



ROYAL ZOOLOGICAL SOCIETY OF NEW SOUTH WALES

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5 April 2016

Dr Larry Marshall
Chief Executive
CSIRO
Canberra
Email: Larry.Marshall@csiro.au

Dear Dr Marshall,

Re: Cuts to Environmental Science jobs in CSIRO

I am writing as the President of the Royal Zoological Society of NSW (RZS NSW), Australia's oldest and largest Zoological Society comprising approximately 1100 members, including scientists, ecologists and people passionate about the conservation of Australia's unique animals.

The Society is deeply concerned about the recent decision to cut the number of environmental science staff positions in the Land and Water Division of CSIRO. I understand that 100 full-time positions will be lost, representing 20-25% of scientists who specialise in biodiversity conservation, some of whom have been employed for decades. This is a major loss of critical scientific knowledge to environmental science in Australia. My understanding is that while budget cuts are widespread across CSIRO, biodiversity staff are suffering significant cuts. Further, these cuts compound the widespread loss of environmental science jobs in all state agencies in Australia and the recent demise of the world-leading CSIRO Division of Wildlife and Ecology.

Such a loss of scientific capacity is not sustainable and the impact on wildlife management will be felt for many decades. Expertise in wildlife conservation takes time to develop and cannot be easily replaced once the balance sheet improves. The staff at risk of losing their jobs are world leaders in biodiversity research and conservation. Their expertise is critical in the scientific assessment of decisions that will impact on biodiversity conservation Australia-wide. This expertise is relied upon by everyone making decisions about managing Australian wildlife and ecosystems, and their research publications and expert advice underpin informed conservation decisions both in Australia and overseas.

The 2011 Australian State of the Environment Report highlighted an ongoing loss and decline of biodiversity in Australia. Therefore, it is incongruous to be cutting staff with specialist expertise in biodiversity conservation at such a critical time. The loss of productive and well-respected researchers will set back the management of Australia's iconic wildlife and ecosystems by decades. It will severely undermine Australia's ability to comply with its international obligations for biodiversity conservation. Effective conservation desperately needs more scientists, not fewer.

CSIRO is uniquely placed to play the lead role in the long-term environmental monitoring and research of Australian ecosystems. After the demise of CSIRO's Division of Wildlife and Ecology, a previous Chief of the division, Professor Charles Krebs, wrote that wildlife research was being left to universities and State agencies (Krebs 2012). But universities cannot do this because of the three-year funding cycle and uncertainty in long-term secure funding. Over the last 5 years, State agencies have also cut their environmental science divisions revealing a distinct unwillingness to undertake any environmental science research. Only CSIRO has the capacity to undertake the long-

term, large-scale research needed to tackle the big environmental issues facing a rapidly changing Australia. The RZS NSW is of the very strong opinion that the proposed round of cuts to environmental science jobs will further undermine that capacity. I have attached Professor Krebs' article "What good is a CSIRO Division of Wildlife and Ecology anyway?" which further explains the very specific needs of an agency like CSIRO to serve environmental science in Australia.

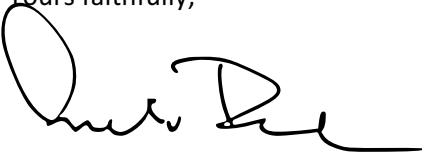
Another issue of considerable importance is the impact of the CSIRO cuts on the promotion of STEM subjects at university. Who is willing to finish a PhD in science for a fickle world of sudden cuts in jobs, even if you are a world leader in your field? Given that the Commonwealth Government is pushing innovation as the path for Australia's future, it is also saying 'but not in a government job'?

The RZS NSW was established in 1879. In looking back at our long heritage, it is obvious that Australia's greatest contributors are scientists with a long run in secure jobs. CSIRO is famous and admired for that role, which needs to continue if Australia's unique biodiversity is to be adequately understood and protected.

Surely there can be less damaging ways to cut costs in CSIRO than to squander decades of experience in wildlife management - an asset which can never be replaced and serves such a vital and extremely effective public role in Australia's research community.

The RZS NSW recommends as a matter of urgency that the CSIRO management rethink the cuts to biodiversity staff, and others, and sustains this vital research group.

Yours faithfully,

A handwritten signature in black ink, appearing to read 'Martin Predavec', written in a cursive style.

Dr Martin Predavec
President, Royal Zoological Society of NSW

What good is a CSIRO division of wildlife research anyway?

Charles J. Krebs

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ABSTRACT

Wildlife research has few immediate economic consequences, and over the last 10-20 years has collapsed as a serious research program within Australia's premier research organization, the Commonwealth Scientific and Industrial Research Organization (CSIRO). In spite of great public support for biodiversity and for Australia's iconic fauna, higher levels within CSIRO and both federal and many state governments have failed to provide adequate funding. I explore here some possible explanations based on my personal observations. The underlying causes are not confined to Australia, and lie deep in the psyche of politicians and managers who view science as a business that generates values measured only in dollars. A consequence of this economic world view is a fixation on economic growth rather than ecosystem well-being. The result in Australia is that wildlife research is being left to the states and the universities, augmented by private funding through foundations that care about the environment. Long-term, large-scale research questions are not being addressed, and organized and systematic monitoring for biodiversity impacts on a continental scale is nearly absent in Australia. Short-term ecological research is valuable and the contributions of the universities here are excellent, but in light of anticipated climate change we need to adopt a longer vision for understanding our iconic wildlife and the ecosystems that they inhabit.

Key words: long-term studies, monitoring, pure and applied research, top-down control

Introduction

Funding for scientific research has flowed freely in developed countries since World War II, but the motives in support of such funding have been varied. At one extreme are those who feel that scientific research must produce goods of economic value for humans. Science in this sense is completely an agent of economic growth and the evaluation of scientific research proposals becomes a judgment of whether or not it will successfully achieve the aim of GDP growth. At the other extreme are idealists who view science as a search for understanding of the world in which we live and the universe which we inhabit. For these idealists the evaluation of scientific work becomes a judgment of how successful it will be in increasing our understanding of the world in which we, our children and our children's children must live.

This tension between humans as economic rationalists and humans as seekers of knowledge plays out in politics as governments decide what level of funding should be directed to scientific research. The most revealing cases of this decision making occur when there is a shift in research funding within an established research organization. During the last decade this kind of shift has occurred within the Commonwealth Scientific and Industrial Research Organization (CSIRO) with the resulting demise of the Division of Wildlife and Ecology and its absorption into Sustainable Ecosystems (CSE). One consequence of this shift was that much of the ecological research on wildlife stopped, to the overall detriment of ecological research in Australia. In this paper I explore some of the reasons for this shift in research focus. My views are purely personal

and observational, with no inside 'leaks' or wiretaps to corroborate or challenge my interpretations. Whether my deductions are right or wrong is less important than the evaluation of what is now missing in wildlife research in Australia as a result of these decisions and what is needed in the future.

Historical perspective

From the time CSIRO was effectively established during the 1950s until sometime in the 1990s the mandate of CSIRO was to do research for the public good to help improve industrial processes and agricultural production. The value of this research was construed to flow to the Australian people in general rather than to any particular private company or corporation. Wildlife interacts with agriculture, and consequently much of the early work within particularly the Division of Entomology and the Division of Wildlife Research was focused on pest species of insects, birds and mammals. But chiefs of these and other divisions were given a broad mandate to carry out both pure and applied research. Examples abound. You cannot control insect pests unless you can identify them. You cannot undertake the management of marsupials unless you understand their reproductive biology. In a sense CSIRO adopted the medical model of research that approaches problems on a broad front utilizing both basic research and applied field trials.

During this golden era the Division of Wildlife Research and its subsequent morphs (Division of Wildlife and Rangelands, Division of Wildlife and Ecology) was the pre-eminent wildlife research organization in Australia

with a complement of scientists who were recognized around the world for their contributions to basic research on behavioural ecology, population dynamics, and marsupial biology as well as applied research on fire ecology, conservation biology, and innovative pest control.

But all of this began to change gradually throughout the 1990s as scientific funding for CSIRO became more and more restrictive and economic rationalism became the dominant view of both governments and the higher levels of management within CSIRO. One observable result was that the Division of Wildlife and Ecology was effectively dismantled during the first few years of this century and transformed into Sustainable Ecosystems. This transition, from about 2000 to 2005, marked the effective end of first-class wildlife research within CSIRO, and while there are still bright sparks within Sustainable Ecosystems it has for now lost its scientific impact and reputation.

There are two possible explanations for these transitions of the last decade. Version 1 suggests that all the important wildlife research in Australia was completed by 2000 and there was a need to move on to address landscape ecology and in particular social ecology. Version 2 suggests that continued funding cuts and the requirements for outside funding of a third or more of its budget made the Division a consulting company. No scientist could seriously believe version 1, and version 2 was predicted well by Doug Cocks (1992, pages 287-288). Version 1 is contradicted by the continued first-class wildlife research being carried out in universities and state departments. What has happened to explain the changes postulated in version 2?

Drivers of change

There has been a continued drop in federal government funding to CSIRO over the past 20 years, once funding levels are corrected for inflation and salary changes. I doubt that this decrease in funding was uniform across all divisions, and continued reorganizations effectively cloud this issue. The result, which no one within CSIRO questions, was that every year more and more external funding had to be found to continue with established research, to commence new research and to protect scientists and technicians from redundancy. External funding typically comes at a great cost because it is highly targeted and short-term, thus effectively eliminating any long-term vision and reducing the amount of basic research that can be permitted. Bidding for external funds commonly meant that 2X amount of research effort needed to be expended for 1X amount of dollars, so that the scientific staff were continually overrun. A niggling adjunct to this was the continually increasing costs of administration and, because divisional administrators did not have to earn any portion of their salaries from external funds, this added burden fell directly upon the scientists. Thus, on a *pro rata* basis, although approximately 30% of the divisional budget had to be generated by external funds, in fact about 50% or more of the divisional budget had to be found by scientists.

At the same time reduced funding on short-term contracts meant that permanent scientific positions nearly disappeared within CSE, replaced with post-doctoral

positions, and talented young scientists were faced with typically 3-year contracts. The net result was that fewer scientists of the highest quality could be attracted to start a career at CSIRO under these conditions.

A more insidious change has been the replacement of first-class scientists at the higher levels of the CSIRO administration with MBAs with little or no scientific experience. If science is deemed just another business, then MBAs will be highly effective in keeping research divisions operating at high efficiency. But if science demands another kind of intellect that is concerned more with analysis and synthesis than with organizational rituals, it is the death knell of a research organization to put MBAs in charge of serious scientists.

But all of these internal CSIRO changes were happening within a social context that reinforced the new world view. Many influential people in developed countries have little interest in the natural world, and it is a revelation to such people that things like ecosystem services exist. If the natural world is thought to consist of snakes, scorpions, and spiders, what is the value of biodiversity? Many scientists fall into this class either because they see technological fixes for every problem or because they feel that biology is molecular biology, and all other disciplines like ecology are stamp-collecting. The dominant paradigm of all these groups is that Mother-Nature-will-take-care-of-herself and we should thus be concerned only with the sciences that facilitate military might, human health, and economic growth. Biodiversity is best viewed on television and viewed as entertainment, soon to be surpassed by electronic games, and not something on which we need to do research.

By and large the news that ecologists provide to the media can be classified as bad news — the loss of species, the bleaching of corals, overfishing, pest and disease outbreaks, to name only a few. Who likes bad news, and the resolution of this problem is simple. If you are a corporation, hire an advertising company to put a positive spin on the problem and a negative image on the ecologists involved. If you are a government you have even better means at your disposal — the politics of ignorance. If you do not provide funding for scientific study of particular problems, you get no data and ignorance is bliss. Fortunately university and Non Government Organisations (NGO) researchers are able to bring many of these problems to the public's attention, but against this Malthusian background, you can be assured that governments do not wish to add to the bad news ledger (Hamilton and Maddison 2007, Wardell-Johnson 2008). The politics of ignorance is shattered by catastrophic events, and the public can readily see that the emperor has no clothes when faced with severe drought, cane toads, mouse and rabbit plagues, and saline soils. This produces calls for action, at least in the short term until the problem is lost from memory.

The result of all these social and political factors is that we obtain governments that are more concerned with propping up failing auto companies than providing adequate funding for biodiversity research. Science is thus under siege in Australia both on an intellectual front and on a financial front.

What is missing?

The existing problem that has arisen from the failure of CSIRO to support research on biodiversity in general and wildlife in particular is illustrated in Figure 1. By expanding university research, much of the short-term, small scale ecological questions can be and are being addressed by postgraduate students. State agencies can fill in the middle ground of longer time-frame questions and larger scale questions but they are compromised by continued budget cuts in their operations. Cooperative research centres (CRCs) have been utilized since 1990 to attack specific problems that the government determines to be of high priority. They have been in the past directed toward programs that promise immediate economic benefits to industry, but in the future it is promised that public good research will benefit from CRCs. They are limited by the requirement of co-investment from industry and a short time-frame of 7 years. In recent years they have taken over some of the previous research agendas of the former Division of Wildlife and Ecology. The gap that is now missing is at the top of Figure 1 – the investigation of long-term, large-scale ecological problems that require expensive infrastructure and a 20-100 year commitment of person-power and field work.

A list of the missing ecological investigations in Australia that has followed from the demise of wildlife research in CSIRO would be extensive. One example would be a long-term monitoring network of the state of Australia's ecosystems. Long-term monitoring cannot be done by satellites but only by biologists on the ground, and short-cuts with GIS- and satellite colour maps are largely an illusion of monitoring that promulgates the politics of ignorance. A serious set of continent-wide studies on the role of dingo predation in structuring predator-prey dynamics might be a second focus. The resurgence of the rabbit in southeastern Australia and the long-term dynamics of fire in northern Australia both cry out for large-scale experimental manipulations that will be

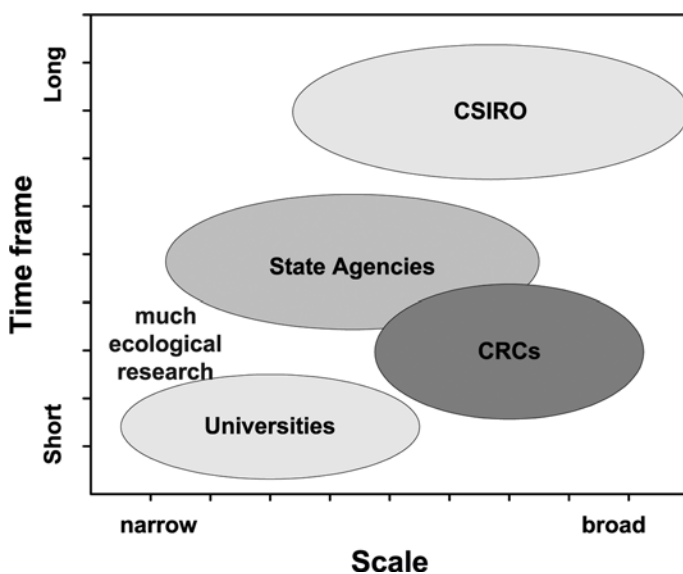


Figure 1. The spatial scale and time frame of ecological research in Australia. CRCs are cooperative research centres, typically with a 7-year time frame aimed at specific problems.

expensive and instructive. The design of landscapes to provide for the secure conservation of biodiversity requires detailed long-term studies to determine sources and sinks for specific taxa of iconic fauna and flora. The setting aside of conservation reserves and corridors without finding out if they do in fact achieve their conservation goal is yet one more example of the politics of ignorance.

What is needed?

But all of this requires both the vision to achieve these long-term goals and the funds to do the work. The typical response of the pseudo-green politician is that these are indeed desirable goals but we just do not have the money to pay for them now. This is largely nonsense, and needs to be restated as an issue in inter-generational equity – we will leave our descendents a world that is diminished in biodiversity and we do not care.

A possible vision for CSIRO and its role in the future of biodiversity research in Australia should be to design and implement the large-scale, long-term studies that will fill the gaps shown in Figure 1. This will require designating a series of long-term ecological research sites to achieve three broad goals: (1) to monitor ecosystem resilience in the light of changing climate for the major ecosystems of Australia, (2) to detect declines in key biodiversity groups within Australia and suggest possible amelioration in cooperation with state agencies and non-government organisations, and (3) to develop long-term management plans for vertebrate pests by understanding and experimentally testing key limiting processes within an ecosystem context. The key is to take a continent-wide vision of wildlife problems so as to fill in the gaps shown in Figure 1. This vision is important in showing Asia and the Pacific that Australia can lead in understanding and maintaining biodiversity in the critical years of this century. New Zealand is now showing this leadership (Sinclair and Byrom 2006), and more collaboration between our two countries on biodiversity conservation in the Pacific would contribute to a good vision for both. All of this requires stable governmental funding for this public-good research agenda.

Conclusion

The demise of the CSIRO Division of Wildlife and Ecology has left a large gap in the research agenda for biodiversity in Australia. Large-scale, long-term research needs have been set aside exactly at a time when climate change looms as the long-term issue to be faced by the next several generations of Australians. CSIRO has been one of the premier world research organizations but a series of questionable decisions by politicians and managers displayed a clear lack of vision and had catastrophic impacts, greatly reducing the ability of current CSIRO scientists to study biodiversity from the molecular to the ecosystem level. Increasing public interest in our iconic flora and fauna has been matched by decreasing governmental support in the apparent belief that Mother Nature will take care of herself, and all this in an era of changing climate. A siege against science has historically been a losing battle because the politics of ignorance does not lead to the bliss that the siren of ignorance promises. We hope for change.

Acknowledgements

I thank Alice Kenney and many others for their comments. If they are not identified here, it is because I do not wish to have them exposed to further harassment from their scientific masters to whom any questioning of the current

mess is treason. I thank the Royal Zoological Society of New South Wales for the invitation to discuss this one example of science under siege at their November 2008 meeting in Sydney.

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