



Submission to the Productivity Commission

Study of Science and Innovation

Invasive Animals Cooperative Research Centre

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August 2006

The Invasive Animals CRC is a member of the CRC Association and supports the Association's submission. This submission is intended to provide brief commentary only against the Commission's Terms of Reference, specifically from the viewpoint of an environmental CRC.

Introduction

The Invasive Animals Cooperative Research Centre is a new (Round 9) CRC, established in 2005/2006. Although classified as a "third round" CRC, following on from the Vertebrate Biocontrol CRC and the Pest Animal Control CRC, both our membership and technology interests have expanded significantly. The IA CRC now includes virtually all significant players in vertebrate animal control and we address a wide range of species, landscapes and technologies as well as social science interests.

Invasive Animals cost Australia at the very least \$720 million per annum² and cause significant social disruption. Worldwide, invasive species (plants and animals) are now recognized as the one of the top issues causing the reduction in biodiversity (generally ranking number two behind habitat destruction). Because Australian fauna and flora evolved in isolation for approximately 200 million years, the impact of European settlement and its introduction of a large number of new species had an enormous impact. Australia has the most number of endangered animals of any country in the world and we have lost more mammals in the last 200 years than any other country. The impact continues today, for example, freedom from the European starling affords the Western Australia grain industry a major advantage and an incursion may cost up to \$200 million in the first year.

Advantages of a Cooperative Research Centre

Innovation in the area of invasive animals faces a number of significant barriers. These include:

Critical mass

- All Australian jurisdictions have retained some capacity to conduct R&D into invasive animal issues. However, even within jurisdictions, this capacity is often split between agriculture and environment agencies and the largest grouping (NSW DPI) probably remains less than a dozen people, even with significant cash support from the IA CRC.

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² McLeod, R. (2004) Counting the Cost; Impact of Invasive Animals in Australia 2004. Cooperative Research Centre for Pest Animal Control. Canberra.

- A Cooperative Research Centre has the unique ability to improve the productivity of all R&D groups in the country by providing a significant, resourced networking opportunity to enable meaningful collaboration.
- A CRC provides an important focus for collaboration with overseas agencies. In the case of the IA CRC, overseas members include the Universities of York and Minnesota, the UK Department of Environment, Food and Agriculture and NZ's Landcare Research and Department of Conservation. The US Department of Agriculture is a major collaborator.

Regulation costs

- An innovation in invasive animal management, if a drug or toxin, requires all the regulatory scrutiny of a normal animal drug, plus exceptionally difficult field efficacy testing. Because the market is limited there is little incentive for private companies to develop new products, despite significant benefits to dispersed industries like wool and beef. Public-private experiments are generally needed to get new products over the "hump" of regulation by providing access to large field trials and comprehensive non-target monitoring. A CRC facilitates these partnerships.

"The other 98%"

Australia is unique in many environmental areas. We have the highest rate of endemism (animals and plants unique to the region) of anywhere on earth.

In many areas of research, Australia will make up to perhaps 2 to 4% of the world's research effort, and will be said to be "punching above its weight". However, invasive animals are one of those areas where most issues are uniquely Australian – we cannot draw on "the other 98%" of research conducted worldwide.

Where a problem is uniquely Australian, a Cooperative Research Centre often plays an important role in bringing together a "Team Australia" approach. In our case, the IA CRC will be the principle instrument for R&D within the Australian Pest Animal Plan, when endorsed by all Australian governments later this year.

Scope of the study

1. Report on:

- ***the economic impact of public support for science and innovation in Australia and, in particular, its impact on Australia's recent productivity performance;***
- ***whether there are adequate arrangements to benchmark outcomes from publicly supported science and innovation and to report on those outcomes as measured by the benchmarks.***

The analysis should cover all key elements of the innovation system, including research and development, taking into account interaction with private support for science and innovation, and paying regard to Australia's industrial structure.

It is extremely difficult to benchmark R&D performance for environmentally-based programs such as the Invasive Animals Cooperative Research Centres. We would point to two issues to demonstrate a commitment to measuring impact:

1. Our **Strategic Plan** (attached as Appendix 1) sets out 13 performance targets against which all activity is reported. We are attempting to build a culture of researchers dedicated to contributing to these priority targets. At review, we ask for demonstration of a "thick black line" linking researcher's activities to the targets, as opposed to simply conducting work in the general area of the target.

In this regard, it is very important in our view that funding arrangements for highly targeted areas such as ours to program-based, not project based and have the management wherewithal to link disparate projects that contribute to the target.

Generalised funding programs do not provide for the very tight linkages necessary to achieve the target, which will clearly have productivity benefits for a range of industries as well as the environment.

2. Our **Participants** number 41, including all virtually State and Territory Departments with an interest in our area of activity, as well as private sector firms. We regard the willingness of Participants to contribute to the CRC as an important measure in itself of a commitment to productivity improvements. CRC's are an extremely effective way of increasing Australia's business expenditure on R&D (BERD) and ensuring public spending to increase BERD is also well managed and spent on Australia's research priorities.

2. Identify impediments to the effective functioning of Australia's innovation system including knowledge transfer, technology acquisition and transfer, skills development, commercialisation, collaboration between research organisations and industry, and the creation and use of intellectual property, and identify any scope for improvements;

Disincentive for top researchers to work in CRCs

We believe the current arrangements for rewarding Universities for conduct of research through DEST block funding contains a **major disincentive** for Australia's top researchers to contribute to Cooperative Research Centres. Currently, when a University wins grants from the Australian Research Council and National Health and Medical Research Council, they receive a significant proportion higher funding from the DEST Block Funding Scheme than if the same size grant was won from a CRC.

Research programs compete, to a degree, for Australia's top researchers and students. However, the Performance Based Block Funding arrangements mean that Universities are financially better off to direct their top people to bid only for those schemes that best reward them, to the detriment of the CRCs. This has the effect of pushing the top researchers to less directed, more curiosity-based research and away from applied work.

The best outcome would be one that allows the top researchers to determine where they can make their best contribution as an individual. Our CRC can cite numerous examples of top researchers who very much want to spend a portion of their time doing applied work which is likely to "make a difference" during their career than purely curiosity-led work that may only provide benefits many years in the future. We quite often find eminent people that want to spend 10-30% of their time on applied work towards the end of their careers when they feel they can make a real difference. Very often, these people are pushed to continue as University "rainmakers", to attract a greater proportion of Performance Based Block Funding (money they themselves rarely gain access to – another source of frustration).

If almost one quarter of the Federal Governments' innovation spending is to be allocated to Universities based on "Performance": evaluation of that performance should not be biased to curiosity driven activities. It should be biased to addressing National Research Priorities.

Resolving conflicts of interest in intellectual property issues

We believe, as a principle, that publicly-employed individuals making significant contributions to generating valuable Intellectual Property should be able to make a financial gain without necessarily having to leave their institution. In our previous CRC, we had enormous difficulty having our member public institutions accept free limited-liability shares in our spin-off company. Providing individual incentives remains firmly in the "too hard" basket for many R&D organisations, but is a possible way of improving R&D performance in Australia at low or no cost.

We have not been able to satisfactorily resolve this issue, and would benefit from clearer national priorities.

Narrowness of Australian postgraduate training

It is now relatively rare that an Australian PhD graduate has undertaken a Masters program. Few are required to do any coursework during their PhD studies and most have entered University directly from school into a reasonably specialised degree. Very significant pressure is now placed on students to complete their PhD in three years. This is quite different from the European and North American experience where PhD graduates will generally be at least two years older (often much more) at graduation. The wider range of experience is important in later careers, which invariably requires flexibility.

Our CRC is providing all PhD students with a minimum of 80 days “non-PhD” training during their tenure with the CRC, to improve skills in communications, IP management, leadership and the like.

3. Identify the decision-making principles and programme design elements that:

- a) influence the effectiveness and efficiency of Australia's innovation system; and**
- b) guide the allocation of funding between and within the different components of Australia's innovation system;**

and identify any scope for improvements and, to the extent possible, comment on any implications from changing the level and balance of current support;

It is our experience that collaboration requires significant ongoing effort and it requires a balance in the relationship between collaborators. It is easy to get agreement that many research areas require end-user involvement, but it is more difficult to get the design of programs right. Funding schemes can range from those that require little more than a letter of support from an industry partner who has nothing to lose by helping a researcher get a grant through to virtual industry subsidies that use public money for something that was going to happen anyway

We recognise that CRC's are onerous to set up. However we believe that much of the effort is due to balancing the relationship of researchers and end-users, and therefore a major contributor to why CRC's are often so successful. Too much power in the hands of end-users can lead to short-term research that probably would have been done anyway. Too much power in the hands of researchers can lead to pure curiosity driven activity that may only be applied in the very long term. If government wants to fund “innovation hotspots” that increase BERD and encourage public R&D institutes into productive areas of national interest, CRC's are an excellent vehicle. In terms of programme design, CRCs offer many advantages

- ✓ Increase BERD
- ✓ Program based
- ✓ Wouldn't happen otherwise
- ✓ National Research Priorities
- ✓ Entry, Exit and Review advantages 'Big enough to make a difference, but not a behemoth.

4. Report on the broader social and environmental impacts of public support for science and innovation in Australia.

Most environmental issues require increased knowledge in order to avoid degradation or create wealth. We would argue again that environmental issues benefit from a program approach (a series of linked projects) to enable comprehensive research likely to make a difference. Short one-off projects in environmental areas often seem to achieve little more than problem description, or measuring decline.

Again, drawing from our experience, we see a need to undertake environmental research in a relatively “commercial” fashion, even if the end product or service is publicly available or publicly subsidised.

By way of example, Figure 1 illustrates the various projects we perceive as necessary to achieve a vital environmental tool – a feral cat bait. Traditional R&D will lead to the most publishable and exciting research getting, done, but not the rigorous testing work that is equally necessary for a product to result.

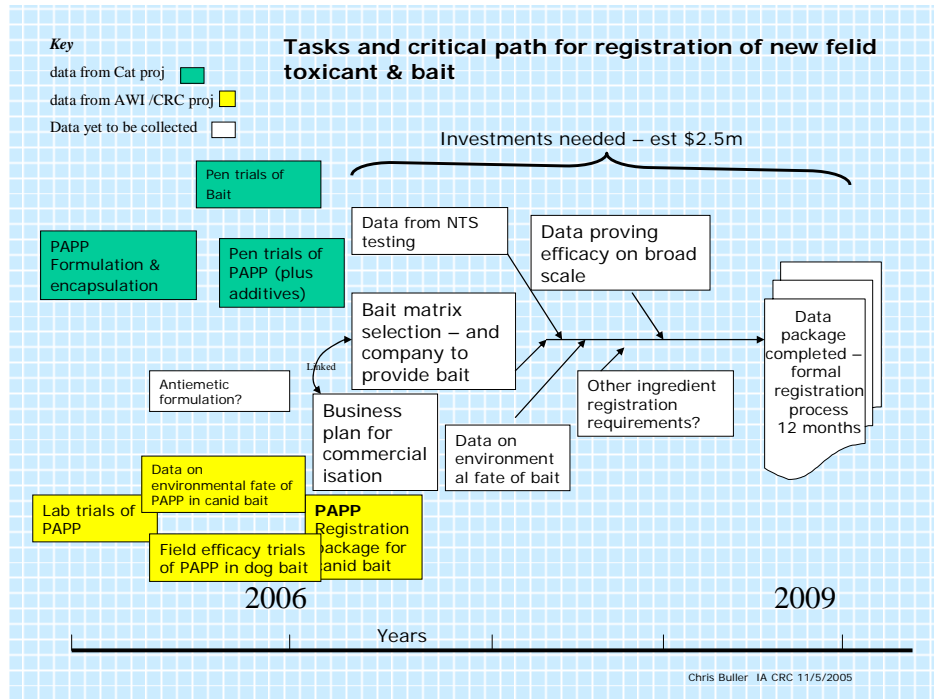


Figure 1. Necessary projects and scale to deliver an important environmental outcome.

Conclusion

Cooperative Research Centres are an effective way of addressing major environmental issues. In doing so, they can contribute to increasing Business Expenditure on R&D, address National Research Priorities and make a positive contribution to University postgraduate training.