CENTRE FOR
INVASIVE SPECIES SOLUTIONS

BALANCED RESEARCHER PROGRAM

FINAL REPORT FOR PROJECT P01-E-004

AUTHOR

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OCTOBER 2022

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The Centre for Invasive Species Solutions gratefully acknowledges the financial and in-kind contributions made by its members, associate members, and partners.

We are a not-for-profit, member-based organisation formed to address the impact of invasive plants and animals across Australia.

We acknowledge the Traditional Custodians of the lands on which we meet and work and pay our respects to Elders — past, present and emerging.

We acknowledge all Aboriginal and Torres Strait Islander peoples and their continuing connection to country, culture and community.

The Centre for Invasive Species Solutions is governed and managed by Invasive Animals Limited.

CITATION
This report should be cited as: Buckmaster T (2022). *Balanced Researcher Program: Final Report for Project P01-E-004*. Report for the Centre for Invasive Species Solutions.

invasives.com.au

ISBN e-Book 978-1-925727-66-1

ISBN Print 978-1-925727-67-8

ACKNOWLEDGEMENT OF PROJECT PARTNERS

The *Balanced Researcher Program* project was led by the Centre for Invasive Species Solutions.

The project was funded by Australian Government Department of Agriculture, Fisheries and Forestry.

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BALANCED RESEARCHER PROGRAM

FINAL PROJECT REPORT FOR P01-E-004

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EXECUTIVE SUMMARY

The traditional career path for PhD graduates is changing. Approximately 60% of PhD graduates now enter industry-based professions rather than pursue a career in academia. This change has highlighted some deficiencies in the traditional PhD training approach, and many graduates, while experts in their field, do not have the transferrable generic skills that industry is seeking. By providing additional training in these skills to higher degrees by research (HDR) students, the Balanced Researcher Program (BRP) creates multiskilled, industry-ready graduates who can enter employment on graduation and actively contribute to the research and operational goals of their chosen workplace.

All HDR students embedded in projects based at the Centre for Invasive Species Solutions (the Centre) are entered into the BRP to provide additional training in areas such as leadership, community engagement, team building, interpersonal skills, innovation skills, communications and media awareness. It was initially anticipated that 11 PhD students would be attached to Centre projects; however, recruitment of PhD students was difficult for most projects, and only four PhD students and one master degree student were found. The BRP was then expanded to include PhD and postdoctoral students studying in projects aligned with the Centre's research outcomes, which gave a total student cohort of nine.

The training was delivered using a combination of student camps, which provided training in core areas, and funds for participants to attend other training courses to expand their skills in both their current research area and their intended career paths. Three training camps were run as part of the course. The first was face to face, and the other two were run virtually due to COVID-19 restrictions on travel and in-person meetings.

By the end of the program, three PhD students and one master degree student had completed their research projects and submitted theses for marking. The remaining three students in the program are well on track to complete their studies and submit within four years of commencing their studies. Transition arrangements have been made to allow continued supervision of these students and monitoring of their progress.

The BRP has been running for 18 years, and a longitudinal survey has been run twice to see if the program is meeting its goals. The third iteration of the longitudinal survey was undertaken to determine if the program is meeting its goals. This survey involved not only the current participants but also past participants to determine if the benefits gained from the program were still assisting those participants in their careers. The survey demonstrated that the program is meeting its required outcomes and is still providing benefit to past participants, even though some of them graduated from the program over 10 years ago.

A celebration event was held to showcase the research undertaken by current and past BRP participants. This was held at the Academy of Sciences' Shine Dome, in Canberra. Presentations were given by 28 past and present BRP participants that displayed the range and diversity of their research and the variety of careers they have pursued since their graduation from the program. This was followed by a dinner event that included presentations of Invasive Species Solutions Trust development bursaries for current participants as well as the awarding of the inaugural Balanced Researcher Program Distinguished Alumni award.

Overall, the BRP meets its goals and outcomes and continues to provide essential additional training and skills for participants that they are using in their research projects and careers.

INTRODUCTION

The traditional career path for PhD graduates is changing. Approximately 60% of PhD graduates now enter industry-based professions rather than academia (Hansen et al. 2014; Guthrie 2016). Some sectors of Australian industry are becoming increasingly aware that this change fulfils an important role in maintaining the pipeline of trained scientists in research, development and extension (RD&E).

A review by Meat and Livestock Australia indicated that the most common pathway into RD&E is high school → undergraduate degree → honours degree → PhD → one or more postdoctoral appointments, then employment as a scientist (Stephens et al. 2013). however, it is believed that these graduates often lack the suitable skills, real-world experience and understanding of industry context. As a result, they require additional training, close supervision and mentoring when they enter a role in industry. Graduating students that have had between three and 10 years of work experience prior to entering a PhD are perceived to retain their industry links and knowledge. The report concluded that industry involvement early in the entry pathway provides a far greater return than becoming involved just at the end (Stephens et al. 2013).

This was also reflected in the Australian Council of Learned Academics (ACOLA) report reviewing the Australian research training system (McGagh et al. 2016, key findings 5 and 6, pp. xiv–xv). The ACOLA report also found that universities need significantly greater investment to provide broader, transferrable skills as part of their higher degrees by research (HDR) training, as this was not currently embedded in traditional HDR training in Australia (McGagh et al. 2016, key finding 4, pp. xiii–xiv).

These findings highlighted some deficiencies in the traditional PhD training approach and that many graduates, while experts in their field, do not have the transferrable generic skills that industry is seeking. The Centre for Invasive Species Solutions (the Centre) runs a Balanced Researcher Program (BRP), which is designed to create multiskilled, industry-ready graduates who can enter employment on graduation and actively contribute to the research and operational goals of their chosen workplace.

The BRP is based around a model with five primary attributes considered essential for students to operate effectively in the workplace as well as in the community as a whole. Students undertake additional training during their PhD tenure to gain skills under these attributes. In this iteration of the BRP, the additional training consisted of a combination of annual training camps where core skills are taught as well as targeted individual training to assist students in both their research projects and intended career paths following their PhD. One part of this additional training was that students needed to complete at least 20 days of industry-based placement to enhance the skills needed for their research project or their intended career path. Unfortunately, this requirement had to be dropped due to the impacts of COVID-19.

A significant portion of students commence but do not complete postgraduate study. In PhD students in Australia, this non-completion rate is 60–63% nationally across all areas of study (Palmer 2012; Department of Education 2020). The non-completion rate is slightly higher for students doing masters degrees by research. A secondary aim of the BRP was to provide the tools, skills and appropriate supervision for the participant HDR students to complete their research thesis and thus raise the completion rate for participants to above the national average.

The COVID-19 pandemic impacted the program in ways that were completely unforeseen when it began. The extended lockdowns, which varied across the states as the pandemic progressed, and the restrictions on travel and face-to-face meetings resulted in changes to ensure that students still benefited and maintained their engagement with their parent project and their studies.

This is the third iteration of the BRP. The first two were run as part of the Centre’s predecessor, the Invasive Animals Cooperative research Centre (IA CRC). The longevity of the program has allowed a longitudinal study to assess whether the goals and outcomes of the program have been met over an extended period. This longevity has also allowed assessment of the levels of participant satisfaction with the program and an opportunity for participants to suggest improvements.

In 2011, the Invasive Animals CRC released *Guide to the Balanced Researcher Program*, a guide for universities and other research organisations to commence their own similar program (Dimond and Sarre 2011). While the guide is still relevant and useful, it has been updated as part of this project. This was particularly important following the findings of the ACOLA report indicating that universities needed to include training in broad transferrable skills for their HDR students and to include industry in the process (McGagh et al. 2016, key findings 4 and 5, pp. xiii–xiv), which are key components of the BRP.

During the initial planning phases of the project, meetings were held with biosecurity-based industry bodies which revealed that most new employees taken on by these organisations have limited or no background knowledge in the biosecurity sphere. A component of this project was to investigate the need and desire for consistent base-level biosecurity training. If a need was apparent, the aim was to develop, in conjunction with key partner agencies, a Biosecurity-Ready training module that could be delivered as part of the BRP or as a standalone module for agencies.

METHODS

The BRP was based on the design implemented by the Invasive Animals CRC (Dimond and Sarre 2011). Due to only five PhD and master degree students who were embedded in research projects under the Centre being recruited to the BRP PhD enhancement program, the BRP expended its intake to include students and postdoctoral fellows from aligned projects.

To ensure that the PhD and master degree students had access to the whole range of training and benefits provided by the BRP, a student agreement was put in place between the Centre, the student and the university. These agreements outline the roles and responsibilities of each of the parties to the agreement and detail what is expected from the student for them to be able to access continued funding from the Centre. The agreement also protects the Centre's IP but still ensures that the student has the copyright to their research thesis.

The key purpose of the BRP is to increase the transferrable skills and abilities of the Centre's HDR students. This was accomplished through providing training over and above that which is received as part of the traditional academic PhD program. To ensure that this additional training did not impact on the ability of the student to produce a high-quality research thesis, a seventh and eight semester of scholarship support was be provided to PhD students. A competitive top-up scholarship was offered, along with operating expenses to ensure that top quality students are attracted to the program. The eighth semester, if required, was fully funded by the Centre for those students who had received an Research Training Program or equivalent scholarship and successfully obtained a seventh semester extension. This additional period was considered recompense for the students undertaking the additional training and skills acquisition that the project required. It was not intended that supervisors use this additional time to have comparatively inexpensive PhD students undertake extended research projects, and the program actively discouraged this from occurring.

The targeted training in core areas took place in a group setting at the annual training camps. As the program had been shortened due to the late intake of students into Centre projects, only three camps were run rather than the traditional four camps.

The first of the camps was held face to face in February 2020. COVID-19 restrictions resulted in the remaining camps for the program transitioning from face-to-face training to virtual training camps.

The training camps focused primarily on training in core areas of leadership, management, team building, commercialisation, grant writing and science writing, delivered in a group situation. Internal communications team staff provided training in the areas of communications and media awareness. Knowledge Teams International Pty Ltd were used as one of the training providers at the first two camps, given their specialisation in leadership, team building, decision-making and networking training. Camilla Myers, from CSIRO, provided training in grant writing at the second camp and in science writing at the third camp. The BRP also provided a grant that the participants of the second camp could apply for, to give them real-world grant application experience. The application requirements for the grant were based around those used by the Ecological Society of Australia for their Holsworth Wildlife Research Endowments.

LONGITUDINAL STUDY

An external social scientist, Dr Saan Ecker – past head of social science research at ABARES – was engaged to undertake the study and ensure its independence by minimising the risk of bias from those providing the program itself. Two book vouchers were provided as an incentive to undertake the survey. To ensure fairness and separation from the program providers, these vouchers were allocated randomly by the independent researcher to students who undertook the survey, regardless of how many questions they answered or the content of their answers.

The semi-structured interviews were wideranging to allow themes that arose to be explored, but the core questions were:

- What is your overall evaluation of the Balanced Researcher Program?
- What core skills do you think a Balanced Researcher needs?
- Is/did the Balanced Researcher Program an aid in the successful completion of the PhD? If so, how? If not, why not?
- Do you think the Balanced Researcher Program has an impact upon future employability and, if so, why?
- What are the strengths and weaknesses of the program?
- If you had the opportunity to change the program, what would you do and why?

These core questions enabled a discussion around the current program and the potential for improvement and allowed the students to give their opinions.

COVID-19 CHANGES

The worldwide COVID-19 pandemic resulted in extended lockdowns across Australia and included a range of restrictions on both travel and in-person meetings. Most of the training and development that the BRP provides to its participants is through face-to-face interactions. These restrictions caused a significant change to the way the program was delivered to ensure it still met its aims and outcomes. These changes are detailed in the outcomes section below.

OUTCOME

The 2017–2022 iteration of the BRP (basically aligned with CISS projects from the same time) had nine participants. Initially, four of the PhD and one master degree by research students were embedded in Centre projects. The remaining participants consisted of two PhD students and two postdoctoral fellows who were working on projects aligned to the Centre's core research projects (Table 1). The participants were based at a range of different partner universities and research organisations. This number was below the expected intake for the program. [Aligned projects are those aligned with CISS work and funded/partially funded as a collaboration between CISS and other research organisations.]

Recruitment of PhD students to the Centre projects was difficult and time-consuming. There was limited interest from Australia-based applicants for the research positions being advertised. International students were recruited into three of the PhD positions, with the fourth PhD and the master degree position being filled by Australia-based applicants. This resulted in students commencing their research studies at differing times than was intended – a single cohort with a consistent commencement date.

The staggered commencement for some of the students has also resulted in there being several PhD students who have not completed their studies and submitted theses for marking by the conclusion of the program. Arrangements have been made for the continued supervision of those students and for the monitoring of their progress by the BRP project lead as they move towards completion of their studies, even though this is after the conclusion of the project.

Table 1: Participants in the 2017–2022 Balanced Researcher Program

Name	Centre project	University/organisation	Research level
Jose Torres	P01-L-002	La Trobe University	PhD
Adam Toomes	P01-I-002	University of Adelaide	PhD
Moses Omogbeme	P01-L-006	Murdoch University	PhD
Jack Rojahn	P01-I-004	University of Canberra	PhD
Debbie Dowden	P01-E-001	University of New England	Masters by research
Elena Smertina [A B]	P01-B-002	CSIRO	PhD
Katherine Hill [A]	P01-I-002	University of Adelaide	PhD
Maria Jenckel [A]	P01-B-002	CSIRO	Post Doc
Egi Kardia [A]	P01-B-002	CSIRO	Post Doc

Note: [A] = participant is involved in an aligned project [B] = participant later became a full BRP student.

Including PhDs and postdocs from aligned projects in the BRP increased the range and depth of experience in the program participants. Having the two postdoctoral researchers allowed them to share firsthand, recent experiences in completing a PhD project and thesis with those that were still undertaking their doctoral research projects. Expanding the BRP intake to aligned projects was a success, and improved the experiences of all participants. It is recommended that postdocs and students from aligned projects be included in the BRP from the commencement of the next iteration of the program.

STUDENT CAMPS

Three student camps were run as part of the BRP.

CAMP 1

The first camp was delayed to the staggered commencement of students over several years and was held over three days immediately following the mid-term portfolio review in February 2020. The camp was attended by eight of the nine participants in the program. One participant was unable to attend due to illness. As part of this camp, students received training in leadership and team-building skills, communication and media awareness, creativity and innovation and emotional intelligence (Table 2). These skills are considered core skills for participants in the program.

Table 2: Program for the Balanced Researcher Program Camp 1 – February 2020

	Thursday 13 February	**Friday 14 February**	**Saturday 15 February**
Morning	Introduction and overview of program Personal introductions and leadership journeys to date Leadership definitions and concepts Emotional Intelligence	Appreciating difference Core skills for building emotional intelligence	Creativity and innovation in R&D teams 12:30 Close
Afternoon	Self-awareness and personality preferences MBTI results 3:30 pm media skills	Collaborations and work teams Factors in R&D team effectiveness	
Evening	Free time	Free time	

The feedback from participants at the camp was overwhelmingly positive, with everyone indicating that they had benefited from the training received at the first camp.

CAMP 2

The second camp was held in November 2020 as a virtual camp. The COVID-19 pandemic had spread to Australia by March 2020, resulting in lockdowns, travel restrictions and limitations being placed on face-to-face gatherings. This necessitated changes to the camp content and format and, as a result, a virtual camp was held rather than a face-to-face camp. The camp was extended to run over a two-week period with shorter teaching periods each day to allow participants time to digest what was being taught and to have a break away from concentrating on a screen for an extended period (Table 3).

The second camp built on the leadership and team-building training from the first camp and included techniques for decision-making, improved interpersonal skills and conflict management. Additionally, Camilla Myers from CSIRO ran a workshop on grant writing to give the participants additional skills for applying for grants. As part of this training, the program offered a grant for students to apply for based around the criteria of the Holsworth Wildlife Research Endowment (https://www.ecolsoc.org.au/awards/holsworth/). A copy of the grant details is attached as Appendix 1.

Table 3: Program for the Balanced Researcher Program Camp 2 – November 2020

Date	Activity	Provided by
16 November	Thought leadership in communities and organisations	KTI
18 November	Decision-making models, tools and traps	KTI
20 November	Power and influence in communities and organisations	KTI
23 November	Grant writing Day 1	CSIRO
24 November	Interpersonal skills, difficult conversations and conflict management	KTI
5 November	Grant writing Day 2	CSIRO
26 November	Career development, networking and personal branding	KTI

Note: KTI = Knowledge Teams International

Approximately half of the participants applied for the grant provided by the BRP, and the rest used these skills to apply for other grants in their fields. The applications for the student grant were reviewed by a panel and the successful applicant for the grant was Jose Torres (project P01-L-002–La Trobe University). There was a high success rate for participants who applied for grants other than the grant provided as part of the BRP.

During the camp, the training providers recommended several books to the participants for use as they progress through their studies and careers. These books were sourced and provided to the participants as part of the program:

- Schimel J (2011) *Writing science: how to write papers that get cited and proposals that get funded*, Oxford University Press.
- Lindsay D (2011) *Scientific writing – thinking in words*, CSIRO Publishing.
- Bolton R (2011) *People skills: how to assert yourself, listen to others and resolve conflicts*, Simon and Schuster.
- Feibelman P (2011) *A PhD is not enough*, Hachette Australia.

Program participants have indicated how several, if not all, of the books have been useful to them on the research journey and for guidance on dealing with situations in their work and personal lives.

CAMP 3

The third and final BRP camp was another virtual camp held in July 2021. As most participants in the program were at least midway through their research and were writing thesis chapters or manuscripts to submit to journals for publishing, this camp focused on science writing. Those who were still in the early stages of their research would find the skills obtained to be very useful when they started writing manuscripts or their thesis.

This camp was again run by Camilla Myers from CSIRO, over two consecutive days (Table 4). Given the presenter's time constraints, the camp was more intensive than the second camp and was run over a shorter time frame. There was still time for participants to break into virtual groups to discuss and work on writing the sections of their manuscript or thesis. Participants received feedback on their writing from the presenter and other participants in the workshop.

Table 4: Program for the Balanced Researcher Program Camp 3 – July 2021

Day/Time – Session	**Topic**
Day 1 (9:30 am – 4:00 pm)	
Session 1	What do we mean by impact in publishing?
Session 2	Writing as part of your research project
Session 3	Making your writing reader friendly
Session 4	The Introduction
Day 2 (9:30 am – 4:00 pm)	
Session 5	Review of Day 1
Session 6	Methods and Results
Session 7	Getting your message across: Discussion
Session 8	Getting noticed: Abstract and Title
Session 9	Getting published: ethics, processes, editors and reviewers
Session 10	Summing up: where to from here?

By the end of the camp, most participants had the outline and draft content for either their manuscript or their thesis chapter. Feedback from the camp was positive, with all participants agreeing that they had obtained benefit from the writing workshop.

GUIDE TO THE BALANCED RESEARCHER PROGRAM

The success of the then Balanced Scientist Program in the Invasive Animals CRC led to many requests from other CRCs and research organisations for guidelines on how to develop and implement a similar program in their organisation. When the program began, there were scant data available on either how to implement such a program or what content should be included in the program. To help other organisations develop a similar program, the initial *Guidelines for the Balanced Scientist Program* were produced and published (Dimond and Sarre 2011).

While this original guide is still relevant and useful, changes to the program and the training environment, particularly post COVID-19, have warranted an updated guide to be developed and published. The need for the guidelines has become more apparent following the ACOLA report that highlighted the lack of broad transferrable skills being taught within the traditional HDR training provided by universities (McGagh et al. 2016, key finding 4, pp. xiii–xiv). Similarly, the report indicated that there is a greater need for both industry collaboration in HDR training and placements for HDR students into industry as part of their training (McGagh et al. 2016, key findings 5 and 6, pp. xiv–xv). All three of these items are important components of the BRP.

The updated *Guide to the Balanced Researcher Program* (Buckmaster 2023) has been written as part of this project. It is currently in the editing and pre-publication stage so is unable to be attached to this report. A copy will be provided once it is available.

BALANCED RESEARCHER PROGRAM CELEBRATION EVENT

An important part of the BRP is the cohesive and collegiate relationships between the participants. This has continually been found in the longitudinal surveys to be an important aspect of the program that contributed to the increased completion rates and feelings of belonging to the organisation.

To celebrate the contribution of the participants to the BRP, an event was held at the Academy of Sciences' Shine Dome in Canberra in September 2022. All present and past BRP participants were invited to attend and present on the research they conducted as part of their PhD and master degree

projects, and to talk about their careers after graduating from the program. Twenty-seven (Figure 1) participants were able to attend and present. A dinner and award presentation followed the event.

Some participants were unable to attend and give talks due to illness, clashes with other prearranged events or due to being overseas; they were given the opportunity to present via pre-recorded talks. The event was streamed live to enable those who could not attend in person to watch the event remotely. All talks were recorded and will later be uploaded to the Centre's YouTube channel as a showcase of the achievements of the program participants.

Figure 1: Balanced Researcher Program celebration event.

Includes all participants at the event and representatives from ABARES, University of Canberra and the Australian National University.

The Invasive Species Solutions Trust provided three professional development bursaries for current participants. These were presented to the successful applicants at the dinner that followed the event. The Trust also provided an inaugural Distinguished Alumni award, which was open to all alumni of the program and was designed to recognise the outstanding contribution that alumni have made to the management of invasive species both in Australia and overseas. Dr Pablo Garcia Diaz won the inaugural Distinguished Alumni award (Figure 2).

Figure 2: Invasive Species Solutions Trust award winners

Professional Development bursaries were awarded to (L to R) Elena Smertina, Katherine Hill and Adam Toomes. The Distinguished Alumni award was awarded to Dr Pablo Garcia Diaz. This was accepted by Associate Professor Phill Cassey (pictured on right) as Dr Garcia Diaz is currently based at the University of Aberdeen and was unable to be present.

TRANSITION ARRANGEMENTS FOR CONTINUING STUDENTS

Due to the staggered commencement of this cohort of students, two of the Centre-supported students and one aligned PhD student have not yet finalised their research projects and submitted their theses for marking. As a result, transition arrangements have been made for the continued supervision of the Centre students by their current supervisory panel. The agreements between the Centre, each student and their university are still in force, and enforceable, and will remain so until the student completes their research project. The funds to support their final semesters have been transferred to their home universities. The progress of the participants who are yet to submit their theses will continue to be monitored by the BRP lead, who will also provide continued support and assistance for them until they are awarded their doctorates.

BIOSECURITY-READY TRAINING COURSE

Consultations with industry in the planning for this project indicated that there was potentially a need for a Biosecurity-Ready training course to provide base-level understanding of biosecurity for new employees of those industry partners. Discussions were held with state-based biosecurity organisations as well as with Animal Health Australia and Plant Health Australia about developing a course that could be provided either as part of the BRP or as a standalone course for those agencies. However, it became increasingly apparent that each jurisdiction and organisation had a different content requirement for such a course and that it would not be possible to design, develop and deliver a course that fitted the needs of all the agencies. Initial considerations were given to developing a generic base-level course; however, this would have provided little to no benefit to the states and other industry organisations as they would still have been required to teach their own courses.

As a result, this portion of the project ceased, and the course was not developed.

PROJECT MILESTONES

The BRP had nine milestones to meet. All milestones have been met or exceeded except those that relate to the Biosecurity-Ready course mentioned above (Table 5).

An additional post-completion milestone has been added for the monitoring and support of those students who are continuing past the end of the project. This will be undertaken by the project lead (see transition arrangements section above).

Table 5: Milestones for the Balanced Researcher Program and their outcomes

Milestone no.	Details	Due date	Outcome
Pre-commencement	Project detail approved	30 Jun 2018	**Executed**
(Utilisation) Milestone 1	Student scholarship agreements between CISS and enrolling universities executed	30 Nov 2018	**Achieved**
(Utilisation) Milestone 2	Linkages formed with external biosecurity industry partners to design and develop Biosecurity-Ready training module	31 Dec 2018	**Achieved**
(Utilisation) Milestone 3	First Centre PhD camp run and completed	30 Jun 2019	**Achieved**
(Utilisation) Milestone 4	Biosecurity-Ready training modules finalised for delivery as a training module for external organisations; individual postgraduate development plans for enrolled students agreed to and completed	31 Dec 2019	**Biosecurity-Ready portion cancelled** **Remainder Achieved**
(Utilisation) Milestone 5	Planning and organising second PhD camp complete; review of BRP during full Centre review	30 Jun 2020	**Achieved**
(Utilisation) Milestone 6	Longitudinal study commenced; survey prepared and NEAF approval obtained for third round of the longitudinal study	31 Dec 2020	**Achieved**
(Utilisation) Milestone 7	Planning for third camp completed; longitudinal study completed; survey and interviews completed by independent researchers and report received	30 Jun 2021	**Achieved**
(Utilisation) Milestone 8	Review *Guide to Balanced Researcher Program*, including revision based on feedback from camps and the longitudinal study; arrange transition of students' funding and progress to universities for students continuing to study	30 Sep 2022	**Achieved**
(Utilisation) Milestone 9	Final report received; *Guide to the Balanced Researcher Program* reviewed; arrangements made for the continuation of students who have not submitted theses for marking by 30 June 2022 to ensure continuity of enrolment and payment of stipend; students enrolled before June 2019 completed	30 Sep 2022	**Achieved**
Milestone 10	This is a post-portfolio milestone to cover two students expected to complete their PhDs by December 2022. As discussed with DAWE, the Centre will make pre-payments to the relevant universities and monitor the students through to completion. The final report (M9 above) will be updated to reflect full completion of the program.	30 Jun 2023	**In progress**

Note: Milestone 10 is a post-portfolio milestone. NEAF = National Ethics Application Form. DAWE = Department of Agriculture, Water and the Environment.

COVID-19 PANDEMIC

The arrival of the novel coronavirus in Australia in January 2020 and the subsequent lockdowns and restrictions on travel and face-to-face meetings that began in March necessitated changes in the BRP. This was primarily to ensure that the health and wellbeing of the participants was maintained during the lockdowns and, secondly, that benefit was still obtained from being part of the program.

In many cases, the participants' universities and research organisations closed their doors and prohibited students from attending the campus or their laboratories. Many of the students were living away from home and families and were then confined to their rooms/flats for extended periods with little to no contact with people. To help overcome this, the program instigated fortnightly virtual catch-ups so all participants could discuss their research as a group. Other activities were also held, such as a 'journal club', discussions around an interesting manuscript, and games such as trivia. Where appropriate or requested, one-on-one virtual meetings were also held with some participants to help them through the periods of isolation. As the lockdowns became less frequent and students were allowed back on their university campus or research organisation laboratories, these meetings transitioned to monthly and were maintained as such until the end of the program.

The restrictions on travel and face-to-face meetings resulted in organisations being unwilling to take on participants for their industry placement. Many industries moved from a full-time office-based environment to either working from home or shutting down all but essential portions of their work. As a result, the industry placement requirement of the program was suspended during the first nationwide lockdown. As many states and territories had a repeated lockdowns, and interstate travel was prohibited for varying and extended periods of time during the subsequent two and a half years, the industry placement requirement was dropped from this iteration of the program.

The first training camp of the 2017–22 iteration of the program was held in February 2020, with all participants being brought together for face-to-face training. In March 2020, the first of the nationwide COVID-19 lockdowns was implemented. To comply with travel and face-to-face meeting restrictions, the remainder of the training camps were converted to virtual camps. This meant that each participant in the program could receive the group training without needing to travel or be in a face-to face environment.

Additional training opportunities outside the BRP were, for many of the students, also diminished due to COVID-19 lockdowns. Fewer training courses were being held, and many organisations struggled with the transition from face-to-face training to virtual training. This meant that a smaller range of training courses were available for students to attend. The transition to virtual or hybrid conferences was also slow, and many students missed the opportunity to travel and interact face to face with peers in their field of study. While virtual conference still allowed students to present their work to their peers, the personal interactions with other researchers and practitioners was missing.

While students were still engaged in the BRP during the COVID-19 pandemic, it was apparent that they were not able to obtain the same benefit from the program as students in the preceding iterations. This was also reflected in the results of the longitudinal study (see Appendix 2).

LONGITUDINAL STUDY

This was the third iteration of the BRP. As with the other iterations, a longitudinal study was undertaken to determine if the participants were gaining benefit from the program. As past program participants were included in the study it allowed an analysis of whether the program is still providing benefit to program alumni.

SURVEY OUTCOMES – OVERALL

The training camps were seen by survey respondents as being effective and enriching for their PhD experience. They indicated that the social, communication and networking skills developed as part of the camps and program were the most valued of the wide range of skills and competencies gained.

The additional training received was also highly valued by the program participants. A number of participants indicated that they had not previously received training in certain skills such as interpersonal skills, media skills and publication writing, and that having these taught at a camp was highly beneficial as they were not offered as part of standard academic training.

The survey also found that substantial benefits were gained that were outside the program goals. The first of these was the sense of cohesion between program participants, particularly within a cohort. This allowed a range of networks and collaborations to be developed between participants as well as with academics and research organisations in the field (Ecker 2021).

It was also noted that COVID-19 affected the ability of participants to form as cohesive a cohort as was seen in previous iterations. A number of measures were put in place to maintain and increase the level of contact and cohesion between the participants, but it was not sufficient to overcome the lack of face-to-face contact and training compared to what previous cohorts had received.

SURVEY OUTCOMES – EMPLOYMENT PROSPECTS

Increased employment prospects are hard to measure in a survey of program participants; however, the majority (75%) of students who graduated from the program indicated that it had made them more competitive for employment (Ecker 2021). It is noted that employment prospects for graduates are not linear or consistent, and that across the 18 years of the program, employment opportunities for graduates have varied. While the program cannot guarantee that graduates will find employment in their chosen field, it aims to make graduates more competitive for the roles that are available. Many of the graduates believe that the skills they learned are still giving them a competitive edge in employment prospects a number of years after having completed the program (Blackman and Moon 2016; Ecker 2021).

SURVEY OUTCOMES – COMPLETION RATES

In the 2005–12 iteration of the BRP, 30 students began PhD studies; 29 of those submitted theses and were awarded their doctorates. The 30th student withdrew due to chronic illness. Of the participants in the 2012–17 iteration of the program, only one student has not submitted their thesis for marking; the research work is complete but the thesis has not submitted, and the reason for this is unknown. In the latest iteration of the program (2017–22), all students who are due to have completed and submitted their theses have done so, and only three are still to submit. These students began their studies later in the program and are not due to submit until after the end of the current iteration. Those students are on track for submission at the time of writing.

There are many reasons students do not complete their PhD research programs. It is recognised that not all of these can be overcome by a support or enhancement program; however, two of the primary causes are a lack of quality supervision and a lack of a supportive collegiate environment. During all three rounds of the longitudinal study, the students who had completed and been awarded their doctorates indicated that the support network provided through the program was of great importance in facilitating their successful completion (Blackman et al. 2014; Blackman and Moon 2016; Ecker 2021). Students identified the annual camps as being places where they could share their ideas and discuss their issues and concerns face to face with peers (Blackman et al. 2014).

The report on the survey is included as Appendix 2.

OVERALL OUTCOMES FROM THREE ITERATIONS OF THE BALANCED RESEARCHER PROGRAM

COMPLETION RATES

The national average rate of PhD completions is approximately 60–63% (Palmer 2012; Department of Education 2020). The mean rate of completions is higher across CRCs and for the Group of 8 (Go8) universities at 65% and 68% respectively (Palmer 2012; Department of Education 2020). In the sciences, the completion rate is higher at 70–75% (a lower rate has been reported in some studies,

such as 67% reported by Jiranek [2010]). Even using the more conservative rate, it still means that at least a quarter of all students who start a science-based PhD do not finish or receive their doctorate.

The numbers of completions given in the section above show that over the three iterations of the BRP, the completion rate is 96% for PhD students supported by the program. This compares favourably with the national completion rate for PhD students (Figure 3). Master degree students have a 100% completion rate in the program; however, there were far fewer of those.

Most of the BRP students submit their thesis within the four years (FTE) of the project. Nationally, only 15% of postgraduate students have completed their studies within four years of commencing their degrees. This increases to approximately 47% completing within six years of commencing their studies. It is noted that some of this for the national figures is due to full-time and part-time students being counted together (but studying for very different periods of time), and there were very few part-time students in the BRP.

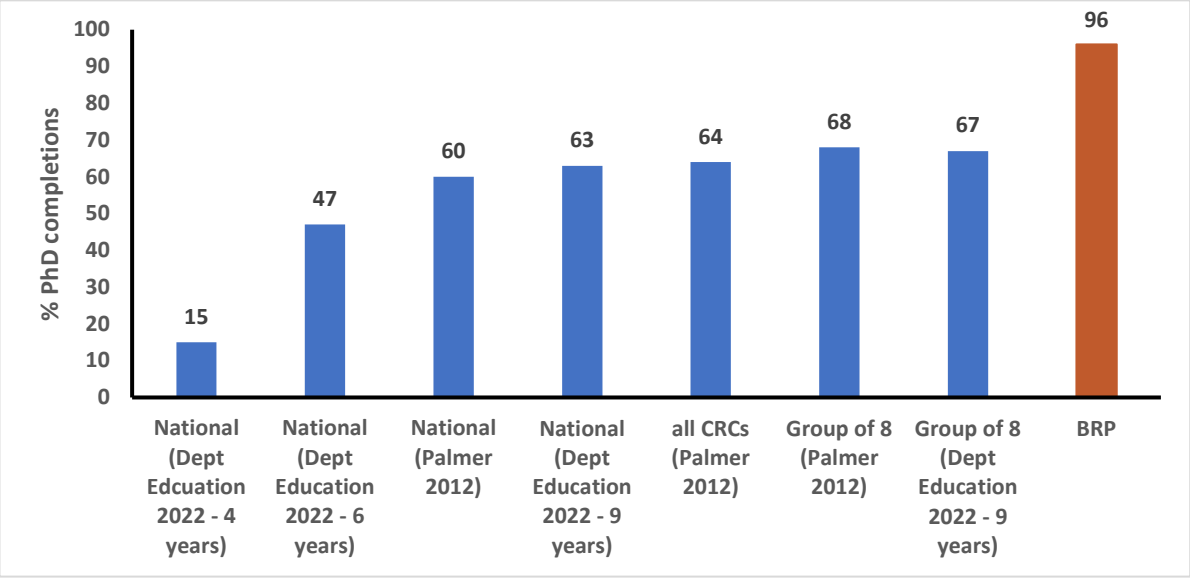

Figure 3: PhD completion rates for the Balanced Researcher Program.

The BRP completions are also counted in those of the preceding columns (e.g. a completion by a BRP student is also counted in the national completion figures as well as in the other rates where applicable). The years, where shown, are the number of years since commencement of study.

RETENTION IN INDUSTRY

Following the careers of the graduates after they leave allows the program to gauge its success at retaining graduates both within the industry and within research. However, limited data are available to compare retention within industry for graduates of the BRP against traditional PhD programs.

The BRP has a high rate of retention of graduates within the invasives industry. Approximately 40% of all graduates are still involved with managing or researching invasive species as their primary role, and a further 17% have at least part of their current role related to invasives species management. Retention within research is also very high, with 70% of all graduates still involved in research to some degree either as their primary role or as part of their role. Not all of these have remained in the invasives field, with some diverging into human disease research, threatened and endangered species research or other non-invasive species fields. Despite this, these graduates are still using the skills and techniques they learned as part of their PhD research and as part of the BRP.

CONCLUSION

The limited number of PhD students embedded in Centre-based projects resulted in the extension of the BRP to include aligned PhD students and postdoctoral fellows. This increased the number of participants in this iteration of the program to nine.

The impacts of COVID-19 on the program were significant. The extended lockdowns, initially nationally then on a state-by-state basis, combined with the restrictions on travel and face-to-face meetings, meant that the participants were not able to access all facets of the program. The COVID-19 lockdowns and restrictions did show that the program was flexible and responsive to the fast-moving changes brought about by the pandemic and was able to maintain participant engagement through its ability to quickly adapt to the changing circumstances.

The outcomes and impacts of this project included better preparing PhD graduates to be effective in the biosecurity industry or other industry of their choice immediately on graduation. Program participants have gained skills in research and project design, leadership, community awareness and team building that will support and enhance their careers following graduation. It is difficult to put a monetary value on increasing skills and training for postgraduate students, but developing the aspects targeted through the BRP will allow greater choice of employment for and increase the employability of Centre PhD graduates. These graduates are better prepared and trained to become future leaders in science, industry and research innovation.

FUTURE ITERATIONS OF THE PROJECT

Initial planning for the BRP was based on the assumption that there would be approximately 11 PhD students embedded in Centre-based projects. However, only five students were successfully recruited by the projects. The low number of students embedded in Centre-based PhD projects resulted in the project needing to be extended to include students and postdoctoral fellows in aligned projects.

This move was successful, and the inclusion of these additional participants enhanced the outcomes for the initial five students as well as provided significant benefit for the aligned participants. It is recommended that all future iterations of the BRP include participants from aligned projects in the initial planning and budgeting phases.

Acknowledgments

The BRP can only succeed if the participants are willing to extend beyond their comfort zones and undertake training that is not considered to be core to a traditional academic HDR program. Special thanks must go to all the participants of the program without whom the project would not have been as successful.

The BRP has been funded by the Australian Government through the Department of Agriculture, Fisheries and Forestry as part of its commitment to funding the Centre for Invasive Species Solutions.

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APPENDICES

Appendix 1. CISS Postgraduate Research Grant provided by the BRP program for the grant writing workshop

CENTRE FOR
INVASIVE SPECIES SOLUTIONS

2020 CISS Postgraduate Research Grant

The 2020 Centre for Invasive Species Postgraduate Research Grant is a small research grant intended for postgraduate/postdoctoral researchers working on CISS or related research projects. The grant is to be allocated for the work of the researcher and is not for the general administration of their employer, university School or Department.

The grant will be awarded to a single postgraduate/postdoctoral researcher and the maximum amount of the grant is **AUD$3,000.00** inclusive of GST. The size of the grant means that the CISS Postgraduate Research Grant may:

- bridge a gap in existing funding,
- be used to instigate a pilot study,
- be devoted to travel costs in the field,
- be used to purchase equipment, or
- be used for professional development (eg training courses).

Please note: the grant **cannot** be used to support or supplement travel to, or the registration costs of, conferences or workshops.

The overall objective of the grant is to provide financial support for invasive species research that will ultimately result in tangible outcomes for management. The scope of the grant is open to terrestrial, marine, freshwater or social research on animals, plants, pathogens or capacity building within communities and included projects for the prevention and/or detection of invasive species. The grant aims to draw out innovative ideas to extend or raise the impact of existing research projects. The grant must be spent within 12 months of the date of notification of the award.

Applications are due by 5pm EDST on the 18th December 2020.

Please note:

a. Late applications cannot be accepted
b. Applicants will be notified of the outcome of their application by the 22nd January 2021
c. Applications will be assessed against the selection criteria by a panel comprising representatives of CISS research staff, partner organisations and/or external independent assessors.

d. If you have any questions or require further information that is not provided in the Instructions to Applicants, please send your inquiries to tony.buckmaster@invasives.com.au

Instructions to applicants

Your Proposal

You must prepare a brief proposal that explains how you want to use the grant and how it will benefit your project and to CISS. Your proposal must be a maximum of four (A4) pages (in Times New Roman font size 12 or equivalent). Please provide the following information in your proposal:

a. Your name, address and host university/employer for your research project.
b. Research project title and summary (<350 words).
c. Your expenditure plan for the grant, including:
   - a description of what you want to do with the grant, including anticipated outcomes and significance,
   - a justification for how the proposed use of the grant will contribute to your research and the aims of CISS (i.e. will be a good use of CISS funds),
   - your methods and/or project design (if appropriate), and
   - a timeline or schedule for the work supported by the grant.
d. A brief budget that clearly supports your expenditure plan and represents good value for money.
e. A brief CV demonstrating your track record of achievements relevant to your proposal.
f. A supporting reference from your PhD supervisor highlighting how this award will contribute to your project and/or your professional development.
g. A signed statement from your supervisor verifying that the project has been represented accurately and that the Institution is prepared to administer the award.

Proposals should be written concisely and so that a person without familiarity or specialist knowledge with the research project can evaluate it.

Selection Criteria

Applications for the CISS Postgraduate Research Grant will be assessed on the following criteria:

- Demonstrated benefit to the research project and goals of CISS
- Proposal represents good value for money
- Track record of the applicant moderated by the length of time in research (ie an early stage PhD researcher will not be expected to have the same track record of research and publication output as a late stage postdoctoral researcher)

Conditions of award

1. The grantee must provide a project report to the CISS RD&E Manager by 18th December 2021. This report should include:

   a. An abstract of up to 400 words suitable for publication in the CISS Feral Flyer newsletter. The abstract should inform members of the nature and outcomes of

the use of the grant. As there are many research disciplines in CISS, the grantee should assume limited prior knowledge on the part of readers and the abstract should be written in a relatively informal style compatible with past Feral Flyer Newsletters.

b. The main body of the report should include a summary of the results of the work undertaken using the grant and their significance and implications, a financial account of how the grant was spent (receipts should not be forwarded with the report, but should be retained for six months in case they are required by CISS auditors), and a statement of any publications that may arise from this support. Project reports may be posted on the CISS website.

2. The results of research supported by this award, where possible, should be published in the scientific literature.
3. The grantee must undertake to acknowledge the support provided by CISS in any publications or spoken presentations arising from the research. A copy of relevant publications or conference abstracts should be forwarded to the CISS RD&E Manager.
4. Any native animal specimens which may be collected as a result of support by the grant must be offered to an approved public (not private) zoological collection. Normally this means deposition in the collections of a State Museum.
5. Upon completion of the project, the grantee must consult with CISS about the ultimate disposition of any equipment purchased using funds from the CISS Postgraduate Research Grant. Normally such equipment will become the property of the host institution in which the work is carried out. In any case, when the grantee is not using this equipment it should be made available to others whose projects will benefit from its use.
6. Applicants must indicate that they have obtained (or will obtain) all necessary permits and animal or human ethics approval from relevant authorities to carry out the research supported by the 2020 CISS Postgraduate Research Grant. The grant will be conditional on all necessary permits being obtained before the research begins.
7. Applicants are required to be Postgraduate (Masters by research or PhD) or Postdoctoral researchers working on CISS or related research projects.

Evaluation of the Centre for Invasive Species Solutions Balanced Researcher Program

December 2021

Independent evaluation prepared for the Centre for Invasive Species Solutions

Prepared by:
Dr Saan Ecker

Inter-relate Consulting

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Executive Summary

An independent evaluation of the Balanced Researcher Program (BRP), inclusive of the BRP and the Balanced Scientist Program was conducted to assess outcomes of the program, in the context of the current phase of the program coming to an end. This evaluation was the third and final evaluation of the BRP.

Progress towards goals was evaluated through assessing the perspectives of program participants and also by benchmarking against other post-graduate course evaluations. The evaluation included an online survey with 25 past and current participants and follow-up interviews with four participants and the program coordinator. The evaluation assessed outcomes related to goals of the program for work-ready graduates and enhanced skills and competencies, including interpersonal and personal skills, team, leadership and collaboration skills, communication (oral and written) skills, research skills relevant to their discipline and understanding of and connectivity with CRCs.

Program goals have been generally achieved including a rate of academic award completion considerably higher than the national average. Results from the current and previous evaluations show many similarities in participants' reported outcomes including enriched experience of PhD studies, enhanced employability and improved interpersonal and research skills. Social, communication and networking skills developed during the BRP appear to be the most valued of the wide diversity of skills and competencies developed.

Training camps were considered effective and enriching due to the combined personal and professional capacities enhanced by attendance. Additional training experiences, including courses and conference attendance occurring outside camps was also highly valued by participants, both for the content and the networking opportunities afforded. An important aspect of the BRP was that participants reported they had not previously encountered several of the training topics (e.g., interpersonal skills, media and writing/publication skills training) and this was a valuable enhancement of skills not provided elsewhere in their academic training.

Other mechanisms of the program including the development plan, record of achievement and training logs were valued by respondents, however the function of these post studies was somewhat unclear. Participant's responses demonstrated they have adherence to values and objectives consistent with the mission of the IA CRC/CISS and ongoing connectivity with the CRC/CISS through acknowledgement or promotion in appropriate forums.

A major outcome of the program, which is beyond the scope of program goals, has been to create a significant sense of cohesion, particularly between participants within cohorts, but also with academics involved and wider networks in the invasive species and natural resource management fields. The environment allowed a wide range of collaborations and linkages to form and ongoing and lasting relationships that offer both professional and personal support. At least for some participants, online training and content, required during Covid restrictions, has not resulted in the same cohesiveness and belonging that face-to-face experiences have.

The BRP was shown to have unique strengths relative to other university learning when general skills and competencies developed through the BRP were benchmarked against other postgraduate programs. This included a strong focus on communication and teamwork, work integrated learning, community service values and fostering of leadership roles. BRP participant scores related to writing, speaking, and working effectively with others were relatively higher

when benchmarked against other postgraduate courses. Strengths of the BRP in enriching career experiences were demonstrated by higher than average participation in research activities; community service and volunteer work; participating in a study or learning community; and holding university or community leadership positions.

Improvements and modifications suggested by participants for future iterations of the program were similar to suggestions in earlier evaluations, possibly influenced by participants from earlier cohorts not being aware of some updates to the program. There were also a number of new suggestions related to the current economic and social environment including the need to address reduced opportunities for academic positions and impacts of Covid restrictions within the delivery of future iterations of the program.

Recommendations

As for previous evaluations, this review has confirmed that the program is valued by participants throughout cohorts both during time of attendance and beyond. Participant responses reflected that program goals were generally achieved. As such, it is recommended that future graduate enhancement programs undertaken in collaboration with the CISS be based on the foundations of the BRP. In developing future iterations of the program, it is recommended that the following be considered:

Social skills and networking opportunities

Consistent with participants' comments on the importance of the social skills and networking aspects of the course, these components should remain a primary focus in new iterations of the program. This includes both formal and informal aspects. Formal training in team, leadership and collaboration skills was identified by participants as the most beneficial of all courses offered at training camps and a strong focus should remain on this aspect of training. Informal opportunities for interaction that allow spontaneous connections leading to collaborations, such as social events for participants, attendance at conferences, external trainings and work placement interactions were highly valued. Oversight of this aspect is particularly imperative while Covid restrictions are impacting ability to interact. Online forums need to be managed with particular attention of the need to encourage interaction both between students and academics/trainers.

Student needs assessment

Needs assessment could potentially be more extensive than previous iterations of the program, as this has been commented on by participants numerous times, both in the current and in past evaluations. A thorough needs assessment, including learning styles, should be conducted for each student allowing targeted training and also to encourage co-learning opportunities such as peer-to-peer learning.

Integrating social science capacities

As for the current program, formal training is required to build 'soft science' or 'people skills' for biological and other scientists to support working with the invariably complex social systems associated with implementing invasive species or natural resource management programs. This aspect could also be more fully integrated throughout the program experience, beyond specific courses. This can be supported by integrating more social science students in student cohorts.

Multi-disciplinary student cohorts

Where possible, student cohort recruitment could aim to include a mix of disciplines and skill areas to enhance the formation of a diversely skilled, cohesive cohort that can collaborate to support each other with data collection, analysis, stakeholder engagement and communications.

Mandatory training camps and work placements

The value of both of these aspects appear to significantly outweigh costs associated and should remain integral. Allowing flexibility in both of these aspects is also important. As the most important outcome of work placements identified by participants was the networking value, assigning of placements should recognise that the opportunity to build networks may be equally or more important than the work tasks involved.

Managing expectations and uncertain futures

Futuring or other forms of future planning may be supportive for participants in developing work and study plans, both as individuals and as cohort student communities. This need for support with understanding and preparing for future trends was communicated by students from more recent cohorts in the context of declining work opportunities in natural resource management and academia.

Clarify role of program tools

There was some ambivalence regarding the usefulness of the BRP Record of Achievement in Research Leadership and Management and the Postgraduate Training Log and to a lesser extent the Postgraduate Development Plan. The role of these tools should be clarified early in the program. A clear and equitable process is needed for identifying and accessing opportunities for training, attending conferences and other supports.

Staffing for consistency and relevancy

Numerous comments were made regarding the benefits of a consistent program coordinator position that held an overview of the program and this should be replicated, as practical. Training staff and mentors need to have applied skills in the topic and be able to present from a position of both research and real-world experience to best engage students.

Manage wellbeing aspects

Supports and psychoeducation should be in place to help students incorporate self-care and address mental health issues that can be associated with the stress of graduate study and entering the workforce.

Assess the role of mentoring

The role of mentoring in the program needs to be clearly clarified and communicated to participants and mentors and a clear process developed to support this.

Introduction

The Balanced Researcher Program is a cross-institutional program facilitated by the Centre for Invasive Species Solutions (CISS), formerly the Invasive Animals CRC, based around a single theme (invasive animals). The program aims to provide support to graduates in addition to their specialised post-graduate research experience to prepare them for leadership roles in industry. The program commenced in 2005 and has involved 55 individuals undertaking post-graduate study. It's current phase is due for completion towards the close of 2022.

The program involves a formal 80 day career training program within its Higher Degree by Research (HDR) programs with participation a condition of top-up stipends. This includes training and support in areas such as research leadership and management, stakeholder and community engagement, project management, innovation and development, effective communication and media awareness. The program is facilitated through annual training camps which include a range of training and workshops; employer placement; additional training as required and leadership/self development skills development.

The aim of this evaluation is to review progress towards program aims including identifying benefits of the program and recommendations for modifications of potential future iterations of the program. The evaluation builds on previous evaluations undertaken in 2014 (Blackman, Buckmaster, & Sarre, 2014) and 2016 (Blackman & Moon, 2016) and involves an online survey with program participants and follow up interviews with participants and program staff.

Objectives and aims

The aim of this independent evaluation was to assess participant's perspectives of the degree to which the program has met its goals. Over-arching evaluation questions recommended by Dimond and Sarre (2011) were used to guide the evaluation, including assessing the benefits of the BRP program to both individual graduates and their studies and careers, understanding the place of collaborations and linkages in influencing career paths and determining what improvements can be made to the program that will better benefit participants in any future iteration of the program.

The evaluation aimed specifically to assess to what degree has the program met goals for the program including:

- Work-integrated learning leading to work-ready graduates;
- Enhanced skills and competence amongst graduates including interpersonal and personal skills; team, leadership and collaboration skills; research program skills; and communication (oral and written) skills
- Understanding and connectivity with the invasive animal sector and CISS

In addition, this evaluation aimed to assess outcomes of the BRP in the context of comparison with outcomes from other evaluations of post-graduate training programs to identify particular strengths or weaknesses associated with the BRP.

Method

Online survey

The survey instrument (Appendix 2) was developed and tested with the support of the program coordinator. Survey items were drawn from a number of sources including the instrument used in the previous evaluation (Blackman & Moon, 2016) and development of new questions. The 2016 survey instrument was not replicated exactly as the intent was to source new information as well as confirm previous findings, rather than a strictly longitudinal comparison. Questions were guided by the overarching objectives and goals of the BRP so that progress towards these goals could be assessed, taking into account that there had already been robust findings across the previous two evaluations (Blackman et al., 2014; Blackman & Moon, 2016).

To both identify specific generalist skills and capacities influenced by participation in the BRP and also to allow benchmarking against other student populations, some items were included that occur in the Australasian Survey of Student Engagement (AUSSE; Coates, 2008; Coates, 2011) and the Student Experiences Survey (SES;Social Research Centre, 2021). Both of these instruments have been widely validated and have been used on large student populations for which there is comparative data. Including these items allowed benchmarking of the outcomes of the BRP against outcomes across general postgraduate programs. The intent of including these items was not for comparison, as survey conditions were not consistent, but to identify any substantial differences between outcomes of the BRP and general postgraduate programs.

Survey participants completed 30 questions of which eight collected qualitative free text information and the remaining were quantitative, using Likert scale answers, numeric entry or ranking. The majority of quantitative questions were compulsory to achieve data integrity. Options to select ‘NA’ were allowed in most questions to ensure that respondents were not forced into answers that did not represent their experience. Logic was used to guide participants between questions such as choosing which training they had attended and then in the next question, ranking their automatically filled selection of training attended according to benefits. All free text questions could be skipped. As such, some of these questions were not answered by all respondents however responses were consistently high. The survey was online for six weeks during October/November 2021 with weekly reminders sent to participants who had not completed the survey, as identified by Survey Monkey software. Participants were offered the incentive of entering into a draw for a publication voucher to encourage uptake for survey completions.

Semi-structured interviews

Survey respondents were invited to participate in a follow-up interview by clicking on a link at the end of the survey which took them to another survey where they could enter their contact details, so as to protect confidentiality of responses. Several invites were sent to participants to encourage participation and entry in a draw for a publication voucher was offered to encourage interview participation. Four participants participated in interviews which each took around 30 minutes. Interview questions drew on recommendations for semi-structured interviews by Dimond and Sarre (2011) and included the following questions.

- How and when were you involved with the BSP/BRP?

- What was the most significant change that came out of BRP/BSP for you?
- What was the most and least important aspects of the training camps for you?
- Was there anything missing from the BRP/BSP for you?
- How did undertaking the BSP/BRP enhance your employability options?
- If the CRC or some other organisation were setting up another Enhanced PhD Programme, what advice would you give to improve it and why?
- Is there anything else you would like to add?

Analysis

Methods of analysis included descriptive statistics, comparison with results from previous evaluations (where possible) and inductive and deductive coding of interview content. Participant quotes are used in the report both to provide expression of common sentiments and to provide information on diversity of experiences.

Quantitative results are mostly presented as percentages. The majority of questions used five point Likert scale based on levels of agreement (strongly disagree through to strongly agree), although some used a Likert scale of frequency (e.g. never through to often). Results are often presented as a positive result meaning that agree and strongly agree (or the equivalent 4th and 5th scale) are combined as a percentage. Percentage positive results are generally seen as being a more understandable measure and are straightforward to benchmark against.

Limitations

This study is subject to the usual limitations associated with self-selection of respondents in that this can present results either biased towards negative or positive experiences. Limitations of the specific survey questions are mentioned in the relevant section of this report.

Participants

BRP Participants (general)

The following information provided by the BRP coordinator summarises demographic and other information about BRP program participants for comparison with the evaluation study participant demographics and characteristics. Program participation included 55 students including 49 PhD, 3 Masters,1 Honours students and 2 Post-doctorates. There were 40 PhDs completed with 2 withdrawals and 6 yet to complete, but still within a 4 year timeframe, at the time of drafting this report. Excluding the 6 yet to complete, the completion ratio is 96% which compares very favourably to the annual 3 year moving average ratio of research doctoral completions to commencements for 2002-2010 for the Group of Eight universities of 68% (Palmer, 2012).

The average time for PhD completion was approximately 4 years. The longest PhD completion was 7 years. The 3 Masters were completed within 2 years and the Honours and post doctorates were also completed within allocated timeframes, with one post-doc ongoing. Estimated average age of participants when they started the program was between 25-30, which was also the most frequently occurring age range. Women made up 65% (36) of participants. Estimated ages ranged from 18-25 to 50-55. Of the students, 36 were domestic with the remaining students International. BSP Cohort 1 had 11 students starting in 2006 or before, BSP Cohort 2 had 13 starting in 2007, BSP Cohort 3 (2008-10) had 8 students and 11 started in the 2013 BRP Cohort, with the remaining 12 starting after 2014.

Evaluation study participants

The survey was delivered using Survey Monkey (SurveyMonkey, Palo Alto California, www.surveymonkey.com), with a link emailed to participant email addresses provided by the program coordinator. The survey was sent to 47 graduates or current students. Email addresses of some graduates were not available, so they could not be included in the study.

A total of 25 students and graduates completed the survey, a response rate of 53%. Of the respondents, 68% (17) were female and the remainder (8) were male. Most students were domestic students (72%: 18) with 7 International students. Full-time students made up 84% of respondents with the remainder nominating as both full-time and part-time. Average age of respondents was 40, ranging from their 20's to 50's. Generally respondent demographics were representative of the BRP participant group. Four BRP participants were interviewed, 2 male and 2 female and the course coordinator was also interviewed.

There was good representation across the cohorts (Table 6) although there was higher relative representation of the most recent cohort (2016 and after). There were 6 (24%) respondents from BSP Cohort 1 (2006); 3 (12%) from BSP Cohort 2 (2007); 2 (8%) from BSP Cohort 3 (2008/9); 5 (20%) from the 2013 BRP Cohort, 2 (4%)from 2014, and 7 (28%) from 2016 onwards.

Findings

Overall experience

Respondents rated statements about their overall experience (

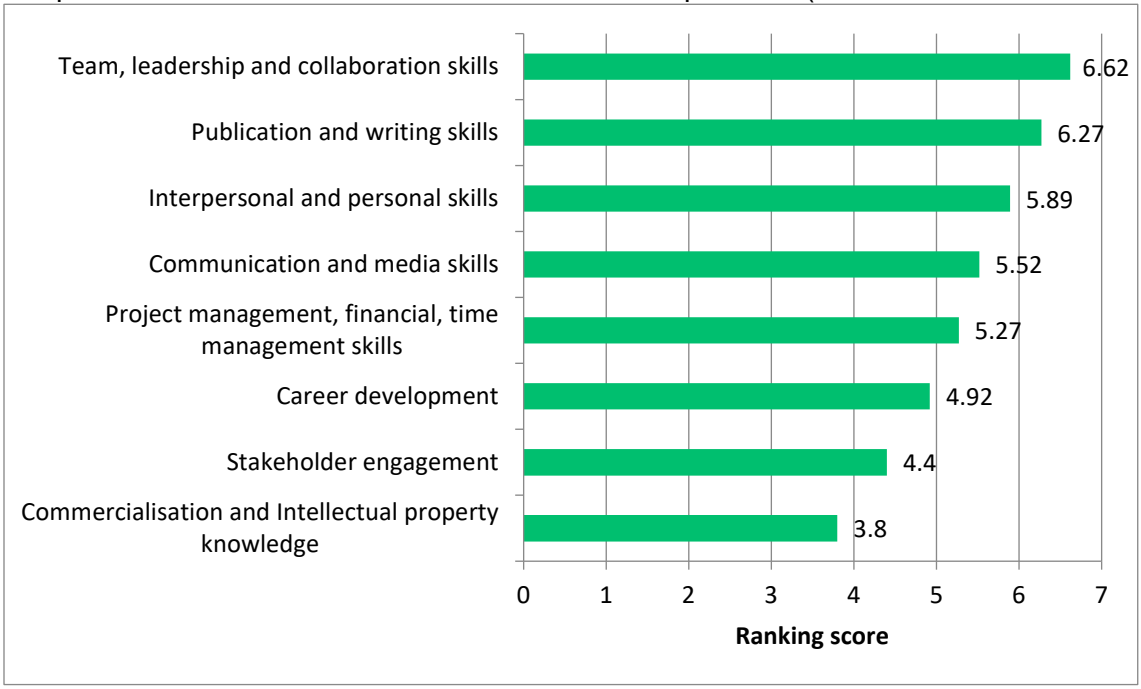

Table 8). All participants agreed that the BRP enriched their overall PhD/Masters/other graduate study experience with 72% strongly agreeing and 28% agreeing. Most participants (76%) agreed that the BRP had helped to make them more employment ready although 20% showed ambivalence around this, neither agreeing nor disagreeing to this statement. One participant disagreed with this statement. An important context to this result is that there has been

significant variation in opportunities for employment in natural resource management and invasives species fields during the period of the BRP, which could potentially influence responses to statements about employability.

All participants agreed that the BRP had aided professional development with 56% strongly agreeing. Most participants also agreed that the BRP had aided their personal development (84%) and 16% of participants neither agreed nor disagreed to this statement.

Out of the responses to the free text question about the best aspects of the BRP for them (N=23), the majority were about social cohesion and interpersonal development followed by training generally, specifically training in communication and 'soft skills', extra time to complete their PhD and external networking. In this question and generally throughout the survey responses, respondents noted that they greatly valued the efforts of the program coordinator and reported that contact with the coordinator helped anchor them to the program.

Training camps

Respondents (N=23) reported that they had attended an average of three face to face training camps with most attending three (40%), 24% attended one, 16% attended four and one participant reported they attended five. Online training camps implemented following Covid-19 lockdowns were attended by two of the respondents. Sample numbers were such that face-to-face versus online experiences could not be compared quantitatively.

All statements regarding value of the training camps received relatively high agreement (Table 9). The highest ranking statement was that the 'social aspects of the training camps were valuable' with 84% agreeing, of which 60% strongly agreed. The remaining neither agreed nor disagreed to this statement. This was closely followed by 'specialised courses were helpful' with all participants agreeing and 40% strongly agreeing.

The value of mentoring sessions and the increased likelihood of publication did not receive as high agreement as the other statements, although still relatively high. There were 12% of respondents who strongly agreed and 44% agreed that the camps increased publication likelihood and 16% disagreed to this statement, with the remaining 24% neither agreeing nor disagreeing. A similar trend was seen with the value of mentoring although more respondents strongly agreed on the value of mentoring sessions (28%).

Qualitative data about training camps was largely enthusiastic with participants reporting that these were important for a range of reasons, primarily connection and networking with other students and researchers. Participants reported on enhanced personal and professional relationships as a result of connections made during the camps. Participants from recent cohorts did not have the opportunity to attend as many camps due to Covid restrictions. One interviewee who said they attended only one camp face-to-face and the remaining content online, commented on the lack of cohesion and belonging that they experienced during online content compared to the face-to-face camp. Their comments, including that their lack of belonging was not noticed (and they did not mention it) suggested that nuanced responses to individuals was more challenging during online interactions.

Training during camps

Respondents selected from Yes/No/Not sure in regard to whether they had attended a list courses which had been available at camps. The most reported training attended during training camps (Table 7) was Publication and writing skills (91%) following by Team, leadership and

collaboration skills and Communication and media skills (both 86%) and Interpersonal and personal skills (79%). The choice of 'not sure' cannot be accurately interpreted but could be construed as the course having in sufficient impact to remember, with 'not sure' selections for a number of courses.

Respondents ranked all training courses that they had attended by perceived benefit. Students could only provide ranking for courses they had nominated as having attended. A ranking score was calculated based on the highest rank overall as shown in Figure 4 in Appendix 1. Team leadership and collaboration skills ranked highest with 62% of respondents ranking this either 1st or 2nd followed by Publication and writing skills (59% ranking this either 1st or 2nd). Interpersonal and personal skills was reported as the next most beneficial training with 37% ranking this either 1st or 2nd). Respondents were invited to describe the benefits they received from the 3 training courses they had ranked most highly, and these comments are summarised below.

Team, leadership and collaboration skills

Respondents consistently reported positive benefits relating to team, leadership and collaboration skills, both from training workshops and the general environment experienced at the camps. Respondents from earlier cohorts noted how valuable these skills were in the workplace after completing their PhD (Respondents 5, 9 and 25). Another common sentiment for many respondents was that because they were studying biological sciences, they had not considered these skills as a necessity before and became aware via the training of how important these skills were:

It's a new environment for me, and I needed to know how collaboration works here. (Respondent 3)

One interviewee said their development in team skills during the BRP was the most significant impact of the program for them.

…working in conservation and environmental management, with large groups of people and stakeholders, you need those kinds of skills and need to understand people. I am now working with (a team of) 25 people and have to coordinate with people. I am happy with my abilities because of the courses. (Interviewee)

Specific valued aspects of training in these skills included "getting to know people and how to collaborate" (Respondent 22), "making networks with other students and mentors" (Respondent 18), gaining "understanding of how to work with people with different personality traits" (Interviewee) and gaining "insights and skills into building and maintaining a team and attributes that make a team successful" (Respondent 14).

Publication and Writing Skills

Participants valued this training, with some noting they had not had access to this type of training before.

One of the first writing workshops I've attended which covers relevant specifics on how to write well (e.g., how to structure a sentence, choice of language etc.). One of the best workshops I've attended through my candidature. (Respondent 13)

Several respondents noted they valued having dedicated time to work on manuscripts:

Explicit time set aside to smash out a publication draft really helps to avoid procrastination and getting instant feedback from an experienced mentor really boosted my confidence. (Respondent 12)

The mentoring and feedback aspect of writing was mentioned by several respondents as highly valued.

Great doing writing process with senior scientists, really humanises industry scientists and realise that everyone struggles. (Respondent 11)

Other aspects that were valued were information on how to lay out manuscripts, ideas for manuscripts (Respondent 9) and information on fulfilling expectations of some journals (Respondent 3).

A number of respondents reported that the writing and publication workshop came at a time in their process when they were not yet motivated to write. This concurred with program coordinator comments that some participants were initially reluctant to attend writing workshops but generally would value what they had learned retrospectively.

Interpersonal and personal skills

Respondents' comments on interpersonal and personal skills emphasised how the training and the overall focus within the BRP on this improved their experience during and beyond the BRP. Attesting to the role of this focus on addressing isolation and low self-evaluation that can be associated with PhD studies, one respondent said this training "made the PhD experience less lonely" (Respondent 24) and another said "it built my confidence" (Respondent 16).

A frequent comment from survey respondents and interviewees was that they had not encountered interpersonal skill development previous to participating in the BRP and they were enriched by exposure to this:

I have never attended a training that emphasised this topic. And I found it really helpful. (Respondent 21)

Many biological science courses don't focus on interpersonal and personal skills. It's important to understand myself better. (Respondent 2).

Several respondents mentioned having insight during this training that their work would require people skills to be successful. Respondents mentioned the value of conflict resolution skills, networking skills and better understanding personality and communication styles during their BRP participation and also into the future.

Personality profiles were the start of a very long learning process for me that has been invaluable. (Respondent 11)

Describing the overall sentiment expressed by participants, one respondent said the best aspect of the BRP was for them was:

Bringing students together to learn about the 'soft skills', as well as science. In my experience, these often get ignored in scientific career development. (Interviewee)

Media and communication

Comments about media and communication skills related to being able to better share information and outcomes of their research including “exposure to ways to communicate science to wide audiences” (Respondent 22). One respondent noted the benefits of this training on achieving on ground outcomes:

Dealing with media and communicating the result of my research to the non-expert meant I was able to effectively convert my research into meaningful actions on ground. (Respondent 14)

Commonly respondents said that they had not had training in this previously and observed that they were “widely transferable skills, not otherwise taught” (Respondent 8). Several respondents noted that this training also built confidence in communication with one respondent saying:

Media skills was a big gap for me, so running some simulations made the whole idea less terrifying and I took away some great tips (Respondent 12).

Stakeholder engagement

As another social skill, respondents commented on the increased understanding of the importance and benefits of stakeholder engagement that they discovered through this training. One respondent joked that “I hadn't heard the word stakeholder before!” (Respondent 8). One interviewee noted that most people working in the IS field will have and complex diverse stakeholder arrangements and expressed gratitude that they had developed skills to manage this:

I had a lot of stakeholders to deal with in my project and this training really helped me.

Other training at camps

Other training during camps that respondents frequently noted as beneficial in free text responses included career development, project management grant and proposal writing and statistics courses.

Social networking and cohesion

While not a specific training, this aspect of the BRP was arguably the most valued aspect of the program according to participant comments. Of the 23 respondents to the free text question enquiring about the best aspects of the BRP, 11 referred to this aspect. Some of the sentiments expressed include the following:

(The best aspect of the BRP was ..) the camps and interaction between fellow students. Many problems were solved around a fire over a beer. The additional training in teams and interpersonal skills has definitely helped in workplace situations since the BRP, as has much of the training that I received, but I think the camaraderie of the student cohort was the defining feature. (Respondent 12).

Another respondent commented on the social cohesion aspect of the BRP:

(The BRP) provided a group of peers to interact with. Our projects tended to be unique in the University curriculum and so lab/group people did not always understand our problems. The BRP program provided peers for discussions of problems and issues. (Respondent 6)

The student camps provided an environment for this networking and cohesion to establish and consolidate beyond those events to enable “strong connections built through casual conversations with other students and staff” (Respondent 13). Many respondents noted that

these relationships have continued after completion. Another respondent noted the importance of the camps in developing social cohesion:

(The best aspect of the BRP was…) student camps. The opportunity to meet and talk with students at the same phase of their research as you, to know that you are not alone and that we all tend to struggle with the same thing. Many of these people are colleagues and friends today. (Respondent 17)

Respondents mentioned this social cohesion being enriched both by working with others in the same field and working with people with different backgrounds and disciplines. The environment was "collaborative rather than competitive" meaning that participants could ask and give support more freely than is typical in academic settings (Interviewee).

Additional training

Respondents were asked to nominate training they had attended through the BRP, additional to training at the training camps. Responses about additional training (N=22) described a wide range of training activities (Table 10). As this was a free text question, this does not represent an exhaustive list of training attended.

The most frequently noted training was statistical analysis, mostly R. The next most frequently nominated training was attending conferences with many noting they had been supported to attend the Australian Vertebrate Pest Conference, as well as other conferences. Respondents also reported on attending the Publishing with Impact course. Others reported they had attended training specific to their research such as courses on genetics, facilitation and advanced four-wheel driving (4WD). Participants also noted monthly catch-ups in response to this question.

Respondents described a wide range of benefits of this additional training also summarised in Table 10. Statistical analysis training gave respondents "widely transferable, technical and practical skills" (Respondent 15), and "a basic understanding of regularly used programs" (Respondent 21). Respondents noted attending conferences allowed networking and collaborations, as well as the chance to "share research and engage stakeholders" (Respondent 20):

… these opportunities allowed me to meet with others in my field, and helped me establish a project collaboration, which would not have been possible otherwise. (Respondent 11)

The benefits of specific training were described as 'providing the foundations for my research' (Respondent 17) and:

Exposure to new methods specific to my field, some of which I used in my PhD and some of which I am now at least aware of if relevant situations come up in future research. (Respondent 12)

Two respondents noted the value of the monthly catch-ups:

The monthly Zoom catch-ups are extremely helpful to me, as I can talk about successes and troubles with people outside of my university bubble, that might experience similar things. (Respondent 11)

Discussions and evaluations of individual presentations during the BRP monthly catch up has helped a lot of us who are not very outspoken in presentations like conferences. (Respondent 19)

As well as expected benefits about increased competence in research skills, a recurring theme was that this additional training allowed further interaction with other students within the BRP.

Industry placements

Half of the respondents (12) said that they had completed an industry placement. Reasons for not completing were not collected but may be related to being too early in the program for the 6 respondents from the recent cohort. One respondent from a recent cohort said they had not been offered a placement in the context of Covid lockdowns.

The industry placements were noted as the best aspect of the BRP by some respondents.

The best thing for me was the industry work experience. I am grateful for the funding that BRP provided for us to be able to undertake the work experience. (Interviewee)

Out of the statements that respondents rated regarding placements (Table 10: Training attended additional to training camp courses

Type of training attended	No. of respondents reporting attendance	Benefits reported by respondents associated with training type
Statistical Analysis	11	Improving statistical skills
Conference attendance	9	Networking, research communication & collaborations
Publishing with impact	5	Confidence to publish
Specific training (e.g. genetics, advanced 4WD)	5	Research skill development
MARK	3	Research skill development

GIS	2	Research skill development
Zoom catch-up	2	Networking

(N=22) NB: This question was a free text entry so does not represent exhaustive data on training attended

Table 11) 'Improved knowledge and skills that will contribute/have contributed to employability' was the most agreed statement, with 92% agreeing to this.

The statements 'Helped me form networking and professional contacts', 'Helped me gain insight into the mechanisms and processes of my chosen industry' and 'Helped me gain ideas, experience and knowledge that I can/did use to aid my research' all had similar levels of agreement with 83% respondents agreeing to all of these statements and no disagreement.

Interview data also indicated that industry placements were highly beneficial in forming networks and professional contacts. One interviewee noted that their placement in a state government setting allowed them to network with scientists in their field such that this led to future work and these remain important networks a decade after completion.

'Helped me blend academic learning with workplace experience' was the least agreed statement. Interview comments that might explain the slightly lower agreement level to this include that placements were not always directly related to the research topic, while they may have had other indirect benefits, such as opportunities to work with stakeholders. To put this in context, this item was taken from the AUSSE Work Integrated Learning sub-scale ('Blended academic learning with workplace experience') and positive (agreed and strongly agreed) scores on this for Australian national student average was 32% (Radloff & Coates, 2010) and 58% for respondents to the current study.

Degree Completion

Of the 24 respondents answering this question, 54% (13) completed their thesis and coursework on time and 29% (7) said they submitted outside of the expected timeframe, with the remaining yet to submit. In response to the free text question about what could have helped to submit on time, respondents three noted that additional funding would have helped such as the following comments:

I was significantly slowed down early on by insufficient operating funds. Maybe information about funding grants, where to find them and how to optimise chances of success would have been a good thing to learn. (Respondent 1)

I ended up running out of scholarship money and giving up on my thesis (and consequently had to find other employment) until 3 months later my industry supervisor offered me some money to complete. (Interviewee)

Two respondents also noted that even the extended 4 year timeframe may not be sufficient for a field based PhD. In contrast, the value of the extended timeframes for ecological research was noted by an interviewee who observed that this extension of 6 months gave an advantage over other PhD student colleagues who had to complete in 3.5 years.

Other delays were explained by motivational issues (1 respondent) family and personal issues (3 respondents) and difficulty due to lack of supervision expertise because a new methodology was involved (1 respondent). As mentioned earlier in this report, program administration has recorded an extremely high completion rate of 96%.

Collaborations and Linkages

Respondents selected from a range of collaboration types, identified in the previous evaluation, that had been fostered as a result of participation in the BRP (N=24 Table 13). Learning new skills or techniques was reported as the most frequent type of collaboration or linkage (67% of respondents selected this), likely because this general term covers a wide range of activities. The next most frequent response was access to additional funding selected by 42% of respondents. Collaborations on joint publications, primary data collection, access to secondary data and generic support were also common with 32% of respondents selecting each of these.

Eighteen respondents completed the free text question about catalysts for collaboration. The most commonly noted catalyst was internal networking with students within the BRP program with 15 of the 18 respondents mentioning this. Respondents reported on longstanding and ongoing collaborations with members of their cohorts including on projects, publishing papers and cross-agency collaborations. The following quotes describe sentiments expressed about the value of networking with other students in forming collaborations:

The interactions with other students were one of the great benefits of the BRP. You realised that you were not alone and you could bounce ideas and thoughts off other students in other fields and get a broader perspective on where you were and the problems your research project was facing. (Respondent 12)

Discussing projects with others that were doing similar things (not conducted at my university) strengthened my understanding in the field. I also developed a project collaboration, sparked by a casual conversation in an online catch-up. (Respondent 13)

Respondents also noted the value of external networking including access to other agencies and academics through conferences and other events. One participant noted that external opportunities had been more valuable than the training because of the opportunity to network externally. The other main theme of catalysts was work placement with participants mentioning this as important in fostering collaborations.

Usefulness of tools

Respondent perspectives on the value of tools specific to the BRP were explored (Table 12). There was some ambivalence in responses with between 33-50% of respondents neither agreeing nor disagreeing as to whether the tools were useful. The Postgraduate Development Plan (PDP) was identified as the most useful tool with 54% of respondents agreeing to the statement that the PDP helped identify and prioritise training needs. The value of this tool was observed by one interviewee who commented that the PDP facilitated significant changes:

The training camps were nice and fun and it was good to get to know other students – but the most exciting (part) for me were the outcomes of the personal development plan which included conferences and specific training which was more relevant to my future employment. (Interviewee)

The role of the BRP Record of Achievement in Research Leadership and Management in enhancing employability was supported by 34%, with 46% neither agreeing or

disagreeing. Several respondents (50%) were ambivalent about the usefulness of the Postgraduate Training Log in enhancing their resume and there was relatively low agreement to this statement (21%) and some disagreement (13%). Based on qualitative data, these results may be explained by participants having more reliance on networks and their resumes for communicating their skills and capacities. For example, in response to a question on the usefulness of the tools, one interviewee answered that in the context of applying for jobs, they list all courses undertaken during the BRP but did not necessary refer to the training log or PDP. The limitation of this question is that there is no measure of the use of the tools, so it may be that respondents had attempted to use the tools to promote their employability and it was not successful, or they had not attempted to use the tools.

Identification with invasive species sector

Understanding of and connection to the invasive species sector, as fostered through the BRP, was explored by asking respondents to rate statements concerning their belonging and commitment to this sector (

Table 14). Respondents mostly agreed that 'Being a part of the BRP has fostered a sense of belonging to the IS R&D community/sector' (79%). There was also strong agreement to 'I identify with the mission of the IA CRC/CISS', with 79% of respondents agreeing to this. 'I am committed to integrating approaches for IS across agencies and jurisdictions' was agreed to by 66% of respondents.

Connectivity with the CRC was explored through asking about acknowledgement and promotion of the CRC (Table 14). All respondents reported that they acknowledged the IACRC/CISS in relevant publication and events, with 54% doing this regularly. Similarly, all respondents said they promote values and objectives consistent with the mission of the IA CRC/CISS in appropriate forums, with 38% doing this regularly. There was slightly less reported direct promotion (as compared to acknowledgement) of the IA CRC/CISS, however all except one respondent reported they did this some of the time. A limitation of this question is that there is no information on how often respondents had the opportunity to promote or acknowledge the IACRC/CISS. This is reflected in the selection of N/A by some respondents.

In interview comments, participants expressed loyalty and a sense of connectedness primarily with the BRP but also with the wider IA community. In contrast, one respondent commented that the overarching focus on IA management was difficult for them as their topic was not directly related to IA management and hence it was difficult to connect with this as a unifying principle.

One interviewee offered their PhD Acknowledgement to describe their gratitude for the CRC.

The Invasive Animals CRC has been the most generous and solid supporter of both myself and the project, and I am forever grateful for their financial and practical assistance… The Balanced Scientist program which provided me with … extra training during the last three years was a great opportunity.

General outcomes

General skills and competencies

Sixteen items were used from the General Learning and Development Outcomes subscales of the AUSSE (Coates, 2011) which relate to development of general competencies and general forms of individual and social development (

Table 16). The highest attributed contribution of the BRP towards these skills and competencies was ‘Acquiring job-related or work-related knowledge and skills’ selected by 88% of respondents. Writing and speaking effectively were the next most endorsed items at 79% and 75% respectively.

Benchmarking against results from postgraduate students completing the last AUSSE survey undertaken in 2012 (Table 17) provides some insight to the skills and capacity development specific to the BRP. BRP participant scores related to writing, speaking and working effectively with others were relatively higher than the AUSSE 2012 postgraduate results (Australian Council for Educational Research, 2012). Skills that might be developed during early study years, such as computer skills and learning to work effectively by oneself, received less attribution to the BRP, with participants likely to already have had these skills before entering the BRP.

Enriching experiences

Respondents also completed items adapted from the Enriching Educational Experiences sub-scale of the AUSSE, which asked whether participants had planned to or undertaken a range of activities (Table 18) The two most frequent experiences were ‘Work on a research project (outside of coursework requirements)’ and ‘Participate in a research group’. For both experiences, 78% said they had already done these activities. The next most frequent was ‘Community service and volunteer work’ with 59% selecting ‘done’ to this item. Although not directly comparable due to both different collection conditions and adaptation of items in some cases, benchmarking against AUSSE results reveals some strengths of the BRP. This includes greater participation in research and community service compared to average AUSSE scores. AUSSE 2012 (Australian Council for Educational Research, 2012) results found that 38% of postgraduate students reported ‘participating in a study or learning community’ and 21% said they had participated in ‘community service and volunteer work’.

Another strength of the program was indicated by 26% of respondents selecting ‘done’ to the item ‘Hold a leadership position in a university group or the community’. In the 2012 AUSSE, 9% of postgraduate students selected ‘done’ for the same item (Australian Council for Educational Research, 2012).

Suggestions for improvement

Sixteen survey respondents completed the free text question about potential improvements, of which three said no improvements were required. Interviewees also offered ideas for improvements. Suggestions were related to more or additional training, networking and mentoring, student needs and trainers. Many suggestions about training courses and camps were very similar to those documented in the previous evaluation (Blackman & Moon, 2016). The recurring themes on training and camps also emerging in the current evaluation included:

- Undertaking needs assessments for students and based on this offering a selection of courses that are appropriate to these needs, rather than a one size fits all course framework with the intent to ensure participants are using their time effectively and not learning skills they already possess.
- Addressing specific needs of mature aged students such as incorporating more interactive learning styles.
- Changes to the duration and regularity of training camps to allow more flexibility (e.g., for participants with children or other responsibilities). One participant (who had attended a

10-day camp) suggested more regular but shorter camps. (Camps have since been reduced to 5 days).

- Ensuring that trainers have appropriate connection with the content, for example one participant suggested that leadership training should be delivered from the academic, not business perspective. Another participant said “I would recommend that the person who facilitates the workshops is closer to the field (e.g., has an appropriate background). This way I think the workshops would be more tailored to the researchers” (Respondent 16).
- Considering timing of courses, with some respondents noting that writing and publication and commercialisation courses were offered at a time when they were not ready to utilise these effectively.
- More and additional training including on statistics and basic writing (i.e., earlier level than the publication writing courses offered)

Additional suggestions for improvement from the current evaluation are largely associated with the more recent economic and social (e.g., Covid) environment and include:

- Additional support to navigate becoming more competitive in the academic work environment which is becoming increasingly difficult to achieve. “More experience in becoming competitive as an academic in Australia and overseas would be helpful given the dire chances of getting an academic job in Australia” (Respondent 4).
- Further information on future work opportunities “maybe something about work placements, i.e., what's possibly available for us in the future” (Interviewee)
- Face-to-face rather in preference to online training camps and training, where practical. “I prefer the BRP camps face to face (rather) than the virtual. It's a good avenue for me to be completely away from my study location and usual daily routine, and to be more focused on the purpose” (Respondent 23)
- Incorporating more awareness around mental health issues, particularly in the context of Covid. “I would recommend adding something about mental health in (the) scientific community, especially in the time of lockdowns” (Respondent 16). One interviewee suggested that mental health support could be integrated into the team running the camps “If it’s about personal development, you can become vulnerable and people can crack, …, you need someone that can be there”.

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Appendix 1: Summary online survey results

For Likert scale items SD (Strongly disagree), D (Disagree), N (Neither agree nor disagree), A (Agree), SA (Strongly agree)

Table 6*:* Year that survey respondents started their BRP participation

Year started	Number of respondents	Percentage
2006	6	24%
2007	3	12%
2008	1	4%
2009	1	4%
2013	5	20%
2014	2	8%
2016 onwards	7	28%

Table 7: Courses attended during training camps

	Attended		
Training courses	Yes	No	Not sure
	%	%	%
Team, leadership and collaboration skills	88%	4%	8%
Career development	50%	17%	33%
Project management, financial, time management skills	46%	17%	38%

Communication and media skills	88%	13%	0%
Publication and writing skills	92%	4%	4%
Interpersonal and personal skills	79%	13%	8%
Commercialisation and Intellectual property knowledge	63%	17%	21%
Stakeholder engagement	42%	25%	33%

N=24

Figure 4: Ranking of courses attended at training camps by benefits

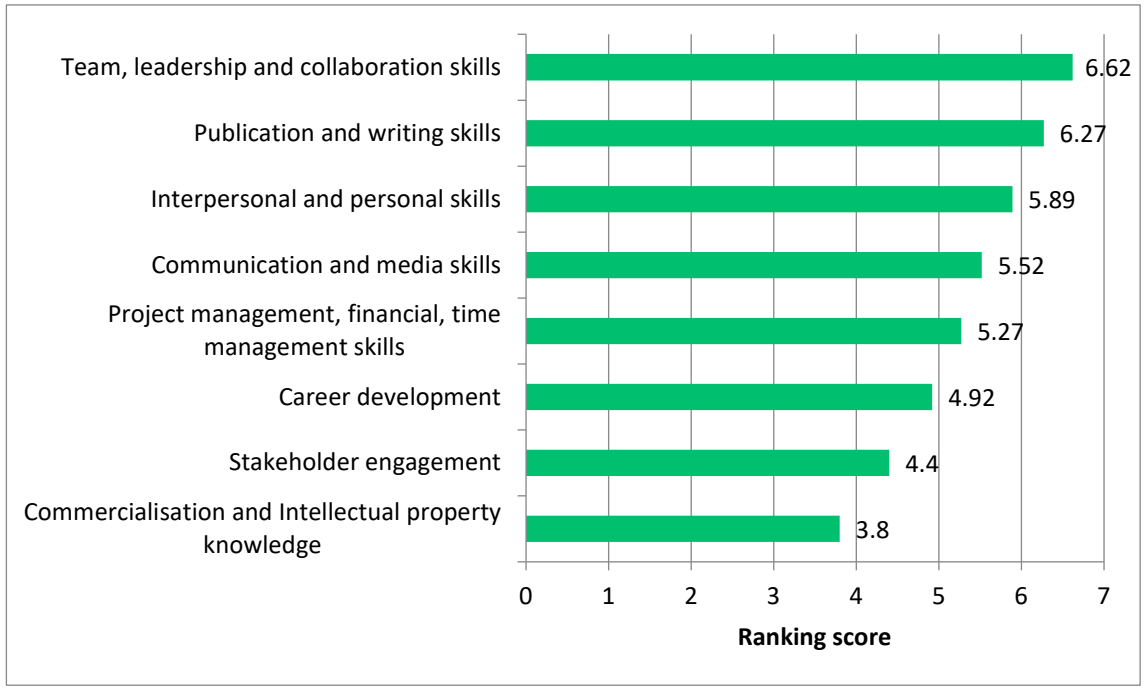

Table 8: Overall experience of BRP

Overall experience	SD	D	N	A	SA	N/A
The BRP has enriched my overall PhD/Masters experience	0%	0%	0%	28%	72%	0%
The BRP has helped to make me more employment-ready	0%	0%	20%	44%	32%	4%
The BRP has aided my professional development	0%	0%	0%	44%	56%	0%
The BRP aided my personal development	0%	0%	16%	36%	48%	0%

N=25

Table 9: Experiences during training camps

Experiences at training camps	SD	D	N	A	SA	N/A
Specialised courses provided were helpful to me	0%	0%	0%	58%	42%	0%
Mentoring sessions were helpful to me	0%	0%	17%	46%	29%	8%
The social aspects of the training camps were valuable to me	0%	0%	13%	25%	63%	0%
The likelihood of publication of my research increased	0%	17%	25%	46%	13%	0%
Training offered was relevant to my needs	0%	4%	8%	54%	33%	0%

N=24

Table 10: Training attended additional to training camp courses

Type of training attended	No. of respondents reporting attendance	Benefits reported by respondents associated with training type
Statistical Analysis	11	Improving statistical skills
Conference attendance	9	Networking, research communication & collaborations
Publishing with impact	5	Confidence to publish
Specific training (e.g. genetics, advanced 4WD)	5	Research skill development
MARK	3	Research skill development
GIS	2	Research skill development
Zoom catch-up	2	Networking

(N=22) NB: This question was a free text entry so does not represent exhaustive data on training attended

Table 11: Experience of industry placement/ other work experience placement

Industry placement experience	SD	D	N	A	SA	N/A
Helped me blend academic learning with workplace experience	0%	8%	33%	25%	33%	0%
Improved knowledge and skills that will contribute/have contributed to employability	0%	0%	8%	58%	33%	0%
Helped me gain insight into the mechanisms and processes of my chosen industry	0%	8%	8%	42%	42%	0%

Helped me gain ideas, experience and knowledge that I can/did use to aid my research	0%	0%	17%	42%	42%	0%
Helped me form networking and professional contacts	0%	0%	17%	8%	75%	0%

N=12

Table 12: Usefulness of BRP tools

Assessment of BRP tools	SD	D	N	A	SA	N/A
My Postgraduate Development Plan (PDP) is/was useful for identifying and prioritising additional training needs	0%	0%	33%	50%	4%	13%
My Postgraduate Training Log is/was useful for enhancing my professional resume.	0%	13%	50%	13%	8%	17%
The BRP Record of Achievement in Research Leadership and Management will enhance/ has enhanced my credibility or competitiveness for future employment	0%	8%	46%	13%	21%	13%

N=24

Table 13: Types of collaborations/linkages as a result of participation in the BRP

Types of collaboration	Responses	No. of respondents
Learnt new skills/techniques	67%	16
Access to additional funding	42%	10
Joint publications	37%	9
Primary data collection	37%	9

Access to secondary data	37%	9
Employment or contract work	37%	9
Received additional support	37%	9
Developing grant applications	21%	5
No collaborations/linkages were formed through my participation in the BRP	12%	3
Other (please specify)	12%	3

N=24

Table 14: Identifying with the invasive species (IS) community R & D sector

Identification with invasive species community	SD	D	N	A	SA	N/A
Being a part of the BRP has fostered a sense of belonging to the IS R&D community/sector	0%	0%	17%	46%	33%	4%
I am committed to integrating approaches for IS across agencies and jurisdictions	0%	4%	21%	33%	33%	8%
I identify with the mission of the IA CRC/CISS	0%	0%	17%	58%	21%	4%

N=24

Table 15: Acknowledgement and promotion of the IA CRC/CISS

Acknowledgement/promotion of IACRC/ CISS	Never	Sometimes	Often	Regularly	N/A
I acknowledge the IA CRC/CISS in relevant verbal or written material (presentations, papers etc)	0%	29%	4%	54%	13%

I promote values and objectives consistent with the mission of the IA CRC/CISS in appropriate forums	0%	21%	21%	38%	21%
I promote the IA CRC/CISS in appropriate forums	4%	21%	25%	29%	21%

N=24

Table 16: Extent to which BRP participation contributed to general skills

Knowledge, skills and personal development areas influenced by participation in BRP	Not at all	Somewhat	Quite a lot	Very much	Don't know
Acquiring job-related or work-related knowledge and skills	0%	13%	42%	46%	0%
Writing clearly and effectively	4%	17%	33%	46%	0%
Speaking clearly and effectively	0%	25%	38%	38%	0%
Working effectively with others	0%	25%	25%	50%	0%
Thinking critically and analytically	4%	25%	29%	42%	0%
Understanding people of other backgrounds/ professions	0%	29%	38%	33%	0%
Analysing and solving problems	4%	29%	29%	38%	0%
Solving complex, real-world problems	4%	29%	33%	33%	0%
Acquiring a broad general education	0%	38%	17%	46%	0%
Understanding yourself	17%	25%	29%	29%	0%
Being more informed in your local and national community	8%	29%	38%	21%	4%

Contributing to your community	13%	25%	38%	21%	4%
Securing relevant work	13%	33%	17%	38%	0%
Learning effectively on your own	8%	46%	21%	25%	0%
Developing a personal code of values and ethics	13%	42%	25%	21%	0%
Using computing and information technology	17%	42%	29%	13%	0%

N=24 (Adapted from AUSSE survey instrument)

Table 17: Benchmarking against AUSSE 2012 Postgraduate student results for general skills

Knowledge, skills and personal development areas influenced by participation in BRP/ postgraduate program	Total BRP	Total AUSSE
Acquiring job-related or work-related knowledge and skills	88%	83%
Writing clearly and effectively	79%	65%
Speaking clearly and effectively	75%	56%
Working effectively with others	75%	49%
Thinking critically and analytically	71%	77%
Solving complex, real-world problems	67%	60%
Understanding yourself	58%	57%
Contributing to your community *	58%	33%
Securing relevant work	54%	41%
Learning effectively on your own	46%	71%

Developing a personal code of values and ethics	46%	49%
Using computing and information technology	42%	60%

(Adapted from AUSSE survey instrument)

**AUSSE item was 'contributing to the welfare of your community'*

Total = Quite a lot plus very much

Table 18: Activities respondents plan to do or have done after graduating from BRP

Activities following graduation	Have not considered	Have not decided	Do not plan to do	Plan to do	Done
Work on a research project (outside of coursework requirements)	4%	4%	0%	13%	78%
Participate in a research group	4%	0%	9%	9%	78%
Community service or volunteer work	18%	9%	5%	9%	59%
Undertake study in another discipline/ area	14%	14%	23%	9%	41%
Post-doctorate or other academic internship	13%	13%	26%	13%	35%
Hold a leadership position in a university group or the community	22%	13%	22%	17%	26%
Industry placement, internship or work experience (additional to BRP placement)	26%	9%	26%	13%	26%
Explore other career options (i.e. different to PhD/ Masters discipline or topic area)	33%	19%	10%	0%	38%
Study abroad or student exchange	30%	9%	30%	4%	26%

Culminating final-year experience additional to requirements (e.g project, summary paper etc.)	35%	0%	35%	13%	17%

*N=24 (*Adapted from AUSSE survey instrument)

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