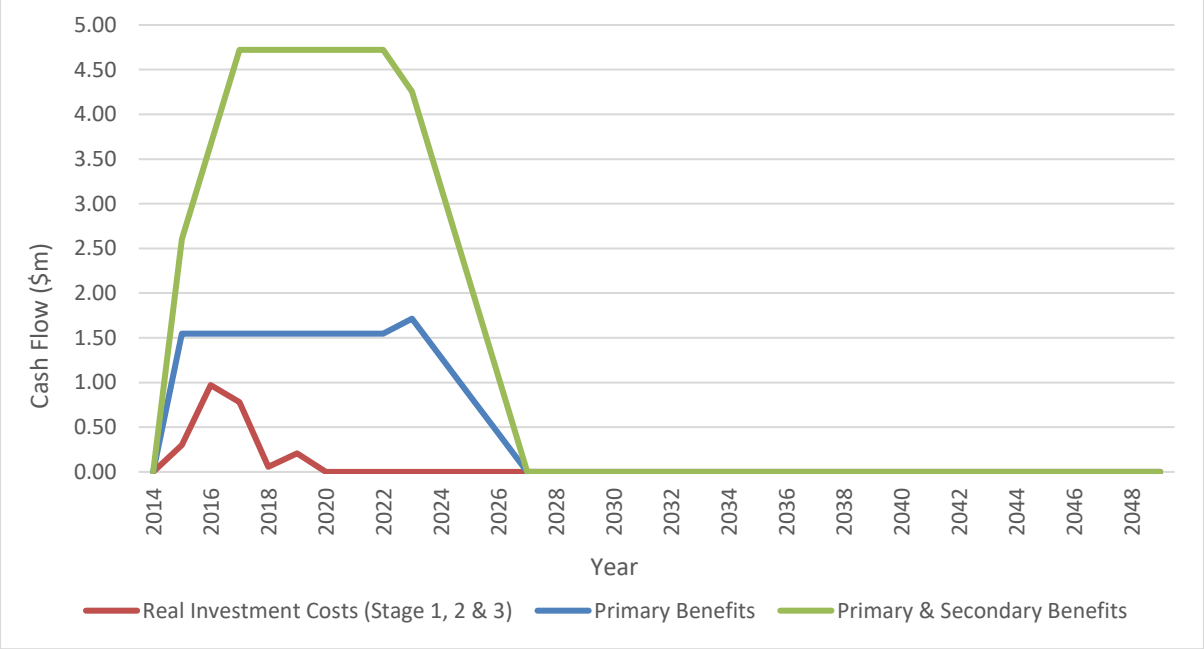
Table 12: Investment Criteria for Total Investment including both Primary and Secondary Impacts (5% Discount Rate)

Investment criteria	Number of from last year of investment						
	0	5	10	15	20	25	30
Present value of benefits ($m)	22.29	41.09	43.30	43.30	43.30	43.30	43.30
Present value of costs ($m)	2.62	2.62	2.62	2.62	2.62	2.62	2.62
Net present value ($m)	19.67	38.47	40.68	40.68	40.68	40.68	40.68
Benefit-cost ratio	8.51	15.70	16.54	16.54	16.54	16.54	16.54
Internal rate of return (%)	NC	NC	NC	NC	NC	NC	NC
MIRR (%)	Negative	809.62	203.77	111.06	74.58	54.96	46.04

NC: Not calculable. See note accompanying **Table 12** for further detail.

The annual, undiscounted benefit and cost cash flows for the total investment in Stages 1, 2 and 3 of the NWDAP are shown in **Figure 14**. The undiscounted cash flow diagram shows that the primary benefits estimated and attributed to the NWDAP Stage 1, 2 and 3 investment outweigh the costs from the first year of investment (2014/15).

Figure 14: Annual Undiscounted Benefit and Cost Cash Flows



3.7.3 Sensitivity Analyses

A sensitivity analysis was carried out on the discount rate. The analysis was performed for the total investment and with primary benefits only taken over the life of the investment plus 30 years from the last year of investment. All other parameters were held at their base values. **Table 13** presents the results. The results showed a low sensitivity to the discount rate. This was largely because the benefit cash flows occur over the short- to medium- term and were not subjected to heavy discounting.

Table 13: Sensitivity to Discount Rate
(Total investment, Primary Benefits, 30 years)

Investment Criteria	Discount rate		
	0%	5% (base)	10%
Present value of benefits ($m)	16.66	15.93	15.96
Present value of costs ($m)	2.32	2.62	2.95
Net present value ($m)	14.34	13.31	13.01
Benefit-cost ratio	7.19	6.08	5.42

3.7.4 Confidence Rating

The results produced are highly dependent on the assumptions made, some of which are uncertain. There are two factors that warrant recognition. The first factor is the coverage of benefits. Where there are multiple types of benefits it is often not possible to quantify all the benefits that may be linked to the investment. The second factor involves uncertainty regarding the assumptions made, including the linkage between the research and the assumed outcomes.

A confidence rating based on these two factors has been given to the results of the investment analysis (**Table 14**). The rating categories used are High, Medium and Low, where:

High: denotes a good coverage of benefits or reasonable confidence in the assumptions made

Medium: denotes only a reasonable coverage of benefits or some uncertainties in assumptions made

Low: denotes a poor coverage of benefits or many uncertainties in assumptions made

Table 14: Confidence in Analysis of Project

Coverage of Benefits	Confidence in Assumptions
High	Medium-Low

Coverage of impacts was assessed as high. The three primary impacts (out of six identified) were valued. The three impacts valued were considered the most direct impacts of the NWDAP investment.

Confidence in assumptions was rated as medium to low. Data for this analysis were drawn from credible, published sources with supplementary data/information provided by the NWDAP stakeholders and wild dog researchers. However, data on wild dog impacts and the benefits of wild dog management are somewhat outdated and speculative. The analysis would benefit from the future availability data based on the nationally-consistent and accepted metrics for wild dog impacts and management being developed through the NWDAP.

3.8 Summary of Previous Evaluations

A number of economic evaluations associated with investments in national coordination of wild dog management have been undertaken in the past. This section describes briefly the findings of these analyses to show that the results of the current NWDAP impact assessment are consistent with previous results.

In 2011, Agtrans completed an economic analysis of the National Wild Dog Facilitator project for the IA CRC. The NWDF project was funded from 2006/07 to 2011/12. The analysis found that the NWDF significantly increased the participation rate of landholders in wild dog control as well as improved wild dog management through enhancing coordination and extension of wild dog management information and resources. Results of the analysis indicated that the NWDF project investment of $1.5 million (present value terms) produced an estimated present value of benefits (PVB) of $11.9 million (over 30-years using a 5% discount rate), a net present value (NPV) of $10.4 million, a benefit-cost ratio (BCR) of 8.0 to 1 and an internal rate of return (IRR) of 41%.

An updated analysis of the NWDF project was conducted in 2015 as part of the IA CRC's end of term impact assessment. The updated analysis estimated that the NWDF had a PVB of $18.05 million and that quantified impacts associated with the IA CRC's integrated fox and wild dog management platform represented approximately 7% of the total PVB of $408.4 million for the total 12-year investment (2005/06 to 2016/17) in the IA CRC.

Finally, a BCA completed as part of the GHD Mid-Term Review of the NWDAP (2017) estimated that the NWDAP Stage 1 and 2 investment had a BCR in the range of 8.7 to 13.8 to 1. The GHD review found that the benefits attributable to the NWDAP resulted mainly from an increase in leveraging of resources and improvements in resource efficiency in managing and controlling wild dogs.

The results of the current NWDAP BCA were consistent with previous analyses with an estimated NPV of between $13.3 million and $40.7 million, and a BCR between 6.1 and 16.5 to 1.

3.9 Discussion

The valuation of impacts associated with the NWDAP Stage 1, 2 and 3 investment was underpinned by data related to wild dog management expenditure by landholders and government agencies, wild dog management RD&E expenditure by research funders, and the impact costs of wild dogs across Australia.

Such data were difficult to obtain. For example, published data on specific wild dog management expenditure (from public and private sources) for different jurisdictions around Australia, were not readily available. Further, estimates of annual impact costs associated with wild dog vary significantly. For example, Table 8 (pg. 20) of the GHD Mid-Term Review (2017) summarised known economic assessments of wild dog impacts and control. Estimates of the annual cost of wild dog impacts ranged from $48.5 million (Gong, Sinden, Braysher, & Jones, 2009) to $67.0 million per annum (Hewitt, 2009).

Also, a study conducted by ABARES in 2014 estimated that the economic costs caused by wild dog attacks for three case study areas. The study found that, over a 20 year period, the economic cost of wild dogs would range from $1.4 million to $54 million in NPV terms across the three regions modelled. A more recent published estimate of wild dog impact costs, used in the current analysis, estimated production losses caused by wild dogs at $89 million per year. However, unpublished information from the Northern Territory Cattle Association suggested that wild dog impact costs could be as high as $30 million per annum for the Northern Territory alone (Adam Bowen, pers. comm., 2019).

The variability of wild dog impact cost data means that the estimates of the value of reducing the negative impacts of wild dog through the NWDAP and associated wild dog management practices is inherently uncertain. Improved, consistent data on the impact of wild dogs across industries, jurisdictions and enviroments would significantly improve any future impact assessment and/or BCA for the NWDAP.

4. Part C: The Future of the NWDAP

4.1 Introduction

As part of the NWDAP Stage 3 Review and Impact Assessment, the NWDAPCC, NWDMC and AWI required an examination of the current NWDAP to inform the development of a new 10-year Plan. In particular, the Review was to investigate specific elements of the current plan that should be carried forward, amended or not incorporated into a new Plan.

Information taken from stakeholder consultations, informal interviews with key NWDAP personnel, the 2017 GHD Mid-Term Review, the informal NWDAP stakeholder survey, and other available NWDAP information was collated, assessed and synthesised to inform the following SWOT[10] analysis of the current NWDAP. The strengths, weaknesses, opportunities and threats identified through the assessment then were distilled into key points that are summarised in the sections below. The findings of the SWOT analysis indicate the key internal and external factors that may affect the potential future NWDAP and its performance.

Consultation with NWDAP stakeholders indicated that the strengths of the current NWDAP, and the opportunities for the future of the NWDAP are more numerous than the perceived weaknesses and/or threats.

4.2 Strengths of the Current NWDAP

Key strengths identified for the current NWDAP included:

- Provision of a national platform and framework for collaboration, communication and coordination of wild dog management investment and activities across different jurisdictions and environments.
- Maintenance and ongoing development of a national network of informed wild dog management stakeholders that contributes to adoption of best practice and information sharing.
- Facilitation of interactions and communication between strategic wild dog management personnel (e.g. Government representatives) and on-the-ground stakeholders involved in direct control of wild dogs around Australia.
- Continuous provision of up-to-date, science-based information regarding wild dog impacts and best practice wild dog management techniques to educate land managers and the broader community.
- An informed and pro-active NWDMC that ensures the sharing of knowledge and encourages ongoing participation in wild dog management by all stakeholders at all levels.

[10] SWOT = Strengths, Weaknesses, Opportunities, and Threats. A SWOT analysis is a tool that enables organisations to examine the internal and external factors that may affect the organisation and its performance. For more information see: https://www.business.qld.gov.au/starting-business/planning/market-customer-research/swot-analysis

- The existence of the Plan increases the confidence of high-level funding bodies (e.g. Federal and State Government, CISS, RDCs, and peak industry bodies) to invest in wild dog management programs and initiatives across Australia.
- Provision of leadership and capacity building opportunities for wild dog management personnel.
- Ability to keep wild dog management on the agenda at a State and Federal Government level.

4.3 Weaknesses for the Current NWDAP

Key weaknesses identified for the current NWDAP included:

- Ongoing lack of cohesion between jurisdictions with respect to wild dog management practices and legislation.
- Limited engagement with, and education of, the broader Australian community with respect to wild dog impacts and the need for best practice, humane wild dog management. Much of the NWDAP communication goes to already interested/committed wild dog management stakeholders ('preaching to the converted').
- Inadequate messaging associated with environmental/biodiversity benefits of wild dog management.
- Undue complexity, particularly with respect to the 35 actions nested within 12 objectives that fall under the NWDAP's four overarching Goals.
- A disconnect between the Plan and landholders, land managers at the grassroots level leading to reduced industry support.
- A lack of reporting using agreed, nationally-consistent metrics to communicate the impact of wild dogs (promoting engagement in, and acceptance of, wild dog management) and the benefits of wild dog management practices to industry and the broader community. Though not a weakness with the Plan itself, the lack of effective mechanisms for assessing and reporting the effectiveness of current wild dog interventions is a factor that may affect the potential future NWDAP and its performance.
- There is no ability for the NWDAP, or those involved in delivering NWDAP activities, to enforce adoption of best practice wild dog management.
- Poor communication regarding the purpose of the NWDAP leading to ongoing issues associated with a lack of understanding within industry and the community (i.e. that the Plan is not directly involved in control of wild dogs but provides a high-level strategy and framework to be implemented across jurisdictions).

4.4 Potential Future Threats to the NWDAP

Key threats identified for the future of the NWDAP included:

- Complacency in areas where success has been observed. Where wild dog impacts have been reduced and/or management of wild dogs has improved, there is a tendency for land managers to disengage leading to less coordination for wild dog control.
- Insufficient or highly variable funding.
- Increased regulation associated with wild dog management programs where it limits access to, or application of, wild dog management tools and methods.

- Loss of social licence to undertake effective and/or widescale wild dog management activities.
- Increasing opposition from animal rights/welfare and environmental groups.
- Increasing costs of wild dog management.
- Continued increases in wild dog numbers despite coordinated control programs in place.

4.5 Future Opportunities for the NWDAP

Key opportunities identified for the future of the NWDAP included:

- Understanding barriers to collaboration/cooperation and adoption of wild dog management best practice.
- Building on success to broaden the NWDAP's stakeholder base and brand.
- Consolidation and utilisation of nationally-consistent and accepted wild dog metrics to describe the impact of wild dogs and the benefits of different wild dog management practices.
- To work with research funders/providers to demonstrate science-based, humane best practice management of wild dogs and to identify key gaps and constraints to improve coordination of wild dog related RD&E.
- Increased involvement of on-the-ground personnel directly involved with wild dog control to create ongoing feedback between high-level strategy and wild dog management implementation.
- Broader community education and engagement through new and existing channels such as social media, industry newsletters, field demonstrations, etc.
- Involvement and guidance for optimal use of priority wild dog control methods such as exclusion fencing.
- Development of a framework for Integrated Multiple Vertebrate Pest Management across Australia (e.g. foxes, feral pigs, feral cats and wild dogs).
- Provision of a successful strategic blueprint for the development of national frameworks for the management of other pest species of national significance (e.g. camels, deer, etc.).

5. NWDAP Stage 3 Review & Impact Assessment: Summary & Discussion

5.1 Stage 3 Review: Summary

As described in Sections 2.3 to 2.5, an assessment of the NWDAP's progress against outcomes for Stage 3 (2017/18 and 2018/19) was undertaken and then combined with the findings of the GHD Mid-Term Review (2017) that covered the NWDAP's progress for Stages 1 and 2 to provide an overall assessment of the NWDAP's progress against its four goals for the five year period 2014 to 2019. The results of the overall assessment are reproduced in **Table 15** below.

Table 15: Assessment of Progress Against NWDAP Goals 2014-2019

Goal	Achieved (✓✓✓)	Partially Achieved (✓✓)	Not Achieved (✓)	Total (no. of activities)
Goal 1: Provide leadership and coordination for the management of wild dogs	3	6	0	9
Goal 2: Increase awareness, understanding and capacity with regard to wild dog management	4	5	0	9
Goal 3: Mitigate the negative impacts caused by wild dogs	3	5	0	8
Goal 4: Monitor, evaluate and report to inform and continuously improve wild dog management	2	5	2	9
Totals	12	21	2	35
Proportion of Total (%)	34%	60%	6%	100%

Over the five-year period of the current NWDAP, 94% of the NWDAP Action Implementation Requirements were assessed as 'Achieved' or 'Partially Achieved' and many of the activities assessed as 'Partially Achieved' were ongoing activities.

Further, following an informal survey of NWDAP stakeholders, the review found that the majority of respondents (between 53% and 74%, or 24 to 33 responses out of 45) rated the NWDAP's performance against all four of its overarching goals as 'good' or 'very good' (on a five-point scale from 'very poor' to 'very good'). Further, all survey respondents indicated that the NWDAP Vision and Mission statements remain relevant or highly relevant.

Survey data also suggested that the NWDAP has had a moderate to high influence on key outcome areas such as alignment of state/regional/local wild dog management plans with the NWDAP, and increased support (financial, human resources, information, etc.) for the formation of groups for wild dog management.

5.2 NWDAP Impact Assessment 2014-2019: Summary

As noted throughout the current assessment, at the broadest level, all investment (and subsequent impacts) for wild dog management have been guided, at least in part, by the NWDAP. However, the current impact assessment focused on actual and potential direct (primary) and indirect (secondary) impacts from the activities undertaken through the specific grant investments for Stages 1, 2 and 3 of the NWDAP.

Total investment in the NWDAP 2014-2019 (all sources, specific Stage 1 to 3 activities only) was $2.62 million (present value terms). The investment was estimated to produce total benefits between $15.93 million and $43.30 million with a net present value between $13.31 million and $40.68 million and a benefit-cost ratio between 6.1 and 16.5 to 1. The results are reproduced in **Table 16** and **Table 17** below.

Table 16: Investment Criteria for Total Investment including Primary Impacts Only

Investment criteria	**Number of from last year of investment**						
	0	**5**	**10**	**15**	**20**	**25**	**30**
Present value of benefits ($m)	8.55	15.11	15.93	15.93	15.93	15.93	15.93
Present value of costs ($m)	2.62	2.62	2.62	2.62	2.62	2.62	2.62
Net present value ($m)	5.93	12.50	13.31	13.31	13.31	13.31	13.31
Benefit-cost ratio	3.26	5.77	6.08	6.08	6.08	6.08	6.08
Internal rate of return (%)	NC	NC	NC	NC	NC	NC	NC
MIRR (%)	Negative	606.45	166.17	93.00	63.16	50.80	39.55

NC: Not calculable. See note accompanying **Table 12** for further detail.

Table 17: Investment Criteria for Total Investment including both Primary and Secondary Impacts

Investment criteria	**Number of from last year of investment**						
	0	**5**	**10**	**15**	**20**	**25**	**30**
Present value of benefits ($m)	22.29	41.09	43.30	43.30	43.30	43.30	43.30
Present value of costs ($m)	2.62	2.62	2.62	2.62	2.62	2.62	2.62
Net present value ($m)	19.67	38.47	40.68	40.68	40.68	40.68	40.68
Benefit-cost ratio	8.51	15.70	16.54	16.54	16.54	16.54	16.54
Internal rate of return (%)	NC	NC	NC	NC	NC	NC	NC
MIRR (%)	Negative	809.62	203.77	111.06	74.58	54.96	46.04

NC: Not calculable. See note accompanying **Table 12** for further detail.

Investment criteria were positive from 2018/19 (year 0, the last year of investment) and were consistent with the CBA results in the 2017 GHD Mid-Term Review. The direct, primary benefits of the NWDAP investment came from more efficient expenditure (both public and private) on wild dog management, more efficient resource allocation for RD&E investment associated with wild dog management and maintained and/or enhanced social licence to undertake wild dog control.

5.3 SWOT Assessment: Summary

NWDAP stakeholders were asked to provide information on the strengths, weaknesses, threats and opportunities of the current NWDAP 2014-2019 to identify the internal and external factors that may affect any new Plan and its implementation in the future. The information provided was collated and synthesised into a general SWOT analysis of the NWDAP.

The key findings of the NWDAP SWOT analysis are summarised and presented in **Table 18** below. Consultation with NWDAP stakeholders suggested that the strengths and opportunities of the current NWDAP were more important than the perceived weaknesses and/or threats.

Table 18: NWDAP SWOT Analysis Summary

Strengths	Weaknesses
• Provision of a national platform and framework for collaboration, communication and coordination. • Maintenance and ongoing development of a national network of informed wild dog management. • Facilitation of interactions and communication between strategic wild dog management personnel (e.g. Government representatives) and on-the-ground stakeholders. • Continuous provision of up-to-date, science-based information regarding wild dog impacts and best practice wild dog management techniques. • An informed and pro-active NWDMC. • The existence of the Plan increases the confidence of high-level funding bodies (e.g. Federal and State Government, CISS, RDCs, and peak industry bodies) to invest in wild dog management. • Provision of leadership and capacity building opportunities. • Ability to keep wild dog management on the agenda at a State and Federal Government level.	• Ongoing lack of cohesion between jurisdictions. • Limited engagement with, and education of, the broader Australian community with respect to wild dog impacts and the need for wild dog management. • Inadequate messaging associated with environmental/biodiversity benefits. • Undue complexity. • A disconnect between the Plan and landholders. • A lack of reporting using agreed, nationally-consistent metrics to communicate the impact of wild dogs and the benefits of wild dog management. • No ability for the NWDAP to directly influence and/or enforce adoption of best practice wild dog management. • Poor communication regarding the purpose of the NWDAP leading to a lack of understanding within industry and the community.
Opportunities	**Threats**
• Understanding barriers to collaboration/cooperation and adoption of wild dog management best practice. • Broaden the NWDAP's stakeholder base and brand.	• Complacency in areas where success has been observed. • Insufficient or highly variable funding. • Increased regulation associated with wild dog management programs.

• Consolidation and utilisation of nationally-consistent and accepted wild dog metrics. • Work with researchers to demonstrate best practice management of wild dogs and identify gaps and constraints for wild dog related RD&E. • Increased involvement of on-the-ground personnel directly involved with wild dog control. • Broader community education and engagement. • Involvement and guidance for optimal use of priority wild dog control methods. • Development of a framework for Integrated Multiple Vertebrate Pest Management. • Provision of a successful strategic blueprint for the development of national frameworks for the management of other pest species.	• Loss of social licence to undertake effective and/or widescale wild dog management. • Increasing opposition from animal rights/welfare and environmental groups. • Increasing costs of wild dog management. • Continued increases in wild dog numbers.

5.4 Discussion & Other Issues

5.4.1 Perceptions of the Current NWDAP

All stakeholders consulted during the 2019 NWDAP Stage 3 Review and Impact Assessment process indicated that the NWDAP 2014-2019 has been highly successful and has contributed significantly to the ongoing improvement of wild dog management throughout Australia. The NWDAP 2014-2019 has provided wild dog management stakeholders at all levels with a platform to coordinate, collaborate, share information and resources, and build capacity and leadership in wild dog management. In general, stakeholders suggested that an agreed, national framework for wild dog management was necessary to implement effective and efficient wild dog control and that the investment in the NWDAP should continue.

However, with respect to the document version of the NWDAP[11], consultation with NWDAP stakeholders suggested that the 2014-2019 Plan, in its current form, may be overcomplicated and include unnecessary detail and duplication. For example, it was suggested that the high level of detail about wild dog ecology and behaviour was largely unnecessary and that the 35 actions and 12 objectives listed under Section 6.3.3 could be consolidated and simplified to better communicate the proposed, ongoing implementation strategy of the Plan.

Also, a frequently expressed view was that there has been a disconnect between the purpose of the Plan and on-ground wild dog management. The purpose of the Plan is to provide a high-level, national framework and strategy to inform best practice wild dog management, utilising the nil-tenure approach, across all Australian jurisdictions. The NWDAP is not directly responsible for wild dog control investment and activities, however, Goal 3 of the NWDAP states:

"Goal 3: Mitigate the negative impacts caused by wild dogs."

The Plan coordinates and facilitates improved management and adoption of best practice, and provides support, information and resources to those impacted by wild dog pressure. However, at ground level, there has been misconceptions that the Plan should somehow directly lead to 'more dogs being killed'. Communication of the purpose and value of the Plan going forward will be key to ensuring ongoing stakeholder support for the Plan at all levels.

5.4.2 Importance of Consistent Metrics

Goal 4 of the current NWDAP (Monitor, evaluate and report to inform and continuously improve wild dog management) specifically targets the ongoing development and reporting of nationally-consistent metrics for the assessment of wild dog impacts and management efficacy. However, objectives/actions under Goal 4 were generally not achieved during the initial five-year term of the NWDAP (2014-2019).

The NWDAPCC has been collecting some data on national wild dog metrics. However, there has been concern over the lack of response and lack of data for some agreed

[11] See: https://www.pestsmart.org.au/wp-content/uploads/2018/10/NWDAP_FINAL_Revision-Aug-2018-1.pdf

national metrics from some states. It was understood that jurisdictional differences makes collation and subsequent synthesis of national data difficult.

The ability to credibly measure, analyse, aggregate and communicate the negative impacts of wild dogs on primary production, the environment and the associated social assets, and the capability of NWDAP personnel to effectively demonstrate the benefits of wild dog management programs, is critical for ongoing support for, and success of, any future NWDAP.

5.4.3 Defining the NWDAP's Target Audience

A key limitation within the 2019 NWDAP Stage 3 Review and Impact Assessment process was the difficultly in defining the target audience for the stakeholder online survey coupled with a poor response rate. Initially, the online stakeholder survey was sent to over 55 potential respondents who were largely members of the NWDAPCC or members of key NWDAP partner organisations, such as relevant State Government Departments and producer groups. However, most of the original potential respondents did not complete the survey and indicated that they felt they should not respond due to inherent biases from their positive involvement with the NWDAP.

Due to its digital form, the online NWDAP stakeholder survey was forwarded on to other potential NWDAP stakeholders by a few of the original targeted respondents. As a result, some of the additional stakeholders who did provide responses to the online survey were people somewhat unfamiliar with the NWDAP and its purpose (e.g. landholders) or were not directly involved with the NWDAP or wild dog management (e.g. coastal city councils). This created difficulties in collating and analysing the survey results so that they could be used meaningfully to inform the current assessment.

At the broadest level, NWDAP stakeholders include landholders affected by wild dogs, local and regional wild dog control groups and councils, State Government agencies, land management, NRM and environmental groups, primary producer groups and peak industry bodies, the Federal Government and the wider Australian community. However, as a high-level, national, strategic Plan, many groups directly involved in wild dog control are not directly aware of Plan or how the Plan filters through the levels of planning to influence on-the-ground wild dog management. For future Reviews or surveys where the NWDAP wishes to collect and analyse data from NWDAP stakeholders, it will be important to define the target audience from where the information is sought.

5.4.4 Broadening Membership of the SCG and the NWDAPCC

Based on the findings and recommendations of the 2017 GHD Mid-Term Review, the NWDAP partially restructured its governance and management. The Stage 3 project oversight and promotion structure was finalised in June 2018 with the NWDAPCC replacing the Stage 2 ISC.

During this restructure, and to highlight the industry-led focus of the NWDAP, State Government representation on the NWDAPCC was reduced and consolidated to just two members (one representative from the NSW Department of Primary Industries, and one from the DoAG's Environment and Invasives Committee) (Ben Russell, pers. comm., 2019). However, as indicated by the information provided earlier in Sections 3.4 and 5.4.3, a key purpose of the Plan is to provide a national framework and strategy that flows through to on-ground wild dog management through State and regional strategies.

Further, it may be difficult to reconcile wild dog management data and policy differences between jurisdictions if State representatives do not have a platform (facilitated by the NWDAP) to engage and share information. Thus, the NWDAPCC should consider whether broadening its membership to include additional State government representation may be beneficial.

5.4.5 Other Issues for Consideration

The NWDAP Stage 3 Review and Impact Assessment process identified a number of key issues that should be considered during the development of any future iterations of the NWDAP post-June 2019. The issues included:

- *Lack of consistency between Stage 3 MERI Plan reporting and the actions listed in the NWDAP (Section 6.3.3)*
  Though the four overarching goals remained consistent, the objectives, outcomes and actions that were reported against in the NWDAP Stage 3 MERI Plan were not consistent with the actions and objectives of Section 6.3.3 in the NWDAP itself. This made assessment of progress against objectives difficult and comparisons between the GHD mid-term review findings and the findings of the current, Stage 3 review less informative.
- *Succession planning for the national and state wild dog coordinator roles*
  Delivery of the Plan was heavily reliant on the activities of the NWDMC and state coordinators, succession planning will be critical to maintain the impact of any future Plan.
- *Recognition of cluster fencing*
  The issue of cluster fencing was raised by a number of key stakeholder groups across several states. Also, cluster fencing was one of the main areas for government investment, in turn supported by increased confidence to invest delivered through the Plan. It was thought that cluster fencing should be explicitly recognised in the NWDAP as a wild dog management strategy to ensure appropriate information is shared across sectors and jurisdictions to promote optimal implementation and ensure cooperative wild dog management programs do not lapse due to the increases in wild dog exclusion fencing.
- *Leverage, collaboration, extension, prioritisation of RD&E and informing government policies*
  The pathways to impact with respect to improved, on-the-ground control of wild dogs include:
  - enhanced collaboration and cooperation leading to increased leveraging and more efficient allocation of resources for wild dog management, and
  - improved coordination and implementation of wild dog control through extension of best practice (including up to date R&D outputs) and policy guidance.

  There is scope to amend the NWDAP to include activities/actions to better target improvements in the efficiency of wild dog management RD&E expenditure and NWDAP stakeholder input to government policy.
- *Funding for face-to-face stakeholder engagement*
  The Review found that, during Stage 3 of the NWDAP, funding and support for face-to-face stakeholder interactions including meetings of the NWDAPCC,

regional stakeholder forums, workshops, field demonstrations, wild dog coordinator training and development and other wild dog management presentations was minimal. Stakeholders indicated that cooperation and collaboration was more likely to be achieved when people with different perspectives and from different levels and/or regions were able to get together to share information and discuss ideas and constraints.

- *Recognition and awareness of the NWDAP's 'brand'*
  Some stakeholders indicated that the NWDAP should consider further developing its 'brand' by implementing strategies to differentiate the NWDAP from PestSmart in terms of traditional and digital media and communication. This would contribute to increase awareness and acceptance of the NWDAP, increase engagement and education of the broader community, and ensure consistent messaging to NWDAP stakeholders.

6. Recommendations

The NWDAP should continue to work towards a consistent, national, nil-tenure approach to all aspects of wild dog management across Australia. Based on the findings of the NWDAP Stage 3 Review and Impact Assessment, the following items are recommended for consideration by the NWDAPCC:

1. All stakeholders to support continuation of the NWDAP post-2019. The future Plan should be simplified to improve clarity and reduce duplication and include a greater focus on coordination, collaboration and communication, the environmental aspects of wild dog management, and development of Integrated Multiple Vertebrate Pest Management strategies.
2. DoAG (formerly DAWR) leadership, support (in terms of funding and representation on the NWDAPCC), and coordination for the NWDAP should continue. However, to promote greater stakeholder engagement and adoption, the NWDAP should consider pursing increased industry and state government-based funding for future Plan activities.
3. In line with the 2017 GHD Mid-Term Review recommendations, a future NWDAP (post-2019) should adopt a planning process that includes an over-arching strategic plan (preferably a 5-year rolling plan that is updated annually) complemented by more detailed annual operating plans. These plans to include responsibility and accountability parameters for each of the stakeholders to be endorsed by the NWDAPCC, including regular two-way reporting and communication of activities and outcomes.
4. Succession and continuity planning for key NWDAP roles (such as the NWDMC, state wild dog coordinators, the APIM and the Communications Coordinator) is required to ensure the continued delivery and success of Plan activities.
5. Continue to pursue and develop consistent, national reporting of wild dog impacts and the benefits of wild dog management programs through nationally-consistent and agreed metrics. Demonstrating the benefits of wild dog management, particularly in the face of increasing wild dog pressure in some regions, is particularly important to ensure ongoing industry support for the Plan and coordinated wild dog management programs in general.
6. Any future NWDAP (post-2019) needs to clearly define its purpose and target audience to improve communication and engagement with stakeholders and the broader community. The Plan should consider amending the current Goal 3 (mitigate the negative impacts caused by wild dogs) to reduce the possibility of misinterpretation/miscommunication of the Plan's purpose and goals. Consistent messaging about the Plan's high-level, strategic purpose and goals (e.g. improved coordination and collaboration for wild dog management and policy across Australia) will be key in any future Plan.

7. Conclusions

The NWDAP 2014-2019 has been highly successful and has contributed to increased coordination, collaboration and investment in best practice wild dog management (focused on a nil-tenure approach) across Australia.

Stage 3 of the NWDAP (2017/18 to 2018/19) was found to have achieved or partially achieved 80% of its planned strategies/activities and, over the whole of the five-year period of the current NWDAP, the Plan achieved or partially achieved 94% of the Action Implementation Requirements described in Section 6.3.3 of the NWDAP 2014-2019.

The NWDAP Vision and Mission statements remain highly relevant and stakeholders are positive about the NWDAP's performance indicating that they rate the Plan's overall progress toward its objectives and goals as 'good' to 'very good' for the 2014-2019 period.

At the broadest level, all investment (and subsequent impacts) for wild dog management are guided, at least in part, by the NWDAP. However, the current impact assessment focused on actual and potential direct (primary) and indirect (secondary) impacts from the activities undertaken through the specific grant investments for Stages 1, 2 and 3 of the NWDAP.

Total investment in the NWDAP 2014-2019 (all sources, Stage 1 to 3 activities only) was $2.62 million (present value terms). The investment was estimated to produce total benefits between $15.93 million and $43.30 million with a net present value between $13.31 million and $40.68 million and a benefit-cost ratio between 6.1 (including primary benefits only) and 16.5 to 1 (including both primary and secondary benefits).

The direct, primary benefits of the NWDAP investment came from more efficient expenditure (both public and private) on wild dog management, more efficient resource allocation for RD&E investment associated with wild dog management and maintained and/or enhanced social licence to undertake wild dog control. However, the NWDAP also has contributed significant value through other key outcomes including increased leadership and capacity, increased government and industry confidence, and increased leverage and investment for wild dog management at all levels throughout Australia.

The Plan has provided a successful blueprint for strategic planning and management of other, nationally significant pest species. The 2019 NWDAP Stage 3 Review and Impact assessment found that the NWDAP should continue to be supported by all stakeholders post-2019 and that the Plan may be improved through more a diverse funding structure and a renewed focus on communication and engagement to increase awareness and adoption of best practice wild dog management across Australia.

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Greg Mifsud, National Wild Dog Management Coordinator, Centre for Invasive Species Solutions

Jane Littlejohn, General Manager – Research, Australian Wool Innovation Limited

Wendy Allen, National Wild Dog Action Plan Implementation Coordinator

Acronyms & Abbreviations

ABARES	Australian Bureau of Agricultural and Resources Economics and Sciences
AHA	Animal Health Australia
AISC	Australian Industry Skills Committee
APIM	Action Plan Implementation Manager
AWI	Australian Wool Innovation Limited
BCA	Benefit-Cost Analysis
BCR	Benefit-Cost Ratio
CISS	Centre for Invasive Species Solutions
COP	Code of Practice
CRC	Cooperative Research Centre
DAWR	Department of Agriculture and Water Resources
DoAG	Department of Agriculture (Commonwealth) (formerly DAWR)
EIC	Environment and Invasives Committee
GHD	Professional services company that provides engineering, architecture, environmental and construction services to private and public sector clients
GST	Goods and Services Tax
IACRC	Invasive Animals Cooperative Research Centre
IAL	Invasive Animals Limited
IMVPM	Integrated Multiple Vertebrate Pest Management
IPAC	Invasive Plants and Animals Committee
IRR	Internal Rate of Return
ISC	Implementation Steering Committee
LGA	Local Government Area
LLS	Local Land Services
MERI	Monitoring, Evaluation, Reporting and Improvement
MLA	Meat and Livestock Australia
NPV	Net Present Value

NRM	Natural Resource Management
NSW DPI	New South Wales Department of Primary Industries
NWDAP	National Wild Dog Action Plan
NWDAPCC	National Wild Dog Action Plan Coordination Committee
NWDF	National Wild Dog Facilitator
NWDMC	National Wild Dog Management Coordinator
PAC	Pest Animal Controller
PAPP	Para-aminopropiophenone
PVB	Present Value of Benefits
RD&E	Research, Development and Extension
RDC	Research and Development Corporation
RTO	Registered Training Organisation
SCG	Stakeholder Consultative Group
SOP	Standard Operating Procedure

Glossary of Economic Terms

Cost-benefit analysis:	A conceptual framework for the economic evaluation of projects and programs in the public sector. It differs from a financial appraisal or evaluation in that it considers all gains (benefits) and losses (costs), regardless of to whom they accrue.
Benefit-cost ratio:	The ratio of the present value of investment benefits to the present value of investment costs.
Discounting:	The process of relating the costs and benefits of an investment to a base year using a stated discount rate.
Internal rate of return:	The discount rate at which an investment has a net present value of zero, i.e. where present value of benefits = present value of costs.
Investment criteria:	Measures of the economic worth of an investment such as Net Present Value, Benefit-Cost Ratio, and Internal Rate of Return.
Modified internal rate of return:	The internal rate of return of an investment that is modified so that the cash inflows from an investment are re-invested at the rate of the cost of capital (the re-investment rate).
Net present value:	The discounted value of the benefits of an investment less the discounted value of the costs, i.e. present value of benefits - present value of costs.
Present value of benefits:	The discounted value of benefits.
Present value of costs:	The discounted value of investment costs.

Appendices

Appendix A: NWDAP Action Implementation Requirements (NWDAP Section 6.3.3) - Reproduced

Goal 1: Provide leadership and coordination for the management of wild dogs						
Objectives & Actions	**Outcome**	**Responsible Parties**	**Resources**	**Priority & Timeframe**	**Performance Measure**	**Context & Comments**
Objective 1A: Clarify roles and accountabilities of all relevant parties						
Action 1A.1: Adopt and maintain a clear governance structure for the implementation of the Plan	1) Officer with responsibility for ensuring implementation of the Plan appointed (APIM). 2) Oversight of the implementation of the Plan.	Lead: ISC	APIM	High priority/ foundation activity in first six months	Governance structure adopted and implemented. APIM appointed.	Good governance of the Plan is contingent on an effective relationship between ISC member representatives. The governance structure is outlined in Section 6. Appointment of the APIM position is fundamental to delivery of the Plan. A partnership organisation could potentially house the APIM as an in-kind contribution.
Action 1A.2: Establish stakeholder responsibilities in relation to the	Stakeholders confirm that they understand their roles and responsibility to implement to Plan.	Lead: ISC	APIM, SCG	High priority/ foundation activity in first six months	Participation by stakeholders confirmed.	This task is about understanding the relationships of stakeholders and between stakeholders. It is also

implementation of the Plan.						about all stakeholders understanding their roles and responsibilities in delivering the goals of the Plan and working with the overseeing body.
Objective 1B: Promote adoption of nationally-consistent approaches to wild dog management						
Action 1B.1: Define the process to gain national recognition of best practice wild dog management.	Agreement on process of best practice recognition adopted by ISC.	Lead: ISC Other: Industry; RD&E; federal, state and territory governments	APIM, SCG	Medium priority/ 18 months	Process established and agreed	This action is about recognition of best practice and the process for recognition. It also recognises that there is a wealth of existing information on best practice. Best practice, for the purpose of the Plan, is defined in Appendix E.
Action 1B.2: Promote integrated and strategic wild dog management supported by a scientific, risk-based and humane approach.	Adoption of scientific risk-based approaches incorporating current best practice.	Lead: ISC Other: Industry; RD&E; federal, state and territory governments; IACRC	APIM IACRC NWDF State and regional facilitators Industry	High priority/ ongoing	Progressive uptake of identified approaches	This action is about ensuring that the approaches used to manage wild dogs are based on the best available information (i.e. safe, effective and humane). Improvements to this approach will be ongoing (e.g. the IACRC is investigating social barriers to uptake by end users). Importantly, this action is about delivery not research and development.

Action 1B.3: Promote implementation of COP and SOPs for humane wild dog management	Clarified status in all jurisdictions of safe and legal use of current toxins (and firearms).	Lead: ISC, APIM Other: Federal, state and territory governments	State and territory governments	High priority/ 12 months	Agreed adoption by jurisdictions	The Model Code of Practice for the Humane Control of Wild Dogs has been endorsed by VPC. Best practice management should follow the COP and associated SOPs to ensure humane destruction of wild dogs.
Action 1B.4: Promote nationally-consistent approaches to the availability of new control technologies.	Nationally-consistent regulatory process for availability of and training for new control tools or products, e.g. PAPP.	Lead: ISC, APIM Other: IACRC; federal, state and territory governments; manufacturers and retailers	State and territory governments IACRC Manufacturers and retailers	High priority/ 12 months	Constant improvement in adopting consistent processes and materials.	This action includes addressing the need for consistent directions for use, labels and training across all jurisdictions. Some products may not be available for all end users. If this is the case, some expectations of end users may need to be managed. Nevertheless strive to have tools available equally to all end users.
Action 1B.5: Facilitate the uptake of new techniques by control authorities and/or land managers.	Process implemented to provide access to skill-building and roll-out programs.	Lead: ISC, APIM Other: IACRC; stat and territory governments; manufacturers and retailers	State and territory governments IACRC Manufacturers and retailers	Medium priority/ 18 months	Constant improvement in the uptake of new techniques when available.	This action focuses on building skills to speed uptake of new techniques, which goes beyond provision of extension materials. For example, manufacturers may be encouraged to facilitate such activities.

Objective 1C: Promote, enhance and implement collaborative best practice management systems **Note:** The process for recognising best practice management systems is defined in Action 1B.1						
Action 1C.1: Recognise, create and/or enhance partnership models that involve government, industry and communities.	Delivery of effective local, regional and jurisdictional wild dog management programs informed by all stakeholders.	Lead: ISC Other: Industry; RD&E; state, territory and local governments NRM regional agencies Landcare	APIM SCG Industry State, territory and local governments NRM agencies Landcare Land managers	High priority/ ongoing	Existing groups are maintained and enhanced where necessary. New partnerships established where gaps in programs exist.	There are current partnership models and processes already in place. In the context of the Plan, recognition of these models and best practice (e.g. Green and Brown books) is an important foundation activity. There partnerships could be at a state, regional or local control level.
Action 1C.2: Further refine, promote and implement proven wild dog facilitation processes that extend to state and territory and regional levels.	1) Facilitation to support the development of community-driven wild dog management programs at the local and regional level is provided. 2) Extension materials and products to fill current knowledge and skill gaps are developed.	Lead: ISC Other: State, territory and local governments; industry; NRM regional agencies; Landcare	APIM, NWDF State and territory governments Industry RD&E	High priority/ 12 months	1) Increased availability and access to extension materials. 2) Increased number of local facilitators in each state.	The facilitation model has proven successful to implement community-led management. This action considers mechanisms for engaging new facilitators and potential sources of funding. The return on investment for the facilitation approach has been documented in Chudleigh, Simpson and Lai (2011).

	3) Structured community of practice is established to support facilitation process.					Legacy contingency is in place to preserve what is developed for future access and benefit.
Goal 2: Increase awareness, understanding and capacity building with regard to wild dog management						
Objectives & Actions	**Outcome**	**Responsible Parties**	**Resources**	**Priority & Timeframe**	**Performance Measure**	**Context & Comments**
Objective 2A: Maximise public and community support for wild dog management						
Action 2A.a: Develop a communication and engagement strategy.	1) Agreed key messages used as a base for the communication strategy. 2) Endorsed communication strategy (endorsed by ISC).	Lead: ISC, APIM Other: SCG	APIM	High priority/ foundation activity in first six months	Gap analysis on communication needs/ requirements is completed. Strategy endorsed by ISC.	The communication and engagement strategy should consider all wild dog issues, including peri-urban, biodiversity protection, dingo conservation situations and raising awareness of recruitment of wild dogs from owned dogs (backyard dogs, pig dogs, etc.). The strategy should consider the use of 'champions' to deliver key messages. This may include networking for effective regional delivery. Where possible, the strategy should influence national consistency.

Action 2A.2: Implement communication and engagement strategy.	Primary and secondary stakeholders are engaged and informed.	Lead: ISC, APIM Other: SCG, IACRC, other primary and secondary stakeholders	APIM, NWDF, IACRC, existing mechanisms of primary and secondary stakeholders	Immediately after strategy endorsement and ongoing	Consistent key messages are incorporated and distributed among primary and secondary stakeholders.	Key messages on purposes, processes and progress are delivered. Need to use existing communication outlets (i.e. using existing infrastructure) and develop new mechanisms as necessary.
Action 2A.3: Evaluate the effectiveness of the communication and engagement strategy. If necessary, review the content of the strategy.	Effectiveness and improvements assessed where appropriate.	Lead: ISC Other: APIM, NWDF	SCG	Components reviewed annually, comprehensive review after 3 years	Annual review as part of SCG meetings and annual stakeholder forum. Comprehensive review at 3 years. Feedback is incorporated into updated strategy.	Feedback needs to be collected and collated from primary and secondary stakeholders by APIM. ISC mechanisms for the review process need to be defined.
Objective 2B: Ensure a comprehensive suite of extension materials is available						
Action 2B.1: Identify and fill gaps in existing materials.	1) Existing materials audited, reviewed and updated (where appropriate). 2) New extension material developed	Lead: ISC, IACRC Other: Information provided by primary and	IACRC, RDCs, state and territory governments	Medium priority/ Annual stocktake of materials	Agreed list of current resources. New materials developed as appropriate.	There is already a large body of existing material. However, existing material may not be adopted by end users effectively. Promotion of agreed list can be a useful tool for primary

	where there are identified needs.	secondary stakeholders				and secondary stakeholders. Link to Action 1B.2 – recognition process for best practice.
Action 2B.2: Ensure required information is available.	Most efficient mechanisms for delivery of extension material identified and used.	Lead: ISC, IACRC, APIM Other: SCG, peak industry bodies, RDCs	IACRC, APIM, SCG	Medium priority/ ongoing	Extension material is available to all stakeholders.	This recognises that stakeholders are different and the methods of engagement need to be appropriate for each group.
Objective 2C: Improve adoption of wild dog best practice management through effective communication, education and training						
Action 2C.1: Promote and support mentoring of stakeholders for the implementation of best practice at the local level.	1) Functional and sustainable management groups at a local level implementing best practice through education and training. 2) Best practice wild dog management accepted and implemented by communities.	Lead: ISC, NWDF, state and regional facilitators Other: NRM regional agencies, peak industry bodies, state, territory and local governments	RDCs NRM agencies	High priority/ ongoing	Increased participation and establishment of wild dog management groups at a local level.	This action is about group participation, coordination, cooperation and mentoring of nil-tenure approach at a local level. NRM agencies may have the potential capacity to implement this objective. IACRC currently has a project investigating barriers to uptake.
Action 2C.2: Use social and traditional media to promote local and regional leadership	1) Delivery of positive local implementation of best practice enhanced and maintained, using the	Lead: ISC, IACRC Other: SCG, peak industry	IACRC, industry RD&E, governments (state and	Medium priority/ ongoing	Media Monitors summaries/ metric.	Media is changing. The Plan needs to consider new tools and emerging techniques to engage all stakeholders

of wild dog management.	most appropriate method/s. 2) Community's general understanding of the benefits of a cooperative approach to wild dog management broadened.	bodies, national industry RD&E groups, NRM regional agencies as appropriate	territory), local groups		New technologies engaged. APIM Facebook page and Twitter account established.	(rural and urban) in wild dog management. However, this objective needs to understand the broader demographic of all stakeholders and methods may need to be targeted for specific audiences.
Action 2C.3: Promote development and delivery of nationally recognised qualifications.	1) Consistency of training and education packages. 2) Increased number of appropriately trained wild dog controllers.	Lead: ISC, SCG, AgriFood Skills Australia, RTOs Other: IACRC, APIM, NWDF and state and regional coordinators.	Commonwealth Government State and territory governments IACRC National industry RD&E groups	Medium priority/ ongoing	Training packages are current and available. Number of trained and competent practitioners and landholders.	This is about registered training organisations (RTOs) delivering accredited training to on-ground practitioners. IACRC is developing a training package for Continuing Professional Development. Note that this does not provide commentary on the cost to delivery training. Costs can be a barrier to uptake. APIM/ NWDF/and state/ regional facilitators need to liaise with the RTOs to meet the performance measure targets.

Action 2C.4: Enable those involved with wild dog control to have access to tools and the capability to use them with appropriate levels of competence and humaneness.	Tools used by land managers to manage wild dogs in a safe, efficient and humane manner.	Lead: ISC, NWDF and state facilitators Other: State and territory governments	IACRC, RDCs Industry RD&E groups NRM regional agencies Commonwealth Government	High priority/ ongoing	Number of meetings, field days and demonstrations provided to landholders (annual). Number of stakeholders trained and effectiveness of transfer of training to wild dog management practices.	This action is about the landholders having the competency to use the tools. This includes landholders having the ability to apply/ access funds for community-led action. Field days, demonstrations may be mechanisms used. Landholders are defined in Appendix C.
Goal 3: Mitigate the negative impacts caused by wild dogs						
Objectives & Actions	**Outcome**	**Responsible Parties**	**Resources**	**Priority & Timeframe**	**Performance Measure**	**Context & Comments**
Objective 3A: Adopt a strategic, consistent, scientific, risk-based humane approach to managing the impacts of wild dogs						
Action 3A.1: Identify priority areas and support the development of strategic wild dog management plans, integrating all appropriate technology.	1) Appropriate tools and strategies implemented by stakeholders effectively, humanely and safely. 2) Protection of local assets within the priority areas.	Lead: ISC, NWDF, state and regional facilitators Other: SCG	National industry RD&E groups NRM agencies State and territory governments	High priority/ ongoing	Maintenance and enhancement of existing plans and implementation of new plans where appropriate.	Priority areas need to be identified based on evidence. These can be existing wild dog areas, emerging areas where the landholders are not coordinated in their management approaches and require guidance; or areas of reinvasion. Priority areas can be based on

						economic, social or environmental assets.
Action 3A.2: Promote and support a community-driven, landscape-scale approach to management	Stakeholder owned and driven wild dog management at effective scales to reduce impacts.	Lead: ISC, NWDF, APIM Other: All primary and secondary stakeholders	All primary and secondary stakeholders	High priority/ ongoing	Number of community-led initiatives implemented. Maintenance and enhancement of existing plans and implementation of new plans where appropriate.	In this action, community includes all stakeholders involved or responsible for wild dog management within a given area.
Action 3A.3: Promote integrated pest species management (i.e. multiple pests, such as foxes, feral cats, feral pigs and wild dogs).	Increased effectiveness of landscape management where multiple invasive species need consideration.	Lead: ISC, APIM, NWDF, state and regional facilitators, APIM Land management agencies and NWDF Other: SCG, all primary and secondary stakeholders	National industry RD&E groups NRM agencies State and territory governments	High priority/ ongoing	Wild dog management plans incorporate other pest species as appropriate.	This action recognised that control of wild dogs may need to be integrated with other pest animal control, for example foxes or pigs.
Action 3A.4: Identify RD&E opportunities to	1) Opportunities identified for developing, adopting	Lead: ISCSCG	IACRC, RDCs	High priority/ ongoing	Number of RD&E projects adopted by RDCs.	This action is about supporting applied RD&E to minimise the impacts of

inform actions to reduce the impacts of wild dogs.	and applying tools, techniques, knowledge and strategies to sustainably reduce the impacts of wild dogs. 2) Outcomes conveyed to RD&E groups to progress development.	Other: NWDF, APIM, IACRC	National industry RD&E groups NRM Agencies State and territory governments		Recognition of the Plan in RD&E funding guidelines by funding bodies.	wild dogs (e.g. developing new tools). Need to recognise there is a wealth of research already undertaken (i.e. there are tools and techniques to manage wild dogs). The challenge is the uptake and adoption by the end users. Need to ensure that RD&E outcomes are priorities for end user applicability.
Action 3A.5: Ensure that the 'toolbox' for managing wild dogs is consistent, adopted and updated as required.	1) All appropriate tools and strategies readily available to end users. 2) New 'tools' made available in a timely manner as they are developed.	Lead: ISC, IACRC, NWDF, SCG, APIM Other:	IACRC National industry RD&E groups NRM agencies State and territory governments	High priority/ ongoing	As new tools become commercially available strategies for use are provided to end users.	
Objective 3B: Promote adoption of best practice at all scales						
Action 3B.1: Promote national consistency in the planning process to manage wild dogs at local, regional	1) Nationally agreed minimum guidelines for plans developed.	Lead: ISC, SCG Other: APIM, NWDF, state and territory governments,	All governments	High priority/ first 12 months	Guidelines for plans are agreed to by ISC.	This is about consistency in planning strategies, recognising that there are local differences in environment and how to best apply the 'toolbox'.

and state/ territory scales.	2) Nationally agreed minimum guidelines for plans adopted.	all primary and secondary stakeholders				Nationally agreed guidelines for plans are consistent with the purpose of the Plan. Plans need to have agreed measurement/s of success.
Action 3B.2: Develop and apply community-driven nil-tenure planning approaches at the appropriate scale.	1) Potential tenure-based impediments overcome. 2) Promotion of the preparation and implementation of community-driven nil-tenure wild dog plans.	Lead: ISC, NWDF, SCG, local wild dog groups Other: All primary and secondary stakeholders	Local stakeholders National industry RD&E groups NRM agencies State and territory governments	High priority/ ongoing	Number of local area plans/ groups engaged. Number of local programs implemented.	Recognition that nil-tenure approaches to the management of wild dogs are essential for pest management. This implies that all landowners are working together to manage wild dogs and that the appropriate adoption mechanisms are in place and functioning well.
Action 3B.3: Promote the development of plans to minimise impacts on non-target species.	Minimal unintended consequences of wild dog management activities.	Lead: ISC, all primary and secondary stakeholders	All primary and secondary stakeholders	High priority/ ongoing	Local control plans consider the potential risks and take appropriate action. (Refer to Action 3B.2 for number of plans).	This recognises there may be non-target species impacts of some tools, therefore management plans must incorporate measures to address these issues. There are differences between jurisdictions' policies to manage dingoes from a conservation

						perspective. However, there is common recognition that the impacts of wild dogs need to be managed.
Goal 4: Monitor, evaluate and report to inform and continuously improve wild dog management						
Objectives & Actions	**Outcome**	**Responsible Parties**	**Resources**	**Priority & Timeframe**	**Performance Measure**	**Context & Comments**
Objective 4A: Develop nationally-consistent metrics for assessment of wild dog impacts and management efficacy						
Action 4A.1: Develop and adopt metrics for assessing the impacts, efficacy and cost-effectiveness of wild dog management for local, state and national scales.	Nationally agreed approach for measuring wild dog management actions, including standard measures of impacts, management efficacy and cost effectiveness relevant to all parties.	Lead: ISC, APIM Other: Primary and secondary stakeholders	State and territory governments RD&E groups Animal welfare groups	High priority/ ongoing	Metrics are agreed to by ISC.	This action is about agreement on the metrics at a national level for application at different scales. ISC need to adopt the metrics as the standard. Inputs: Cost-effectiveness, participation, and control activity. Outputs: Decreased stock attacks, decreased stock loss; and increased productivity. Return on investment: Number of local plans, number of baits/ programs/ plans/ trappers, and livestock productivity.

						Metrics may need to consider the triple bottom line approach.
Action 4A.2: Promote the application of agreed metrics at a local level.	Metrics implemented in local wild dog plans.	Lead: ISC, NWDF, state and territory facilitators Other: All primary and secondary stakeholders	Local stakeholders National industry RD&E groups NRM regional agencies State and territory governments	High priority/ ongoing	Agreed metrics are incorporated into each local plan.	This action is about the application/ implementation and reporting of the metrics at a local level and using the metrics to guide improvements.
Action 4A.3: Analyse, report and improve metrics.	1) Analysis of collated and standardised data on the impacts of wild dogs and the effectiveness of management, leading to improved on-ground outcomes. 2) Improved national understanding of wild dog management and guides investment, based on analysis.	Lead: APIM, ISC Other: SCG	Local stakeholders National industry RD&E groups NRM agencies State and territory governments	Medium priority/ ongoing	1) Local groups have information to guide and improve local application. 2) Reports to SCG.	This action is consistent with monitoring, evaluation, reporting and improvement (MERI) frameworks.
Objective 4B: Develop and adopt processes for evaluating implementation and outcomes of the Plan						

Action 4B.1: Adopt a timetable and process for the review of the Plan leading to continuous improvement.	Independent assessment of the delivery and outcomes of the Plan.	Lead: ISC, SCG	APIM State and territory governments	High priority/ 3 year (mid term) High priority/ 5 year (final)	Independent review undertaken.	This is about assessing the effectiveness of the Plan and not local plans.
Action 4B.2: Implement the recommendations of the Mid-Term and final reviews.	Recommendations of independent review adopted by stakeholders where appropriate.	Lead: ISC, APIM Other: SCG	APIM State and territory governments	High priority/ 3-5 years	Recommendations are implemented.	This action is about continually improving the implementation and effectiveness of the Plan delivery.
Objective 4C: Develop and adopt reporting processes and structures						
Action 4C.1: Develop and adopt a system of reporting to stakeholders.	Agreed system for reporting to stakeholders.	Lead: ISC, APIM, SCG	APIM Commonwealth, state and territory governments	High priority/ foundation activity	System is agreed to by SCG.	This action is about developing the system for reporting. It needs to be agreed to by the ISC and be in a format that is informative to end users.
Action 4C.2: Implement the reporting system.	Informed stakeholder network.	Lead: ISC, APIM	APIM Commonwealth, state and territory governments	High priority/ ongoing	Reports are distributed to stakeholders.	This action is about keeping stakeholders informed of progress.
Objective 4D: Undertake continuity planning						
Action 4D.1: Determine the need for major revision of the Plan.	Decision made on the future direction of the Plan.	Lead: ISC Other: SCG	APIM Commonwealth, state and	High priority/ 3-5 years	Determination is informed by the 3-5 year review and has been made.	This action is about ensuring that there is a clear continuity plan, if it is required .This should be

			territory governments		Refer to Action 4B.1.	informed by the review process.
Action 4D.2: Ensure continuity of access to resources and materials from the Plan.	Ongoing access to resources and materials by all stakeholders.	Lead: ISC Other: SCG	State and territory governments	High priority/ 3-5 years	Repository for resources established.	This action includes data, plans, documents etc. developed under the Plan to ensure ongoing application by end users. Mechanisms for appropriate archiving of resources will need to be determined, mapped and resourced.

Appendix B: NWDAP Stakeholder Survey (Online Questionnaire)

Survey for NWDAP review:

Dear NWDAP participant

The National Wild Dog Action Plan is nearing the end of its first, five-year term (2014 to 2019). The NWDAP Coordination Committee has commissioned a final review and impact assessment of the NWDAP to determine whether the objectives of the NWDAP had been fully met and investigate the implications for structuring a continuing NWDAP covering the next 10 years.

Agtrans Research has been contracted to complete the final NWDAP review. As part of the review we are seeking responses from stakeholders on various aspects of the NWDAP with a view to assessing performance and impact to date and provide recommendations for the future, and as such we invite you to complete the following survey.

Please note that Agtrans also will be contacting by phone and/or email a limited number of key stakeholders to enable a better understanding of performance.

The survey has three parts (A, B & C) that reflect the terms of reference for the review. Also, we would like to know which stakeholder group you belong to as this will assist in better determining future priorities.

All questions within the survey are OPTIONAL. Completing the survey should take approximately 10 to 15 minutes. If you are a landholder, please answer from your own personal perspective. If you are a representative for a NWDAP stakeholder group (e.g. producer representative, control group rep., state government rep., etc.), please answer the survey questions from the perspective of your organisation.

If you have any questions in relation to this survey, please contact the project leader:

Talia Hardaker (Project Leader, Agtrans Research)

Email: talia@agtrans.com.au

Phone: (07) 3870 4047

Your Stakeholder Group

Q1: What category of stakeholder group best describes your involvement with the NWDAP? (please select)

- ☐ Producer and/or producer representative
- ☐ Control group coordinator/participant
- ☐ Researcher (including research funding agency representative)
- ☐ Government agency
- ☐ NWDAP Coordination Committee member
- ☐ Other – please describe

Q2) If applicable, please state the name of the organisation/group that you represent (e.g. Department of Agriculture and Fisheries QLD):

Q3) OPTIONAL - for administrative purposes only. Note: all information/data will be confidential. Please state your name:

Part A: Progress toward outcomes

Funding partners of the NWDAP review require an assessment of the NWDAP's outcomes against the Plan's stated objectives and goals. Please answer the following questions to contribute to this assessment.

Q4) How relevant is the NWDAP vision statement?

"Stakeholders work together to deliver effective, coordinated and humane management of wild dogs."

- ☐ Very relevant
- ☐ Relevant
- ☐ Neither relevant or irrelevant
- ☐ Irrelevant
- ☐ Very irrelevant

Comments or suggestions

Q5) How relevant is the NWDAP mission statement?

"The Plan provides direction for the national management of wild dogs to minimise their negative impacts on agricultural, biodiversity and social assets."

- ☐ Very relevant
- ☐ Relevant
- ☐ Neither relevant or irrelevant
- ☐ Irrelevant
- ☐ Very irrelevant
- ☐ Comments or suggestions

Q6a) How would you rate the NWDAP's performance in meeting its stated objectives for each of the four NWDAP goals?

GOAL 1: Provide leadership and coordination for the management of wild dogs.

Objective	**Very Good**	**Good**	**Average**	**Poor**	**Very Poor**	**Don't Know**
1A: Clarify roles and accountabilities of all relevant parties						
1B: Promote adoption of nationally-consistent approaches to wild dog management						
1C: Promote, enhance and implement collaborative best practice management systems						
Overall rating of performance for Goal 1						

Evidence of performance or opportunities for improvement with respect to Goal 1 objectives

Q6b) How would you rate the NWDAP's performance in meeting its stated objectives for each of the four NWDAP goals?

GOAL 2: Increase awareness, understanding and capacity with regard to wild dog management

Objective	Very Good	Good	Average	Poor	Very Poor	Don't Know
2A: Maximise public and community support for wild dog management						
2B: Ensure a comprehensive suite of extension materials is available						
2C: Improve adoption of wild dog best practice management through effective communication, education and training						
Overall rating of performance for Goal 2						

Evidence of performance or opportunities for improvement with respect to Goal 2 objectives

Q6c) How would you rate the NWDAP's performance in meeting its stated objectives for each of the four NWDAP goals?

GOAL 3: Mitigate the negative impacts caused by wild dogs

Objective	Very Good	Good	Average	Poor	Very Poor	Don't Know
3A: Adopt a strategic, consistent, scientific, risk-based humane approach to managing the impacts of wild dogs						
3B: Promote adoption of best practice in plans at all scales						
Overall rating of performance for Goal 3						

Evidence of performance or opportunities for improvement with respect to Goal 3 objectives

Q6d) How would you rate the NWDAP's performance in meeting its stated objectives for each of the four NWDAP goals?

GOAL 4: Monitor, evaluate and report to inform and continuously improve wild dog management

Objective	Very Good	Good	Average	Poor	Very Poor	Don't Know
4A: Develop nationally-consistent metrics for assessment of wild dog impacts and management efficacy						
4B: Develop and adopt processes for evaluating implementation and outcomes of the Plan						
4C: Develop and adopt reporting processes and structures						
4D: Undertake continuity planning						
Overall rating of performance for Goal 4						

Evidence of performance or opportunities for improvement with respect to Goal 4 objectives

Part B: Impact assessment (including cost-benefit analysis)

As part of the NWDAP final review, Agtrans Research was tasked with assessing and estimating the impacts of the NWDAP. It is understood that the Plan does not directly fund RD&E or wild dog control activities.

The Plan helps to:

a) leverage resources and support for wild dog management,
b) coordinate more effective wild dog management at state/territory and/or regional level,
c) improve prioritisation of wild dog management RD&E, and
d) facilitate information sharing, particularly with respect to best management practices.

Q7) To what extent has the NWDAP influenced <u>you/your organisation</u> with respect to the following?

Area of influence	**High**	**Moderate**	**Low to nil**	**Don't Know**
Alignment of state/ regional/ local wild dog management plans with the NWDAP				
Increased support (financial, human resources, information, etc.) for the formation of groups for wild dog management				
Increased research, development and extension (RD&E) to identify and implement tools leading to more effective, coordinated and humane management of wild dogs				
Increased willingness to provide resources (staff, funding, etc.) for wild dog management				
Identification of priorities for investment in wild dog control activities and/or wild dog management RD&E				

Other influences or additional information

Q8) To what extent has the NWDAP achieved the following broad outcomes?

Outcome	**High**	**Moderate**	**Low to nil**	**Don't Know**
Increased awareness of wild dog impacts (among landholders)				
Increased awareness of wild dog impacts (broader community)				
Increased acceptance of 'nil-tenure' approach				
Increased acceptance of a coordinated, community-led approach to wild dog management				

Increased adoption of wild dog control best management practice				
Increased adoption of integrated pest animal management				
More effective implementation of appropriate tools and strategies for wild dog management				
Reduced number of wild dog attacks over the last 12 months				
Improved protection of wildlife (non-livestock)				
Improved emotional/ psychological state of landholders in regions affected by wild dogs				

Evidence or opportunities for improvement

Q9) Please provide an estimate of your/your organisation's average, annual expenditure ($ p.a.) on wild dog management (cash and in-kind). If unknown, please enter 'don't know'.

Q10) If applicable, please provide an estimate of your/your organisation's average, annual investment ($ p.a.) in wild dog management research and development (cash and in-kind).

Q11) How much, in terms of additional resources for wild dog management (cash and in-kind), do you estimate you/your organisation has **contributed** as a result of the NWDAP (i.e. compared to if a national plan **did not exist**)?

- ☐ 0%
- ☐ 5 – 10%
- ☐ 10 – 20%
- ☐ 20 – 50%

☐ More than 50%

Comments/evidence

Q12) How much, in terms of additional resources for wild dog management (cash and in-kind), do you estimate you/your organisation has **received** as a result of the NWDAP (i.e. compared to if a national plan **did not exist**)?

☐ 0%
☐ 5 – 10%
☐ 10 – 20%
☐ 20 – 50%
☐ More than 50%

Comments/evidence

Q13) To what extent has the existence of the NWDAP improved the efficiency of you/your organisation's wild dog control efforts (e.g. by reducing duplication, improving coordinating, information sharing, other resources, etc.)

☐ 0%
☐ 5 – 10%
☐ 10 – 20%
☐ 20 – 50%
☐ More than 50%

Comments/evidence

Part C: The future of the NWDAP (post-2019)

The current NWDAP is due to be completed on 30 June 2019. The NWDAP Coordination Committee is seeking recommendations about what elements of the plan to carry forward, remove, or amend for the next iteration of the plan.

Q14) In one or two sentences, from your/your organisation's perspective, what are the key strengths of the current NWDAP?

Q15) In one or two sentences, from your/your organisation's perspective, what are the key weaknesses of the current NWDAP?

Q16) In one or two sentences, from your/your organisation's perspective, what are the key threats to the future of the NWDAP?

Q17) In one or two sentences, from your/your organisation's perspective, what are the key opportunities for the NWDAP going forward?

Q18) Please provide any further comments or suggestions for improvements to the NWDAP

Thank you for completing the NWDAP Review Stakeholder survey!

Appendix C: Record of Documentation Reviewed

No.	File Name	Document Type	Note/Comment
1	3L14 Full Annual Report to 30062013	PDF	IA CRC project reports – Project 3.L.14: Facilitating Strategic Management of Wild Dogs Throughout Australia
2	3L14 Annual Report to 30 June 2014 Draft	WORD	
3	3L14 Annual Report to 2014-2015 draft	WORD	
4	3L14 Annual Project Report 2015 -2016	WORD	
5	3L14 Annual Report to 2014-2015 GM draft	WORD	
6	3L14 Progress Report to 31122016	WORD	
7	3L14 Progress Report to December 2015	WORD	
8	3L14 Progress Report to July – December 2014	WORD	
9	Australian Wool Innovation Final Report WP474	WORD	AWI June 2012 – final report summarising state/regional wild dog management activities and extension
10	Key Achievements generated by the National Wild Dog Management Facilitator	WORD	Summary of key outputs and outcomes of the NWDF for 2013/14 to 2015/16
11	Download 5 FINAL 24DEC 2014 – with MJ analysis	EXCEL	AWI wild dog management survey results (control group data) 2014
12	Wild dog survey_National_summary	WORD	Summary of information provided to Livestock Biosecurity Network officers in response to the survey on wild dog control at a producer level (National level)
13	Wild dog_NSW_summary	WORD	Summary of the wild dog programs in NSW and the NSW Wild Dog Management Strategy
14	Wild dog_NT_summary	WORD	Summary of the wild dog program in the NT
15	Wild dog_Qld_summary	WORD	Summary of Qld wild dog management activities/extension
16	Wild dog_WA_summary	PDF	Summary of feedback from the Wild Dog National Survey March 2015
17	NWDAP_FINAL_MAY14	PDF	Published version of the NWDAP
18	GMD2575 draft Final report Wild Dog Management Stage 2 1 May 2017	WORD	Project report for September 2015 to May 2017 for Stage 2 of the NWDAP including evaluation

19	Executed NWDAP stage 3 Agreement – 21112017	PDF	Executed NWDAP Stage 3 contract between AWI and DoAG
20	NWDAP Stage 3 Progress report to April 2018 180510	PDF	Project report – progress report for Stage 3 NWDAP activities
21	NWDAP Stage 3 Progress report to October 2018 181029	WORD	
22	FINAL NWDAP Stage 3 MERI Plan 20180416	PDF	NWDAP Stage 3 monitoring, evaluation, reporting and improvement plan
23	Australian Wool Innovation Milestone Report Jul-Dec 2017	PDF	Draft final report for the NWDMC project
24	CIS PO1-E-005 NAtional WIld dog Coordinator report August 2018	WORD	Project report – CISS NWDMC project progress report
25	PO1-E-005 National Wild Dog Coordinator Project Details_Nov18	WORD	Project report – CISS project details summary
26	abares-participatory_wild_dog_management_report	PDF	Report on the views and practices of Australian wild dog management groups
27	abares---wild-dog-management-2010-ot-20214-national-landholder-survey-results	PDF	National landholder survey June 2015
28	ABARES Report 2006 sheep-movement-ead	PDF	Report on the structure and dynamics of Australia's sheep population
29	ABARES Integrated assessment of the impact of wild dogs in Australia April 2014	PDF	Impact assessment of wild dog impacts (case study approach) including market and non-market impacts
30	RAPAD Rnd 3_applications-combined_TCV	PDF	Application document and summary of 17 applicants for the RAPAD QLD feral pest initiative
31	GHD NWDAP Midterm review_FinalReport 7 April 2017	PDF	Midterm review and findings for the NWDAP Stages 1 and 2
32	NWDAP Stage 3 Progress report to May 2019 final 20190521	WORD	Project report – progress report for Stage 3 NWDAP activities
33	NWDAP Stage 3 Objectives taken from MERI Plan	WORD	2-page summary of NWDAP Stage 3 goals and objectives
34	NWDAP RD WG Gap Analysis 2015	WORD	Wild dog research gap analysis for discussion and progress update at the NWDAP stakeholder forum May 2019

34	150330 FINAL SCHEMA	PDF	1-page summary of investment (including in-kind), collaborators and outcomes of the wild dog management project
35	CISS PO1 National Wild dog Coordinator Report February 2019	PDF	Project report – CISS NWDMC project progress report
36	Canberra 20190502 Attendance list (24_4)	PDF	List of attendees at the NWDAP stakeholder forum May 2019
37	Stakeholder Consultation Group Contact List -Review meeting May 2019	EXCEL	List of attendees from the NWDAP stakeholder forum (May 2019) with associated contact information for consultation
38	NWDAPCC meeting MINUTES- 3 May 2019	PDF	Meeting minutes from the NWDAPCC meeting following the stakeholder forum May 2019
39	NWDAP Workshop PollEV Results	EXCEL	Survey data from a digital audience survey conducted during the NWDAP stakeholder forum (May 2019)
40	NWDAP Workshop PollEV Results Analysis	WORD	Summary and findings from the PollEV data
41	NWDAP Review Stakeholder Consultation Forum MINUTES_2 May 2019	PDF	Meeting minutes from the NWDAP stakeholder forum May 2019
42	ECONOMIC_ANALYSIS_OF_THE_SA_WILD_DOG_FENCE	PDF	BDA report supporting a business case for the replacement of the SA Dog Fence
43	Wild_dog_evaluation_-_report_1	PDF	A review of the role of the wild dog control advisory committee and the governance arrangements for implementation of the Action Plan for Managing Wild Dogs in VIC 2014-2019 (June 2016)
44	Wild-dog-evaluation-report-2	PDF	Review of the VIC Wild Dog Management Program and recommendations for future approaches (June 2016)

45	Wild dog funding (CISS)	WORD	Summary of investment by CISS in wild dog management projects 2014/15 to 2018/19 provided by R.Price
46	NWDAP campaigns	EXCEL	Summary of NWDAP communiques, media releases and other digital updates June 2016 to May 2019
47	National coordinator buggdet anbd inkind 2012-17	WORD	Schedule of resources/ expenditure for the NWDF Project 3L14
48	June 2019 – Dept of Ag feedback for NWDAP 5 Year Review	WORD	Department of Ag. responses to consultation questions posed by Agtrans during the review process
49	Copy of 190726 Summary of State WD Coordinators gm edits	EXCEL	List of names and contact details for State wild dog coordinators and funding partners
50	Communications Survey Data_All_190613(PDF format)	PDF	Data on individual responses to the NWDAP communications survey conducted May-June 2019
51	Communications survey results_NWDAP Review_13 June	EXCEL	
52	BJoyce Correspondence	PDF	MP correspondence regarding funding for pest animal and weed management for drought affected farmers in QLD
52	28774295_Published_report	PDF	NSW DPI final report on the social acceptability of pest animal management in meeting total grazing pressure requirements
53	190620 Wild Dog Project AgTrans	EXCEL	AWI wild dog project cost data (confidential)
54	190614_NWDAP Review & Impact Assessment Consultation	PDF	WoolProducers response to consultation questions posed by Agtrans during the review process
55	190614 CWDCI Ssheet AgTrans	EXCEL	AWI wild dog project and survey data (confidential)
56	5311T4776	PDF	VIC Wild Dog Management Strategy 2011-16
57	GMS-2317 Wild Dog Management FINAL Report – Stage 1	WORD	IA CRC project report – final report for Stage 1 of the NWDAP December 2015

58	160819_NWDAP_comms_report_aprjun19	WORD	Project report – progress (activities and achievements) associated with NWDAP digital communications
59	180409_NWDAP_comms_report_janmar18v2	WORD	
60	180517_NWDAP_comms_report_aprjun18	WORD	
61	181009_NWDAP_comms_report_julsep18	WORD	
62	190115_NWDAP_comms_report_octdec18	WORD	
63	190405_NWDAP_commes_report_janmar19	WORD	

Appendix D: Summary of NWDAP Stage 3 Review & Impact Assessment Consultation Respondents

Consultation Type	Organisation	Respondent(s)	Notes
F2F	Multiple	NWDAP stakeholder consultation forum attendees; NWDAPCC	NWDAP Stage 3 Review & Impact Assessment 2019 process presentation; one-on-one interviews (informal) with NWDAP stakeholders at the May 2019 forum; discussion with the NWDAPCC (May 2019)
Email	DJPR	Iain McLaren	Submission of information regarding evaluation and impact of wild dog management program(s) at for VIC (May 2019)
F2F (with follow up email)	NWAPCC Chair	Geoff Power	Submission of contact details for key stakeholders/ personnel associated with wild dog management in SA (May 2019)
Telephone	NTCA	Romy Carey	Discussion of estimated impact cost of wild dogs on NT cattle industry (May 2019)
Email	DAF QLD	John Cuskelly	Provision of information regarding interest in cluster fencing in Central Western QLD
Email	NSW DPI	Peter Fleming	NWDAP Stage 3 Review & Impact Assessment – information request (2)
Email	Multiple	Email sent 23 May, 50+ recipients	NWDAP Stage 3 Review & Impact Assessment – information request Note: email failed to John Roberston, Will Demilliano, Shane Griffiths, gwinkrob@bigpond.com, and mylesh@berriganshire.nsw.go
Email	RAPAD	Morgan Gronold	NWDAP Stage 3 Review & Impact Assessment – information request
Email	DELWP	Tim Enshaw	Submission of addition cost/ budget data for the State wild dog coordinator(s) for VIC 2012/13 to 2018/19
Email	PIRSA	Brad Page	Submission of addition cost/ budget data for the State wild dog coordinator(s) for SA 2012/13 to 2018/19

Email	AgForce QLD	Michael Allpass	Submission of addition cost/ budget data for the State wild dog coordinator(s) for QLD 2012/13 to 2018/19
Email	NSW Farmers	Luke Messer	Submission of addition cost/ budget data for the State wild dog coordinator(s) for NSW 2012/13 to 2018/19
Telephone	Dep. Environment	Benjamin Russell	Discussion about wild dog metrics and state level data
Email	CCA	Justin Toohey	NWDAP Stage 3 Review & Impact Assessment – information request
Email	CISS	Ian McDonald	Submission of digital communication and engagement data for the NWDAP
Email	DoAG	Shalan Scholfield, Chris Clowes, Heath Molloy, brindstockmedia@bigpond.com	Feedback on draft report post-presentation (August 2019)
Email	Aussie Feral Control	Adam Bowen	NT estimates for annual production losses associated with wild dogs
Email	CISS	Richard Price	Additional cost data on RD&E investment in wild dog management 2014/15 to 2018/19
Email	MLA	Christine Purdy	

Appendix E: NWDAP – Assessment of Achievement Against Stage 3 MERI Plan Activities and Overarching Goals (Assessment Matrix)

Goal 1		Provide leadership and coordination for the management of wild dogs	**Performance against Goal (survey)**	Average-Good
Outcome A: Leadership capacity to transition NWDAP beyond its 2019 end				
Strategy	**Alignment with NWDAP[(a)]**	**Measure(s)**	**Achievement Status**	**Comments**
Transition of ISC to NWDAP Stage 3 oversight and promotion structure	1A.1	Project oversight and promotion structure established	Achieved	
Stage 3 Staff Resourcing		Grant agreement with funders executed	Achieved	
		Project management, event management, executive support and communications coordination resources secured	Achieved	
NWDAP 2020 strategic planning	4B.1; 4B.2; 4C.1; 4C.2; 4D.1; 4D.2	NWDAP Strategic plan written and Operational Plan 2020 written and funded	Not Achieved	SCG and NWDAPCC consulted on 3 May 2019. Writing group appointed. Writing group due to meet 30 August 2019.
Outcome B: NWDAP leadership in community landscape management				
Strategy	**Alignment with NWDAP[(a)]**	**Measure(s)**	**Achievement Status**	**Comments**
Promote integrated multiple vertebrate pest management (IMVPM)	1B.2; 3A.3	IMVPM key messages written and extension material updated	Partially achieved	Affected by ongoing delays in creating a NWDAP specific webpage.
		IMVPM content within NWDAP post FY18/19	Partially achieved	NWDAP updated and uploaded to PestSmart website.

Collaborate with community biosecurity and landcare leadership		Identified opportunities for collaboration with biosecurity and landcare leadership on community engagement	Partially achieved	Some promotion to biosecurity and landcare leadership is occurring but it is not translating to many collaboration opportunities.
Scope future alliances for national coordination of wild dog management		Value proposition to new NWDAP stakeholders	Partially achieved	Cattle Council of Australia, WoolProducers Australia and Sheep Producers Australia (through AHA) now fund 25% of the cost of the NWDMC salary and on-costs.
Goal 2		Increase awareness, understanding and capacity building with regard to wild dog management	**Performance against Goal (survey)**	Average-Good
Outcome C: A public voice for wild dog management				
Strategy	**Alignment with NWDAP[(a)]**	**Measure(s)**	**Achievement Status**	**Comments**
Promote best practice through communications	2A.1; 2A.2	NWDAP website communiques at least bi-monthly including article relevant to key messages	Partially Achieved	12 communiques (e-updates) uploaded to the PestSmart NWDAP website from 2017 to 2019. An average of six stories per NWDAP newsletter during Stage 3 (average of 2.4 per newsletter in Stages 1 and 2)
		NWDAP website content including key messages reflecting each key result area of this project	Partially achieved	20 media releases and news items uploaded and available on the PestSmart NWDAP website. New IMVPM fact sheet not yet completed.

Identify and include missing stakeholders in activities		New SCG members	Achieved	See NWDAPCC: https://www.pestsmart.org.au/national-wild-dog-action-plan/stakeholders/
		Media releases featuring the NWDAP champions and SCG on each key result area	Partially achieved	
		New media partnerships	Partially achieved	
Proactivity on threats to social licence		Social media feeds relevant to key messages through PestSmart or other SCG members	Achieved	Activity is ongoing Since January 2018 there has been 6 positive stories referring to NWDAP and 3 neutral stories. The neutral stories combined readership reach was 356,480. The positive stories combined readership was 1,526,412 (Jane Littlejohn, pers. comm., 2019)
Evaluate communications effectiveness		Evaluation report on communications from this project	Achieved	Survey of NWDAP communication effectiveness completed June 2019
Outcome D: Capacity in pest animal controllers (PAC)				
Strategy	**Alignment with NWDAP[(a)]**	**Measure(s)**	**Achievement Status**	**Comments**

Minimum national measures for PAC certificate assessment	2C.3	The promotion of the new Certificate III in Rural and Environmental Pest Management (vertebrate pest controller) to Industry, government and the VET sector (RTOs, trainer/assessors)	Achieved	https://www.skillsimpact.com.au/agriculture/training-package-projects/pest-management-project/?reg=email&_cldee=Z3JIZy5taWZzdWRAaW52YXNpdmVzLmNvbS5hdQ%3d%3d&receipientid=contact-90b801b9f5a3e7118128e0071b68f7c1-c6ca22e633114c60998283abe70cdb4e&esid=2fe1d9dc-b4c6-e811-8171-70106fa3d971
Planning for PAC training and adoption by employers		Number of RTOs agreeing to get on-scope to use the new package	Achieved	E.g. course has been adopted by Biosecurity QLD
		Identify and secure other funding for a web page for contacting pest animal control service providers	Not Achieved	Activity discontinued after detailed discussions between AWI and NWDAP personnel. No market failure identified. AWI investing more in grower training instead (Jane Littlejohn, pers. comm., 2019).
Outcome E: Capacity in coordinators				
Strategy	**Alignment with NWDAP[(a)]**	**Measure(s)**	**Achievement Status**	**Comments**
Continuing professional development for coordinator roles	1C.2	3 training events in community engagement conducted	Partially achieved	One event only completed: https://www.queenslandcountrylife.com.au/story/5680073/awi-builds-capacity-in-wild-dog-control/
Succession planning for coordinators		5 people trained from outside of wild dog management sector	Not Achieved	

		5 people trained from the wild dog management sector that are outside the community of practice	Not Achieved	Only one landcare/wild dog coordinator trained at the invitation of the NWDMC (Roper River Landcare NT)
Goal 3		Mitigate the negative impacts caused by wild dogs	**Performance against Goal (survey)**	Average-Good
Outcome F: Reduce constraints to effective programs				
Strategy	**Alignment with NWDAP[(a)]**	**Measure(s)**	**Achievement Status**	**Comments**
Promote best practice tool and plan method	1C.1; 3B.2	Funders sourced for landscape specific extension messages	Partially achieved	MLA has agreed to include predator control as mandatory reporting requirement for industry adoption and extension programs.
		NWDAP actions updated	Partially achieved	SCG and NWDAPCC consulted on 3 May 2019. Writing group appointed. Writing group due to meet in August 2019. Actions updated as recommended by the 2017 GHD Mid-Term Review.
Promote participation to those on ground		New SCG membership reflects sectors important to achieving long-term control	Partially achieved	

		Funders sourced for evidence on cattle losses	Partially achieved	Cattle Council nominated sarcocystosis and possible dog bite injury as issues of interest for the collection of abattoir data under a national surveillance project. AHA reported that responses from prospective abattoirs for participation have been slow.
		Value proposition for wild dog group continuity	Not Achieved	
		A body of evidence gathered to promote participation	Partially achieved	AWI has invested $150,000 to write up the IA CRC's scientific papers for publication.
Goal 4		Monitor, evaluate and report to inform and continuously improve wild dog management	**Performance against Goal (survey)**	Average-Good
Outcome G: Minimum national measures of impact and investment				
Strategy	**Alignment with NWDAP[(a)]**	**Measure(s)**	**Achievement Status**	**Comments**
Promote voluntary data collection	4A.3	NWDAP communiques and website updates	Not Achieved	NWDAPCC remain concerned with the lack of response or any data for national metrics from some states.
		Coordinator training includes data collection	Achieved	National Wild Dog Coordinators Workshop (2018) included monitoring and evaluation which the coordinators promote to the community.

National report to stakeholders	4A.2	Collate and analyse national wild dog metrics data provided by state/territory governments (as agreed by IPAC (now EIC) in 2017)	Partially achieved	Activity is ongoing. Ben Russell has responsibility.
		Produce annual national metrics reports to stakeholders on impacts and investments	Not Achieved	
Outcome H: Stakeholder and independent input				
Strategy	**Alignment with NWDAP[(a)]**	**Measure(s)**	**Achievement Status**	**Comments**
Stakeholder reports and consultation	4C.1; 4C.2; 4D.1	SCG membership broadened	Partially achieved	
		Convene an annual forum of Stakeholder Consultative Group includes reporting and airing of stakeholder concerns	Achieved	DoAG and AWI funded a NWDAP stakeholder forum and coordination committee meeting on 2-3 May 2019
Final review	4B.2	Secure SCG funding for final review	Achieved	
		Contribution to the final review of NWDPA year 5	Achieved	

(a) Alignment with the NWDAP's Action Implementation Requirements (Section 6.3.3, pg. 38-48). Source: Jane Littlejohn (AWI), pers. comm., 2019.

Appendix F: Summary Table of GHD Mid-Term NWDAP Assessment (Reproduced)

GOAL 1 (Effective Leadership and Governance): Provide leadership and coordination for the management of wild dogs			
Objective/Action	**Performance Measure**	**Achievements / Evidence**	**GHD Assessment**
Objective 1A: *Clarify roles and accountabilities of all relevant parties*			
Action 1A.1 Adopt and maintain a clear governance structure for the implementation of the Plan.	Stage 1 Governance structure adopted and implemented. APIM appointed. Engagement of Independent Chair Appointment of ISC Agreed Terms of Reference/Duty Statements for each Stage 2 APIM transitioned ISC structure transitioned	• Governance arrangements in place for national leadership and coordination, with the capability to manage partner funds for specific activities. • NWDAP Development Project Steering Committee handover • ISC Chair, Membership and APIM appointments, duty statements confirmed (31 August 2014) • ISC Terms of Reference sign-off. (IA CRC 2015 MERI St1) • Recruitment of replacement APIM - Stage 2 • ISC transitioned (OP Plan St 2) • APIM meeting KPIs • Reviewed and updated ToR for ISC (summary activities St2)	✓✓✓
Action 1A.2 Establish stakeholder responsibilities in relation to the implementation of the Plan.	Stage 1 The ISC will establish a Stakeholder Consultative Group (SCG) with other consultative mechanisms arranged as required. • Membership agreed by ISC • Governance instruments developed; Terms of Reference agreed by ISC • inaugural meeting process completed Stage 2	SCG established 30 September, SCG forum 3, 4 December 2015 where ToR were endorsed. Five Working Groups formed and working on assigned tasks (IA CRC 2015 MERI St1). Research and Development Working Group reported their annual findings and other working groups (Investment and Collaboration, Communications and Engagement, Training and Extension and Metrics) held interim workshops and	✓✓ Further clarification of stakeholder responsibilities and accountabilities is required

	• Annual meeting of Stakeholder Consultative Group • SCG on-going engagement and input through Working Groups • Local community input and intelligence to add to SCG input and identify hotspots around Australia	reported to the SCG (GMS2575 1st half Yearly St2) SCG ToRs reviewed annually (MERI St2) Annual SCG forum held 21-22 July 2016, reviewed and updated ToR for SCG, SCG Working Groups report annually (summary activities St2)	
***Objective 1B**: Promote adoption of nationally-consistent approaches to wild dog management*			
Action 1B.1 Define the process to gain national recognition of best practice wild dog management	Stage 1 Process established and agreed	The Invasive Plants and Animals Committee (IPAC) noted progress with implementing the NWDAP, regarded as a model for an integrated, coordinated response to pest animal management involving governments, industry, the community and landholders (IPAC Meeting 2 November 2015) National Recognition through Pest Animal Controller Training Project (PAC Project Update July-Sept 2016) IPAC received a paper in August 2016 from the ISC recommending a change to the SOPs for humane destruction of dogs. Four updated SOPs relating to WD have been accepted and are available on PestSmart. These updated SOPs were communicated via email (correspondence list state agencies, policy ministers and state farming organisations) and Communique 22 (IPAC Meeting 6 August 2016, Communique 22 December 2016 Edition 5). IPAC agreed to recommend to the National Biosecurity Committee that Wild Dogs be	✓✓ Ongoing – continuous improvement

		declared as Established Pest of National Significance (IPAC Meeting 6 August 2016)	
Action 1B.2 Promote integrated and strategic wild dog management supported by a scientific, risk-based and humane approach	Stage 1 Promote and encourage ongoing delivery, through jurisdictional processes, of nationally consistent wild dog control training programs. Stage 2 • Development of additional research and extension material for wild dog management • Improved relationships between producers and government to manage wild dog across all tenures • Producers, land managers and other stakeholders have access to online extension material to get better available information on wild dog management – to enable better on-farm business decisions to get on with the job at hand • Producers/land managers have access to best practice management techniques	PestSmart resources were reviewed and updated, placed on PestSmart connect website (IA CRC 2015 MERI St1). Additionally 20 PestSmart Wild Dog publications were peer-reviewed during April/May 2016, and a new field guide to poison baiting published (Faber and McDonald 2016) 2014-2015 Field testing of canid ejectors completed in periurban areas of New South Wales and Queensland. Satellite telemetry of wild dogs in periurban areas is continuing, and data have been collected on 36 dogs so far (IANN Report Nov 15) Under Stage 2 ISC provided a submission to the Draft WA Wild Dog Action Plan, the NSW NRC pest animal review and the Victorian Parliamentary Inquiry into the Control of Invasive Animals on Crown Land by the Environment, Natural Resources and Regional Development Committee.	✓✓ Ongoing incl. agreement on parameters for 1080 use.

Action 1B.3 Promote implementation of COP and SOPs for humane wild dog management.	Stage 1 The Plan supports the draft Model Codes of Practice for the welfare of production animals and the most recent Animal Welfare Standards and Guidelines. It also supports the use of the Model Code of Practice for the Humane Control of Wild Dogs and associated standard operating procedures (NWDAP 2014) Stage 2 • ISC continues work with governments and industry • Support to be provided through web-based tools and other materials as required • Integrate NWDAP branding in new/updated PestSmart wild dog publications • Update and add to the Wild Dog PestSmart Connect material online • Review, print and distribute PestSmart wild dog publications	PestSmart resources were reviewed and updated to reflect COP/SOPs for humane WD management and placed on PestSmart connect website (IA CRC 2015 MERI St1). Letters sent from ISC to all states Invasive Animal and Plant Controllers (e.g. Biosecurity Queensland), Police Ministers and other stakeholder representatives (e.g. AgForce) regarding changes to wording for firearms use in the SOP for wild dog, fox and cat control (November 2016).	✓✓✓
Action 1B.4 Promote nationally consistent approaches to the availability of new control technologies.	Stage 1 Development of a Professional Wild Dog Management Skill Set, trialled with interstate participants and observers, to provide a common and credentialed level of competence for commercial wild dog controller and landholders (IA CRC 2015 MERI St1). Stage 2	PAPP release. 2014-2015 Field testing of canid ejectors has been completed in periurban areas of New South Wales and Queensland. Satellite telemetry of wild dogs in periurban areas is continuing, and data have been collected on 36 dogs so far (IANN Report Nov 15) Special Communique: WildDogScan (new tutorial video and enhanced features) sent to stakeholders September 2016.	✓✓ Still differences between jurisdictions.

	• ISC continues work with governments and industry • Support to be provided through web-based tools and other materials as required • Integrate NWDAP branding in new/updated PestSmart wild dog publications • Investigate other Web Based tools such as webinars	PestSmart resources were reviewed and updated, placed on PestSmart connect website (IA CRC 2015 MERI St1). Additionally 20 PestSmart Wild Dog publications were peer-reviewed during April/May 2016, and a new field guide to poison baiting published (Faber and McDonald 2016) The WildDogScan App was updated (Special Communique WildDogScan 2016) The NWDAP logo is being added to all wild dog PestSmart publications once they have been edited and approved (Half Yearly Progress Report January 2017)	
Action 1B.5 Facilitate the uptake of new techniques by control authorities and/or land managers.	Stage 2 • ISC continues work with governments and industry • Support to be provided through web-based tools and other materials as required • Continue support for registration through APVMA • Preparation of Communiqués (with IA CRC and ACTA) to advise stakeholders of availability of new technologies, benefits and operational requirements • Identify applicability and use of new tools as part of integrated management approaches. • Facilitate attendance at industry events to advertise the availability of new control tools and their applicability to integrated management approaches i.e. Lambex, Beef Week, Landcare, AVPC etc.	WildDogScan tutorial and Canid Pest Ejector and PAPP training videos as well as updated PestSmart resources available online (summary activities St2) (Special Communique WDScan 2016).	✓✓✓

	• Development of recognised wild dog control profession • Five training courses delivered or negotiated over next two years • Facilitate training delivery of nationally consistent Professional Canid Skill Set that aligns to each state/territory variation requirements • Facilitate training delivery for new products at state/territory level		
Objective 1C: *Promote, enhance and implement collaborative best practice management systems. NOTE: The process for recognising best practice management systems is defined in Action 1B.1*			
Action 1C.1 Recognise, create and/or enhance partnership models that involve government, industry and communities	Stage 1 Greater alignment of state wild dog management strategies/plans with the NWDAP Stage 2 • Implement Plan actions with IA CRC and other stakeholders	Collaborative SCG membership established with Animal Health Australia, Australian Veterinary Association, RSPCA and Animal Management in Regional and Remote Indigenous Communities (IA CRC 2015 MERI St1) Alignment of state plans with NWDAP - current SA (2015-2020) and WA (2016-2021) plans are aligned with the NWDAP. Vic (2014-2019) and Qld (2011-2016) plans are reasonably aligned with the NWDAP; the QLD plan is in review. There is no current published NSW WD plan; the NSW WD Management strategy expired in 2015 (2012-2015). NT does not have a formal plan, only guidelines (2015) on developing WD management groups and Baiting plans. Tasmania also only has Guidelines (2013).	✓✓✓ Increasing adoption of partnership models

		A number of control groups have been established with implementation based on collaborative funding, e.g. Wongwibinda Cluster Fence Association was granted $549,839 from Local Land Services (LLS) through the Australian Government's $3 million Agricultural Competitiveness White Paper Program for pest and weed management in NSW.	
Action 1C.2 Further refine, promote and implement proven wild dog facilitation processes that extend to state and territory and regional levels.	Stage 1 Greater alignment of state wild dog management strategies/plans with the NWDAP Stage 2 • Improved delivery of extension services and targeted information for stakeholder groups • Broader community made aware of wild dog issue and impacts • Improved social licence for the management of wild dogs	ISC members, who are also leaders and farmers in their respective communities, currently champion the NWDAP using key messages from the communications strategy to all end-users, governments and agencies, industry peak bodies and RD&E, pest animal controllers. (GMS2317 Report St1) There is an increased level of availability and access to extension materials- PestSmart website, training videos, etc. The broader community is also being engaged via online media and ABC Landline segment.	✓✓✓ Increasing adoption of partnership models
GOAL 2 (People): Increase awareness, understanding and capacity building with regard to wild dog management			
Objective/Action	**Performance Measure**	**Achievements / Evidence**	**GHD Assessment**
***Objective 2A**: Maximise public and community support for wild dog management*			
Action 2A.1 Develop a communication and engagement strategy	Stage 1 National Communication and Engagement Strategy and Action Plan (IA CRC 2015 MERI St1)	The Communication and Engagement Strategy and Action Plan has been developed by the Action Plan Implementation Manager and IA CRC Communications Officer in consultation with stakeholders. The strategy and plan is supported by the Stakeholder Consultative	✓✓✓

		Group with sign-off by the Implementation Steering Committee (IA CRC 2015 MERI St1). C&E strategy drafted (Dec 15-Mar 16), accepted as working document (April 16), updated (July 16) (Faber and McDonald 2016)	
Action 2A.2 Implement communication and engagement strategy	Stage 2 • Recruit part time Communication Co-ordinator – marketing, video coordination, plan development and implementation, web updates • Schedule out regular NWDAP communications using various communications tools (social media, media, online)	Part time Communications Co-ordinator contracted to start 27th January 2016 (GMS2575 1st half Yearly St2) Field days 2016 allowed engagement and promotion of wild dog management and humane methods of control (Bendigo Sheep Show, Murray Bridge Merino Field day, National Landcare Conference, Northern Beef Research Update, NSW Vertebrate Pest conference) – display canid pest ejectors, and PAPP baits (Communique 22 December 2016 Edition 5) 23 Communiques have been sent to stakeholders as of January 2017.	✓✓✓
Action 2A.3 Evaluate the effectiveness of the communication and engagement strategy. If necessary, review the content of the strategy.	Aim to put in place a reporting measure to capture media and online mentions of NWDAP (GMS2317 Report St1) Stage 2 • Review and implement communications plan in collaboration with APIM, IA CRC Communications Manager and SCG Working Group	Communication team tracks and reports media and online mentions of NWDAP.	✓✓ Limited assessment of effectiveness
***Objective 2B**: Ensure a comprehensive suite of extension materials is available*			

Action 2B.1 Identify and fill gaps in existing materials	Stage 2 Advice regarding methodology is distributed to control groups for use by landholders Improved delivery of extension services and targeted information for stakeholder groups	Review of current Pest Smart Resources completed. 14 publications identified with 9 requiring revision/updating. Relevant PestSmart resources reviewed and updated, placed on PestSmart connect website; Wild Dog Investment Mapping survey (IA CRC 2015 MERI St1) 20 PestSmart Wild Dog publications peer-reviewed during April/May 2016, new field guide to poison baiting published (Faber and McDonald 2016) Updated WildDogScan App (Special Communique WildDogScan 2016) Additional PestSmart resources/ training videos to be made available online.	✓✓✓
Action 2B.2 Ensure required information is available	Stage 2 Advice regarding methodology is distributed to control groups for use by landholders Improved delivery of extension services and targeted information for stakeholder groups Access to extension information on best practice management through using a range of media and new technology	NWDAP website registered, 6 Communiques distributed to over 500 stakeholders, meeting media releases (IA CRC 2015 MERI St1) 13 communiques since May 2013, distribution list of 475 subscribers (GMS2317 Report St1). Wild Dog Scan Tutorial filming completed, other videos to come; Communique 20 sent to 528 subscribers (Faber and McDonald 2016) Updated WildDogScan App with tutorial video (Special Communique WildDogScan 2016) Planning underway for 6 social licence WD videos (summary activities St2)	✓✓✓
Objective 2C: *Improve adoption of wild dog best practice management through effective communication, education and training*			

Action 2C.1 Promote and support mentoring of stakeholders for the implementation of best practice at the local level	Stage 2 • Reinforce best practice management. • Improved delivery of extension services and targeted information for stakeholder groups • Access to extension information on best practice management through using a range of media and new technology • Support implementation of WildDogScan at community group level	Facilitator Community of Practice meeting will identify likely hot spots (emerging or escalating wild dog problem) at their meeting of 25th February to initiate future consultation with the SCG on choosing locations and thus subsequent activity planning. Will train coordinators/facilitators in the use of Wild Dog Scan and train them as trainers for Wild Dog Scan (GMS2575 1st half yearly St2) ISC members, who are also leaders and farmers in their respective communities, currently champion the NWDAP using key messages from the communications strategy to all end-users, governments and agencies, industry peak bodies and RD&E, pest animal controllers. (GMS2317 Report St1) PestSmart and WildDogScan available online for easy access by the public and include within them best practice and human treatment of WD. These were also discussed at the Field Days in 2016. Six best practice videos planned; one wild dog scan tutorial, the Canid Pest ejectors training video and Introduction to PAPP video are all complete (Half Yearly Progress Report January 2017).	✓✓✓

Action 2C.2 Use social and traditional media to promote local and regional leadership of wild dog management	Stage 2 • Pursue media partnerships • Produce a series of videos in a range of landscapes to inform the community/create awareness and provide a balanced perspective about wild dog management • Communicate benefits to biodiversity, animal welfare, detailed research, risk of diseases to human health	Media articles, 2 interviews (ABC Rural), feature articles (IA CRC 2015 MERI St1) NWDAP and other wild dog news promoted on Twitter and Facebook by the IACRC. 130 page views of WD glovebox guide and 161 page views of 1080 baiting guide since Jan 2015 (GMS2317 Report St1) ABC Landline segment aired 12 June (960K + views), NWDAP mentioned 28 time in online media articles since Jan 16. Communique 20 sent to 528 subscribers (Faber and McDonald 2016)) WD Scan tutorial video (summary activities St2) (Special Communique WildDogScan 2016) Six social licence and six best practice WD videos are completed or currently planned (Half Yearly Progress Report January 2017)	✓✓✓
Action 2C.3 Promote development and delivery of nationally recognised qualifications	Stage 1 • Development of a Professional Wild Dog Management Skill Set, trialled with interstate participants and observers, to provide a common and credentialed level of competence for commercial wild dog controller and landholders (IA CRC 2015 MERI St1). • Nationally agreed and accredited VET training program developed. At least two pilot programs delivered to at least 20 participants (MERI St1 Plan 140902) Stage 2	State/territory governments agree to co-investment for training delivery for nationally agreed and accredited VET training program. Mapping for the Professional Canid Controller Skill Set conducted with input to AgriFood Skills Australia. Two pilot review training demonstration programs conducted incorporating 20 participants from WA, SA, QLD, VIC and NSW (Stage 1 Final progress report December 2015) Audit of current learning resources/training available (throughout each state and territory), identification of nationally recognised minimum standards for skill and	✓✓ Delays in delivery

	• Development of recognised wild dog control profession • Greater recognition of wild dog control officer skill sets • Five training courses delivered or negotiated over next two years • Training course will include all aspects of best practice management and the various control tools. • Industry and government agreement on nationally endorsed professional wild dog controller skill set • Facilitate national recognition of state chemical training requirements • Facilitate training delivery of nationally consistent Professional Canid Skill Set that aligns to each state/territory variation requirements • Facilitate training delivery for new products at state/territory level	knowledge required for PAC's as part of the Pest Animal controller Training Project running from May 2016-May 2017 (PAC Training Audit- Carroll 2016) Dates have been set for three Pest Animal Controller pilot training programs involving 25 candidates (Communique 23: January 2017). National consistent approaches through Pest Animal Controller Training Project (PAC Project Update July-Sept 2016). Dates have been set for three Pest Animal Controller pilot training programs involving 25 candidates (Communique 23: January 2017) Developed Professional WD Mgmt Skill Set to provide a common and credentialed level of competence. Two pilot review training demonstration programs conducted incorporating 20 participants from WA, SA, QLD, VIC and NSW. Mapping for the Professional Canid Controller Skill Set conducted with input to AgriFood Skills Australia. Further work required to achieve national harmonisation of licensing for Professional Canid Controllers. Consultation workshop on scope of course content July 2016 (summary activities St2)	

Action 2C.4 Enable those involved with wild dog control to have access to tools and the capability to use them with appropriate levels of competence and humaneness	Stage 2 • Development of recognised wild dog control profession • Five training courses delivered or negotiated over next two years • Training course will include all aspects of best practice management and the various control tools. • Facilitate training delivery of nationally consistent Professional Canid Skill Set that aligns to each state/territory variation requirements • Facilitate training delivery for new products at state/territory level	Relevant PestSmart resources reviewed and updated, and placed on a new PestSmart Connect website to ensure ready availability to landholders (IA CRC 2015 MERI St1) 130 page views of WD glovebox guide and 161 page views of 1080 baiting guide since Jan 2015 (GMS2317 Report St1) PestSmart Wild Dog toolkit page has had 4665 visits since Jan 16; communications Network developed (Faber and McDonald 2016) Six social licence and six best practice WD videos are completed or currently planned (Half Yearly Progress Report January 2017) Pest Animal Controller Training Project (May16-May17) currently underway (Carroll 2016) Dates have been set for three Pest Animal Controller pilot training programs involving 25 candidates (Communique 23: January 2017). Field days 2016 (Bendigo Sheep Show, Murray Bridge Merino Field day, National Landcare Conference, Northern Beef Research Update, NSW Vertebrate Pest conference) – display canid pest ejectors, and PAPP baits (Communique 22 December 2016 Edition 5)	✓✓ Progressing
GOAL 3 (Tools and Methods): Mitigate the negative impacts caused by wild dogs			
Objective/Action	**Performance Measure**	**Achievements / Evidence**	**GHD Assessment**
***Objective 3A**: Adopt a strategic, consistent, scientific, risk-based humane approach to managing the impacts of wild dogs*			

Action 3A.1 Identify priority areas and support the development of strategic wild dog management plans, integrating all appropriate technology	Stage 2 • Document and evaluate the delivery of community-led action in these emerging/escalating areas and make learning available via website • Review and identify improvements to current models • Disseminate outcomes through Wild Dog Facilitator CofP, SCG Networks, PestSmart Connect etc. • WildDogScan application – community-led mapping of wild dog activity, impacts and control activities. Extension and marketing activities to encourage and teach use of application and incorporate wild dog metrics • Communiques advising stakeholders of the availability of new control technologies, their benefits and operational requirements	Forward Projection Plan developed forming basis for the Wild Dog Management Stage 2 Operational Plan (IA CRC 2015 MERI St1) Hot spot areas identified and assistance provided. Case study documentation on hotspot areas (Half Yearly Progress report Jan 2017) PAPP release communicated via Communiques, online media and major rural press outlets (summary activities St2). 23 Communiques have been sent to stakeholders as of January 2017. "What does community-led success look like? Paroo Model": Filming completed during late November 2015. Alun Hoggett from Desert Channels to produce clip. Interviews with people around Charleville are on how community-led action is best. Expected completion February 2016 (Half Yearly Progress report Jan 2017).	✓✓ Question NWDAP's role in identifying priority areas
Action 3A.2 Promote and support a community driven, landscape scale approach to management	Stage 2 • Analysis of data collected by stakeholders to identify effective control and investigate the sustainability of community-led management groups. • Facilitate the delivery of community-led wild dog management in areas where wild dog problems are escalating or just emerging. Includes development and documentation of case studies for development of community groups and wild dog management plans from a range	The National Wild Dog Facilitator has been supporting regional coordinators throughout Australia. In western New South Wales, more than 200 properties have been participating in eight wild dog management groups. The program saw baiting occur across 42% of New South Wales, including many properties with no history of baiting. (IANN Report Nov 15) Presence at Industry events and field days to promote NWDAP, IA CRC Pest Smart toolkit, Govt and Industry funded WD research and	✓✓✓

	of areas with emerging or escalating wild dog problems. • Document and evaluate the delivery of community-led action in these emerging/escalating areas and make learning available via website WildDogScan application – community-led mapping of wild dog activity, impacts and control activities. Extension and marketing activities to encourage and teach use of application and incorporate wild dog metrics	new tools (summary activities St2, Communique 22 December 2016 Edition 5) Wild Dog Alert improvements 2016 (summary activities St2) 14,000 Australian's used FeralScan, over 3,000 WD sightings in over 1,000 locations (Special Communique WildDogScan 2016) Hot spot areas identified and assistance provided. Case study documentation on hotspot areas (Half Yearly Progress report Jan 2017) One Wild Dog Scan tutorial clip completed in August 2016. 15 new landholder groups are using WildDogScan, new Alert notifications are now active across all of NSW and the ACT, are being set up in Western Australia (DAFWA), Victoria (DEWLP), and discussions are underway with Queensland Government (Half Yearly Progress report Jan 2017).	
Action 3A.3 Promote integrated pest species management (i.e. multiple pests, such as foxes, feral cats, feral pigs and wild dogs)	Stage 1 Determining if regional control of wild dogs influences populations of quolls, foxes, feral cats and native prey species. This will enable improved strategic wild dog management in sheep and cattle regions of Australia. (IANN Report Nov 15) Stage 2 • Engage SCG membership to facilitate focus groups to promote integrated wild dog management	In 2014-2015, four scientific papers on wild dog management were published covering the interactions between wild dogs, foxes and feral cats, and appropriate optimal monitoring methods (IANN Report Nov 15) EOI ToRs developed for an independent 1080 literature review of humanness and non target species impact (co-investment secured from Landcare NZ, IACRC and being sought from other entities) (GMS2575 1st half yearly St2) Improvements and distribution of information about updated WildDogScan	✓✓ Progressing

	• Promote the benefits of integrated pest management and highlight the risks of impacts	App includes mention of FeralScan (Special Communique WildDogScan 2016)	
Action 3A.4 Identify RD&E opportunities to inform actions to reduce the impacts of wild dogs.	Stage 1 Analysis of gaps in current research and development from a landholder's perspective, to inform priority setting by research and development corporations and other research providers (IA CRC 2015 MERI St1) Stage 2 • Work with RSPCA and AVA (AMRRIC for Indigenous Communities) to develop and implement a peri-urban and urban responsible dog ownership communication campaign. (AMRRIC for Indigenous Communities) • As part of the NWDAP Communications and Engagement Plan, develop messages around responsible pet ownership in relation to wild dog control programs that can be delivered by local councils, RSPCA and other identified stakeholder groups.	Stage 1 RD&E gap analysis was forwarded to investors and supporting organisations during Stage 2 Many councils, state governments and the RSPCA have information regarding responsible dog ownership. There is the potential to team-up with the Gold Coast City Council to produce a video for the responsible dog ownership campaign. A large campaign is not feasible within the timeframe unless there is greater contribution from RSPCA and AVA. (Half Yearly Progress report Jan 2017)	✓✓ Progressing, noting that RSPCA has offered support.

Action 3A.5 Ensure that the 'toolbox' for managing wild dogs is consistent, adopted and updated as required	Stage 2 • Metrics built into wild dog management plans are consistent across country • Support for registration of new control technologies • Nationally consistent methods for use of new control tools across the states and territories • Communiques advising stakeholders of the availability of new control technologies, their benefits and operational requirements	PestSmart resources updated (Half Yearly Progress report Jan 2017) 4 SOP's updated (Communique 22 December 2016 Edition 5) FeralScan and WildDogScan resources updated regularly with new improvements and tutorial videos Canid Pest ejector and Introduction to PAPP training videos completed (Half Yearly Progress report Jan 2017). PAPP release communicated via Communiques, online media and major rural press outlets (summary activities St2).	✓✓✓
***Objective 3B**: Promote adoption of best practice in plans at all scales*			
Action 3B.1 Promote national consistency in the planning process to manage wild dogs at local, regional and state/territory scales.	Stage 2 • Metrics built into wild dog management plans are consistent across country • Nationally consistent methods for use of new control tools across the states and territories	Currently SA (2015-2020) and WA (2016-2021) plans are aligned with the NWDAP. Vic (2014-2019) and Qld (2011-2016) plans are reasonably aligned with the NWDAP; the QLD plan is in review. Other states are either not aligned or don't have a Plan. Metrics project not complete therefore not built into plans. Canid Pest ejector and Introduction to PAPP training videos completed (Half Yearly Progress report Jan 2017). State chemical use legislation and independent processes mean that there is inconsistent national producer user requirements to Canid Pest Ejectors at present	✓✓ Progressing

Action 3B.2 Develop and apply community-driven nil-tenure planning approaches at the appropriate scale.	Stage 1 Increasing adoption of regional nil-tenure wild dog management, and integrated use of existing and new wild dog products and techniques. (IANN Report Nov 15) Stage 2 • Update nil-tenure planning and best-practice resources as required • Facilitate the delivery of community led wild dog management in areas where wild dog problems are escalating or emerging • Document and evaluate the delivery of community led action in emerging escalating areas and make learnings available on line	The National Wild Dog Facilitator has been supporting regional coordinators throughout Australia. In western New South Wales, more than 200 properties have been participating in eight wild dog management groups. The program saw baiting occur across 42% of New South Wales, including many properties with no history of baiting. (IANN Report Nov 15) "What does community-led success look like? Paroo Model" - filming of video completed during late November 2015, containing interviews on how community-led action is best (Half Yearly Progress report Jan 2017). 25,000 Australian's used FeralScan; it has bought together over 160 local landholder and Landcare community groups to map, monitor and control pest populations (Communique 22 December 2016 Edition 5) Many instances of control groups being established with best practice guidelines.	✓✓ Control groups increasingly adopting best practice methods.
Action 3B.3 Promote the development of plans that minimise impacts on non-target species	• Engage the SCG membership to facilitate focus groups to promote integrated wild dog management • Promote the benefits of integrated pest management and highlight the impacts	New PAPP bait developed to reduce impacts on working dogs (antidote); the 1080 antidote is still in development (Communique 22 December 2016 Edition 5) Best practice use of tools is contained promoted in extension material.	✓✓✓
GOAL 4 (Monitoring, Evaluation and Reporting): Monitor, evaluate and report to inform and continuously improve wild dog management			
Objective/Action	**Performance Measure**	**Achievements / Evidence**	**GHD Assessment**
***Objective 4A**: Develop nationally-consistent metrics for assessment of wild dog impacts and management efficacy*			

Action 4A.1 Develop and adopt metrics for assessing the impacts, efficacy and cost effectiveness of wild dog management for local, state and national scales.	Stage 2 • All states recording wild dog management and impact data in a consistent and comparable manner • Information gathered can be used to improve local, regional and state wide management of wild dogs. • Facilitate development of reporting systems to report wild dog control and impacts • Update PESTSMART resources with agreed national standard metrics requirements • Facilitate dissemination of metrics information and promotion of agreed standards at State, Regional and Local levels	One face-to-face Forum held. R&D and Metrics Working Group Teleconferences held to progress business. SCG Working Group Leads participated in ISC teleconference to provide update of needs in September 2015. (GMS2317 Report St1) Nationally Agreed Standardised Metrics- In May 2015 consultants were engaged to conduct the Metrics Project with an estimated December 2015 end date. Implementation Steering Committee tracking progress. (IA CRC 2015 MERI St1) Clarification of details of metrics in progress (summary activities St2) A stakeholder workshop was held on 3rd December 2015 to consult on the National Wild Dog Metrics Discussion Paper 2015. The findings from this workshop were presented to the SCG on 4th December 2015. The contracted consultants (MLA investment project) will report to MLA 12th February 2016. MLA staff will then report to this project so that activity planning can commence. (GMS2575 1st half yearly St2) Final report received September 2016. Report sits with Working Group for Metrics.	✓ Further work required.
Action 4A.2 Promote the application of agreed metrics at a local level	Stage 2 • All states recording wild dog management and impact data in a consistent and comparable manner	No progress yet, waiting for metrics to be adopted	✓ Further work required.

Action 4A.3 Analyse, report and improve metrics	Stage 2 • Information gathered can be used to improve local, regional and state wide management of wild dogs • Integrate reporting systems for wild dog impacts into wild dog planning process	No progress yet, waiting for metrics to be adopted	✓ Further work required.
Objective 4B: *Develop and adopt processes for evaluating implementation and outcomes of the Plan*			
Action 4B.1 Adopt a timetable and process for the review of the Plan leading to continuous improvement	Mid-Term review	Engaged GHD to undertake review.	Report complete. Recommendations to be considered by ISC and SCG.
Action 4B.2. Implement the recommendations of the Mid-Term and final reviews	To be determined	NA	To be determined
Objective 4C: *Develop and adopt reporting processes and structures*			
Action 4C.1 Develop and adopt a system for reporting to stakeholders.	To be determined	NWDAP Communiques, updated PestSmart resources, SCG forums, Stakeholder feedback	✓✓ Many reports but need to consider effectiveness of two-way communication
Action 4C.2 Implement the reporting system	NA	Keep stakeholders informed, reports distributed to stakeholders	✓✓ Improve effectiveness of two-way communication
Objective 4D: *Undertake continuity planning*			
Action 4D.1 Determine the need for a major revision of the Plan.	NA	NA	Response to this report
Action 4D.2 Ensure continuity of access to resources and materials from the Plan.	NA	Resources on PestSmart website and development of training course will ensure	Response to this report

		ongoing access to documents. This Action will be ongoing after this current review.	

Source: (GHD, 2017)

Appendix G: WoolProducers Australia – Response to NWDAP Stage 3 Review Information Request 2019

The following is the written response received by the review team from WoolProducers Australia in response to a request for information about the influence and impact of the NWDAP 2014-2019

Re: NWDAP review and impact assessment – Information request

WoolProducers Australia is pleased to provide the following information to Agtrans to be considered during the review and impact assessment of the National Wild Dog Action Plan (NWDAP).

As you would be aware, WoolProducers Australia initiated the development of the NWDAP in February 2013 with the aim of bringing together peak livestock councils, research organisations and Australian governments to form a collaborative approach to wild dog management. WoolProducers has remained significantly engaged in the NWDAP not only as the initiating organisation and as a peak industry body, but as a funding partner and stakeholder. The NWDAP remains a priority focus area for our vertebrate pest management portfolio as we continue to work with industry and governments to control pests that cause adverse outcomes to wool growing enterprises throughout Australia.

In providing this information to Agtrans for the NWDAP review and impact assessment, WoolProducers has sought input from our Directors and our State Farming Organisation members in Queensland, New South Wales, Victoria, Tasmania, South Australia and Western Australia.

WoolProducers remains supportive of the NWDAP and believes that the value of the Plan is being realised in many areas across Australia that have been impacted by wild dogs. However, there is also increasing anecdotal evidence being provided to WoolProducers that wild dog numbers and impacts are increasing in many areas and as such, this review and impact assessment must account for this increase and the need to continue to enhance control outcomes. Anecdotal evidence has highlighted wild dog problems have increased/worsened in:

- Areas surrounding Armidale in the New England region of New South Wales;
- The south-east high country of New South Wales around Cooma and Bombala;
- Outside exclusion-fenced areas in Queensland;
- The northern and eastern fringes of Perth in Western Australia;
- The areas around Lancelin and Wundowie in Western Australia;
- The north-east region of Victoria, and
- The pastoral zone south of the barrier dog fence in South Australia.

Feedback from the New England (New South Wales) has highlighted that wild dog programmes must not identify reports as ‘one-off attacks’ but instead consider these reports as part of the wider wild dog issue. Feedback from Victoria identifies that hunters are facilitating wild dog existence as animal carcasses provide a feed source. This should be addressed by the appropriate control programmes in Victoria, but opportunity exists for national communications and actions to address similar issues that likely occur in other areas where wild dogs are problematic.

The NWDAP has proven instrumental in providing several positive outcomes in the fight against wild dogs, which include (and are not limited to):

- Aiding the development of regional and state wild dog control strategies/plans, for example the South Australian Wild Dog Action Plan and the Western Australian Wild Dog Action Plan 2016-2021;
- Facilitating the employment of wild dog coordinators/officers in strategic locations, for example the Wild Dog Coordinators funded by AWI-managed producer levies in Queensland, New South Wales, South Australia, Victoria and Western Australia;
- Facilitating co-investment between industry, state/territory and Commonwealth governments for wild dog fences and/or wild dog programs, for example the NWDAP, the AWI 'Community Wild Dog Control Initiative', 1600 kilometres of new dog fence in South Australia, and trapping programmes;
- Facilitating collaborative approaches to wild dog management, for example cluster fences in smaller regional areas, group baiting programmes, and the development of the FeralScan 'WildDogScan' application; and
- Advocacy by the National Wild Dog Coordinator to retain the right to use 1080 baits to control wild dogs.

While many producers are aware of the NWDAP, clarification should be sought from the NWDAP Coordinator as to the influence of the Plan on the establishment of producer-driven control programmes that arise from this knowledge. Collation of information regarding wild dog control outcomes from all control activities by the NWDAP Coordinator would be beneficial and is sought by WoolProducers. This will improve transparency of the effects of NWDAP-associated activities in reducing wild dog impacts and will demonstrate returns on investment in the NWDAP. Further, it will provide part of a monitoring and evaluation system to reflect on the outcomes and return on investment from undertaking research, development and extension activities relative to wild dog control.

The work of the NWDAP in providing support and communications to producers is established through resources available on the NWDAP website (which sits under PestSmart Connect) and the work undertaken by the NWDAP Coordinator and colleagues to address producer concerns regarding wild dog control. Additional wild dog information developed and distributed by stakeholders should be considered when reviewing communications material as part of Agtrans' assessment. Communication reach could be enhanced by stakeholders distributing information through their networks to producers and other relevant parties, and it has been requested by producers (through WoolProducers) that more information on current NWDAP and associated programme undertakings reaches landholders in wild dog affected areas. However, not every stakeholder organisation has the resources to distribute this information and so provision of information for distribution needs to be enhanced to facilitate information sharing.

From meetings with producers, the NWDAP Coordinator and other Wild Dog Coordinators have driven control of wild dogs in many areas across Australia. However, as referred to previously, increasing anecdotal evidence that wild dog numbers are increasing means there is more work to be undertaken to achieve adequate control. Data

needs to be collected that demonstrates reduced impacts from wild dogs to support ongoing investment in the NWDAP and associated activities.

To this point, at the recent NWDAP Stakeholder Consultation, WoolProducers raised that producers do expect evidence of decreases in wild dog numbers and attacks in areas where the pest presents significant problems for farmers. This was supported by some stakeholders who spoke that when lobbying governments for programme support and associated wild dog control asks, it is figures such as decreased numbers of wild dogs that is sought by government to understand and prove efficacy of the NWDAP. Associated outcomes from effective control, including increased rates of lamb survival, decreased attacks by dogs on sheep and other livestock, and decreased sightings of wild dogs by farmers are certainly important and are enveloped in reporting, but demonstration of actual reductions in dog numbers is pertinent going forwards. Whilst WoolProducers understands that this metric is not part of the initial evaluation of NWDAP, we now feel that as the plan has been in place for a number of years that this is not an unreasonable request.

WildDogScan does provide information on sightings, evidence, impacts and control of wild dogs; the application also encourages producer collaboration to combat wild dogs through control. However, there are other applications such as 'Fulcrum' available to producers and so WildDogScan may not necessarily be receiving all data inputs. The ability for WildDogScan to capture this information possibly through synchronisation of the apps is a possible solution although we acknowledge there may be issues with intellectual property and technological restraints that may cause difficulty in achieving this. Nonetheless, research into potential data sharing certainly will prove beneficial if it is able to be achieved and we support this work being undertaken.

There are limitations with the WildDogScan application such as the accrual of data and which gives somewhat of a false sense of sightings, evidence, impacts and control information. Improvements to the application through the ability to filter historical data would enhance data collection and provide a useful tool in monitoring wild dog control activities and their effectiveness. There should also be increased promotion of the app and its adoption by producers (and others) to report wild dog information.

There are variations between state/territory legislation in reference to wild dog baiting rates, the use of control agents, and trap check times. A more coordinated approach between jurisdictions to wild dog control would be a positive step in the future and could be facilitated by the NWDAP. Issues also exist with properties that hold organic status as solutions need to be implemented to overcome the challenges in regard to the use of 1080 around these properties.

A future NWDAP should continue to drive collaborative approaches to wild dog control by building the capacity to respond to, and enhance tools that can be used to, control wild dogs. This collaboration must continue to be between all landholders, including producers and public land managers, peak industry bodies, research and development corporations, researchers and state/territory and federal governments. The future NWDAP should:

- Have improved reporting of wild dog control outcomes from associated activities/programs;

- Demonstrate how control activities in a particular area do not cause relocation of wild dogs into surrounding areas, thereby simply transferring the problem caused by wild dogs;
- Demonstrate return on investment for:
  - Research, development and extension in the space of wild dog control,
  - Control activities including the erection of exclusion fences, baiting, trapping and other controls.
- Demonstrate how collaborations between relevant stakeholders result from the NWDAP;
- Improve communication with producers and stakeholders, and
- Improve data recording that can be used to monitor and evaluate the effectiveness of the NWDAP in controlling wild dogs through associated programs.

WoolProducers strongly supports expansion of the NWDAP to include other vertebrate pests such as feral pigs and deer. By expanding the species covered by the NWDAP there will be continued relevance of the programme to Australian agriculture, peak industry councils, research organisations and Australian governments. Expanding the NWDAP to include other vertebrate pest species will secure a future for the programme, particularly with the NWDAP model's ability to be transferred to a range of vertebrate pest species other than wild dogs. Future vertebrate pest control programmes for species other than wild dogs may not necessarily have to be conducted under the NWDAP but could instead operate in parallel with a central convenor for all control activities.

WoolProducers looks forward to continuing our engagement in the NWDAP review and impact assessment consultation. Should you wish to discuss the information provided in this letter further, please do not hesitate to contact WoolProducers Policy Manager, Ashley Cooper on 0455 442 776 or via email (acooper@woolproducers.com.au).

Yours Sincerely,

Jo Hall

CEO