AUSTRALIAN RESEARCH COUNCIL
Linkage - Projects
Linkage Projects Round 1 - 2011

LP

PROJECT ID: LP110100162

First Investigator: Dr Fiona Hogan

Admin Org: Monash University

Total number of sheets contained in this Proposal: 117

Information on this form and its attachments is collected in order to make recommendations to the Minister on the allocation of financial assistance under the Australian Research Council Act 2001 and for post award reporting. The information collected may be passed to third parties for assessment purposes. It may also be passed to the National Health and Medical Research Council, the Department of Foreign Affairs and Trade, the Department of Innovation, Industry, Science and Research, the Department of the Environment, Water, Heritage and the Arts, the Department of Education, Employment and Workplace Relations, the Department of Agriculture, Fisheries and Forestry and the Department of Veterans' Affairs for the purpose of checking eligibility. In other instances, information contained in this Proposal can be disclosed without your consent where authorised or required by law.

CERTIFICATION

The Administering Organisation must obtain the written agreement of all parties necessary to allow the proposed research to proceed. The ARC reserves the right to seek evidence of this agreement from the Administering Organisation.

Certification by the Deputy/Pro Vice-Chancellor (Research) or their delegate or equivalent in the Administering Organisation

I certify that—

- To the best of my knowledge, all of the information provided in this Proposal is true and complete and I understand that it is an offence under the *Criminal Code Act 1995* to provide false or misleading information.
- This Proposal does not have a significant focus on Medical and Dental Research as referred to in the ARC *Linkage Projects Funding Rules for funding commencing in 2011* and as defined on the ARC website.
- I consent, on behalf of all parties, to the ARC dealing with the Proposal as specified in Appendix A7.2 of the ARC *Linkage Projects Funding Rules for funding commencing in 2011*.
- I consent, on behalf of all the parties, to this Proposal being referred to third parties, who will remain anonymous, for assessment purposes.
- To the best of my knowledge, the Privacy Notice appearing at the top of this application form has been drawn to the attention of all participants whose personal details have been provided in this Proposal.
- I have notified the ARC of any conflicts of interest relating to parties involved in or associated with this Proposal and agree to notify the ARC of any such conflicts that may arise after the submission of this Proposal.
- I agree, and have obtained the agreement as required by the ARC *Linkage Projects Funding Rules for funding commencing in 2011* of the Partner and Collaborating Organisations to contribute the resources and facilities outlined in this Proposal.
- All Chief Investigators and Partner Investigators meet the eligibility criteria for the role as defined in the ARC *Linkage Projects Funding Rules for funding commencing in 2011*.
- The amount of time that the participants will be devoting to the project is appropriate to existing workloads.
- This Proposal does not duplicate Commonwealth-funded research including that in a Commonwealth-funded Research Centre.
- I have confirmed that project costs will be met by the Commonwealth-funded Research Centre for any successful fellowship candidate undertaking research within Centre research activities.
- For each Fellowship candidate on this Proposal who currently holds an ARC fellowship and who is seeking a subsequent fellowship, I have obtained the agreement from the Administering Organisation for the current fellowship, as well as the Fellowship candidate, that the current fellowship will be relinquished if the fellowship candidate is successful.
- I will notify the ARC if there are changes to any named Participant after the submission of this Proposal.
- All funds for this Project will only be spent for the purpose for which they are provided.
- The Project will not be permitted to proceed until appropriate ethical clearance(s) has been obtained.
- I understand and agree that all statutory requirements must be met before the proposed research can commence.
- I have obtained the written agreement of all parties identified in this Proposal to submit this Proposal.
- I have read, understood and complied with the ARC *Linkage Projects Funding Rules for funding commencing in 2011*, and if the Proposal is successful I agree to abide by the terms and conditions of the ARC *Linkage Projects Funding Agreement for funding commencing in 2011*.

PART A - Administrative Summary (LP110100162)

A1. If this proposal is successful, which organisation will it be administered by?

Administering Organisation Name

Monash University

A2. Proposal Title

(Provide a short descriptive title of no more than 150 characters (20 words). Avoid the use of acronyms, quotation marks and upper case characters.)

The Strzelecki Koala: a unique population under threat?

A3. Person Participant Summary

	Person number	Family name	First name	Current organisation
1	1	Hogan	Fiona	Monash University
2	2	Taylor	Andrea	Monash University
3	3	Wright	Wendy	Monash University
4	4	Mosse	Jennifer	Monash University
5	5	Menkhorst	Peter	Peter Menkhorst (sole trader)

	Relevant organisation for this proposal	Role
1	Monash University	Chief Investigator
2	Monash University	Chief Investigator
3	Monash University	Chief Investigator
4	Monash University	Chief Investigator
5	Peter Menkhorst (sole trader)	Partner Investigator

A4. Organisation Participant Summary

	Organisation number	Short name	Name	Role
1	1	Monash	Monash University	Administering Organisation
2	2	HPV	Grand Ridge Plantations Pty Ltd	Partner Organisation
3	3	Peter Menkhorst	Peter Menkhorst (sole trader)	Partner Organisation
4	4	Parks Vic	Parks Victoria	Partner Organisation
5	5	GHD Pty Ltd	GHD Pty Ltd	Partner Organisation
6	6	LYPS	Loy Yang Power Station	Partner Organisation
7	7	Victorian Department of Sustainability and Environment	Victorian Department of Sustainability and Environment	Partner Organisation

A5. Summary of Proposal

(In no more than 750 characters (approx 100 words) of plain language, summarise aims, significance and expected outcomes.)

The population of Koalas in the Strzelecki Ranges has not been affected by events that have limited the genetic diversity of Koalas elsewhere in SE Australia. Therefore, it may be a key population, with better ability to respond to environmental pressures. However, land use practises and recent fires may threaten the viability of this population with associated implications for the conservation and management of the species.

A multidisciplinary research team will determine genetic differences between the Strzelecki population and other Koala populations and establish its viability in the face of a rapidly changing environment. Research outcomes will facilitate evidence based management of this and other Koala populations in Australia.

A6. Summary of Project for Public Release

(In no more than 350 characters (approx 50 words), please provide a two-sentence descriptor of the purpose and expected outcome of the project which is suitable for media or other publicity material. Do not duplicate or simply truncate the 'Summary of Proposal'.)

Koalas in the Strzelecki Ranges may be genetically more diverse than other Koalas and could be an important population for Koala conservation and management. The research will establish the genetic distinctiveness and the viability of the Strzelecki Koala; and facilitate evidence based management of this and other Koala populations in Australia.

PART B - Classifications and Other Statistical Information (LP110100162)

B1. National Research Priorities

	National Research Priority Area	National Research Priority Goal
1	An Environmentally Sustainable Australia	Sustainable use of Australia's biodiversity

B2. Field of Research (FOR)

	Field of Research (FOR)	Field of Research (FOR) Percent
1	Population, Ecological and Evolutionary Genetics	40
2	Forestry Management and Environment	30
3	Geospatial Information Systems	20
4	Landscape Ecology	10

B3. Socio-Economic Objective (SEO-08)

	Socio Economic Objective (SEO)	Socio Economic Objective (SEO) Percent
1	Forest and Woodlands Flora, Fauna and Biodiversity	50
2	Hardwood Plantations	25
3	Ecosystem Assessment and Management of Forest and Woodlands Environments	25

B4. Keywords

	Keywords
1	Koala
2	Genetics
3	Forestry

B5. If the proposed research involves international collaboration, please specify the country/ies involved.

	International Collaboration Country Name
1	
2	

B6. How many stipends (either for a research student studying towards a Masters or PhD award) are being requested in this proposal?

2

C1. Please upload a Project Description as detailed in the Instructions to Applicants in no more than 10 A4 pages and in the required format.

Attached PDF

The Strzelecki Koala: a unique population under threat?

PART C - Project Description (LP100100162)

AIMS AND BACKGROUND

Aims

To develop a method for effective and practical studies of key wildlife populations using non-invasive, genetic sampling techniques and to apply these techniques to:

1. determine the extent to which the Strzelecki Koala population is genetically distinct from other south-eastern Australian Koala populations and to assess whether differences can be attributed to evolutionary divergence or to previous translocation events; and
2. assess the viability of the Strzelecki Koala population in the face of current and future threats, including fire, plantation forestry and climate change.

Background

Human impacts on world ecosystems have increased species extinction rates to unprecedented levels (Mace et al., 2005; McKinney et al., 2010). In Australia, the impact on the environment has been severe. Australia has a heavy 'ecological footprint', with one of the highest numbers of threatened species of any country with a strong economy (Baillie, et al., 2004). In a recent study that determined each nation's share of threatened bird and mammal species, Australia ranked ninth (of 139 countries), with 100 threatened bird and mammal species (McKinney et al., 2010).

Genetic analysis has enhanced our understanding of the ecology and biology of a diverse range of wildlife. Recent advances in both information technology and molecular techniques now provide conservation biologists with effective tools for rapid collection and analysis of large data sets (Hogan et al. 2009). Many novel genetic markers that facilitate investigations into the biology and ecology of wild populations are now available. Sequencing the mitochondrial genome provides an insight into the evolutionary history of populations, whilst microsatellite markers (located in the nuclear genome) have become the marker of choice for studies of intraspecific variation in wild populations (DeWoody, 2005). The use of several microsatellite markers, in combination with a gender marker, is a powerful tool that can provide a DNA profile that unequivocally identifies individuals (Hogan et al. 2007).

Previous genetic studies of Koala populations have relied primarily on collection of blood or tissue samples (e.g Worthington Wilmer et al., 1993; Houlden et al., 1996, 1999; Lee et al., 2010). Obtaining such samples by animal capture is labour intensive, costly, stressful for the individual animals and raises questions of research ethics in both the scientific and general communities (Swaart, 2004; Radford et al., 2006). Non-invasive genetic sampling, where DNA is recovered from discarded tissues such as shed hair, scats and feathers (Waits & Paetkau, 2005) is an attractive alternative. These techniques provide an opportunity to obtain genetic material from free-ranging animals in their natural environment, without having to catch, handle or even observe them (Taberlet & Luikart, 1999); this technique is especially valuable when studying species that are rare, elusive, or difficult to capture (Piggott & Taylor, 2003), such as Koalas, which may reside in trees over 30m tall.

Opportunistic collection of faeces has been shown to be a reliable method of obtaining DNA from animals in the wild (Constable et al., 1995; Gerloff et al., 1995; Wasser et al., 1997). By recovering DNA from the epithelial cells on faecal pellets, wild populations can be sampled unobtrusively, and without the sampling biases inherent in other opportunistic approaches. Faecal samples have been used as a source of DNA for assessing the genetic structure, breeding behaviour, habitat use and home-range of a variety of mammals including the brown bear and dugong (Kohn & Wayne, 1997), seals (Reed et al., 1997), chimpanzees (Constable et al., 2001) and wombats (Banks et al., 2002). Koala faecal pellets are readily available and have previously been used to indicate Koala presence (Allen, 2000) as they are easily distinguished from faecal pellets of other species by their characteristic shape and size. They are, therefore, a good potential source of Koala DNA.

Degradation of faecal samples can result in incomplete or fragmented DNA genomes, which can lead to genotyping errors. Degradation increases with time since faecal deposition and is accelerated by exposure to environmental elements, such as rain and high temperatures. Protocols for the collection and storage of faecal

samples from Australian native animals, subjected to Australian environmental conditions, have been developed and optimised (Piggott & Taylor, 2003; Piggott et al., 2004) and have facilitated the application of non-invasive genetic sampling. Techniques for genetic analysis of DNA from faecal samples have been developed in the northern hairy-nosed wombat (Walker et al., 2009) and the brush-tailed rock wallaby (Piggott et al., 2006) and may, in the future, inform their conservation. **In this project, we will extend this methodology to investigate evolutionary gene flow, by mitochondrial DNA sequencing; and assess genetic diversity within a key Australian wildlife population; the Strzelecki Koala, using a suite of Koala specific microsatellite markers** (Houlden et. al., 1996).

Historically the Koala (*Phascolarctus cinereus*) has suffered drastic population reductions following European settlement, primarily due to hunting. As a result, Koalas almost became extinct in south-eastern Australia in the 1920s (Lewis, 1934; Lewis, 1954), with only a few remnant populations surviving in South Gippsland (DSE, 2004), including in the Strzelecki Ranges. Koala populations have now been re-established throughout most of their previous Victorian range, but this has been achieved by extensive restocking and translocation involving descendants of only a few individual animals from isolated populations on Phillip and French islands in Westernport Bay (Houlden et al., 1996; DSE, 2004; Menkhorst, 2008). Koalas may now be perceived as abundant in Victoria (Phillips, 2000), however Houlden et al. (1996) showed that Koala populations in south-eastern Australia have low genetic diversity, compared to those of north-eastern Australia. As a consequence, the Victorian Koala population may be vulnerable to new and unpredictable environmental pressures. Seymour et al. (2001) attributed morphological abnormalities, such as testicular aplasia, to low genetic diversity within South Australian Koala populations and low genetic diversity has previously been linked to the emergence of disease in other Australian marsupial populations, including the Tasmanian Devil (*Sarcophilus harrisii*) (Siddle et al., 2007). The Koalas in the Strzelecki Ranges Bioregion may represent a gene pool that is more diverse than that of other Koala populations in Victoria and therefore be of value as a natural insurance population (Jones et al., 2007) should the consequences of low genetic diversity become manifest in other Victorian Koala populations.

Although hunting practices have now ceased, Koalas are still under threat from human activities that remove, alter or fragment forest habitats (McAlpine et al., 2006) and from natural disasters such as wildfires. It has been suggested that these threats may exacerbate one another, such that fires in altered forest habitats may differ in frequency and intensity from those in natural forest (Gustafson et al., 2004; Braun, 2006). Wildfires have recently ravaged Australia's south-eastern forests. The "Black Saturday" fires that occurred in Victoria in February, 2009, significantly reduced the available Koala habitat in the Strzelecki Ranges; together, the Boolarra and Churchill fires affected approximately 7500 ha of forest in the area. The frequency and intensity of such fire events is predicted to increase under the influence of climate change (Hennessey et al., 2006).

Managed forests, including publicly owned natural forests and privately owned plantation forests, are a major economic resource for Australia (DSE, 2009). While the potentially detrimental effects of some silvicultural practices on biodiversity have been documented (for example, Tyndale-Biscoe & Smith, 1969; McIlroy, 1978; Smith & Lindenmayer, 1988; Lindenmayer, 1992), well managed plantations, especially those of native tree species, can also provide key habitat for wildlife (Lindenmayer, 1994; Kavanagh et al., 2001; MacHunter et al., 2006). This 'managed' habitat can be vital where habitat loss, habitat fragmentation and/or habitat degradation reduces the amount, connectivity and quality of habitat remaining outside of the production forest area (Loyn et al., 2007.) At present, approximately sixty percent of preferred Koala habitat in the Strzelecki Ranges is on land owned and managed by HVP Plantations Pty Ltd (6,300 hectares of damp forest out of 10,500 hectares in the Strzelecki Ranges Bioregion). Landscape heterogeneity, along with climate change, will inflict unknown pressures on Koala populations and biodiversity within these forests (Noss, 2001). It is therefore a matter of urgency that the viability of the Strzelecki Koala is assessed, to inform the development of management strategies aimed to assist the population as it recovers from recent fires and to promote the sustainable management of habitat within privately owned plantation forests in the future.

The conservation status of the Koala under the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999 (*EPBC Act)* is currently under review. The recently revised National Koala Conservation and Management Strategy 2009–2014 (NRMMC, 2009) indicates that the species is declining in abundance and states: "While the Koala is not yet considered to be threatened with extinction nationally, there is no doubt

that it is declining and the time to act is now." It notes that much of the known national Koala habitat occurs on private land and acknowledges that "protecting, restoring and managing Koalas and their habitat will have significant benefits for a wider range of other species and ecological communities that also share the Koala's habitat" (NRMMC, 2009). The Koala also has international significance and its Red List entry notes that the population trend for the species is unknown (IUCN, 2009). Thus, appropriate long-term management of the Koala and its habitat is of immediate concern, both nationally and internationally.

To date, information regarding abundance and distribution of the Koala has been inconsistent and difficult to verify. For example Melzer et al. (2000) contrast the widely varying estimates of the total number of Koalas in Australia, ranging from an estimated national total of 45,000-80,000 individuals, to estimates of 75,000-130,000 Koalas at the Strathbogie Plateau in Victoria, and 600,000 and 100,000 Koalas in Queensland and New South Wales respectively. As Koala colonies are typically isolated and separated by areas of unsuitable habitat or cleared land (Martin & Handasyde, 1999), assessing presence and abundance of these animals is difficult; especially in tall forests and in steep terrain, where censusing populations by direct observation is expensive, time consuming and ineffective. An ability to identify individual Koalas, without direct observation, is essential to obtain accurate population and distribution data and to improve Koala management at national, state and regional levels.

The Strzelecki Ranges Bioregion covers an area of 341,866 hectares, with the eastern region particularly steep, heavily forested and difficult to access (WGCMA, 2003). Due to the ruggedness and isolation of the area, there has been no direct assessment of the genetic diversity of Koalas within this important bioregion. While Houlden et al. (1999) found that individuals sourced around this region had rare haplotypes and higher nucleotide diversity than other south-eastern Australian populations (attributing this to the fact that these populations were not involved in translocation programs conducted elsewhere in Victoria) none of the animals in Houlden's study originated from the Strzelecki Ranges Bioregion. Strzelecki Koalas may represent an ancestral gene pool even more diverse than that described by Houlden et al. (1999).

This study will clearly establish whether the Strzelecki Koala population is genetically differentiated from other populations and explain the basis of any divergence. We will determine the abundance of individuals in the Strzelecki Koala population, their distribution within the Bioregion, and the extent and quality of their habitat following the impact of the Black Saturday fires. Together, these data will be used to assess the future viability of the Strzelecki Koala population. This information is essential to: 1) determine whether the Strzelecki population has a distinct and more diverse gene pool compared to other Koala populations; 2) provide data for the formation of evidence-based policy; and 3) inform Koala management at regional, state and national levels.

SIGNIFICANCE AND INNOVATION

This proposal is significant in its timing, its multidisciplinary approach, the strength of the relationships among the team members, and the regional location of the research team. Together, the research team forms a unique multidisciplinary research collaboration with extensive and relevant expertise in molecular ecology, population and conservation genetics, conservation biology, marsupial biology, landscape ecology, spatial analysis and the development of conservation policy.

The use of genetic methods to answer ecological questions is an emerging approach (Lee et al., 2010; Hogan & Cooke, in press) advocated by Sherwin et al. (2000) to inform Koala management strategies. In this project, individual animals will not be physically tagged. Instead, they will be identified and tracked by DNA analysis, allowing ecological studies to be undertaken in remote and difficult terrain throughout the Strzelecki Ranges Bioregion. The isolation of DNA from faecal samples reduces the inherent biases of some other studies (for example, Lee et al., 2010) that rely on blood or tissue taken from animals that have been killed or injured. While the proposed methodology has previously been used for conservation studies of other mammals, these methods have not previously been applied to Koala populations, and no studies of this scale have been reported.

There have been repeated calls to establish the status of the Koala nationally, and at state and regional levels; and it has been acknowledged that Koala management plans in Australia need to be developed and implemented on a local scale (Lee et al., 2010). Establishing accurate base-line data for the Strzelecki Koala population and clearly identifying its genetic relationships to other south-eastern Australian Koala populations

is paramount, and aligns with **National Research Priority 1: An environmentally sustainable Australia**, under the priority goals: sustainable use of Australia's biodiversity and responding to climate change and variability.

The Strzelecki Koala population in Gippsland, Victoria may be genetically distinct from, and more diverse than, other south-eastern Australian Koala populations and may represent an ancestral Koala gene pool. This study will determine whether the Strzelecki population is an important reservoir of genetic diversity, especially in a future scenario where Koala populations elsewhere in south-eastern Australia, known to have limited genetic diversity (Houlden, 1999; Seymour et al., 2001), become threatened by a reduced ability to respond to environmental pressures. Impacts from plantation forestry operations taking place within Koala habitat, together with the predicted increasing frequency and intensity of fires under climate change scenarios, are likely to be key management issues for the Strzelecki Koala population, now and into the future. The plantation forestry company currently managing the majority of Koala habitat within the Strzelecki ranges is a partner organisation in this research proposal.

Anticipated outcomes include a clear determination of the genetic distinctiveness and importance of the Strzelecki Koala population and an indication of its viability in the face of past and future environmental pressures including fire and plantation forestry. Given the liability of limited genetic diversity among Koalas in other south-east Australian populations, such information is necessary for the development of future policies and strategies for the ongoing management of Koala populations across Australia.

Validation and application of the method proposed in this research will provide important information for the management of one of Australia's iconic species. The techniques, approaches and methods that will be refined during this research project will be applicable to other species of conservation interest in Australia and internationally.

APPROACH AND TRAINING

This research involves a multi-disciplinary approach, combining genetics, ecology and spatial analysis, that permits genetic studies of animals that are rare, cryptic or inaccessible. In this study, these methods will be used to investigate the population genetics and viability of the Strzelecki Koala, an inhabitant of remote and difficult terrain. We have recently adapted protocols for the recovery of DNA from Koala faecal pellets and have identified the morphological characteristics of pellets that are likely to yield 'good quality' DNA, suitable for genetic analysis. Preliminary analysis of these findings indicates that amplification of DNA extracted from these pellets produces a consistent 'DNA fingerprint' for an individual Koala. A molecular biology approach will validate and refine this methodology, using faecal pellets obtained from a captive population (Phillip Island Nature Park) with known pedigree. Faecal pellets will subsequently be collected from the forest floor within the Strzelecki Bioregion and from other geographic regions with suitable reference populations. The location of each sample collected will be georeferenced using Global Positioning Systems (GPS) to facilitate spatial analysis. DNA isolated will undergo sequencing, to assess variation in the mitochondrial genome, and genotyping, using a suite of microsatellite loci (Houlden et. al., 1996). Information obtained will be employed to assess the genetic diversity within the Strzelecki Koala population, to estimate population size, and to assess contemporary and historic gene flow.

An approach based in spatial sciences and ecology will utilise Geographical Information Systems (GIS) and spatial modelling to understand the effect of fires and land management practises on the extent and quality of Koala habitat and on the distribution of Koalas in the Strzelecki Bioregion. Historical data describing past extents and distributions of Koala habitat and Koalas (AKF, 2005) will be used to develop and validate spatial models of the distribution of Koalas and their habitat. Information regarding the extent and severity of recent fires and land management practices, and their impacts on Koala habitat will then be incorporated into the spatial analyses. Distribution models will be validated by comparing predicted koala distribution with mapped locations of individual Koalas, identified by faecal DNA analysis.

GIS data will be sourced from the various Partner Organisations and will include information collected by the Australian Koala Foundation (AKF) for HVP Plantations Pty Ltd (AKF, 2005); and data on the extent and severity of recent fire events from the Department of Sustainability and Environment (DSE) and Parks Victoria (PV). DSE will also provide access to additional GIS data including flora and fauna records from the Atlas of Victorian Wildlife and the Victorian Flora Information System. HVP Plantations will provide spatial data on silvicultural

activities in the study area. Spatial analyses and modelling will allow us to understand past and present distribution and abundance of Koalas; and the effect of fire and silvicultural practises on these parameters (Kearney & Porter, 2004; Zhang et al., 2007, Isaac et al. 2008). The ability to track individual Koalas, without disturbance, also provides a unique opportunity to explore demographics and patterns of socialisation.

Information collected using our multi-disciplinary approach will allow us to assess the importance and future viability of the Strzelecki Koala population. The genetic diversity of the Strzelecki Koala population will be established and compared to that of other south-eastern Australian Koala populations, testing the hypotheses of Houlden (1999) and Seymour et al. (2001) regarding the potentially high conservation value of the Strzelecki population for Victoria and south-eastern Australia and, therefore, its potential role as a natural insurance population. The mapping of distribution and abundance of Koalas and their habitat throughout the Strzelecki Bioregion will provide a better understanding of Koala ecology in the Bioregion and will inform future management strategies.

Table 1: Timeline and method for the proposed research

<table>
<tr><th>Year</th><th>Quarter</th><th>Molecular Biology Approach</th><th>Spatial Sciences/Ecology Approach</th></tr>
<tr><td rowspan="4">1</td><td rowspan="2">1</td><td colspan="2">Recruit postgraduate students, ethics approval etc.</td></tr>
<tr><td>Sample collection
• Captive population (Phillip Island Koala Park)
Validation of methology
• Sample storage
• DNA extraction
• Genotyping (microsatellites)
• Sequencing (mitochondrial)</td><td>Model historic data of the Strzelecki Ranges Bioregion:
• Previous extent & condition of Koala habitat (from HVP Plantations Pty Ltd)
• Previous abundance and distribution of Koalas (from HVP Plantations Pty Ltd & DSE)
• Extent, severity & timing of recent fire events (from DSE)
• Nature, extent and timing of future silvicultural activities
• Predicted future fire ‘hotspots’</td></tr>
<tr><td>2&3</td><td>Genotyping (microsatellite analysis) & sequencing (mitochondrial) of DNA from captive population samples.</td><td>Data Collection
• Field surveys of post-fire extent & condition of Koala habitat

Model current status of the Strzelecki Ranges Bioregion</td></tr>
<tr><td>4</td><td colspan="2" rowspan="2">Field surveys to establish distribution of Koalas across the Strzelecki Ranges Bioregion; collection & storage of faecal samples</td></tr>
<tr><td rowspan="3">2</td><td>1</td></tr>
<tr><td>2&3</td><td>Genetic analysis of samples collected in the Strzelecki Ranges Bioregion:
• Microsatellite genotyping to identify scats from individual Koalas
• Mitochondrial sequencing to identify genetic divergence
• Estimate Koala abundance & distribution in the Strzelecki Ranges Bioregion</td><td>Analysis of spatial data:
• Estimate current Koala abundance & distribution & home ranges in the Strzelecki Ranges Bioregion</td></tr>
<tr><td>4</td><td colspan="2">Comparison of Koala abundance, distribution & home range estimates in the Strzelecki Ranges Bioregion obtained using microsatellite data and field data; cross reference to habitat data.</td></tr>
</table>

3	1&2	Genetic analysis of samples collected in reference regions: • Microsatellite genotyping • Mitochondrial sequencing • Compare the genetic structure of the Strzelecki Koala population with other Gippsland, SE & NE Australian populations (using field and published data)	Map current distribution & abundance of Koalas in particular: • Koala habitat extent & condition • Koala distribution and abundance • Koala demographics Model: • Future silvicultural activities • Predicted fire 'hotspots'
	3&4	Data synthesis and reporting: Provide advice to land managers & government regarding: • Genetic importance & future management of the 'Strzelecki Koala' • Best practice for the conduct of silvicultural activities in key Koala habitat Preparation of manuscripts for publication	

NATIONAL BENEFIT

This project is directly aligned with National Research Priority 1: An environmentally sustainable Australia under the priority goals: sustainable use of Australia's biodiversity and responding to climate change and variability.

This research will validate a method for rapid assessment of abundance, distribution and genetic diversity of important and/or vulnerable populations and species. The application of this method will be transferable to investigations of other mammals (and taxa) of interest and concern in a range of ecosystems and, in this study, will identify the genetic status of the Strzelecki Koala population, ostensibly a key population for Koala management in south-eastern Australia, and inform consideration of its potential value as a natural insurance population. The research will provide evidence that will inform the management of this important population and species at the local, state and national levels, while modelling a pro-active consideration of biodiversity conservation by a major private production company. This project will assist government and industry to develop evidence-based management strategies that balance sustainable plantation forestry operations in the Strzelecki Ranges Bioregion with minimum risk to Koalas and other fauna in the area. This is especially urgent in the wake of recent fires and while preparing for predicted increases in intensity and frequency of fires in the future, due to climate change.

The proposed research will be useful in achieving several key actions identified in the National Koala Conservation and Management Strategy 2009-2014 (NRMMC, 2009), including:

- Action 1.03: Assess and develop options for protecting Koala habitat on private lands
- Action 1.04: Prioritise conservation of populations under immediate pressure
- Action 1.06: Develop standard monitoring/habitat assessment protocols
- Action 1.07: Establishing a national database of Koala population distribution and density and habitat mapping data
- Action 1.08:Establish or continue surveying and monitoring programs
- Action 1.09: Incorporate causes of habitat loss or degradation, other than land clearing, into planning for Koala habitat conservation (fire, climate change, plantation forestry operations)
- Action 6.05: Develop method for enabling comparison of disparate data on Koala distribution and abundance

PARTNER ORGANISATION COMMITMENT AND COLLABORATION

The proposal is a result of discussions between the CIs, from Monash University, and the industry partners over several years. Three of the four CIs (FH, WW and JM) are located at Monash University's Gippsland campus and have worked previously with AT (Monash, Clayton) in developing a pilot study related to this research. A key aspect of this research is the involvement of partner organisations with strong interests and influences in the management of forests and forest fauna.

HVP Plantations Pty Ltd is a private forestry company with extensive operations in the Strzelecki Ranges. It is the largest private landholder in the region with a total estate of 120,000 hectares, including 34,000 hectares of native (custodial) forest that has been mapped for likely suitability as Koala habitat using a predictive model developed by AKF (2005). The custodial forest is managed entirely for conservation purposes under HVP Plantations' forest stewardship program and is legally protected under Section 69 of the *Victorian Conservation Forests and Land Act* 1987. The company has a strong commitment to responsible forest stewardship through its internal stewardship policies and procedures, as well as dual certification through the international Forest Stewardship Council (FSC) and the Australian Forestry Standard (AFS), and is developing operating standards for Koala management in both its plantation and custodial forests. The outcomes of this research will inform these standards. HVP Plantations Pty Ltd will provide cash and in kind contributions of $52,500 and $59,500 respectively; they will facilitate access to field locations across the Strzelecki Bioregion and provide information regarding future silvicultural pressures on the Koala population. They will also provide access to data and maps detailing the distribution of Koalas and the quality of their habitat prior to the Black Saturday fires. CIs Wright and Mosse have an established relationship with HVP Plantations Pty Ltd who have provided cash and in kind support for several past student research projects including research that received the David Ashton Biodiversity Award for 2008 (e.g. Rossi et al., 2005; MacHunter et al., 2006). In 2007, HVP provided funds for the pilot study (CI Mosse) that established the methodology for recovery of DNA from Koala faecal pellets. Further collaboration between the CIs and this organisation will cement an important relationship between a regional University campus and a key industry organisation in the region.

The Victorian Department of Sustainability and Environment (DSE) is Victoria's lead government agency for sustainable management of public land, forest ecosystems and wildfire. DSE is responsible for Koala management in Victoria and will directly use the outcomes of this research in developing Koala management strategy for the State. DSE is supporting this research via access to GIS data (particularly regarding recent fires in the study area). DSE staff have contributed to the research design and will assist in ensuring that results of the study are meaningful to wildlife managers. DSE will also facilitate access to field sites on public land. CI Wright has established a collaborative relationship with DSE during previous research (MacHunter et al., 2006, Barr et al. in press).

Parks Victoria (PV) is responsible for the protection of natural and cultural heritage across Victoria and manages land within the Strzelecki Ranges Bioregion, including Koala habitat. PV will facilitate access to field sites, GIS data and facilities, and provide storage and work space. CI Hogan has established a collaborative relationship with PV during past research (Hogan et al., 2008, Hogan and Cooke, in press). PV is committed to conservation and excellence in environmental management; participation in this research is strongly aligned with these goals.

PI Menkhorst is supporting this research as a PI and a PO (via his status as a sole trader – consultant ecologist). He has extensive experience in Koala research and policy development and until recently was responsible for overseeing the management of Koalas in Victoria. PI Menkhorst prepared the Victorian Government's Koala Management Strategy (DSE, 2004) and contributed, as the Victorian member of the National Koala Network, to the first National Koala Conservation Strategy (ANZECC, 1998). As a PO he is contributing his time and expertise; he has previously worked as a consultant to HVP Plantations Pty Ltd in the development of stewardship prescriptions for the management of Koalas in plantation forests.

GHD Pty Ltd is an international network of environmental consultants. GHD has recently completed a study into the habitat of Koalas in south-east Queensland and participation in this research will extend their expertise and reputation in this area. Support for this proposal comes from GHD's Morwell office, in Gippsland, which has well established relationships with DSE and HVP Pty Ltd. GHD will provide training in use of digital mapping techniques (GPS and GIS) to research personnel. Support for the project is linked to GHD's commitment to the development and application of innovative research methods and connecting with local communities within their operating regions.

Loy Yang Power is Victoria's largest power station, located in the immediate vicinity of the study area. Support for the project stems from their Corporate Social Responsibility and Environmental Policies Program which recognises their significant environmental and community responsibilities, in particular promotion of effective management of forest ecosystems.

Key outcomes of the research for all industry partners include: validation of a genetic approach to understanding the ecology of a key wildlife population; an understanding of the significance of the Strzelecki Koala population in the context of other south-eastern Australian populations; improved knowledge of Koala ecology and validation of current predictive mapping of Koala habitat within plantations and native forest (both publicly and privately owned); and an understanding of the effects of plantation forestry policies and operations on the Koala population.

The research team is physically located close to the Strzelecki Bioregion; the involvement of two PhD students in the research will provide research training in the related areas of conservation, population genetics, spatial analysis, modelling and biodiversity management. Their location at Monash University's regional campus will contribute to its growing research culture; their interaction with staff in the partner organisations and with the wider Gippsland community will increase the community's understanding of, and appreciation for, research leading to evidence-based management of community resources.

COMMUNICATION OF RESULTS

The outcomes of this research will be embedded in the knowledge base, and thus the activities, of all partner organisations and will influence national policy regarding the management and conservation of the Koala. The research approach is designed such that research outcomes are expected regularly throughout the three year period of the research. Both the approach and results will be of interest to discipline experts and to the general community. Scientific outputs will involve production of high quality journal papers, conference papers, and reports to partner organisations.

ROLE OF PERSONNEL

The four CIs will be responsible for the overall planning, coordination and monitoring of all aspects of the project, including: overseeing the two APAI research programs; coordinating access to resources (including in-kind support from partner organisations); providing direction regarding the design and execution of experimental work and theoretical analysis; guiding the interpretation of experimental results, and critically examining all aspects of the research. PI Menkhorst will add extensive knowledge regarding Koala ecology; together with expertise regarding past and future Koala management strategies to the research team. The entire research team will meet on a monthly basis to discuss and review research progress.

CI Hogan has expertise in molecular ecology, conservation genetics and spatial analysis. She will share the role of project manager with CI Wright, ensuring that the project is well coordinated and the overall timeline is on target. She will take particular responsibility for the direction of the molecular biology aspects of the research and will be part of the supervisory team for both APAI-1 & APAI-2.
CI Taylor has pioneered applications of microsatellite technology in studies of wildlife species. She will mentor CIs Hogan and Wright, giving advice on overall project management and will make a particular contribution to genotype analysis and ecological interpretation of molecular data. She will be a member of the supervisory team for APAI-1.
CI Wright's research has focussed on conservation and restoration biology in production environments. She will share the role of project manager with CI Hogan, will take particular responsibility for the direction of the spatial sciences/ecology aspects of the research and will be the main supervisor for APAI-2.
CI Mosse is a molecular biologist who developed the methodology for recovery of DNA from Koala faecal pellets. She will direct the development and application of the methodology used in the molecular biology aspect of the research. She is an experienced supervisor who will be main supervisor for APAI-1.
PI Menkorst is a renowned Koala ecologist. He will add extensive knowledge regarding Koala ecology; together with expertise regarding past and future Koala management strategies. He will be a member of the supervisory team for APAI-2.
APAI -1 will apply and refine a novel method involving recovery of DNA from faecal pellets and carry out the laboratory and fieldwork required to complete the molecular biology component of the project.
APAI-2 will develop the spatial sciences aspect of the research, focussing on modelling and understanding the effect of recent fires and land management practises on the extent and quality of Koala habitat and on the distribution of remaining Koalas in the Strzelecki Bioregion.

REFERENCES

AKF (2005). Strzelecki Koala Habitat Atlas. Australian Koala Foundation, Brisbane and HVP Plantations Pty Ltd Churchill, Victoria, Australia.

Allen, C. (2000). Surveying Koalas, National Parks Journal 44: 10.

ANZECC (1998). National Koala Conservation Strategy. Australian and New Zealand Environment and Conservation Council.

Arnheim, N., White, T. & Rainey, W. E. (1990). Application of PCR: Organismal and population biology. *Bioscience* 40(3):174-182.

Ballie, J. E. M., Hilton-Taylor, C. & Stuart, S. N (Eds) (2004). 2004 IUCN Red List of Threatened Species. A Global Species Assessment, IUCN, Gland, Switzerland and Cambridge, UK.

Banks, S.C., Piggott, M.P., Hansen, B.D., Robinson, N.A. & Taylor, A.C. (2002). Wombat coprogenetics: enumerating a common wombat population by microsatellite analysis of faecal DNA. *Australian Journal of Zoology* 50:193-204.

Barr, R., Wright, W. & Rayment, P. (In Press) Thinning, fire and birds in Boola Boola State Forest, Victoria, Australia . *Australian Forestry.* Accepted 4 May 2010

Braun, K. (2006). Fire behaviour and impact in blue gum plantations. *Forest Ecology and Management* 234, Supplement 1: S134 .

Constable, J.L., Packer, C., Collins, D. A. & Pusey, A.E. (1995). Nuclear DNA from primate dung. *Nature* 373: 393.

Constable, J.L., Ashley, M.V., Goodall, J. & Pusey, A.E. (2001). Noninvasive paternity assignment in Gombe chimpanzees. *Molecular Ecology* 10, 1279-1300.

DeWoody R. W. (2005). Molecular approaches to the study of parentage, relatedness, and fitness: practical applications for wild animals. *Journal of Wildlife Management* 69, 1400-1418.

DSE (2004). Victoria's Koala Management Strategy. Victorian Government Department of Sustainability & Environment, East Melbourne.

DSE (2009). Victoria's State of the Forests Report 2008. Victorian Government Department of Sustainability & Environment, East Melbourne.

Gerloff, U., Schlotterer, C., Rassman, K., Rambold, I., Hohmann, G., Fruth, B. & Tautz, D. (1995). Amplification of hypervariable simple sequence repeats (microsatellites) from excremental DNA of wild living bonobos (*Pan paniscus*). *Molecular Ecology* 4: 515-518.

Gustafson, E.J., Zollner, P.A. Sturtevant, B.R., Hong S. H & Mladenoff, D.J. (2004). Influence of forest management alternatives and land type on susceptibility to fire in northern Wisconsin, USA. *Landscape Ecology* 19:327-341.

Hennessy K, Lucas C, Nicholls N, Bathols J, Suppiah R, Ricketts J. (2006). Climate change impacts on fire-weather in south-east Australia. CSIRO, Australia.

Hogan, F. and Cooke, R. (In Press). Insights into the breeding behaviour and dispersal of the powerful owl (*Ninox strenua*) determined through the collection of shed feathers. *Emu*. Accepted 19/03/2010.

Hogan, F. and Cooke, R. (2009). Conservation Biology: A 'crisis discipline'. *Victorian Naturalist* 126: 92-98.

Hogan, F., Cooke, R., Burridge, C. and Norman, J. (2008). Optimizing the use of shed feathers for genetic analysis. *Molecular Ecology Resources* 8, 561-567.

Hogan, F., Cooke, R., Burridge, C. and Norman, J. (2007). Isolation and characterization of microsatellite loci to DNA fingerprint the powerful owl (*Ninox strenua*). *Molecular Ecology Notes* 7: 1305-1307.

Houlden, B. A., England, P.R., Taylor, A.C., Greville, W.D. & Sherwin, W. B. (1996). Low genetic variability of the Koala *Phascolarctus cinereus* in south-eastern Australia following a severe population bottleneck. *Molecular Ecology* 5: 269-281.

Houlden, B. A., Costello, B. H., Sharkey, D., Fowler, E. V., Melzer, A., Ellis, W., Carrick, F., Baverstock, P.R. & Elphinstone, M. S. (1999). Phylogenetic differentiation in the mitochondrial control region in the Koala, *Phascolarctus cinereus* (Goldfuss 1817). *Molecular Ecology* 8: 999-1011.

Isaac, B., Cooke, R., Simmons, D. & Hogan, F. (2008). Predictive mapping of powerful owl (*Ninox strenua*) breeding sites using Geographical Information Systems (GIS) in urban Melbourne, Australia. *Landscape and Urban Planning* 84: 212-218.

IUCN (2009). IUCN Red List of Threatened Species. Version 2009.1. <www.iucnredlist.org>. Downloaded on 08 August 2009.

Jones, M., Jarman, P. J., Lees, C. M., Hesterman, H., Hamede, R. K., Mooney, N. J., Mann, D., Pukk, C. E., Bergfeld J & McCallum, H. (2007). Conservation Management of Tasmanian Devils in the Context of an Emerging, Extinction-threatening Disease: Devil Facial Tumour Disease. *Ecohealth* 4(3):326-337.

Kavanagh, R., Law, B., Lemckert, F., Stanton, M., Chidel, M.&Towerton, A., (2001). Birds, mammals, reptiles and amphibians in eucalypt plantations near Albury–Wodonga: a pilot study of variables influencing biodiversity. State Forests of New South Wales, Sydney.

Kearney, M. & Porter, W. P. (2004). Mapping the fundamental niche: physiology, climate and the distribution of a nocturnal lizard. *Ecology* 85: 3119-3131.

Kohn, M.H. & Wayne, R.K (1997). Facts from faeces revisited. *Trends in Ecology and Evolution* 12(6):223-227.

Lee, T., Zenger, K.R., Close, R.L., Jones, M. & Phalen, D.N. (2010). Defining spatial genetic structure and management units for vulnerable koala (*Phascolarctos cinereus*) populations. *Wildlife Research* 37: 156-165.

Lewis, F. (1934). The Koala in Victoria. *Victorian Naturalist* 51: 73-76.

Lewis, F. (1954). The rehabilitation of the Koala in Victoria. *Victorian Naturalist* 70: 197-200.

Lindenmayer, D. B. (1992). Some impacts on arboreal marsupials of clearfelling on a 80-120 year rotation in mountain ash, *Eucalyptus regnans* forests in the Central Highlands of Victoria. *Victorian Naturalist* 109, 18 1-6.

Lindemayer, D. B. (1994). Wildlife corridors and the mitigation of logging impacts on fauna in wood production forests in south-eastern Australia: a review. *Wildlife Research* 21:323-340.

Loyn, R.H., McNabb, E. G., Macak, P. & Noble, P. (2007). Eucalypt plantations as habitat for birds on previously cleared farmland in south-eastern Australia. *Biological Conservation* 137: 533-548.

Mace, G., Masundire, H. & Baillie, J. (2005). Chapter 4: Biodiversity. In Hassan, R., Scholes, R & Ash, N. (Eds) Ecosystems and Human Well-being: Current State and Trends, Volume 1 of the Millenium Ecosystem Assessment. Island Press, USA.

MacHunter, J., Wright, W., Loyn, R. & Rayment, P. (2006). Bird declines over 22 years in forest remnants in south-eastern Australia: Evidence of faunal relaxation? *Canadian Journal of Forest Research* 36(11): 2756-2768.

McAlpine, C. A., Rhodes, J. R., Callaghan, J. G.,. Bowen, M. E., Lunney, D., Mitchell, D. L., Pullar, D. V. & Possingham, H.P. (2006). The importance of forest area and configuration relative to local habitat factors for conserving forest mammals: A case study of Koalas in Queensland, Australia. *Biological Conservation* 132(2):153-165.

McIlroy, J. A. (1978). The effects of forestry practices on wildlife in Australia: a review. *Australian Forestry* 41, 78-94.

McKinney, L. A., Kick, W. L. & Fulkerson, G. M. (2010). World System, Anthropogenic and Ecological Threats to Bird and Mammal Species: A Structural Equation of Biodiversity Loss. *Organisation and Environment* 23(1) 3-31.

Martin, R. & Handasyde, K. (1999). "The Koala: Natural History, Conservation and Management" University of New South Wales Press.

Melzer, A. M., Carrick, F., Menkhorst, P., Lunney, D. & St John, B. (2000). Overview, critical assessment and conservation implications of koala distribution and abundance. *Conservation Biology* 14(3): 619-628.

Menkhorst, P. (2008). Hunted, marooned, re-introduced, contracepted: A history of Koala management in Victoria. Pages 73-92 in 'Too Close for Comfort. Contentious issues in human-wildlife encounters', edited by D. Lunney, A. Munn & W. Meikle. Royal Zoological Society of New South Wales, Mosman, New South Wales.

NRMMC (2009). National Koala Conservation and Management Strategy 2009-2014. Natural Resource Management Ministerial Council, Canberra, Australia.

Noss, R. F. (2001). Beyond Kyoto: Forest Management in a Time of Rapid Climate Change. *Conservation Biology* 15(3):578-590.

Phillips, S. (2000). Population Trends and the Koala Conservation Debate. *Conservation Biology* 14(3): 650-659.

Piggott, M. P., Bellemain, E., Taberlet, P. & Taylor, A. (2004). A multiplex pre-amplification method that significantly improves microsatellite amplification and error rates for faecal DNA in limiting conditions. *Conservation Genetics* 5: 417-420.

Piggott, M. P., Banks, S. C., Stone, N, Banffy, C. & Taylor, A. C (2006). Estimating population size of endangered brush-tailed rock-wallaby (*Petrogale penicillata*) colonies using faecal DNA. *Molecular Ecology* 15: 81-91.

Piggott, M.P. & Taylor, A. (2003). Extensive evaluation of faecal preservation and DNA extraction methods in Australian native and introduced species. *Australian Journal of Zoology* 51: 341-355.

Radford, S.L. McKee, J., Goldingay, R.L & Kavanagh , R.P. (2006). The protocols for Koala research using radio-collars: a review based on its application in a tall coastal forest in New South Wales and the implications for future research. *Australian Mammalogy* 28(2):187-200.

Reed J. Z., Tollit, D. J., Thompson, P. M. & Amos, W. (1997). Molecular scatology: the use of molecular genetic analysis to assign species, sex and individual identity to seal faeces. *Molecular Ecology* 6: 225-234.

Rossi, S., Wright, W. & Loyn, R. (2005). 'Birds, mammals and their habitat in a variegated landscape in the Eastern Strzelecki Ranges, Victoria, Australia.' 5th North American Forest Ecology Workshop, Aylmer, Quebec, Canada. 12-16 June.

Seymour, A. M., Montgomery, M. E., Costello, B. H., Ihle, S., Johnsson, G. St. John, B. Taggart, D. & Houlden, B. A. (2001). High effective inbreeding coefficients correlate with morphological abnormalities in populations of South Australian Koalas (*Phascolarctos cinereus*). *Animal Conservation* 4: 211–219.

Sherwin, W. B., Timms, P., Wilken, J. & Houlden, B. (2000). Analysis and conservation implications of Koala genetics. *Conservation Biology* 43(3): 211-219.

Siddle, H. V., Kreiss, A., Eldridge, M. D. B., Noonan, E., Clarke, C. J., Pyecroft, S., Woods, G. M. & Belov, K. (2007). Transmission of a fatal clonal tumor by biting occurs due to depleted MHC diversity in a threatened carnivorous marsupial. *Proceedings of the National Academy of Sciences USA* 104: 16221–16226.

Smith, A. P. & Lindenmayer, D. B. (1988). Tree hollow requirements of Leadbeater's possum and other possums and gliders in timber production forests of the Victorian Central Highlands. *Australian Wildlife Research* 15, 347-62.

Swaart, J. A. A. (2004). The wild animal as a research animal. *Journal of Agricultural and Environmental Ethics* 17, 181-197.

Taberlet, P. & Luikart, G. (1999). Non-invasive genetic sampling and individual identification. *Biological Journal of the Linnean Society* 68, 41-55.

Tyndale-Biscoe, C. H., and Smith, R. F. (1969). Studies of the marsupial glider, *Schoinobates volans* (Kerr). 111. Response to habitat destruction. *Journal of Animal Ecology* 38, 651-9.

Waits, L. P. & Paetkau, D. (2005). Noninvasive genetic sampling tools for wildlife biologists: a review of applications and recommendations for accurate data collection. *Journal of Wildlife Management* 69, 1419-1433.

Walker, F. M., Horsup, A. & Taylor, A. (2009). Leader of the pack: faecal pellet deposition order impacts PCR amplification in wombats. *Molecular Ecology Resources* 9:720-724.

Wasser, S. K., Houston, C. S., Koehler, G. M., Cadd, C. G. & Fain, S. R. (1997). Techniques for application of faecal DNA methods to field studies of Ursids. *Molecular Ecology* 6: 1091-1097.

WGCMA (2003). West Gippsland Native Vegetation Plan. West Gippsland Catchment Management Authority, Traralgon, Victoria.

Worthington Wilmer, J. M., Meltzer, A., Carrick, F. & Moritz, C. (1993). Low genetic diversity and inbreeding depression in Queensland Koalas. *Wildlife Research* 20: 177-188.

Zhang, Z., Peterson, J. A., Zhu, X., Wright, W. (2007). Modelling land use and land cover change in the Strzelecki ranges, International Congress on Modelling and Simulation, 10 December 2007 - 13 December 2007, The Modelling and Simulation Society of Australia and New Zealand Inc, Christchurch New Zealand, pp. 1328-1334.

PART D - Project Cost (LP110100162)

D1. What is the proposed budget for your project?

(Please provide details of the budget proposed for your project.)

Proposal Funding Summary

Total requested budget: $163332

Year 1

Description	ARC	AdminOrg		PO	
	Cash	Cash	In-kind	Cash	In-kind
Direct Cost	54444	0	93346	19500	47000
Personnel	54444	0	61346	0	39500
APAI 1	27222	0	0	0	0
APAI 2	27222	0	0	0	0
CI Hogan	0	0	16038	0	0
CI Wright	0	0	22654	0	0
CI Mosse	0	0	22654	0	0
PI Menkhorst	0	0	0	0	12000
PO Grand Ridge	0	0	0	0	22500
PO DSE	0	0	0	0	1000
PO GHD	0	0	0	0	3000
PO Parks Vic	0	0	0	0	1000
Equipment	0	0	32000	15000	6200
Database access	0	0	0	0	6200
Molecular Biology consumables	0	0	0	2000	0
Molecular Biology reagents	0	0	0	4000	0
AGRF analysis	0	0	0	5000	0
Sequencing	0	0	0	2000	0
Genotype software / consulting	0	0	0	2000	0
Research training & infrastructure	0	0	26000	0	0
Office space & computing	0	0	6000	0	0
Maintenance	0	0	0	1500	800
Personal protective equipment	0	0	0	1000	0
Binoculars	0	0	0	500	0
GPS equipment	0	0	0	0	800
Travel	0	0	0	3000	0
Vehicle hire	0	0	0	3000	0
Other	0	0	0	0	500
Storage / work space	0	0	0	0	500

Year 2

Description	ARC	AdminOrg		PO	
	Cash	Cash	In-kind	Cash	In-kind
Direct Cost	54444	0	95799	19500	38500
Personnel	54444	0	63799	0	32500

Description	ARC	AdminOrg		PO	
	Cash	Cash	In-kind	Cash	In-kind
APAI 1	27222	0	0	0	0
APAI 2	27222	0	0	0	0
CI Hogan	0	0	16679	0	0
CI Wright	0	0	23560	0	0
CI Mosse	0	0	23560	0	0
PI Menkhorst	0	0	0	0	12000
PO Grand Ridge	0	0	0	0	15500
PO DSE	0	0	0	0	1000
PO GHD	0	0	0	0	3000
PO Parks Vic	0	0	0	0	1000
Equipment	0	0	32000	14000	4700
Database access	0	0	0	0	4700
Molecular Biology consumables	0	0	0	2000	0
Molecular Biology reagents	0	0	0	4000	0
AGRF analysis	0	0	0	4000	0
Sequencing	0	0	0	2000	0
Genotype software / consulting	0	0	0	2000	0
Research training & infrastructure	0	0	26000	0	0
Office space & computing	0	0	6000	0	0
Maintenance	0	0	0	0	800
GPS equipment	0	0	0	0	800
Travel	0	0	0	5500	0
Vehicle hire	0	0	0	5500	0
Other	0	0	0	0	500
Storage / work space	0	0	0	0	500

Year 3

Description	ARC	AdminOrg		PO	
	Cash	Cash	In-kind	Cash	In-kind
Direct Cost	54444	0	98351	19500	38500
Personnel	54444	0	66351	0	32500
APAI 1	27222	0	0	0	0
APAI 2	27222	0	0	0	0
CI Hogan	0	0	17347	0	0
CI Wright	0	0	24502	0	0
CI Mosse	0	0	24502	0	0
PI Menkhorst	0	0	0	0	12000
PO Grand Ridge	0	0	0	0	15500
PO DSE	0	0	0	0	1000
PO GHD	0	0	0	0	3000
PO Parks Vic	0	0	0	0	1000
Equipment	0	0	32000	14000	4700
Database access	0	0	0	0	4700
Molecular Biology consumables	0	0	0	2000	0

Description	ARC	AdminOrg		PO	
	Cash	Cash	In-kind	Cash	In-kind
Molecular Biology reagents	0	0	0	4000	0
AGRF analysis	0	0	0	2000	0
Sequencing	0	0	0	2000	0
Genotype software / consulting	0	0	0	4000	0
Research training & infrastructure	0	0	26000	0	0
Office space & computing	0	0	6000	0	0
Maintenance	0	0	0	0	800
GPS equipment	0	0	0	0	800
Travel	0	0	0	5500	0
Vehicle hire	0	0	0	2500	0
Conference attendance	0	0	0	3000	0
Other	0	0	0	0	500
Storage / work space	0	0	0	0	500

Partner Organisation Summary

	Year 1		Year 2		Year 3		Year 4		Year 5	
	Cash	In-kind	Cash	In-kind	Cash	In-kind	Cash	In-kind	Cash	In-kind
GHD Pty Ltd	0	5000	0	5000	0	5000	0	0	0	0
Grand Ridge Plantations Pty Ltd	17500	24500	17500	17500	17500	17500	0	0	0	0
Loy Yang Power Station	2000	0	2000	0	2000	0	0	0	0	0
Parks Victoria	0	3000	0	3000	0	3000	0	0	0	0
Peter Menkhorst (sole trader)	0	12000	0	12000	0	12000	0	0	0	0
Victorian Department of Sustainability and Environment	0	2500	0	1000	0	1000	0	0	0	0
Total	**19500**	**47000**	**19500**	**38500**	**19500**	**38500**	**0**	**0**	**0**	**0**

PART E - Budget Justifications (LP110100162)

E1. Justification of funding requested from the ARC

(In no more than two A4 pages and within the required format, fully justify in terms of need and cost, each budget item requested from the ARC (Use the same headings as indicated under Direct Costs in the ARC Requested Budget Table). Proposals requesting a Linkage Industry Fellowship may include up to one additional A4 page outlining the case for the fellowship.)

E1. Justification of funding requested from the ARC

Direct cost

Personnel

Two APAI stipends comprise the only budget items requested from the ARC. The value of each stipend is cited as per Appendix D of the Funding rules, at $27222 per year (for three years).

The CIs, PI and POs comprise a strong team, based in the study area, with the unique combination of expertise required for this multidisciplinary project. The running costs of the project are entirely covered by Monash University and the POs, however two full time students, with specific skill sets, are required to carry out the research program, since CIs Hogan, Wright and Mosse have high teaching loads and significant administrative responsibilities

The highly regarded APAI scholarships will be advertised widely and will attract high quality PhD candidates with the required skills and experience (documented below) to Monash University's regional campus in Gippsland. These stipends will directly support the two APAIs involved in this project, and will also increase the research profile and research capacity of the regional campus more generally.

Both APAIs will be located at the School of Applied Sciences and Engineering at Monash University's Gippsland Campus. This research represents an ideal opportunity for two APAIs to gain research skills and training, interact with industry partners, assist in the development of new approaches in conservation biology and contribute meaningful outcomes. It is anticipated that the APAIs will share the expertise that they develop with other professionals in partner organisations, who have limited opportunity to interact with other science professionals. The APAIs will also play a significant role in community engagement. By presenting relevant aspects of their work to local interest groups, they will stimulate interest and generate an improved understanding of the role of science in conservation and management of biodiversity.

APAI- 1 will focus on the genetic characteristics of the Strzelecki Koala and will have a molecular biology background and must have an interest in applying genetic analyses to ecological questions.

APAI-2 will take a landscape ecology approach to understanding the distribution and status of the Strzelecki Koala population and will have a background in ecology and spatial sciences as well as an interest in molecular ecology.

E2. Justifications of Partner Organisation and other non-ARC contributions

(In no more than two A4 pages and within the required format, provide a justification of how non-ARC contributions will support the proposed project (use the same headings as in the non-ARC contributions Budget Column). Contributions by eligible Partner Organisations should be highlighted, and attributed to specific Partner Organisations.)

E2. Justification of Partner Organisation and other non-ARC contributions ARC

Direct

Personnel

Monash University personnel (CIs Hogan, Taylor, Wright and Mosse) will be responsible for the overall planning, coordination and monitoring of all aspects of the project, including: overseeing the two APAI research programs; coordinating access to resources (including in-kind support from partner organisations); providing direction regarding the design and execution of experimental work and theoretical analysis; guiding the interpretation of experimental results, and critically examining all aspects of the research.

> **CI Hogan** is employed at Monash University at Level B, step6. She will contribute 0.15 of her time to the project, valued at: $16038 in year 1, $16679 in year 2 and $17347 in year 3. Total is $50064 (salary + 35.26% on-costs).
>
> **CI Taylor** is an Adjunct Senior Research Fellow at Monash University. This is an honorary appointment and CI Taylor will not draw a salary for work relating to this project.
>
> **CIs Wright and Mosse** are both employed at Monash University at Level C, step 1. They will each contribute 0.15 of their time to the project, each contribution is valued at: $22654 in year 1, $23560 in year 2 and $24502 in year 3. Total is $70716 (salary + 35.26% on-costs).

PI Peter Menkhorst (sole trader) is a consultant ecologist. He will provide advice on research design, implementation of methods, interpretation of results and formulation of policy recommendations as well as co-supervision of one APAI. This will involve attending 12 meetings per annum for three years, plus telephone and email discussions, at an estimated value of $12000 per annum for three years.

Grand Ridge (HVP) Plantations will provide personnel to assist with GIS plotting and mapping (3 hours per week) $9000pa; initial selection of monitoring sites (two people/ 4 visits, year 1 only) $7000; field visits to monitoring sites (two people/ two visits per year) $3500pa; collection of scats and recording of koala sightings by field staff (1 hour per week in addition to normal duties) $3000pa; overall total of $22500 in Year 1, $15500 in Years 2 & 3

Dept of Sustainability and Environment (DSE) personnel will provide logistical and liaison support and facilitate contact with local wildlife shelter operators (2 hours per month) $1000pa

GHD will provide the services of a spatial scientist who will provide specialist technical expertise, support and training of the APAIs (4 hours per month) $3000pa

Parks Victoria personnel will provide access to PV-managed land and relevant information (2 hours per month) $1000pa

Equipment

Database access

HVP Plantations Pty Ltd will provide access to data and maps describing the extents and distributions of Koalas and their habitat (AKF, 2005). This information was originally collected (prior to 2005) by the Australian Koala Foundation (AKF) for HVP Plantations Pty Ltd and will be repeated by APAI 2 to establish any differences following the Black Saturday fires in 2009. HVP Plantations Pty Ltd also has an extensive, high resolution GIS database pertaining to their estate, collected over several decades. This includes data regarding vegetation type, silvicultural history and fire history which will all be available to the project. Access to these combined databases is estimated to be worth $2000 per year. Costing is based on 10% costs of annual software license for one person (3hrs/week) and database maintenance costs.

Parks Victoria will contribute GIS data to the project, supplementing data regarding the recent distribution of koalas and their habitat, particularly in areas managed by PV. Access to these databases is estimated to be worth $1500 per year.

GHD will provide access to specialised remote sensing data (including aerial photography) and software for spatial analysis of changes to preferred Koala habitat over time. Access to these databases and software is estimated to be worth $1200 per year.

DSE will further supplement the GIS database for the project, providing detailed mapping of the extent and severity of recent fire events in the study area. DSE will also provide access to additional data including flora and fauna records from the Atlas of Victorian Wildlife and the Victorian Flora Information System. Access to these databases is provided in the first year only and is estimated to be worth $1500.

Grand Ridge (HVP) Plantations will provide funds to cover costs of **Molecular biology consumables**: comprising disposable plasticware (pipette tips, transfer pipettes, microfuge and PCR tubes), storage boxes, spin columns and transfer membranes $2000pa; **Molecular biology reagents**: including DNA isolation kits, Taq polymerase, dNTPs, enzymes, specialised buffers, agarose $4000pa; **AGRF analysis**: Primer design ($120/pair) and microsatellite genotyping (8 markers; $20/ sample); approx 250 samples in year 1 ($5000); 200 samples in year 2($4000) ; 100 samples in Year 3 ($2000); **Genotype analysis software/ consulting**: access to specialist software and expertise (years 1&2 $2000pa; year 3 $4000).

Loy Yang Power will provide funds to cover costs of mitochondrial genome sequencing: 150 samples @ $9/sample (Micromon) plus reagents $4/sample; $2000pa.

Maintenance

Monash University will provide each APAI with access to appropriately equipped laboratory facilities, research training and office space; a lap top computer and computer support; estimated value $32000pa.

Grand Ridge (HVP) Plantations will provide funds to cover purchase of **Personal protective equipment** (safety glasses, safety boots, lab coat, reflective vest, hard hat) for each APAI ($500 per student in Year 1 only) and a good quality pair of field **Binoculars** will be required by APAI 2. (Cost estimate of $500 is from Camera House Pty Ltd).

GHD will waive the costs of hire of **GPS data collection equipment** and associated software to the value of $800 to enable the accurate recording of the locations of samples collected in the field.

Travel

Grand Ridge (HVP) Plantations will provide funds to cover **hire costs for a 4WD vehicle** (14 days Year 1; 30 days Year 2; 14 days year 3); Avis quotes $91/day for multi day hire (includes 100km travel); additional travel 27.5c/km; excess $100 plus petrol (estimate $3000 in Years 1, $5500 in Year 2, $2500 in Year 3) and funds to permit APAIs to attend a conference within Australia to present and discuss their findings with other researchers ($1500 per student in Year 3).

Other

Parks Victoria will provide access to storage and work space at PV work centres, valued at $500pa

PART F - Personnel (Dr Fiona Hogan)

F1. Personal details

(The personal details will be filled out for you automatically. To update any of your personal details in this form, please update your profile accordingly and your details will update automatically in this form.)

Title

Doctor

Family Name

Hogan

First Name

Fiona

Second Name

Elizabeth

Person identifier

32838594

Role

Chief Investigator

F2. Postal address

(The postal address will be filled out for you automatically. To update your postal address, please update your profile accordingly and your postal address will update automatically in this form.)

Postal Address Line 1

Monash University, Gippsland Campus

Postal Address Line 2

Northways Rd

Locality

Churchill

State

VIC

Postcode

3842

Country

Australia

F3. Are you applying for a Linkage Industry Fellowship (LIF)?

Linkage Industry Fellowship

No

F4. Are you a current member of the ARC or its selection or other advisory committees?

(This relates only to College of Experts members or Selection Advisory Committee members for National Competitive Grants Program funding schemes.)

Current Member of Advisory Committee

No

F5. Please name any of your relatives or close social/professional associates that are members of the ARC or its selection or other advisory committees.

	Associates and Relatives Members of Advisory Committee
1	
2	
3	
4	

F6. Please name any Commonwealth-funded Research Centre that you will be associated with as at 1 January 2011.

	Full Legal Name of Centre	Start Date	Cessation Date	Centre Role
1				
2				

	Centre Role if Other
1	
2	

F7. Partner Organisation Association

Do you have an association with a Partner Organisation named in this proposal which is, or may be perceived as, a Conflict of Interest?

Association With Partner Organisation

No

In no more than 750 characters (approx. 100 words) of plain language, please describe the Conflict of Interest and how it will be managed.

Not applicable for this candidate

F8. If you hold a PhD or expect to be awarded a PhD qualification in the near future, please enter the date your PhD has been awarded or the date your thesis will be submitted, respectively.

Date of Award

02/10/2008

F9. Qualifications

	Degree/Award	Year	Discipline/Field	Organisation Name
1	PhD	2008	Population Genetics	Deakin University
2	BSc (Hons)	1996	Biological Science	La Trobe University

	Country
1	Australia
2	Australia

F10. Current and previous appointment(s)/position(s) – during the past 10 years

	Position	Organisation Name	Department	Year Appointed
1	Lecturer	Monash University	School of Applied Science and Engineering	2010
2	Lecturer	Deakin University	School of Life and Environmental Sciences	2009
3	Lecturer	Deakin University	School of Life and Environmental Scineces	2008
4	Marketing Officer	Deakin University	Faculty of Science and Technology	2008
5	Associate Lecturer	Deakin University	School of Life and Environmental Scinences	2006
6	Research Officer	Deakin University	Faculty of Science and Technology	2003
7	Chemical Analyst	CSL Ltd	Quality Control	1999

	Continuity	Employment Kind
1	Contract	Full Time
2	Contract	Full Time
3	Contract	Full Time
4	Contract	Full Time
5	Contract	Part Time
6	Contract	Part Time
7	Permanent	Full Time

F11. Organisational affiliations for eligibility purposes for this Proposal

(Name of the organisation you will be associated with for the purposes of satisfying the eligibility requirements for your nominated role in undertaking the proposed research. (i.e. for a CI and Supervisors this will usually be the Eligible Organisation at which they will be employed or hold an adjunct appointment as at 1 January 2011 and beyond; for Fellowship candidates it will be the Host Organisation).)

Organisation Name

Monash University

Type of Affiliation

Employee

F12. Research Record Relative to Opportunities

F12.1. Details on your career and opportunities for research over the last 5 years.

(Write a maximum of 3750 characters (approx 500 words). Provide and explain: (i) The number of years it has been since you graduated with your highest educational qualification; (ii) The research opportunities that you have had in the context of your employment situation (e.g., Early Career Researcher), the research component of your employment conditions, and any unemployment or part-time employment you may have had; (iii) Whether you are a research-only, teaching and research, teaching-only, teaching and administration, research and administration, or administration-only academic, giving any additional information (e.g., part time status) needed to understand your situation. Give an indication of what percentage of time you have spent over the last five years in those roles; (iv) Any career interruptions you have had for childbirth, carer's responsibility, misadventure, or debilitating illness; (v) The research mentoring and research facilities available to you; and (vi) Any other aspects of your career or opportunities for research that are relevant to assessment and that have not been detailed elsewhere in this Proposal (e.g., any circumstances that may have slowed down your research and publications) or affected the time you have had to conduct and publish from research.))

(i) It has been 1.5 years since I was awarded my PhD degree from Deakin University, Australia.
(ii) My position at Monash University is the first full time (long tenure) academic position I have held since being awarded my PhD in 2008 and therefore the first opportunity I have had to establish my research career remote of my PhD studies. Prior to this, my appointments as a lecturer at Deakin University were short tenure (6 month) teaching only positions. There was no support or allowances for me to conduct research during 2008 and 2009.
(iii) In the last 5 years I have completed my PhD, along with holding a number of short tenure (6 month) teaching academic positions. These positions were teaching only where 100% of my time was devoted to teaching and administration. I currently hold a full time teaching and research academic position, where I have teaching (50%), research (40%) and administration / service (10%) responsibilities.
(iv) I have had no career interruptions.
(v) I have recently been appointed as a research/teaching academic at Monash University, Gippsland Campus and am currently developing my future research career. I am currently being mentored by a number of highly successful research academics from both Monash University and Deakin University. I have access to research laboratories and facilities at Monash University and Deakin University, as well as access to the excellent genetic laboratory facilities at Melbourne Museum.
(vi) Over the past five years I have undertaken and completed my PhD research along with being appointed to numerous academic teaching positions. During this time I have excelled in both teaching and research, where I have received awards in both areas. Relative to opportunity my research achievements are substantial. I have published 8 scientific papers in refereed journals, 2 papers in peer reviewed conference proceedings and presented my research at 5 international / national conferences. In 2009 I was nominated as an Australian Fresh Scientist, which is awarded to Early Career Researchers whose research is of high standard and of interest to the greater general community.

F12.2. Recent significant publications (2005 onwards)

(Please attach a PDF with a list of your recent significant publications (40 pages maximum). (1) Provide your research publications published in the last five years split into the five categories of: (a) scholarly books, (b) scholarly book chapters, (c) refereed journal articles, (d) refereed conference papers only when the paper was published in full in the proceedings, and, (e) other. You must number your publications continuously. Asterisk the publications relevant to this Proposal. (2) Provide a list of your ARC grants awarded in the last 10 years on which you have been a Chief Investigator. Give the ARC grant number, Chief Investigator names in the order that they appear on the grant, the amount funded, the years for which the grant was awarded, and the title of the grant. Please refer to the Instructions to Applicants for format requirements. With respect to your numbered publications in the last 5 years given in part 1 of question F12.2, next to each ARC grant, provide the numbers of the publications from part 1 of question F12.2 that arose from, or were in part supported by, your ARC grants.)

Recent Significant Publication – Dr Fiona Hogan

* pertinent to this application.

Italicized surnames indicate students for whom I was supervisor on the published work.

C1. Refereed Journal Articles

1. * **Hogan, F**. and Cooke, R. (in Press). Insights into the breeding behaviour and dispersal of the powerful owl (*Ninox strenua*) determined through the collection of shed feathers*. Emu*. Accepted 19 March 2010.

2. * **Hogan, F**., Cooke, R. and Norman, J. (2009). Reverse ascertainment bias in microsatellite allelic diversity in owls (Aves, Strigiformes). *Conservation Genetics* 10, 635-638.

3. * **Hogan, F**. and Cooke, R. (2009). Conservation biology: a 'crisis discipline'. *The Victorian Naturalist* 126(3), 92-98.

4. * **Hogan, F**., Cooke, R., Burridge, C. and Norman, J. (2008). Optimizing the use of shed feathers for genetic analysis. *Molecular Ecology Resources* 8, 561-567.

5. * *Isaac, B*., Cooke, R., Simmons, D. and **Hogan, F**. (2008). Predictive mapping of powerful owl (*Ninox strenua*) breeding sites using Geographical Information Systems (GIS) in urban Melbourne, Australia. *Landscape and Urban Planning* 84, 212-218.

6. * **Hogan, F**., Burridge, C., Cooke, R. and Norman, J. (2007). Isolation and characterisation of microsatellite loci to DNA fingerprint the powerful owl (*Ninox strenua*). *Molecular Ecology Notes* 7, 1305 - 1307.

7. * *Hurley, V.G*., **Hogan, F**., White, J. and Cooke, R. (2007). A morphometric model for sexing nestling Peregrine Falcons (*Falco peregrinus macropus*) derived from genetic analysis. *Wildlife Research* 34, 54-58.

8. Cooke, R., Wallis, R., **Hogan, F**., White, J. and Webster, A. (2006). The diet of Powerful Owls (*Ninox strenua*) and prey availability in a continuum of habitats from disturbed urban fringe to protected forest environments in south-eastern Australia. *Wildlife Research* 33, 199-206.

E1. Refereed Conference Papers

1. * **Hogan, F**., Cooke, R., Norman., J and Burridge, C. (2007). A non-invasive sampling strategy for mapping the genetics of Powerful Owls in Australia. Proceedings of the 4th Symposium on Asian Raptors, Taiping, 28-31 October 2005.

2. * Cooke, R., **Hogan, F**., Wallis, R. and Hurley, V.G. (2007). Methods of marking juvenile Powerful Owls in Melbourne, Australia. Proceedings of the 4th Symposium on Asian Raptors, Taiping, 28-31 October 2005.

ARC Grants

I have not been awarded any ARC grants in the past 10 years.

F12.3. Ten career-best publications

(Please attach a PDF with a list of your ten career-best publications (10 pages maximum). Provide the full reference for each of your ten best publications. Next to each provide information on any ARC grant scheme on which you were a Chief Investigator from which they originated, as described in F12.2. Add a statement of a maximum of 30 words explaining and justifying the impact or significance of each publication. Asterisk the publications relevant to this Proposal.)

Ten Career Best Publications – Dr Fiona Hogan

1. * **Hogan, F**. and Cooke, R. (In Press). Insights into the breeding behaviour and dispersal of the powerful owl (*Ninox strenua*) determined through the collection of shed feathers. *Emu.* Accepted 19 March 2010.

   This paper provides the first conclusive information on the mating behaviour and juvenile dispersal of the powerful owl, through the collection of shed feathers and genetic analysis.

2. * **Hogan, F**., Cooke, R. and Norman, J. (2009). Reverse ascertainment bias in microsatellite allelic diversity in owls (Aves, Strigiformes). *Conservation Genetics* 10, 635-638

   This paper demonstrates how microsatellite loci can be more variable in closely related species than in the target species and are therefore useful for future genetic studies on such species.

3. * **Hogan, F.** and Cooke, R. (2009). Conservation biology: a 'crisis discipline'. *The Victorian Naturalist* 126(3), 92-98.

   How recent advances in molecular techniques and information technology can be used to benefit studies of wild populations.

4. * **Hogan, F**., Cooke, R., Burridge, C. and Norman, J. (2008). Optimizing the use of shed feathers for genetic analysis. *Molecular Ecology Resources* 8, 561-567.

   Describes a novel protocol for pre-screening DNA extracted from non-invasive genetic samples eg. feathers, scats, to minimise genotyping errors.

5. * Isaac, B., Cooke, R., Simmons, D. and **Hogan, F**. (2008). Predictive mapping of powerful owl (*Ninox strenua*) breeding sites using Geographical Information Systems (GIS) in urban Melbourne, Australia. *Landscape and Urban Planning* 84, 212-218.

   Detecting potential nesting sites by modelling powerful owl habitat using GIS. This approach can be used to model any species habitat spatially.

6. * **Hogan, F**., Burridge, C., Cooke, R. and Norman, J. (2007). Isolation and characterisation of microsatellite loci to DNA fingerprint the powerful owl (*Ninox strenua*). *Molecular Ecology Notes* 7, 1305 - 1307.

   The suite of markers described are highly polymorphic and are able to distinguish between closely related individuals eg. siblings and have a P_{ID} of 1 in 10,000.

7. * Hurley, V.G., **Hogan, F**., White, J. and Cooke, R. (2007). A morphometric model for sexing nestling Peregrine Falcons (*Falco peregrinus macropus*) derived from genetic analysis. Wildlife Research 34, 54-58.

   Provides a model which can be used in the field to identify the gender of peregrine nestlings, which is extremely important to inform on band size.

8. Cooke, R., Wallis, R., **Hogan, F**., White, J. and Webster, A. (2006). The diet of Powerful Owls (*Ninox strenua*) and prey availability in a continuum of habitats from disturbed urban fringe to protected forest environments in south-eastern Australia. Wildlife Research 33, 199-206.

   This paper was the first to describe in detail the food resources required by the powerful owl within the urban city of Melbourne, through the collection of regurgitated food pellets.

9. * **Hogan, F**., Cooke, R., Norman., J and Burridge, C. (2007). A non-invasive sampling strategy for mapping the genetics of Powerful Owls in Australia. Proceedings of the 4th Symposium on Asian Raptors, Taiping, 28-31 October 2005.

   This paper presents an approach to obtain a large genetic sample size, over an extensive spatial scale, from rare, cryptic and elusive species.

10. * Cooke, R., **Hogan, F**., Wallis, R. and Hurley, V.G. (2007). Methods of marking juvenile Powerful Owls in Melbourne, Australia. Proceedings of the 4th Symposium on Asian Raptors, Taiping, 28-31 October 2005.

    Describes a novel method of using unique banding methods for identifying individuals from a distance.

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F12.4. Further evidence in relation to research impact and contributions to the field over the last 10 years.

(Write a maximum of 7500 characters (approx 1000 words).In this section, provide: (1) Research outputs other than publications. Other research outputs might include patents and policy advice, competitive grants and other research support, major exhibitions, compositions or performances, relevant consultancies, and other professional activities or other outputs; and (2) Evidence for the quality of your research outputs including those in F12.2 to F12.4 that are within the last 10 years. Assess the impact of your research for all of these outputs relative to opportunity and in the context of discipline expectations. Include a wide range of research evaluations of impact (e.g., citations, evaluation of the publication's quality; the journal, the book publishing house, the conference etc; and any other measures of impact; honours and awards/prizes, esteem measures, and any other evaluations of your outputs).)

(1) RESEARCH OUTPUTS OTHER THAN PUBLICATIONS
• Invited speaker: Have been invited to speak about at numerous events such as National Science Week, Melbourne Museum Exhibition, Victorian Naturalists, BOCA and Birds Australia.
• Consultant: I was a consultant on Powerful Owls in the Mullum Mullum for the East Link freeway project, in addition to other private consultations concerning owls.
• Non-ARC grants: I have received funding from National Geographic Society, Birds Australia, Parks Victoria, Holsworth Research Endowlement, Linnean Society of NSW and Stuart Leslie Research Award.
• Presentations and media: I have presented my research at five national / international conferences. My research has attracted substantial media attention. Since 2005 I have been interviewed on 7 radio programs and appeared in 10 print and online articles, including the front page of the Higher Education Section of The Australian.
• Awards: I was awarded the Loch Postgraduate Research Award in 2007 and nominated as an Australian Fresh Scientist in 2009.

(2) EVIDENCE FOR QUALITY OF RESEARCH OUTPUTS
Relative to opportunity my research achievements are substantial. I have published 8 scientific papers in refereed journals (ERA ranking: A 1, B 4, C 3), 2 papers in peer reviewed conference proceedings and presented my research at 5 international / national conferences. My publications have been cited 18 times combined, with one paper published in 2008 being cited 6 times. In 2009 I was nominated as an Australian Fresh Scientist, which is awarded to Early Career Researchers whose research is of high standard and of interest to the greater general community.

F12.5. A statement on your most significant contributions to this research field of this Proposal.

(Write a maximum of 3750 characters (approx 500 words).)

My research interest and expertise is in population genetics and conservation genetics. Although my research career is young, I have already made a significant contribution to these fields. My pioneering research on Australian owls was undertaken in collaboration with numerous organisation of significance in Australia, including; Australian Geographic, Museum Victoria, NSW State Forests, Parks Victoria, Zoos Victoria and The Department of Sustainability and Environment.

My research on owls was the first large scale genetic study in Australia which used DNA extracted from shed feathers as the prominent sample source. My sampling strategy was novel (and to my knowledge has not been undertaken previously) in that I employed the services of the general public and government agencies to engage in feather collection from owls across Australia. The sampling regime was successful, where I receive >2,000 feathers, some from endangered species such as the rufous owl (Ninox rufous) in habiting far north Queensland.

A significant outcome from my research was isolating and characterising genetic markers from the powerful owl (Ninox strenua). Primer pairs were designed which allow for the unequivocal identification of individuals with high resolution (PID 1 in 10,000) (Hogan et al. 2007). The greater application of these markers was assessed where I demonstrated the application of this suite of markers for identifying individuals within all Australian Ninox species (Hogan et al. 2009). I am currently collaborating with NSW State Forests to apply these markers to assess populations of barking owls (Ninox connivens) and boobooks (Ninox novaeseelandiae).

My most significant contribution to date, however, was identifying characteristics of shed feathers which could be used as cues to indicate DNA quality and quantity (Hogan et al. 2008). The research presented in this paper provides a method for optimizing DNA extracted from non-invasively collected samples. My

expertise in this area will be of great value in the proposed project where we aim obtain DNA from faecal pellets from Koalas. Although only recently published, this research is being adopted both nationally and internationally, where the paper has already been cited 6 times in published literature.

Finally, DNA extracted from shed feathers enable me to assess ecological and biological attributes of Australia's largest owl, the powerful owl, and provide the first conclusive information about its breeding behaviour, dispersal (Hogan & Cooke, in press) and population structure (Hogan & Cooke, under review).

My expertise in both molecular genetics and spatial analysis, supported by publication, will be of utmost value in the proposed project. I have extensive experience in obtaining DNA from non-invasive genetic samples and subsquently genotyping and identifying individuals. I also have six years of experience in spatial analysis / modelling species habitats using GIS.

F12.6. Fellowship candidates only

Please provide details of the contribution you will make to the project (such as your experience, skills and expertise and how they will be applied).

(Write a maximum of 1250 characters (approx 167 words).)

Not applicable for this candidate

Please provide details of the research environment, that is, the facilities and support at your host organisation, including the intellectual environment.

(Write a maximum of 1250 characters (approx 167 words).)

Not applicable for this candidate

Justify the choice of the proposed host organisation for the fellowship, including reasons for not moving to another organisation if you intend to remain at your organisation.

(Write a maximum of 1250 characters (approx 167 words).)

Not applicable for this candidate

F13. Additional Fellowship Details

F13.1. Host organisation—department, contact numbers and email address

Host Organisation Name

Not applicable for this candidate

Host Department Name

Not applicable for this candidate

Contact Name

Not applicable for this candidate

Phone

Not applicable for this candidate

Fax

Not applicable for this candidate

Email

Not applicable for this candidate

F13.2. Citizenship/Residency Details

(Please note, that the Australian citizenship status as well as the list of countries that you have citizenship of is populated from your profile.)

Australian Citizen?

Not applicable for this candidate

F13.3. Has a successful eligibility exemption been granted by the ARC for this fellowship candidate?

Not applicable for this candidate

PART F - Personnel (Dr Andrea Taylor)

F1. Personal details

(The personal details will be filled out for you automatically. To update any of your personal details in this form, please update your profile accordingly and your details will update automatically in this form.)

Title

Doctor

Family Name

Taylor

First Name

Andrea

Second Name

Carolyn

Person identifier

G1264342

Role

Chief Investigator

F2. Postal address

(The postal address will be filled out for you automatically. To update your postal address, please update your profile accordingly and your postal address will update automatically in this form.)

Postal Address Line 1

School of Biological Sciences

Postal Address Line 2

Monash University

Locality

Clayton

State

VIC

Postcode

3800

Country

Australia

F3. Are you applying for a Linkage Industry Fellowship (LIF)?

Linkage Industry Fellowship

No

F4. Are you a current member of the ARC or its selection or other advisory committees?

(This relates only to College of Experts members or Selection Advisory Committee members for National Competitive Grants Program funding schemes.)

Current Member of Advisory Committee

No

F5. Please name any of your relatives or close social/professional associates that are members of the ARC or its selection or other advisory committees.

	Associates and Relatives Members of Advisory Committee
1	
2	
3	
4	

F6. Please name any Commonwealth-funded Research Centre that you will be associated with as at 1 January 2011.

	Full Legal Name of Centre	Start Date	Cessation Date	Centre Role
1				
2				

	Centre Role if Other
1	
2	

F7. Partner Organisation Association

Do you have an association with a Partner Organisation named in this proposal which is, or may be perceived as, a Conflict of Interest?

Association With Partner Organisation

No

In no more than 750 characters (approx. 100 words) of plain language, please describe the Conflict of Interest and how it will be managed.

Not applicable for this candidate

F8. If you hold a PhD or expect to be awarded a PhD qualification in the near future, please enter the date your PhD has been awarded or the date your thesis will be submitted, respectively.

Date of Award

00/04/1996

F9. Qualifications

	Degree/Award	Year	Discipline/Field	Organisation Name
1	PhD	1996	Wildlife Genetics	The University of New South Wales
2	BSc(Hons)	1986	Genetics	Monash University

	Country
1	Australia
2	Australia

F10. Current and previous appointment(s)/position(s) – during the past 10 years

	Position	Organisation Name	Department	Year Appointed
1	Adjunct Senior Research Fellow	Monash University	Biological Sciences	2010
2	Senior Research Fellow	Monash University	Biological Sciences	2002
3	Research Fellow	Monash University	Biological Sciences	1999

	Continuity	Employment Kind
1	Contract	Part Time
2	Contract	Part Time
3	Contract	Part Time

F11. Organisational affiliations for eligibility purposes for this Proposal

(Name of the organisation you will be associated with for the purposes of satisfying the eligibility requirements for your nominated role in undertaking the proposed research. (i.e. for a CI and Supervisors this will usually be the Eligible Organisation at which they will be employed or hold an adjunct appointment as at 1 January 2011 and beyond; for Fellowship candidates it will be the Host Organisation).)

Organisation Name

Monash University

Type of Affiliation

Adjunct Appointment

F12. Research Record Relative to Opportunities

F12.1. Details on your career and opportunities for research over the last 5 years.

(Write a maximum of 3750 characters (approx 500 words). Provide and explain: (i) The number of years it has been since you graduated with your highest educational qualification; (ii) The research opportunities that you have had in the context of your employment situation (e.g., Early Career Researcher), the research component of your employment conditions, and any unemployment or part-time employment you may have had; (iii) Whether you are a research-only, teaching and research, teaching-only, teaching and administration, research and administration, or administration-only academic, giving any additional information (e.g., part time status) needed to understand your situation. Give an indication of what percentage of time you have spent over the last five years in those roles; (iv) Any career interruptions you have had for childbirth, carer's responsibility, misadventure, or debilitating illness; (v) The research mentoring and research facilities available to you; and (vi) Any other aspects of your career or opportunities for research that are relevant to assessment and that have not been detailed elsewhere in this Proposal (e.g., any circumstances that may have slowed down your research and publications) or affected the time you have had to conduct and publish from research.))

Since being awarded my PhD 14 years ago I have been continuously employed in research-only positions, but have worked for only a total of 8 years FTE due to parental leave and subsequent part-time hours enabling me to care for my 2 young children. In the last 5 years I have worked half-time, and over this period continued supervision of 9 Honours and 6 PhD students.

Monash University has provided research mentoring in the form of annual performance review discussions with the Head of School. I also regularly meet with more senior colleagues within the School on an informal basis to discuss my research development needs. My research facilities at Monash consist of a standard molecular population genetics laboratory that I established when I took up my position there in 1999, along with a genotyping facility for which I and colleagues raised special infrastructure funds from the Victorian government and through competitive and internal grants. I also have access to standard computing support and some field vehicle availability. Internal institutional funds are available on a competitive basis for seeding grants, equipment and travel for amounts in the order of $5000.

F12.2. Recent significant publications (2005 onwards)

(Please attach a PDF with a list of your recent significant publications (40 pages maximum). (1) Provide your research publications published in the last five years split into the five categories of: (a) scholarly books, (b) scholarly book chapters, (c) refereed journal articles, (d) refereed conference papers only when the paper was published in full in the proceedings, and, (e) other. You must number your publications continuously. Asterisk the publications relevant to this Proposal. (2) Provide a list of your ARC grants awarded in the last 10 years on which you have been a Chief Investigator. Give the ARC grant number, Chief Investigator names in the order that they appear on the grant, the amount funded, the years for which the grant was awarded, and the title of the grant. Please refer to the Instructions to Applicants for format requirements. With respect to your numbered publications in the last 5 years given in part 1 of question F12.2, next to each ARC grant, provide the numbers of the publications from part 1 of question F12.2 that arose from, or were in part supported by, your ARC grants.)

Publications last 5 years

* pertinent to this application

Italicized surnames indicate students for whom I was supervisor on the published work. 5-year impact factors (IF) are given for all journals with ISI IFs. The last author position usually denotes 'Head of the Laboratory', and implies major roles in inspiring, leading and providing intellectual and other input throughout the research.

B. Scholarly book chapters

1. *Sunnucks P & **Taylor AC** (2008) The application of genetics to landscape management. In: (ed. C Pettit) *Landscape Analysis and Visualisation: Spatial Models for Natural Resource Management and Planning*, Springer-Verlag. ISBN: 978-3-540-69167-9 http://www.springer.com/geography/gis+cartography/book/978-3-540-69167-9

C. Refereed journal articles

2. *Simmons* JM, Sunnucks P, **Taylor AC**, van der Ree R (2010) Beyond road-kill, radiotracking, recapture and FST – a review of some genetic methods to improve understanding of the influence of roads on wildlife. *Ecology and Society* **15** (1):9 (online). URL: http://www.ecologyandsociety.org/vol15/iss1/art9/
   IF: 3.34
3. *Marks CA, Gigliotti F, McPhee S, *Piggott* MP, **Taylor AC** & Glen AS (2009) DNA genotypes reveal red fox (*Vulpes vulpes*) abundance in a comparison of survey techniques. *Wildlife Research* **36**, 647-658.
   IF: 1.28
4. Lancaster M, Cooper S, Carthew S & **Taylor AC** (2009) Microsatellite markers for the Common ringtail possum (*Pseudocheirus peregrinus*) and their amplification in other Pseudocheirids. *Molecular Ecology Resources* **9**, 1535-1537.
   IF: 1.85
5. *Lada* H & **Taylor AC** (2009) Polymorphic nuclear markers for aquatic macroinvertebrates *Anisops hackeri*, *Micronecta gracilis* and *Necterosoma wollastoni*. *Conservation Genetics* **10**, 1625-1627.
   IF: 2.55
6. *Rourke* M, McPartlan H, Ingram B & **Taylor AC** (2009) Polygamy and low effective population size in a captive Murray cod (*Maccullochella peelii peelii*) population: genetic implications for wild restocking programs. *Marine & Freshwater Research* **60**: 873-883.
   IF: 1.80
7. **Hansen* B, Harley D, Lindenmayer D & **Taylor AC** (2009) Population genetic analysis reveals a long-term decline of a threatened endemic Australian marsupial. *Molecular Ecology* **18**: 3346-3362.
   IF: 5.97
8. Mac Nally R, Horrocks G, Lada H, Lake PS, Thomson JR & **Taylor AC** (2009) Distribution and status of anuran amphibians in massively altered landscapes in south-eastern Australia. *Global Ecology and Biogeography* **18**: 575-585.
   IF: 5.69
9. **Walker* FM, Horsup A & **Taylor AC** (2009) Leader of the pack: faecal pellet deposition order impacts PCR amplification in wombats. *Molecular Ecology Resources* **9**: 720-724.
   IF: 1.85
10. **Piggott* M, Wilson R, Marks CA, Banks SC, Gigliotti F & **Taylor AC** (2008) Evaluating exotic predator control programs using non-invasive genetic tagging. *Wildlife Research* **35**: 617-624.
    IF: 1.28

11. **Lada* H, Thomson J, Mac Nally R, & **Taylor AC** (2008) Impacts of massive landscape change on a carnivorous marsupial in south-eastern Australia: inferences from landscape genetics analysis. *Journal of Applied Ecology* **45**: 1732-1741.
    IF: 5.62
12. **Hansen* B & **Taylor AC** (2008) Isolated remnant or recent introduction? Estimating the provenance of Yellingbo Leadbeater's possums by genetic analysis and bottleneck simulation. *Molecular Ecology* **17**: 4039-4052.
    IF: 5.97
13. **Lada* H, Mac Nally R, & **Taylor AC** (2008) Phenotype and gene flow in a marsupial (*Antechinus flavipes*) in contrasting habitats. *Biological Journal of the Linnean Society* **94**: 303-314.
    IF: 3.00
14. **Lada* H, Mac Nally R, & **Taylor AC** (2008) Distinguishing past from present gene flow along and across a river: the case of the carnivorous marsupial (*Antechinus flavipes*) on southern Australian floodplains. *Conservation Genetics* **9**: 569-580.
    IF: 2.55
15. *Lada* H, Mac Nally R, & **Taylor AC** (2008) Responses of a carnivorous marsupial (*Antechinus flavipes*) to local habitat factors in two types of forests. *Journal of Mammalogy* **89**: 398-407.
    IF: 2.00
16. **Walker* FM, Sunnucks P & **Taylor AC** (2008) Evidence for habitat fragmentation altering within-population processes in wombats. *Molecular Ecology* **17**: 1674-1684.
    IF: 5.97
17. **Walker* FM, **Taylor AC** & Sunnucks P (2008) Female dispersal and male kinship-based association in southern hairy-nosed wombats (*Lasiorhinus latifrons*). *Molecular Ecology* **17**: 1361–1374.
    IF: 5.97
18. *Banks* SC, Stow A, Piggott M & **Taylor AC** (2007) Sex and sociality in a disconnected world: a review of the effects of habitat fragmentation on animal social behaviour. *Canadian Journal of Zoology* **85**: 1065-1079.
    IF: 1.80
19. Martin JK, Handasyde KA, **Taylor AC** & Coulson G (2007) Long-term pair bonds without mating fidelity in a mammal. *Behaviour* **144**: 1419-1445.
    IF: 1.94
20. *Kraaijeveld-Smit FJL, Lindenmayer DB, **Taylor AC**, MacGregor C, Wertheim B (2007) Comparative genetic structure reflects underlying life histories of three sympatric small mammal species in continuous forest of south-eastern Australia. *Oikos* **116**: 1819-1830.
    IF: 3.96
21. Beckman J, Banks S, Sunnucks P, Lill A & **Taylor AC** (2007) Phylogeography and environmental correlates of a cap on reproduction: teat-number in a small marsupial, *Antechinus agilis*. *Molecular Ecology* **16**: 1069-1083.
    IF: 5.97
22. ***Taylor AC**, Tyndale-Biscoe H & Lindenmayer DB (2007) Unexpected persistence on habitat islands: genetic signatures reveal dispersal of a eucalypt-dependent marsupial through a hostile pine matrix. *Molecular Ecology* **16**: 2655-2666.
    IF: 5.97
23. **Lada* H, Mac Nally R, Horrocks G & **Taylor AC** (2007) Genetic reconstruction of the effects of floods on population dynamics of a marsupial carnivore (*Antechinus flavipes*) on Australian floodplains. *Molecular Ecology* **16**: 2934-2947.
    IF: 5.97

24. *Lada* H, Thomson J, Mac Nally R, Horrocks G & **Taylor AC** (2007) Evaluating simultaneous impacts of three anthropogenic effects on a floodplain-dwelling marsupial *Antechinus flavipes*. *Biological Conservation* **134**: 527-536.
IF: 3.82
25. **Walker* FM, **Taylor AC** & Sunnucks P (2007) Does soil type drive social organization in southern hairy-nosed wombats? *Molecular Ecology* **16**: 199-208.
IF: 5.97
26. Martin JK, Handasyde KA & **Taylor AC** (2007) Linear roadside remnants: their influence on den-use, home range and mating system in bobucks (*Trichosurus cunninghami*). *Austral Ecology* **32**: 686-696.
IF: 2.22
27. *Charlton* K, **Taylor AC** & McKechnie SW (2006) A note on divergent mtDNA lineages of "bottlenose" dolphins from coastal waters of southern Australia. *Journal of Cetacean Research and Management* **8**: 173-179.
28. **Piggott* MP, Banks SC, Stone N, Banffy C & **Taylor AC** (2006) Estimating population size of endangered brush-tailed rock-wallaby (*Petrogale penicillata*) colonies using faecal DNA. *Molecular Ecology* **15**: 81-91.
IF: 5.97
29. **Piggott* MP, Banks SC and **Taylor AC** (2006) Population structure of brush-tailed rock-wallaby (*Petrogale penicillata*) colonies inferred from analysis of faecal DNA. *Molecular Ecology* **15**: 93-105.
IF: 5.97
30. **Walker* FM, Sunnucks P & **Taylor AC** (2006) Genotyping of 'captured' hairs reveals burrow-use and ranging behavior of southern hairy-nosed wombats. *Journal of Mammalogy* **87**: 690-699.
IF: 2.00
31. **Banks* SC, Finlayson GR, Lawson SJ, Lindenmayer DB, Paetkau D, Ward SJ & **Taylor AC** (2005) The effects of habitat fragmentation due to forestry plantation establishment on the demography and genetic variation of a marsupial carnivore, *Antechinus agilis*. *Biological Conservation* **122**: 581-597.
IF: 3.82
32. **Banks* SC. Lindenmayer DB, Ward SJ & **Taylor AC** (2005) The effects of habitat fragmentation via forestry plantation establishment on spatial genotypic structure in the small marsupial carnivore, *Antechinus agilis Molecular Ecology* **14**: 1667-1680.
IF: 5.97
33. *Banks* SC, Ward SJ, Lindenmayer DB, Finlayson GR, Lawson SJ & **Taylor AC** (2005) The effects of habitat fragmentation on the social kin structure and mating system of the agile antechinus, *Antechinus agilis*. *Molecular Ecology* **14**: 1789-1801.
IF: 5.97
34. *Hansen* BD, Sunnucks P, Blackett M & **Taylor AC** (2005) A set of microsatellite markers for an endangered arboreal marsupial, Leadbeater's possum. *Molecular Ecology Notes* **5**: 796-799.
IF: 1.85
35. Sutherland DR, Spencer PBS, Singleton GR and **Taylor, AC** (2005) Kin interactions and changing social structure during a population outbreak of feral house mice. *Molecular Ecology* **14**: 2803-2814.
IF: 5.97

E. Other

36. Invited contribution in key recent text in the discipline: Allendorf F & Luikart G (2006) *Conservation and the Genetics of Populations*. Blackwell, Malden, MA

37. **Taylor AC** (2005) Book Review: *A Primer of Conservation Genetics*, by Frankham, Ballou and Briscoe. *Australian Mammalogy*: **27**: 105-106.

ARC Grants last 10 years

Project ID	CI Name(s)	Amount funded ($k)	Years	Project Title	Publication Numbers
C00002085	Taylor, Temple-Smith	114	2000-2002	Monitoring the abundance of cryptic threatened species by microsatellite DNA analysis of faecal pellets	3,9,10,16,17,25, 28,29,30 + 7 others preceding 2005 and therefore not listed above.
X00106532	Luikart, Taberlet, Taylor	27	2001-2002	Development of new noninvasive sampling approaches for qildlife conservation management	3,9,10,16,17,25, 28,29,30 + 7 others preceding 2005 and therefore not listed above.
DP0209627	Taylor, Ward	129	2002-2004	The effects of habitat fragmentation on genetic structure and social organisation in the Brown Antechinus	18,31,32,33
LP0560443	Burgman, Sunnucks, Taylor, van der Ree	490	2005-2007	Quantifying and mitigating the barrier effect of roads and cleared land on the movement and dispersal of wildlife	2
DP0664065	Lake, Mac Nally, Taylor	366	2006-2008	Aquatic biodiversity: consequences of massive modification of agricultural landscapes	5,8
LP0668987	Carthew, Taylor, Cooper	210	2006-2009	Conservation genetics and socio-ecology of marsupials in fragmented populations of south-eastern South Australia: towards a regional biodiversity management plan	4

F12.3. Ten career-best publications

(Please attach a PDF with a list of your ten career-best publications (10 pages maximum). Provide the full reference for each of your ten best publications. Next to each provide information on any ARC grant scheme on which you were a Chief Investigator from which they originated, as described in F12.2. Add a statement of a maximum of 30 words explaining and justifying the impact or significance of each publication. Asterisk the publications relevant to this Proposal.)

Ten career-best publications

*Indicates papers on which the first author was a graduate student carrying out work under my supervision, on a project that was a component of one of my major research focus areas. My role in these publications involved obtaining research funding, and overseeing and contributing to the study design, data analysis and interpretation, and manuscript preparation.

1. *Hansen B & **Taylor AC** (2008) Isolated remnant or recent introduction? Estimating the provenance of Yellingbo Leadbeater's possums by genetic analysis and bottleneck simulation. ***Molecular Ecology*** 17: 4039-4052.

   Innovative use of population simulations to distinguish between two competing hypotheses regarding the origin of an important isolate of a threatened species.

2. *Lada H, Mac Nally R, & **Taylor AC** (2008) Distinguishing past from present gene flow along and across a river: the case of the carnivorous marsupial (*Antechinus flavipes*) on southern Australian floodplains. ***Conservation Genetics*** 9: 569-580.

   Innovative use of population simulations to reveal unexpected patterns of gene flow of a small mammal in a highly threatened ecosystem.

3. *Walker FM, Sunnucks P & **Taylor AC** (2008) Evidence for habitat fragmentation altering within-population processes in wombats. ***Molecular Ecology*** 17: 1674-1684.

   Novel combination of cutting-edge single hair genotyping for individual identification and analysis of finescale genetic patterns to address whether animals can adjust their social organisation in the face of environmental perturbations.

4. **Taylor AC**, Tyndale-Biscoe H & Lindenmayer DB (2007) Unexpected persistence on habitat islands: genetic signatures reveal dispersal of a eucalypt-dependent marsupial through a hostile pine matrix. ***Molecular Ecology*** 16: 2655-2666.

   Pioneering use of a variety of genetic analyses to infer population dynamics in a highly fragmented habitat. Described by the Subject Editor as a 'minor classic'.

5. *Beckman J, Banks S, Sunnucks P, Lill A & **Taylor AC** (2007) Phylogeography and environmental correlates of a cap on reproduction: teat-number in a small marsupial, *Antechinus agilis*. ***Molecular Ecology*** 16: 1069-1083.

   Combination of ecological and molecular genetic approaches to study a variation on an intriguing mammalian evolutionary trait akin to clutch size in birds.

6. *Walker FM, **Taylor AC** & Sunnucks P (2007) Does soil type drive social organization in southern hairy-nosed wombats? ***Molecular Ecology*** 16: 199-208.

   A rare use of non-invasive genotyping to comprehensively describe an important ecological phenomenon relating to how resource characteristics can influence sociality.

7. *Banks SC, Ward S.J, Lindenmayer DB, Finlayson GR, Lawson SJ & **Taylor AC** (2005) The effects of habitat fragmentation on the social kin structure and mating system of the agile antechinus, *Antechinus agilis*. ***Molecular Ecology*** 14: 1789-180.

One of the first studies to describe social organisation consequences of habitat fragmentation, as part of a program designed to better understand the relationship between fragmentation and extinction.

8. *Banks SC, Hoyle SD, Horsup A, Sunnucks P, **Taylor AC** (2003). Demographic monitoring of an entire species by genetic analysis of non-invasively collected material. ***Animal Conservation*** 6: 1-10.

   The first non-invasive census of an entire species, establishing the technique used to monitor abundance for this highly endangered species, and to study sociobiology in the closely-related southern hairy-nosed wombat.

9. **Taylor AC**, Horsup A, Johnson CN, Sunnucks P & Sherwin WB (1997). Relatedness structure detected by microsatellite analysis and attempted pedigree reconstruction in an endangered marsupial, the northern hairy-nosed wombat, *Lasiorhinus krefftii*. ***Molecular Ecology*** 6: 9-19.

   Pioneering use of simulation to evaluate the significance of genetic parentage assignments, and of randomisation tests in spatial analysis of relatedness, a now widely-used technique to avoid pseudoreplication in pairwise analyses.

10. **Taylor AC**, Sherwin WB & Wayne RK (1994). Genetic variation of microsatellite loci in a bottlenecked species: the Northern Hairy-nosed Wombat, *Lasiorhinus krefftii*. ***Molecular Ecology*** *3*: 277-290.
    Widely recognised and highly cited as probably the first application of microsatellite markers to a wild population.

F12.4. Further evidence in relation to research impact and contributions to the field over the last 10 years.

(Write a maximum of 7500 characters (approx 1000 words).In this section, provide: (1) Research outputs other than publications. Other research outputs might include patents and policy advice, competitive grants and other research support, major exhibitions, compositions or performances, relevant consultancies, and other professional activities or other outputs; and (2) Evidence for the quality of your research outputs including those in F12.2 to F12.4 that are within the last 10 years. Assess the impact of your research for all of these outputs relative to opportunity and in the context of discipline expectations. Include a wide range of research evaluations of impact (e.g., citations, evaluation of the publication's quality; the journal, the book publishing house, the conference etc; and any other measures of impact; honours and awards/prizes, esteem measures, and any other evaluations of your outputs).)

(1) RESEARCH OUTPUTS OTHER THAN PUBLICATIONS

• National Advisory Roles: I was appointed in 2005 by the federal Environment Minister to the Threatened Species Scientific Committee, an advisory body provided for under the Environment Protection and Biodiversity Conservation Act 1999. The committee advises the Minister on the amendment and updating of lists for threatened species, threatened ecological communities and key threatening processes together with recovery and threat abatement plans. Until it was recently disbanded I had served on the Northern Hairy-nosed Wombat Recovery Team since 1993.

• Professional activities: I have served on the Editorial Boards of international journals including Animal Conservation, Biological Conservation and Wildlife Research, the latter of which I have been Editor since 2008. I was invited to editorships for Molecular Ecology Notes and Journal of Wildlife Management (declined). I have served as an International Expert reviewer for ARC Discovery applications in multiple years, and examined 8 PhD and 1 Masters theses, including one international. I served on the Council of the Australian Mammal Society 2004-2006, and School of Biological Sciences Animal Ethics Committee 1999 - 2009.

• Highlighted work in key texts: My pioneering conservation genetics program on the Northern Hairy-nosed Wombat was highlighted in a recent text book An Introduction to Conservation Genetics (Frankham et al. 2002).

• Non-ARC grants: I have had tens of non-ARC competitive and non-competitive grants including Hermon Slade Foundation, SA NPWS, Recreational Fishing Trust , MA Ingram Trust, Norman Wettenhall Foundation, Australian Academy of Sciences, National Geographic Society, Mark Mitchell Foundaion, Chicago Zoological Society, DETYA Strategic Infrastructure, DSE VIC and Environmental Protection Agency QLD.

• Agency interactions: My research expertise has been sought on numerous occasions by various State wildlife agencies including the Department of Sustainability & Environment (VIC), Environmental Protection Agency (QLD) and National Parks and Wildlife Service (SA). This has led to various research income and agreements, including partnership and financial contributions to ARC SPIRT/Linkage projects.

• Student supervision: I have made a contribution to national capacity by student training of 17 Honours and 10 PhDs. Of 7 completed PhDs, all went on to jobs in the science sector, either as University research staff or government management agencies. The recent awarding of a Eureka prize to one graduate (Piggott) constitutes a significant acknowledgement of quality and achievement. The research outputs of another student (Hansen) have been integrated into a threatened species Action Plan for the State of Victoria.

• Presentations and media: I have given invited conference presentations at Zoological Society of London (2001) and Australian Academy of Sciences (2003) symposia. In addition, I and my group have presented >60 contributed presentations at professional meetings, and I have been invited to speak in 10 University department seminar programs. Several of my research programs have attracted media attention, resulting in my being interviewed for 3 television programs/news slots, 7 radio programs, and several newspaper/popular magazine articles including internationally.

(2) EVIDENCE FOR QUALITY OF RESEARCH OUTPUTS

Total citation, ISI, 1475+, h-index 20. Five papers have near or over 100 citations. My total 67 data articles in journals have attracted an average of 22 citations each. Of my 55 C1 publications in the last 10 years, 19 were in Molecular Ecology, which has the 6th highest impact factor of the 124 'Ecology' journals on ISI.

F12.5. A statement on your most significant contributions to this research field of this Proposal.

(Write a maximum of 3750 characters (approx 500 words).)

I have made significant contributions to molecular ecology, in which I have been working in a variety of capacities and laboratories both in Australia and overseas, for 20 years. My pioneering applications of microsatellite technology in studies of wildlife species are widely recognised. For example, Taylor et al. (1994) has been cited 221 times to date in the primary literature, and is recognized as 'perhaps the first study of genetic bottlenecks using microsatellites in a natural population' (Beaumont & Bruford 1999 in Microsatellites: Evolution and Applications, eds. Goldstein & Schlötterer). Also, Taylor et al. (1997) was one of the first to use randomisation tests in spatial analysis of relatedness, a technique now routinely used in finescale population genetic research.
Through my many associations with other geneticists and field ecologists both in Australia and overseas, my research program has highly effectively integrated genetics and ecological studies to address important issues in population biology.

I have been involved since the early stages in the emerging field of non-invasive genetics, in particular developing a novel hair-based individual identification method for censusing a highly endangered wombat species that is now used routinely by the relevant management agency. More recently my group has collaborated with the leading French laboratory in the field (that of Pierre Taberlet at the University of Grenoble) to extend these techniques to faecal samples, and have applyied them to a range of questions in several species. This program has resulted in a series of publications (including an invited review) that in total have been cited in excess of 160 times.

I continue to attract excellent students from Australia and abroad to work with me, as shown by publications of their research in international journals (Le Page, Sloane, Banks, Piggott, Hansen, Walker, Charlton, Beckman, Rourke & Lada).

F12.6. Fellowship candidates only

Please provide details of the contribution you will make to the project (such as your experience, skills and expertise and how they will be applied).

(Write a maximum of 1250 characters (approx 167 words).)

Not applicable for this candidate

Please provide details of the research environment, that is, the facilities and support at your host organisation, including the intellectual environment.

(Write a maximum of 1250 characters (approx 167 words).)

Not applicable for this candidate

Justify the choice of the proposed host organisation for the fellowship, including reasons for not moving to another organisation if you intend to remain at your organisation.

(Write a maximum of 1250 characters (approx 167 words).)

Not applicable for this candidate

F13. Additional Fellowship Details

F13.1. Host organisation—department, contact numbers and email address

Host Organisation Name

Not applicable for this candidate

Host Department Name

Not applicable for this candidate

Contact Name

Not applicable for this candidate

Phone

Not applicable for this candidate

Fax

Not applicable for this candidate

Email

Not applicable for this candidate

F13.2. Citizenship/Residency Details

(Please note, that the Australian citizenship status as well as the list of countries that you have citizenship of is populated from your profile.)

Australian Citizen?

Not applicable for this candidate

Countries of Citizenship

Not applicable for this candidate

Current Australian residency status

Not applicable for this candidate

F13.3. Has a successful eligibility exemption been granted by the ARC for this fellowship candidate?

Not applicable for this candidate

PART F - Personnel (Dr Wendy Wright)

F1. Personal details

(The personal details will be filled out for you automatically. To update any of your personal details in this form, please update your profile accordingly and your details will update automatically in this form.)

Title

Doctor

Family Name

Wright

First Name

Wendy

Person identifier

Q1275375

Role

Chief Investigator

F2. Postal address

(The postal address will be filled out for you automatically. To update your postal address, please update your profile accordingly and your postal address will update automatically in this form.)

Postal Address Line 1

Gippsland Campus

Postal Address Line 2

Northways Road

Locality

Churchill

State

VIC

Postcode

3842

Country

Australia

F3. Are you applying for a Linkage Industry Fellowship (LIF)?

Linkage Industry Fellowship

No

F4. Are you a current member of the ARC or its selection or other advisory committees?

(This relates only to College of Experts members or Selection Advisory Committee members for National Competitive Grants Program funding schemes.)

Current Member of Advisory Committee

No

F5. Please name any of your relatives or close social/professional associates that are members of the ARC or its selection or other advisory committees.

	Associates and Relatives Members of Advisory Committee
1	
2	
3	
4	

F6. Please name any Commonwealth-funded Research Centre that you will be associated with as at 1 January 2011.

	Full Legal Name of Centre	Start Date	Cessation Date	Centre Role
1				
2				

	Centre Role if Other
1	
2	

F7. Partner Organisation Association

Do you have an association with a Partner Organisation named in this proposal which is, or may be perceived as, a Conflict of Interest?

Association With Partner Organisation

No

In no more than 750 characters (approx. 100 words) of plain language, please describe the Conflict of Interest and how it will be managed.

Not applicable for this candidate

F8. If you hold a PhD or expect to be awarded a PhD qualification in the near future, please enter the date your PhD has been awarded or the date your thesis will be submitted, respectively.

Date of Award

12/12/1992

F9. Qualifications

	Degree/Award	Year	Discipline/Field	Organisation Name
1	PhD	1992	Zoology	UNIVERSITY OF READING
2	Bachelor of Science (Hons)	1988	Zoology	Monash University

	Country
1	United Kingdom
2	Australia

F10. Current and previous appointment(s)/position(s) – during the past 10 years

	Position	Organisation Name	Department	Year Appointed
1	Senior Lecturer, Environmental & Biological Sciences	Monash University	School of Applied Sciences & Engineering	2002
2	Lecturer, Environmental & Biological Sciences	Monash University	School of Applied Sciences	2001
3	Lecturer, Biological & Environmental Sciences	Monash University	School of Applied Sciences	2000

	Continuity	Employment Kind
1	Permanent	Full Time
2	Permanent	Full Time
3	Contract	Full Time

F11. Organisational affiliations for eligibility purposes for this Proposal

(Name of the organisation you will be associated with for the purposes of satisfying the eligibility requirements for your nominated role in undertaking the proposed research. (i.e. for a CI and Supervisors this will usually be the Eligible Organisation at which they will be employed or hold an adjunct appointment as at 1 January 2011 and beyond; for Fellowship candidates it will be the Host Organisation).)

Organisation Name

Monash University

Type of Affiliation

Employee

F12. Research Record Relative to Opportunities

F12.1. Details on your career and opportunities for research over the last 5 years.

(Write a maximum of 3750 characters (approx 500 words). Provide and explain: (i) The number of years it has been since you graduated with your highest educational qualification; (ii) The research opportunities that you have had in the context of your employment situation (e.g., Early Career Researcher), the research component of your employment conditions, and any unemployment or part-time employment you may have had; (iii) Whether you are a research-only, teaching and research, teaching-only, teaching and administration, research and administration, or administration-only academic, giving any additional information (e.g., part time status) needed to understand your situation. Give an indication of what percentage of time you have spent over the last five years in those roles; (iv) Any career interruptions you have had for childbirth, carer's responsibility, misadventure, or debilitating illness; (v) The research mentoring and research facilities available to you; and (vi) Any other aspects of your career or opportunities for research that are relevant to assessment and that have not been detailed elsewhere in this Proposal (e.g., any circumstances that may have slowed down your research and publications) or affected the time you have had to conduct and publish from research.))

(i) It has been 17 years since I was awarded my PhD degree from the University of Reading, UK.

(ii) Immediately following the award of my PhD and until 2001, I did not have any research opportunities. Prior to 1994, I worked at ABC TV's Natural History Unit, making wildlife documentaries. From 1994-2001, I held a series of short-term, teaching-only contracts at Monash, and was ineligible for many internal and external grants. My research career therefore began in 2001, when I received an ongoing appointment at Monash University's regional campus (Gippsland). However, at this time the campus was primarily teaching-focused and there was no research support or infrastructure. This remained the case until approximately 2005.

(iii) In the last 5 years I have been a full time academic, balancing a developing research career with significant teaching and administration responsibilities.

(iv) I have had no career interruptions.

(v) Research has only recently been made a priority (since 2005) at Monash University's Gippsland campus. A research culture is now developing and research support and infrastructure is becoming available. Prior to 2010 I was the only staff member in my discipline area at my campus. Thus, my research successes have been achieved in a short period of time, in relative isolation and with access to minimal research support and infrastructure.

(vi) Researchers at major Universities generally have opportunities to discuss and develop ideas with (senior) academics from their disciplines, in their own schools or departments; and have access to technical or general staff to support their research efforts. Such support has not been available to me. A strong contribution to the introduction of new units and courses at Monash, a high face-face teaching load (between 150 to 180 hours of lectures and tutorials per semester and responsibility for the development of off campus learning materials), significant administrative commitments and the geographical location of the Gippsland Campus have continued to limit both my research productivity, and opportunities to seek mentoring from senior researchers at other campuses or institutions.

Despite these challenges, I have developed relationships with researchers in my discipline who are based elsewhere, and have created a small research group which has high quality output in the areas of conservation biology and restoration ecology, focussing particularly on understanding the effects of anthropogenic and natural disturbances on ecological communites. I am an experienced HDR supervisor with Level 2 certification from Monash University's Research Graduate School. I have developed strong research collaborations with outside organisations. HDR completions and publications are increasing and new domestic and international HDR students are enrolling into the group. In 2008, our research on the role of plantations in the conservation of forest birds received state-wide recognition with the award of the David Ashton Prize for Biodiversity Research.

F12.2. Recent significant publications (2005 onwards)

(Please attach a PDF with a list of your recent significant publications (40 pages maximum). (1) Provide your research publications published in the last five years split into the five categories of: (a) scholarly books, (b) scholarly book chapters, (c) refereed journal articles, (d) refereed conference papers only when the paper was published in full in the proceedings, and, (e) other. You must number your publications continuously. Asterisk the publications relevant to this Proposal. (2) Provide a list of your ARC grants awarded in the last 10 years on which you have been a Chief Investigator. Give the ARC grant number, Chief Investigator names in the order that they appear on the grant, the amount funded, the years for which the grant was awarded, and the title of the grant. Please refer to the Instructions to Applicants for format requirements. With respect to your numbered publications in the last 5 years given in part 1 of question F12.2, next to each ARC grant, provide the numbers of the publications from part 1 of question F12.2 that arose from, or were in part supported by, your ARC grants.)

F12.2 Recent significant publications - Dr Wendy Wright

Notes:

* indicates publications pertinent to this application

Italicized surnames indicate students for whom I was supervisor on the published work.

Scholarly Books

1. Dutta, D. & Wright, W (Eds) (2010) Coastal Zones and Climate Change: Assessing the Impacts and Developing Adaptation Strategies. Proceedings of the International Symposium on Coastal Zones and Climate Change, Monash University, Melbourne, Australia.

Scholarly Book Chapters

1. Mosse, J. & Wright, W. (2010) Laboratory Confidence in on-campus and distance education students studying biological sciences. In Kennepohl, D. and Shaw, L. (Eds). Accessible Elements: Teaching Science Online and at a Distance. AU Press: Athabasca, Canada .

Refereed journal articles

1. *Barr, R*., Wright, W. And Rayment, P. (accepted 4 May, 2010) Thinning, fire and birds in Boola Boola State Forest, Victoria, Australia . Australian Forestry

2. *Lester, R*. & Wright, W. (2009) Reintroducing wood to streams in agricultural landscapes: changes in velocity profile, stage and erosion rates. River. Res. Applic. 25: 376–392

3. *Lester, R*., Wright, W., Jones-Lennon, M. & Rayment, P. R. (2009) Large versus small wood in streams: the effect of wood dimension on macroinvertebrate community composition. Fundamental and Applied Limnology. 174(4): 339–351

4. *Lester, R*., Wright, W. & Jones-Lennon, M.(2007) Does adding wood to agricultural streams enhance biodiversity? An experimental approach. Marine and Freshwater Research, Vol 58, pp687-698.

5. *Lester, R*., Wright, W. & Jones-Lennon, M. (2006) Determining target loads of large and small wood for stream rehabilitation in high rainfall agricultural regions of Victoria, Australia. Ecological Engineering Vol 28, Issue 1, pp71-78.

6. **MacHunter, J*., Wright, W., Loyn, R. and Rayment, P. (2006) Bird declines over 22 years in forest remnants in southeastern Australia: Evidence of faunal relaxation? Canadian Journal of Forest Research-Revue Canadienne De Recherche Forestiere, Vol 36, Issue 11, pp 2756-2768.

Refereed Conference Papers

1. Wright, W., Dutta, D. And Rayment, P. (2010) Flood vulnerability and analysis in coastal zones: a comparative analysis across five Asia-Pacific countries. Proceedings of the International Symposium on Coastal Zones and Climate Change: Assessing the Impacts and Developing Adaptation Strategies 11-13 April, 2010 Monash University Gippsland Campus, Monash University, Australia

2. Dutta, D., Wright, W. & Rayment, P. (2010) Use of Synthetic Impact Response Functions for the analysis of vulnerability to flood damage in Gippsland Coastal Zones. Proceedings of the International Symposium on Coastal Zones and Climate Change: Assessing the Impacts and Developing Adaptation Strategies 11-13 April, 2010 Monash University Gippsland Campus, Monash University, Australia

3. Dutta, D., Wright, W. & Adeloju S. (2008) A holistic approach for analysing impacts of climate changes on coastal zone systems. 7th International Symposium on New Technologies for Urban Safety of Mega Cities in Asia, pp305-314, China, 21-22 October.

4. **Zhang, Z.*, Peterson, J., Zhu, X and Wright, W. (2008) Long term land use and land cover change and its impact on cool temperate rainforest in the Strzelecki ranges, Australia. The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences. Vol. XXXVII. Part B7: 899-904

5. **Zhang, Z.*, Peterson J., Zhu, X. & Wright, W. (2008) 'Revealing long term land use and land cover change in a severely disturbed environment.' 8th International Symposium on Spatial Accuracy Assessment in Natural Resources and Environmental Sciences, pp302-308, Shanghai, China. 25-27 June.

6. **Zhang, Z.*, Peterson, J., Zhu, X. & Wright, W.(2007) Modelling Land Use and Land Cover Change in the Strzelecki Ranges. In Oxley, L. and Kulasiri, D. (eds) *MODSIM 2007 International Congress on Modelling and Simulation*. Modelling and Simulation Society of Australia and New Zealand, December 2007, pp. 1328-1334. ISBN : 978-0-9758400-4-7.

I have not previously received funds from the ARC

F12.3. Ten career-best publications

(Please attach a PDF with a list of your ten career-best publications (10 pages maximum). Provide the full reference for each of your ten best publications. Next to each provide information on any ARC grant scheme on which you were a Chief Investigator from which they originated, as described in F12.2. Add a statement of a maximum of 30 words explaining and justifying the impact or significance of each publication. Asterisk the publications relevant to this Proposal.)

F13.3 Career Best publications - Dr Wendy Wright

Notes:
* indicates publications pertinent to this application
Italicized surnames indicate students for whom I was supervisor on the published work.

1. *Barr, R*., Wright, W. And Rayment, P. (accepted 4 May, 2010) Thinning, fire and birds in Boola Boola State Forest, Victoria, Australia . Australian Forestry

   Reports the medium term effects of thinning and wildfire on forest birds. Previous work published on the effects of thinning has focussed on shorter term effects.

2. Wright, W., Dutta, D. & Rayment, P. (2010) Flood vulnerability analysis in coastal zones: a comparative analysis across five Asia-Pacific countries Proceedings of the International Symposium on Coastal Zones and Climate Change, School of Applied Sciences and Engineering, Monash University Gippsland Campus, Victoria, Australia

   Presents a method for predicting potential environmental, social and economic impacts of climate change on vulnerable coastal zone systems in across five case study sites in five Asia-Pacific countries.

3. *Lester, R*., Wright, W. & Jones-Lennon, M. (2007) 'Does adding wood to agricultural streams enhance biodiversity?' An experimental approach. *Marine and Freshwater Research*, Vol 58, pp687-698.

   Demonstrates a practical way for farmers to increase biodiversity in streams in agricultural environments. The method has been adopted by Landcare Australia and widely promoted in regional Australia.

4. Wright, W., *Rossi, S., Weston, N.* and *Barr, R*., with additional contributions from Tolsma, A. and Loyn, R.H., (2007). 'Effects of fire on vertebrate fauna: a selective review of literature relevant to south-eastern Australian forests 1980-2007' Arthur Rylah Institute for Environmental Research (Department of Sustainability and Environment: Heidelberg).

   Commissioned by the Victorian Department of Sustainability and Environment, this review informed development of the DSE's new policies and research directions in the area of fire and biodiversity.

5. **MacHunter, J.*, Wright, W., Loyn, R. and Rayment, P. (2006) 'Bird declines over 22 years in forest remnants in southeastern Australia: Evidence of faunal relaxation?' *Canadian Journal of Forest Research-Revue Canadienne De Recherche Forestiere*, Vol 36, Issue 11, pp 2756-2768.

   Demonstrated an alarming and ongoing loss of forest bird species from remnant forest patches; it was part of the work for which we received the David Ashton Biodiversity award (2008).

6. Dutta, D., Wright, W. & Adeloju S. (2008) 'A holistic approach for analysing impacts of climate changes on coastal zone systems.' 7th International Symposium on New Technologies for Urban Safety of Mega Cities in Asia, pp305-314, China, 21-22 October.

   Demonstrated a method for analysing environmental, social and economic impacts of climate change on vulnerable coastal zone systems in the Asia-Pacific region.

7. R J Lyall & W Wright (1998), 'Bridging the gap: Scientists, Managers and community groups working together to improve a wetland', in Williams W D, (Ed) Wetlands in a Dry Land: Understanding for Management, Environment Australia, Canberra.

   Encouraged the collaboration of various interest groups in managing wetlands and conserving biodiversity.

8. Wright, W. & Vincent, J. (1996) 'Herbivory and the Mechanics of Fracture in Plants'. *Biol Rev*. 71, 401-413

   Theoretical discussion of the relationship between the plant structure herbivore digestion. Allowed plant breeders to select for maximum digestibility in fodder grasses.

9. Wright, W. & Illius, A. (1995) 'A comparative study of the fracture properties of five grasses' *Functional Ecology* 9(2): 269-278

   Demonstrated the relationship between the biomechanics of plant structure and the ability of domestic herbivores to digest and extract energy.

F12.4. Further evidence in relation to research impact and contributions to the field over the last 10 years.

(Write a maximum of 7500 characters (approx 1000 words).In this section, provide: (1) Research outputs other than publications. Other research outputs might include patents and policy advice, competitive grants and other research support, major exhibitions, compositions or performances, relevant consultancies, and other professional activities or other outputs; and (2) Evidence for the quality of your research outputs including those in F12.2 to F12.4 that are within the last 10 years. Assess the impact of your research for all of these outputs relative to opportunity and in the context of discipline expectations. Include a wide range of research evaluations of impact (e.g., citations, evaluation of the publication's quality; the journal, the book publishing house, the conference etc; and any other measures of impact; honours and awards/prizes, esteem measures, and any other evaluations of your outputs).)

My research activity is primarily focused in the area of conservation and restoration biology; and in understanding the effects of anthropogenic and natural disturbances on ecological communites. My research is largely carried out in production environments (agriculture and forestry) and uses methodology relevant to this proposal from various disciplines including landscape ecology and the spatial sciences.

Given the circumstances described in Section F12.1, I have made a solid research contribution in this area, publishing and presenting research outcomes in the scientific literature; and directly influencing the management of agricultural land as well as public and private production forests in Victoria. Since 2002 I have received a total of $387,454 in research funding. I am experienced in supervision of posgtraduate students. I am currently the postgraduate coordinator in my School and have supervised 3 Higher Degree by Research (HDR) students to completion. I am currently supervising 5 HDR students.

My research contributes directly to the formation of policy and practice in land management. I have received awards from the Victorian Government (DSE) and the West Gippsland Catchment Management Authority for contributions to natural resource management relating to my research.

I have established a reputation regionally, within the state of Victoria, and internationally, working collaboratively with the Victorian Government Departments of Sustainability and Environment (DSE) and Primary Industry (DPI) on several projects, one of which won the David Ashton Biodiversity Award for Biodiversity in 2008. I was commissioned by DSE to review the literature on the effect of fire on the forest fauna of south-eastern Australia. The content of this review has already influenced priorities for research efforts within DSE and is thus of significance within the State of Victoria. I have been an invited speaker at several fora convened by DSE and the West Gippsland Catchment Management Authority (WGCMA), e.g. the "Fire and Biodiversity" forum held at Tidal River in 2007. This forum was attended by key staff from DSE, WGCMA and Parks Victoria and other speakers included leading researchers from the University of Melbourne and Latrobe University.

In 2004, I co-convened a national meeting for researchers working on the ecological restoration of rivers. The 'Wood in Streams: Current Research Methods and Directions Symposium" was held in September 2004 at Monash University's Gippsland Campus, and was attended by participants from Victoria and interstate. Many of the management recommendations made at this meeting have since been adopted by DPI and have been available to the farming community via extension materials and Landcare Australia.

Due to the uniqueness of the Australian ecosystems which I study, and the applied focus of some aspects of my work, some of my research is highly relevant to regional south-eastern Australia, but less relevant internationally. In addition, some research outcomes, particularly those relating to work carried out in collaboration with industry or government agencies are not immediately publishable (e.g. because of commercial-in confidence agreements). Nevertheless, there is clear evidence that this research has an impact in that it has led to changes in land management practices by government and/or private landowners. For example, I have provided data and advice to DSE relating to the effect of thinning operations on bird communities, and to HVP Plantations Pty Ltd relating to the role of plantations in buffering remnant patches of native vegetation, and the expansion of rainforest elements into plantation areas.

I am frequently consulted by natural resource management companies and agencies in the Gippsland region regarding the design and implementation of biodiversity monitoring and management programs. For example, I have contributed extensively to the "custodial land and biodiversity management program" for HVP Plantations Pty Ltd. In 2008, my contributions to natural resource management in the Gippsland region were formally recognised by the West Gippsland Catchment Management Authority (WGCMA) and I received a Medal and Certificate of Appreciation "for valuable contributions to Natural Resource

Management across Gippsland".

The international relevance of other aspects of my research was demonstrated when, after presenting at the International Union of Forest Research Organisations' World Congress in Canada in 2005, I was invited to contribute to a special edition of the Canadian Journal of Forest Ecology. A paper addressing the global issue of decline in forest bird communities was subsequently published in 2006.
More recently, I have provided the ecological perspective for a major international project funded by the Asia Pacific Network for Global Change Research (US$90,000). This project: Climate Perturbation and Coastal Zone Systems in the Asia Pacific Region, involves collaborators from Australia, Bangladesh, Japan, Sri Lanka, Thailand and Vietnam and is providing advice to the governments of these countries regarding necessary actions to mitigate or adapt to increases in the impacts of flood events resulting from climate-induced sea-level rise. My role includes ensuring that environmental and ecological impacts are included in the analyses and I have provided key input into the overall project design; co-coordination and chairing sessions at two international workshops (Bangkok, 2007 and Hanoi, 2008); data collection (in Australia); and data analysis (for data from all countries). I will also have a major role in report preparation and final data analysis. As a part of this project, I co-chaired the "International Symposium on Coastal Zones and Climate Change International Symposium" 12-13 April 2010 at Monash University's Gippsland Campus in Churchill, Victoria and co-edited the proceedings of the symposium. The symposium was attended by 65 delegates from 15 countries. There were 2 keynote speakers and 34 technical papers.

I have been invited by colleagues at Sichuan University in China, and Kitami Institute of Technology in Japan, to present aspects of my research to academics, policy makers and government representatives and am planning to attend meetings in these countries in November 2010 and September 2011 respectively.

Papers recently submitted for publication include:
Hatanaka, N., Wright, W. MacNally, R. & Loyn, R. (in review) 'Ecologically complex carbon' – linking biodiversity values, carbon storage and habitat structure in some austral temperate forests. Global Ecology and Biodiversity.
This is an important paper, which will significantly add to the debate about the value of mature forests in Australia and around the world. It relates both carbon-storage and biodiversity values to stand age in a consistent way, and reports data from several forest types across south-eastern Australia.

F12.5. A statement on your most significant contributions to this research field of this Proposal.

(Write a maximum of 3750 characters (approx 500 words).)

My most significant contributions in the area of biodiversity conservation include the development of practical and achievable methods of assessing and enhancing the health of ecological systems, particularly in riparian and forest ecosystems. My research has impacted biodiversity and natural resource management policy at Regional and State levels and I have worked extensively with the West Gippsland Catchment Management Authority (WGCMA) and the Victorian Government Departments of Primary Industry (DPI) & Sustainability and Environment (DSE). The DSE has developed new biodiversity management policies and a new research direction for fire and biodiversity, which are partially based on the findings of my research group. As a member of the Catchment Ecosystem Advisory Group for the WGCMA, I contribute to natural resource management practise and policy in the Gippsland region (the location of the study site proposed for this research) and have received awards from the DSE and the WGCMA for these contributions.

In addition I have previously contributed to natural resource management via research projects which combine social and ecological values. These projects include research into practical methods of improving biodiversity in agricultural streams by adding woody debris – the outcome of this research was adopted by Landcare Australia and widely promoted throughout regional Australia. In addition, participation as the only ecologist in an international collaboration, funded by the Asia Pacific Network, involving six Asia-Pacific countries, has allowed me to contribute to the identification and protection of vulnerable ecoystems in coastal zones in Australia, Bangladesh, Japan, Sri Lanka, Thailand and Vietnam.

F12.6. Fellowship candidates only

Please provide details of the contribution you will make to the project (such as your experience, skills and expertise and how they will be applied).

(Write a maximum of 1250 characters (approx 167 words).)

Not applicable for this candidate

Please provide details of the research environment, that is, the facilities and support at your host organisation, including the intellectual environment.

(Write a maximum of 1250 characters (approx 167 words).)

Not applicable for this candidate

Justify the choice of the proposed host organisation for the fellowship, including reasons for not moving to another organisation if you intend to remain at your organisation.

(Write a maximum of 1250 characters (approx 167 words).)

Not applicable for this candidate

F13. Additional Fellowship Details

F13.1. Host organisation—department, contact numbers and email address

Host Organisation Name

Not applicable for this candidate

Host Department Name

Not applicable for this candidate

Contact Name

Not applicable for this candidate

Phone

Not applicable for this candidate

Fax

Not applicable for this candidate

Email

Not applicable for this candidate

F13.2. Citizenship/Residency Details

(Please note, that the Australian citizenship status as well as the list of countries that you have citizenship of is populated from your profile.)

Australian Citizen?

Not applicable for this candidate

Countries of Citizenship

Not applicable for this candidate

Current Australian residency status

Not applicable for this candidate

F13.3. Has a successful eligibility exemption been granted by the ARC for this fellowship candidate?

Not applicable for this candidate

PART F - Personnel (Ms Jennifer Mosse)

F1. Personal details

(The personal details will be filled out for you automatically. To update any of your personal details in this form, please update your profile accordingly and your details will update automatically in this form.)

Title

Ms

Family Name

Mosse

First Name

Jennifer

Second Name

Anne

Person identifier

69349246

Role

Chief Investigator

F2. Postal address

(The postal address will be filled out for you automatically. To update your postal address, please update your profile accordingly and your postal address will update automatically in this form.)

Postal Address Line 1

Monash University, Gippsland campus

Postal Address Line 2

Monash Way

Locality

Churchill

State

VIC

Postcode

3842

Country

Australia

F3. Are you applying for a Linkage Industry Fellowship (LIF)?

Linkage Industry Fellowship

No

F4. Are you a current member of the ARC or its selection or other advisory committees?

(This relates only to College of Experts members or Selection Advisory Committee members for National Competitive Grants Program funding schemes.)

Current Member of Advisory Committee

No

F5. Please name any of your relatives or close social/professional associates that are members of the ARC or its selection or other advisory committees.

	Associates and Relatives Members of Advisory Committee
1	
2	
3	
4	

F6. Please name any Commonwealth-funded Research Centre that you will be associated with as at 1 January 2011.

	Full Legal Name of Centre	Start Date	Cessation Date	Centre Role
1				
2				

	Centre Role if Other
1	
2	

F7. Partner Organisation Association

Do you have an association with a Partner Organisation named in this proposal which is, or may be perceived as, a Conflict of Interest?

Association With Partner Organisation

No

In no more than 750 characters (approx. 100 words) of plain language, please describe the Conflict of Interest and how it will be managed.

Not applicable for this candidate

F8. If you hold a PhD or expect to be awarded a PhD qualification in the near future, please enter the date your PhD has been awarded or the date your thesis will be submitted, respectively.

Date of Award

Date of Submission

F9. Qualifications

	Degree/Award	Year	Discipline/Field	Organisation Name
1	Graduate Certificate in Higher Education	2001	Education	Monash University
2	Master of Biotechnology	1992	Biotechnology	Monash University
3	Bachelor of Education	1980	Education	Monash University
4	Diploma of Education	1975	Education	Melbourne College of Advanced Education
5	Bachelor of Science (Honours)	1975	Biochemistry	Melbourne University

	Country
1	Australia
2	Australia
3	Australia
4	Australia
5	Australia

F10. Current and previous appointment(s)/position(s) – during the past 10 years

	Position	Organisation Name	Department	Year Appointed
1	Deputy Head, School of Applied Sciences and Engineering	Monash University	Faculty of Science	2008
2	Senior Lecturer	Monash University	Faculty of Science	1998

	Continuity	Employment Kind
1	Permanent	Full Time
2	Permanent	Part Time

F11. Organisational affiliations for eligibility purposes for this Proposal

(Name of the organisation you will be associated with for the purposes of satisfying the eligibility requirements for your nominated role in undertaking the proposed research. (i.e. for a CI and Supervisors this will usually be the Eligible Organisation at which they will be employed or hold an adjunct appointment as at 1 January 2011 and beyond; for Fellowship candidates it will be the Host Organisation).)

Organisation Name

Monash University

Type of Affiliation

Employee

F12. Research Record Relative to Opportunities

F12.1. Details on your career and opportunities for research over the last 5 years.

(Write a maximum of 3750 characters (approx 500 words). Provide and explain: (i) The number of years it has been since you graduated with your highest educational qualification; (ii) The research opportunities that you have had in the context of your employment situation (e.g., Early Career Researcher), the research component of your employment conditions, and any unemployment or part-time employment you may have had; (iii) Whether you are a research-only, teaching and research, teaching-only, teaching and administration, research and administration, or administration-only academic, giving any additional information (e.g., part time status) needed to understand your situation. Give an indication of what percentage of time you have spent over the last five years in those roles; (iv) Any career interruptions you have had for childbirth, carer's responsibility, misadventure, or debilitating illness; (v) The research mentoring and research facilities available to you; and (vi) Any other aspects of your career or opportunities for research that are relevant to assessment and that have not been detailed elsewhere in this Proposal (e.g., any circumstances that may have slowed down your research and publications) or affected the time you have had to conduct and publish from research.))

i. I graduated with an MSc(Biotechnology) in 1992

ii. While I have had ample opportunity to participate in teaching, management and supervisory activities, establishing molecular biology research activities at the Gippsland campus has been particularly challenging. Until 2002, I was the only academic with expertise in molecular biology at the Gippsland campus. While dedicated research facilities for analytical chemistry, coal research and air studies were available on campus, research in the biotechnology area was restricted to class laboratories until a new laboratory was constructed in 2003. I had a major role in designing this new laboratory, ensuring that it was suitable for molecular biology and biotechnology research that might be undertaken in future years. Finding funds to adequately equip this laboratory has been an on-going challenge, as our equipment budget is not large. However, we have now established a versatile laboratory that is able to support a range of molecular biology research activities.

iii. I was appointed to a teaching position at Gippsland Institute of Advanced Education, prior to becoming part of Monash University. I have always had heavy teaching and significant administration responsibilities, being course adviser since 1997, Head of the Biological Sciences teaching team since 1999 and Deputy Head of the School of Applied Sciences and Engineering (SASE) since 2008. Until 1998, my position involved teaching and administration only. During the last five years, my time allocation has been approximately 50% teaching, 35% administration, 15% research (includes supervision of Honours students)

iv. Until 2008, I worked part-time due to family responsibilities (average service fraction to date is 70%).

v. Historically, SASE had a physical sciences focus with dedicated research facilities for analytical chemistry, coal research and air studies. Prior to 2010, all Heads of School have been chemists. I have needed to look elsewhere for mentoring and have established effective collaborations with staff at the WHO Collaborating Centre for Reference & Research on Influenza (North Melbourne) and, more recently, Monash Institute for Reproduction and Development (Clayton).

vi. Living in a rural area, with limited child care facilities in the early years and no public transport, meant that my working hours were essentially restricted to school hours until my children were able to drive. Part-time work and a heavy teaching and administration load, reduced the time available for research activities; lack of access to equipment, facilities and appropriate mentors limited research outputs.

F12.2. Recent significant publications (2005 onwards)

(Please attach a PDF with a list of your recent significant publications (40 pages maximum). (1) Provide your research publications published in the last five years split into the five categories of: (a) scholarly books, (b) scholarly book chapters, (c) refereed journal articles, (d) refereed conference papers only when the paper was published in full in the proceedings, and, (e) other. You must number your publications continuously. Asterisk the publications relevant to this Proposal. (2) Provide a list of your ARC grants awarded in the last 10 years on which you have been a Chief Investigator. Give the ARC grant number, Chief Investigator names in the order that they appear on the grant, the amount funded, the years for which the grant was awarded, and the title of the grant. Please refer to the Instructions to Applicants for format requirements. With respect to your numbered publications in the last 5 years given in part 1 of question F12.2, next to each ARC grant, provide the numbers of the publications from part 1 of question F12.2 that arose from, or were in part supported by, your ARC grants.)

SCHOLARLY BOOK CHAPTER

1. Mosse & Wright (2010) *"Laboratory Confidence in on-campus and distance education students studying biological sciences"* in "Accessible Elements: Teaching Science Online and at a Distance", Kennepohl, D. and Shaw, L. (Eds.), Athabasca University Press

REFEREED JOURNAL ARTICLES

2. Schliephake & Mosse (2010) **"***Practicum and work experience in microbiology and related disciplines"* Microbiology Australia 31(1): 27-30

3. D Y Oh, I Barr, J Mosse, K Laurie (2008) *"MDCK SIAT-1 cells show improved isolation rates for recent human influenza viruses compared to conventional MDCK cells"* J. Clin. Microbiol. 46: 2189-2194 (cited 12 times)

4. H-T Ho, A C Hurt, J Mosse and I Barr (2007) *"Neuraminidase inhibitor drug susceptibility differs between influenza N1 and N2 neuraminidase following mutagenesis of two conserved residues"*, Antiviral Research, 76 (3): 263-266 (cited 10 times)

OTHER

5. Barbagallo, M. S., Lucas, K., Deacon, N. J., Mosse, J. A., (2009) Negative sense transcription in HIV-1: alternative splicing in the upstream UTR, *Australian Virology Group: 5th Australian Virology group Meeting*, 13 Dec 2009 to 17 Dec 2009, CSL, Lorne Vic Australia, p. 79.

6. Ding Yuan Oh, Peng Cui, Jennifer Mosse, Ban-Hock Toh, James Chan (2009) *"Highly purified mouse mesenchymal stem cells exhibit equal potential in non-hematopoietic differentiation and enhanced immunosuppressive ability"* International Society for Stem Cell Research**,** 7th Annual Meeting, July 8-11, 2009, Barcelona, Spain

7. Barbagallo, M. S., Mosse, J. A., Deacon, N. J., (2008) Localization of HIV-1 Vpo to the secretory compartments of the cell, *AIDS 2008: XVII International AIDS Conference*, 3 August 2008 to 8 August 2008, International AIDS Society, Geneva Switzerland, p. 61.

8. Joanne Ernest, Yee Suan Poo, Ian G. Barr,Yi-Mo Deng, Jenny Mosse, Karen L. Laurie (2008) *"The use of siRNA to investigate gene expression and infectivity of influenza viruses"*. Australian Society for Immunology, 38th Australian Society for Immunology Annual Scientific Meeting December 07, 2008

9. M S Barbagallo, N Deacon and J Mosse (2007) *"Negative Sense Transcripts in HIV-1 : The Regulation of Expression and Role of vpo/Vpo"*, 4th IAS Conference on HIV Pathogenesis, Treatment and Prevention, Sydney July 22 – 25, 2007.

I have not been awarded any ARC grants in the last 10 years

10. Ernest, J. R., Barr, I. G., Deng, Y. M., Mosse, J. A., Laurie, K. L., (2007) The use of SIRNA to investigate gene expression and infectivity of influenza viruses, *Australian Society for Immunology: 37th Annual Scientific Meeting*, John Wiley & Sons, Brisbane Qld Australia, p. 190.

11. Oh, D. Y., Barr, I. G., Mosse, J. A., Laurie, K. L., (2007) Analysis of an alternative cell line for the isolation and propagation of human influenza viruses, *Abstract and Delegate Information: Australian Virology Group 4th Australian Virolgy Group Meeting*, 09 December 2007 to 13 December 2007, ASN Pty Ltd, Balnarring Vic Australia, p. 93.

12. Schliephake, K., Mosse, J. A.,(2007) "*Benefits of industry sponsored undergraduate science projects"*, ASM 2007 Adelaide: Fermenting New Ideas, 9 July 2007 to 13 July 2007, Cambridge Publishing, West Leederville SA Australia.

F12.3. Ten career-best publications

(Please attach a PDF with a list of your ten career-best publications (10 pages maximum). Provide the full reference for each of your ten best publications. Next to each provide information on any ARC grant scheme on which you were a Chief Investigator from which they originated, as described in F12.2. Add a statement of a maximum of 30 words explaining and justifying the impact or significance of each publication. Asterisk the publications relevant to this Proposal.)

Names underlined represent papers published by Honours and PhD students while under my supervision.

1. D Y Oh, I Barr, J Mosse, K Laurie (2008) *"MDCK SIAT-1 cells show improved isolation rates for recent human influenza viruses compared to conventional MDCK cells"* Journal of Clinical Microbiology 46: 2189-2194

   This work demonstrated that MDCK SIAT- cells are superior to MDCK cells for isolation and propagation of influenza virus from human clinical specimens; the article has been cited 12 times.

2. Ai Lee CHEAM, Ian BARR, Alan HAMPSON, Jennifer MOSSE, and Aeron HURT (2004), "*In Vitro Generation and Characterisation of an Influenza B Variant with Reduced Sensitivity to Neuraminidase Inhibitors"* Antiviral Research 63 177-181

   This study demonstrated the ability of influenza viruses to become resistant to influenza antivirals following serial passaging in the presence of drug; the article has been cited 10 times.

3. H-T Ho, A C Hurt, J Mosse and I Barr (2007) *"Neuraminidase inhibitor drug susceptibility differs between influenza N1 and N2 neuraminidase following mutagenesis of two conserved residues"*, Antiviral Research, 76 (3): 263-266

   This study used reverse genetics techniques to produce mutant influenza virus resistant to antiviral drugs, highlighting the usefulness of this technique for prospective studies.

4. Ai Lee CHEAM, Ian BARR, Jennifer MOSSE, Alan HAMPSON, and Aeron HURT, (2004) *"Characterisation of an influenza B variant selected with the neuraminidase inhibitor zanamavir"* International Congress Series 1263 122-125

   This study described the molecular changes that occurred in a strain of influenza virus that had become resistant to influenza antivirals following serial passaging in the presence of drug.

5. Ding Yuan Oh, Peng Cui, Jennifer Mosse, Ban-Hock Toh, James Chan (2009) *"Highly purified mouse mesenchymal stem cells exhibit equal potential in non-hematopoietic differentiation and enhanced immunosuppressive ability"*

International Society for Stem Cell Research**,** 7th Annual Meeting, July 8-11, 2009, Barcelona, Spain

This work documents a method for efficient isolation of multipotent, immunosuppressive mesenchymal stem cells from mouse bone marrow; a manuscript summarising this work is in preparation.

6. Joanne Ernest, Yee Suan Poo, Ian G. Barr,Yi-Mo Deng, Jenny Mosse, Karen L. Laurie (2008) *"The use of siRNA to investigate gene expression and infectivity of influenza viruses"*. Australian Society for Immunology, 38th Australian Society for Immunology Annual Scientific Meeting December 07, 2008

This study investigates the ability of design algorithms to predict siRNAs that effectively inhibit influenza virus, and highlights off-target mutations that reduce efficacy; a manuscript is currently under revision.

7. Barbagallo, M. S., Lucas, K., Deacon, N. J., Mosse, J. A., (2009) Negative sense transcription in HIV-1: alternative splicing in the upstream UTR, *Australian Virology Group: 5th Australian Virology group Meeting*, 13 Dec 2009 to 17 Dec 2009, CSL, Lorne Vic Australia, p. 79.

8. Barbagallo, M. S., Mosse, J. A., Deacon, N. J., (2008) Localization of HIV-1 Vpo to the secretory compartments of the cell, *AIDS 2008: XVII International AIDS Conference*, 3 August 2008 to 8 August 2008, International AIDS Society, Geneva Switzerland, p. 61.

These studies have investigated negative sense transcription and translation events in HIV-1; a manuscript summarising this work is in preparation.

9. Mosse & Wright (2010) *"Laboratory Confidence in on-campus and distance education students studying biological sciences"* in "Accessible Elements: Teaching Science Online and at a Distance", Kennepohl, D. and Shaw, L. (Eds.), Athabasca University Press

This study demonstrates that students who study biological sciences in both on- and off-campus modes perceive themselves to be equally competent when considering the acquisition of laboratory skills.

10. Schliephake & Mosse (2010) **"***Practicum and work experience in microbiology and related disciplines"* Microbiology Australia 31(1): 27-30

This study highlights the benefits of industry based placements and projects in developing both specific scientific skills and generic skills that impart work readiness.

F12.4. Further evidence in relation to research impact and contributions to the field over the last 10 years.

(Write a maximum of 7500 characters (approx 1000 words).In this section, provide: (1) Research outputs other than publications. Other research outputs might include patents and policy advice, competitive grants and other research support, major exhibitions, compositions or performances, relevant consultancies, and other professional activities or other outputs; and (2) Evidence for the quality of your research outputs including those in F12.2 to F12.4 that are within the last 10 years. Assess the impact of your research for all of these outputs relative to opportunity and in the context of discipline expectations. Include a wide range of research evaluations of impact (e.g., citations, evaluation of the publication's quality; the journal, the book publishing house, the conference etc; and any other measures of impact; honours and awards/prizes, esteem measures, and any other evaluations of your outputs).)

I have become research active rather late in my academic career, with much of my effort being devoted to the development of a Science Honours program at the Gippsland campus. Consequently, I cannot provide substantial evidence of the type traditionally associated with research success.

Since the introduction of a full Honours program at the Gippsland campus in 2003, I have supervised 18 honours students in molecular biology projects, the one exception being co-supervision of a project linking production of plant volatiles to the activity of specific enzymes in the plant (my role here was as an enzymologist). Projects co-supervised with staff at the WHO Influenza Centre focus on influenza characterisation, viral evolution, mechanisms of viral resistance (reverse genetics) and new antiviral strategies (siRNA therapeutics). On the Gippsland campus, most Honours projects focus on aspects of antisense gene expression in HIV-1.

My Honours students generally perform very well in their Honours year and beyond; I was nominated for the 2009 Vice-Chancellor's Award for Excellence in Honours Supervision and received a Special Commendation.

I have completed Levels 1 and 2 of the Research Supervisor Accreditation Program. My first PhD student commenced studies in 2006 and graduated in March, 2010. I am currently supervising three PhD students; two off campus (at MIMR and the WHO Influenza Centre) and one on campus at Gippsland.

I have experience managing large projects, having written a proposal that was awarded $1.7million DEEWR funding in 2008, for a project aimed at increasing participation of rural and indigenous students in higher education; I am currently leading this project.

F12.5. A statement on your most significant contributions to this research field of this Proposal.

(Write a maximum of 3750 characters (approx 500 words).)

In 2007, in response to ongoing discussions about the genetic status of the Strzelecki Koala population, I offered an Honours project aiming to develop a method for isolating Koala DNA from faecal pellets. HVP Plantations provided $5000 to support this project. This project produced a first class Honours thesis:
Karsa, M (2007) "Genetic analysis of Koala populations using DNA extracted from faecal material" School of Applied Sciences and Engineering, Faculty of Science, Monash University, Australia.

During her Honours year, Mawar Karsa adapted established protocols for the recovery of good quality DNA from Koala faecal pellets. She also identified the morphological characteristics of pellets which are likely to yield 'good quality' DNA, suitable for subsequent genetic analysis. Her work showed that amplification of DNA extracted from these pellets produces a consistent 'DNA fingerprint' for an individual Koala.

It is this work which forms the foundation for the molecular biology component of the proposed experimental program.

F12.6. Fellowship candidates only

Please provide details of the contribution you will make to the project (such as your experience, skills and expertise and how they will be applied).

(Write a maximum of 1250 characters (approx 167 words).)

Not applicable for this candidate

Please provide details of the research environment, that is, the facilities and support at your host organisation, including the intellectual environment.

(Write a maximum of 1250 characters (approx 167 words).)

Not applicable for this candidate

Justify the choice of the proposed host organisation for the fellowship, including reasons for not moving to another organisation if you intend to remain at your organisation.

(Write a maximum of 1250 characters (approx 167 words).)

Not applicable for this candidate

F13. Additional Fellowship Details

F13.1. Host organisation—department, contact numbers and email address

Host Organisation Name

Not applicable for this candidate

Host Department Name

Not applicable for this candidate

Contact Name

Not applicable for this candidate

Phone

Not applicable for this candidate

Fax

Not applicable for this candidate

Email

Not applicable for this candidate

F13.2. Citizenship/Residency Details

(Please note, that the Australian citizenship status as well as the list of countries that you have citizenship of is populated from your profile.)

Australian Citizen?

Not applicable for this candidate

Countries of Citizenship

Not applicable for this candidate

Current Australian residency status

Not applicable for this candidate

F13.3. Has a successful eligibility exemption been granted by the ARC for this fellowship candidate?

Not applicable for this candidate

PART F - Personnel (Mr Peter Menkhorst)

F1. Personal details

(The personal details will be filled out for you automatically. To update any of your personal details in this form, please update your profile accordingly and your details will update automatically in this form.)

Title

Mr

Family Name

Menkhorst

First Name

Peter

Second Name

Warwick

Person identifier

Q1264148

Role

Partner Investigator

F2. Postal address

(The postal address will be filled out for you automatically. To update your postal address, please update your profile accordingly and your postal address will update automatically in this form.)

Postal Address Line 1

11

Postal Address Line 2

Haig Street

Locality

Heidelberg Heights

State

VIC

Postcode

3081

Country

Australia

F3. Are you applying for a Linkage Industry Fellowship (LIF)?

Linkage Industry Fellowship

No

F4. Are you a current member of the ARC or its selection or other advisory committees?

(This relates only to College of Experts members or Selection Advisory Committee members for National Competitive Grants Program funding schemes.)

Current Member of Advisory Committee

No

F5. Please name any of your relatives or close social/professional associates that are members of the ARC or its selection or other advisory committees.

	Associates and Relatives Members of Advisory Committee
1	
2	
3	
4	

F6. Please name any Commonwealth-funded Research Centre that you will be associated with as at 1 January 2011.

	Full Legal Name of Centre	Start Date	Cessation Date	Centre Role
1				
2				

	Centre Role if Other
1	
2	

F7. Partner Organisation Association

Do you have an association with a Partner Organisation named in this proposal which is, or may be perceived as, a Conflict of Interest?

Association With Partner Organisation

Yes

In no more than 750 characters (approx. 100 words) of plain language, please describe the Conflict of Interest and how it will be managed.

PI Menkhorst is currently employed as a sole trader and will be involved as both a Partner Investigator and a Partner Organisation.

F8. If you hold a PhD or expect to be awarded a PhD qualification in the near future, please enter the date your PhD has been awarded or the date your thesis will be submitted, respectively.

Date of Award

Date of Submission

F9. Qualifications

	Degree/Award	Year	Discipline/Field	Organisation Name
1	BSc	1973	Zoology and Botany	Monash University

	Country
1	Australia

F10. Current and previous appointment(s)/position(s) – during the past 10 years

	Position	Organisation Name	Department	Year Appointed
1	consultant ecologist	Peter Menkhorst (sole trader)	Peter Menkhorst (sole trader)	2008
2	Manager Threatened Species and Communities	Department of Sustainability and Environment	Department of Sustainability and Environment	2006
3	Senoir Wildlife Policy Officer	Department of Sustainability and Environment	Department of Sustainability and Environment	1996
4	Research Officer	Department of Sustainability and Environment	Arthur Rylah Institute for Environmental Research	2008

	Continuity	Employment Kind
1	Contract	Part Time
2	Permanent	Full Time
3	Permanent	Full Time
4	Contract	Full Time

F11. Organisational affiliations for eligibility purposes for this Proposal

(Name of the organisation you will be associated with for the purposes of satisfying the eligibility requirements for your nominated role in undertaking the proposed research. (i.e. for a CI and Supervisors this will usually be the Eligible Organisation at which they will be employed or hold an adjunct appointment as at 1 January 2011 and beyond; for Fellowship candidates it will be the Host Organisation).)

Organisation Name

Peter Menkhorst (sole trader)

Type of Affiliation

Other

F12. Research Record Relative to Opportunities

F12.1. Details on your career and opportunities for research over the last 5 years.

(Write a maximum of 3750 characters (approx 500 words). Provide and explain: (i) The number of years it has been since you graduated with your highest educational qualification; (ii) The research opportunities that you have had in the context of your employment situation (e.g., Early Career Researcher), the research component of your employment conditions, and any unemployment or part-time employment you may have had; (iii) Whether you are a research-only, teaching and research, teaching-only, teaching and administration, research and administration, or administration-only academic, giving any additional information (e.g., part time status) needed to understand your situation. Give an indication of what percentage of time you have spent over the last five years in those roles; (iv) Any career interruptions you have had for childbirth, carer's responsibility, misadventure, or debilitating illness; (v) The research mentoring and research facilities available to you; and (vi) Any other aspects of your career or opportunities for research that are relevant to assessment and that have not been detailed elsewhere in this Proposal (e.g., any circumstances that may have slowed down your research and publications) or affected the time you have had to conduct and publish from research.))

1. It is 36 years since I graduated with a BSc.

2. I worked in a research capacity for the Victorian Government's biodiveristy conservation department [under many different names] at the Arthur Rylah Institute for Environmental Research for 20 years between 1976 and 1997. I then undertook a 10 year stint in policy development before returning to the Arthur Rylah Institute in 2008 in a part-time (0.6 eft) role combining research and administration.

3. Although described as Scientists, the reality for State Government researchers is that they are expected to carry out a broad range of duties including many that are ancilliary to research, such as policy development, administration and public education. In the past 5 years my research opportunities have totalled about 2 days per week for 2008, 2009 and the first quarter of 2010.

4. No interruptions

5. The Arthur Rylah Institute provides good facilities and equipment for field-based ecological research. In my early years as a base-level scientist the culture of the Arthur Rylah Institute was somewhat deficient in scientific rigour and I did feel a lack of quality scientific mentoring. This situation has greatly improved in the past 20 years, and part of my role now is to help young scientists to develop their skills and career.

F12.2. Recent significant publications (2005 onwards)

(Please attach a PDF with a list of your recent significant publications (40 pages maximum). (1) Provide your research publications published in the last five years split into the five categories of: (a) scholarly books, (b) scholarly book chapters, (c) refereed journal articles, (d) refereed conference papers only when the paper was published in full in the proceedings, and, (e) other. You must number your publications continuously. Asterisk the publications relevant to this Proposal. (2) Provide a list of your ARC grants awarded in the last 10 years on which you have been a Chief Investigator. Give the ARC grant number, Chief Investigator names in the order that they appear on the grant, the amount funded, the years for which the grant was awarded, and the title of the grant. Please refer to the Instructions to Applicants for format requirements. With respect to your numbered publications in the last 5 years given in part 1 of question F12.2, next to each ARC grant, provide the numbers of the publications from part 1 of question F12.2 that arose from, or were in part supported by, your ARC grants.)

12.2 Major Publications since 2005

A. Scholarly books

1. Menkhorst, Peter and Knight, Frank. In press (accepted March 2010). *A Field Guide to the Mammals of Australia*. Third edition. Oxford University Press, Melbourne.

2. Pizzey, G., Knight, F. & Menkhorst, P. 2007. *The Field Guide to the Birds of Australia.* eighth edition. HarperCollins Publishers, Sydney. Reprinted 2008.

B. Scholarly book chapters

3. Van Dyke, S. and Strahan, R. (eds) 2008. *The Mammals of Australia*. New Holland Publishers, Sydney. Author of species texts for several species - Eastern Barred Bandicoot, Long-footed Potoroo, Heath Mouse and Silky Mouse.

C. Refereed journal articles

4. Smales, I. J., Quin, B., Menkhorst, P. W. and Franklin, D. C. 2009. Demography of the Helmeted Honeyeater (*Lichenostomus melanops cassidix*). *Emu* 109: 352-359.

5. Bennett, A.F., Haslem, A., Cheal D.C., Clarke, M.F., Jones, R.N., Koehn, J.D., Lake, P.S., Lumsden, L.F., Lunt, I.D., Mackey, B.G., Mac Nally, R, Menkhorst, P.W., New, T.R., Newell, G.R., O'Hara, T., Quinn, G.P., Radford, J.Q., Robinson, D., Watson, J.E.M. and Yen, A.L. 2009. Ecological processes: a key element in strategies for nature conservation. *Ecological Management and Restoration* 10: 192-199.

*6. Kitchener, A.L., Kay, D.J., Walters, B., Menkhorst, P., McCartney, C.A., Buist, J.A., Mate, K.E. and Rodger, J.C. 2009. The immune response and fertility of koalas (*Phascolarctos cinereus*) immunised with porcine zonae pellucidae or recombinant Brushtail possum ZP3 protein. *Journal of Reproductive Immunology* 82: 40-47.

7. Menkhorst, P.W. 2009. Blandowski's mammals: Clues to a lost world. *Proceedings of the Royal Society of Victoria* 121(1): 61-89.

8. Burbidge, A. A., McKenzie, N. L., Woinarski, J. C. Z., Dickman, C. R., Baynes, A., Gordon, G., Menkhorst P. W. and Robinson A. C. 2008. Conservation status and biogeography of Australia's terrestrial mammals. *Australian Journal of Zoology* 56: 411-422.

9. Chambers, L. E., Quin, B., Menkhorst, P., Franklin, D. and Smales, I. 2008. The effects of climate on breeding in the Helmeted Honeyeater. *Emu* 108: 15-22.

10. Bennett, A. F., Lumsden, L. F. and Menkhorst, P. W. 2007. Mammals of the mallee region, Victoria: past, present and future. *Proceedings of the Royal Society of Victoria* 118:259-280.

11. N.L. McKenzie, A.A. Burbidge, A. Baynes, R.N. Brereton, C.R. Dickman, G. Gordon, L.A. Gibson, P.W. Menkhorst, A.C. Robinson, M.R. Williams, J.C.Z. Woinarski. 2007. Analysis of factors implicated in the recent decline of Australia's mammal fauna. *Journal of Biogeography* 34: 597-611.

12. Menkhorst, P., McInerny, C. and Isles, A. 2006. Large aggregations and evening rafts of Pomarine Jaegers *Stercorarius pomarinus* at Apollo Bay, Victoria, Australia. *Corella* 30: 67-70.

*13. Baxter, P. W. J., McCarthy, M. A., Possingham, H. P., Menkhorst, P. W. and McLean, N. 2006. Accounting for management costs in sensitivity analyses of matrix population models. *Conservation Biology* 20: 893-905.

D. Refereed conference papers

*14. Menkhorst, P. 2008. Hunted, marooned, re-introduced, contracepted: A history of Koala management in Victoria. Pages 73-92 in 'To Close for Comfort. Contentious issues in human-wildlife encounters', edited by D. Lunney, A. Munn and W. Meikle. Royal Zoological Society of New South Wales, Mosman, New South Wales.

E. **Other**

15. MacHunter, J., Menkhorst, P. and Loyn, R. 2009. Towards a process for integrating vertebrate fauna into fire management planning. Arthur Rylah Institute for Environmental Research Technical Report Series Number 192. Department of Sustainability and Environment, Melbourne.

16. MacHunter, J. and Menkhorst, P. 2009. Statewide framework for monitoring the impacts of strategic fuelbreaks on biodiversity. Arthur Rylah Institute for Environmental Research Unpublished Report number 2009/17. Department of Sustainability and Environment, Heidelberg, Victoria.

17. Nelson, J., Menkhorst, P., Howard, K., Chick, R. amd Lumsden, L. 2009. The Status of Smoky Mouse Populations at some Historic Sites in Victoria, and survey methods for their detection. Arthur Rylah Institute for Environmental Research Unpublished Report number 2009/17. Department of Sustainability and Environment, Heidelberg, Victoria.

18. Menkhorst, P. and Jarman, P. 2008. National Recovery Plan for the Brush-tailed Rock Wallaby, *Petrogale penicillata.* Department of Sustainability and Environment, Melbourne.

19. Menkhorst, P. & Broome, L., 2008. National Recovery Plan for the Smoky Mouse, *Pseudomys fumeus.* Department of Sustainability and Environment, Melbourne.

20. Menkhorst, P. 2008. National Recovery Plan for the Helmeted Honeyeater, 2006-2010. Department of Sustainability and Environment, Melbourne.

ARC Grants awarded in the last 10 years – none.

F12.3. Ten career-best publications

(Please attach a PDF with a list of your ten career-best publications (10 pages maximum). Provide the full reference for each of your ten best publications. Next to each provide information on any ARC grant scheme on which you were a Chief Investigator from which they originated, as described in F12.2. Add a statement of a maximum of 30 words explaining and justifying the impact or significance of each publication. Asterisk the publications relevant to this Proposal.)

12.3 Ten career best scientific publications – P. Menkhorst

1.Smales, I. J., Quin, B., Menkhorst, P. W. and Franklin, D. C. 2009. Demography of the Helmeted Honeyeater (*Lichenostomus melanops cassidix*). *Emu* 109: 352-359.

Analysis of a long-term population dataset, providing important insights for management of this critically endangered taxon. Maintaining funding for this research project over an 18 year time period is a major achievement.

2.*Menkhorst, P. 2008. Hunted, marooned, re-introduced, contracepted: A history of Koala management in Victoria. Pages 73-92 in 'To Close for Comfort. Contentious issues in human-wildlife encounters', edited by D. Lunney, A. Munn and W. Meikle. Royal Zoological Society of New South Wales, Mosman, New South Wales.

Reviews and documents Australia's longest-running and most intensive wildlife management program, including significant recent advances in the regulation of over-abundant Koala populations.

3.N.L. McKenzie, A.A. Burbidge, A. Baynes, R.N. Brereton, C.R. Dickman, G. Gordon, L.A. Gibson, P.W. Menkhorst, A.C. Robinson, M.R. Williams, J.C.Z. Woinarski. 2007. Analysis of factors implicated in the recent decline of Australia's mammal fauna. *Journal of Biogeography* 34: 597-611.

Assessed the explanatory value of eight faunal and environmental factors thought to have contributed to Australian mammal extinctions on a continental scale. Provides an explicit basis for setting conservation priorities amongst regions and species.

4.*Baxter, P. W. J., McCarthy, M. A., Possingham, H. P., Menkhorst, P. W. and McLean, N. 2006. Accounting for management costs in sensitivity analyses of matrix population models. *Conservation Biology* 20: 893-905.

Uses Victoria's Koala and Helmeted Honeyeater management programs, both of which I led for extended periods, to explore methods for including financial costs of proposed management actions in models designed to assess efficacy of management options.

*5.*Middleton, D. R., Walters, B, Menkhorst, P. & Wright, P. 2003. Fertility control in the koala, *Phascolarctos cinereus*: The impact of slow-release implants containing levonorgestrel or oestradiol on the production of pouch young. *Wildlife Research* 30: 207-212.

Provided a cost-effective and ethically-acceptable means of controlling over-abundant Koala populations. Now routinely applied to the two Koala populations in Victoria where Koala over-browsing is the greatest problem.

*6.*Melzer, A., Carrick, F., Menkhorst, P., Lunney, D. and St John, B. 2000. Koala distribution and abundance: an overview, critical assessment and conservation implications. *Conservation Biology* 14: 619-628.

A global conservation and management assessment of this high-profile and contentious species.

7.Franklin, D., Smales, I., Quin, B. and Menkhorst, P. 1999. The annual cycle of the Helmeted Honeyeater: a sedentary inhabitant of a predictable environment. *Ibis* 141: 256-268.

Based on detailed study of a marked population, provides a rare level of insight into population processes in an endangered species, particularly the relationship between breeding, moult and dispersal.

8.Menkhorst, P.W. (Ed). 1995. *'Mammals of Victoria: Distribution, ecology and conservation'*. Oxford University Press, Melbourne. 359 pages.

The most comprehensive review of the mammals of any Australian region, based on the records of the Atlas of Victorian Wildlife and a comprehensive review of the literature. Still has a high citation rate 15 years after publication.

9.Menkhorst, P.W., Weavers, B.W. & Alexander, J.S.A. 1988. Distribution, habitat and conservation status of *Petaurus norfolcensis* (Marsupialia: Petauridae) in Victoria. *Australian Wildlife Res*earch 15:59-71.

An early and important contribution to knowledge of this poorly-known (at the time) species.

10. Menkhorst, P.W. 1984. The application of nest boxes in research and management of possums and gliders. Pp. 517-525 in '*Possums and Gliders*' ed. by A.P. Smith and I.D. Hume, Australian Mammal Society, Sydney.

Stimulated many studies using nest boxes as a tool to gain access to hollow-using fauna.

F12.4. Further evidence in relation to research impact and contributions to the field over the last 10 years.

(Write a maximum of 7500 characters (approx 1000 words).In this section, provide: (1) Research outputs other than publications. Other research outputs might include patents and policy advice, competitive grants and other research support, major exhibitions, compositions or performances, relevant consultancies, and other professional activities or other outputs; and (2) Evidence for the quality of your research outputs including those in F12.2 to F12.4 that are within the last 10 years. Assess the impact of your research for all of these outputs relative to opportunity and in the context of discipline expectations. Include a wide range of research evaluations of impact (e.g., citations, evaluation of the publication's quality; the journal, the book publishing house, the conference etc; and any other measures of impact; honours and awards/prizes, esteem measures, and any other evaluations of your outputs).)

The impact of my research in this field is best illustrated by significant changes made during the last decade to the management of over-abundant and unsustainable populations of the Koala in Victoria. Following successful field trials of contraceptive implants in the Koala (Middleton et al. 2003 (reference 5 at 12.3)), the Victorian Government has now adopted the technique in its Koala Management Strategy (Department of Sustainability and Environment 2004, Victoria's Koala Management Strategy). Large-scale population control programs based on levonorgestrel implants have now replaced the previous, ethically-questionable, translocation program for two major Koala populations – Mt Eccles NP and French Island (Menkhorst 2008 (reference 14 at 12.2)). As well as providing an ethically and financially suitable solution to a serious ecological problem, this work has overcome a political issue for the Victorian Government and effectively taken the Koala 'off the front page' in that State.

During the search for a suitable population control strategy, I was also instrumental in initiating research into other possible options including immuno-contraception (reference 6 at 12.2). Following my advice, the Victorian Department of Sustainability and Environment was also an industry partner in the Kangaroo and Koala Contraception Program ARC Linkage project.

Other recent research contributions include supervision of research into the ecology, population biology and management of the critically endangered Helmeted Honeyeater (references 4, 9 and 20 at 12.2), population modelling for assessing wildlife population management options (reference 13 at 12.2), collaborative analyses of the biogeography of Australian mammals (references 8 and 11 at 12.2), and the causes of mammalian extinctions in Australia (references 7 and 11 at 12.2).

My scientific standing is also reflected in invitations to prepare books for Oxford University Press (references 1 at 12.2 and 8 at 12.3) and for CSIRO Publications (The Australian Bird Guide in prep).

F12.5. A statement on your most significant contributions to this research field of this Proposal.

(Write a maximum of 3750 characters (approx 500 words).)

My most significant contribution to the research field of this proposal is my experience in wildlife policy and wildlife management, rather than research per se. In my role as Senior Wildlife Policy Officer with the Victorian Department of Sustainability and Environment I coordinated Koala management and conservation activities statewide for 12 years between 1995 and 2007. This included playing a central role in the development of the National Koala Conservation Strategy (Commonwealth of Australia 1998) and Victoria's Koala Management Strategy (DSE 2004). This role has provided me a valuable overview of Koala ecology and the history and future direction of Koala management in Victoria (and Australia). That is the most important quality that I bring to this research proposal, along with a history of successful collaborative research in many fields of wildlife ecology and management.

F12.6. Fellowship candidates only

Please provide details of the contribution you will make to the project (such as your experience, skills and expertise and how they will be applied).

(Write a maximum of 1250 characters (approx 167 words).)

Not applicable for this candidate

Please provide details of the research environment, that is, the facilities and support at your host organisation, including the intellectual environment.

(Write a maximum of 1250 characters (approx 167 words).)

Not applicable for this candidate

Justify the choice of the proposed host organisation for the fellowship, including reasons for not moving to another organisation if you intend to remain at your organisation.

(Write a maximum of 1250 characters (approx 167 words).)

Not applicable for this candidate

F13. Additional Fellowship Details

F13.1. Host organisation—department, contact numbers and email address

Host Organisation Name

Not applicable for this candidate

Host Department Name

Not applicable for this candidate

Contact Name

Not applicable for this candidate

Phone

Not applicable for this candidate

Fax

Not applicable for this candidate

Email

Not applicable for this candidate

F13.2. Citizenship/Residency Details

(Please note, that the Australian citizenship status as well as the list of countries that you have citizenship of is populated from your profile.)

Australian Citizen?

Not applicable for this candidate

Countries of Citizenship

Not applicable for this candidate

Current Australian residency status

Not applicable for this candidate

F13.3. Has a successful eligibility exemption been granted by the ARC for this fellowship candidate?

Not applicable for this candidate

PART G - Partner Organisation Details (Grand Ridge Plantations Pty Ltd)

G1. Organisation contact details

Title

Mr

Family Name

Appleton

First Name

Richard

Position

Stewardship Forester

Phone

03 51220609

Fax

03 5122 0680

Email Address

RAppleton@hvp.com.au

G2. Organisation postal address

(The postal address will be filled out for you automatically. To update the organisation's postal address, please contact the ARC at rms@arc.gov.au.)

Postal Address Line 1

PO Box 385

Locality

Churchill

State

Victoria

Postcode

3842

Country

Australia

G3. Other organisation details

(Other organisation details will be filled out for you automatically. To update these details, please contact the ARC at rms@arc.gov.au.)

Australian Business Number (ABN)

56004285705

ANZSIC

Forestry and Logging

Organisation type

Australian Private Company

G4. Has a successful eligibility exemption been granted by the ARC for this Partner Organisation?

	Pre-submission Issue Identifier
1	
2	

G5. Attach a letter of eligibility and support for this proposal including Partner Organisation certification.

(Please attach a PDF of the Partner Organisation certification letter, signed by the CEO or delegated officer. Refer to the Instructions to Applicants for details of the required content for this letter.)

March 22nd 2010

To Whom it May Concern,

Re: Monash University ARC Linkage Grant application
The Strzelecki Koala: a unique population under threat?

HVP Plantations is the largest private land manager in the Strzelecki Ranges of Gippsland. The Company's estate includes over 30,000 hectares of native forest managed for conservation purposes, most of which is now permanently protected through a Land Management Co-operative Agreement with DSE. Koala habitat mapping carried out in recent years in partnership with the Australian Koala Foundation (AKF) has identified some 9,000 hectares of this estate as high to very high quality koala habitat, with much more considered to be of secondary importance. This represents a high proportion of the remaining habitat in the Strzelecki Ranges bioregion.

Managing both our native forest and plantation estates to protect koalas and assure the future of this population is a high priority for the Company. We recognize that the Strzelecki koalas may represent an important genetic reservoir for the species that retains its original integrity, and that this could have implications for the long term survival of the species. Protection of species and other environmental values are entrenched in the Company's policies and certification.

Research that confirms the genetics and the extent (boundaries) of the population is therefore highly relevant. Following the devastating impact of the February 2009 fires on koalas and their habitat in the Strzelecki Ranges, the urgency of implementing informed management strategies to mitigate this impact and ensure the resilience of the population to future disasters is evident. The Company is actively monitoring koalas, other species and habitat recovery in the bushfire impacted and surrounding areas to collect information that will inform ongoing management. We therefore regard the koala research proposed by Monash University to be well aligned with the Company's resource management objectives, and of high priority.

HVP Plantations has previously sponsored Monash biodiversity research projects that help inform our forest management and promote a better understanding of biodiversity values across our estate. The close geographic association between the Monash University Gippsland campus and HVP Plantations Gippsland estate presents unique opportunities for research that is mutually beneficial.

HVP Plantations enthusiastically supports the ARC Linkage Grant funding proposal. We are offering a cash contribution of $17,500 annually for 3 years (a total of $52,500) as our industry contribution. In addition, our in-kind support will provide staff time, contractor time (eg. monitoring and habitat assessment by qualified consultants), GIS support and access to our extensive and detailed vegetation and habitat mapping databases which are essential tools for this research. The value of this contribution is estimated to be $24,500 in year one, $17,500 in year two and $17,500 in year 3, totaling $59,500.

I certify that no part of the cash contribution is drawn from funds previously appropriated from government sources for the purposes of research, evaluation and/or consultancy activity; and I have read and understood the requirements in the standard Linkage Projects Funding Agreement about Partner Organisation written agreements, including the requirement to enter into arrangements regarding intellectual property.

Yours sincerely,

Owen Trumper
General Manager

Grand Ridge Plantations Pty Ltd
50 Northways Road
Churchill VIC 3842
PO Box 385
Churchill VIC 3842
Tel. +61 3 5122 0600
Fax. +61 3 5122 0680
www.hvp.com.au
ABN 56 004 285 705

PART G - Partner Organisation Details (Peter Menkhorst (sole trader))

G1. Organisation contact details

Title

Mr

Family Name

Menkhorst

First Name

Peter

Position

sole trader

Phone

03 9450 8679

Email Address

pmenk@bigpond.net.au

G2. Organisation postal address

(The postal address will be filled out for you automatically. To update the organisation's postal address, please contact the ARC at rms@arc.gov.au.)

Postal Address Line 1

11 Haig Street

Locality

Heidelberg Heights

State

Victoria

Postcode

3081

Country

Australia

G3. Other organisation details

(Other organisation details will be filled out for you automatically. To update these details, please contact the ARC at rms@arc.gov.au.)

Organisation type

Other

G4. Has a successful eligibility exemption been granted by the ARC for this Partner Organisation?

	Pre-submission Issue Identifier
1	
2	

G5. Attach a letter of eligibility and support for this proposal including Partner Organisation certification.

(Please attach a PDF of the Partner Organisation certification letter, signed by the CEO or delegated officer. Refer to the Instructions to Applicants for details of the required content for this letter.)

Peter Menkhorst
11 Haig Street
Heidelberg Heights VIC 3081

5 May 2010

To whom it may concern

Re: ARC Linkage proposal – The Strzelecki Koala; a unique population under threat?

I, Peter W. Menkhorst, ecological consultant, agree to be a Partner Organisation in this ARC Linkage project. I am registered with the Australian Tax Office as a Sole Trader [ATO Code 000 0156 03, ABN 79 413 255 462].

I have considerable experience in the management of Koalas in Victoria, having, in a previous role, coordinated Koala management on behalf of the Department of Sustainability and Environment for more than a decade. In particular, I played a central role in the development of Victoria's Koala Management Strategy, which was adopted by the State Government in September 2004, and in the development of the National Koala Conservation Strategy (1998). I have also researched the history of Koala management in Victoria and its implications for current management. This has provided me with important insights to contribute to this research proposal.

Victoria's Koala Management Strategy highlights the conservation significance of the Strzelecki Koala population and recommends further research into its genetic diversity, geographic range and conservation threats. The loss of Koala habitat caused by extensive wildfires in the Strzelecki Ranges in February 2010 means that this research is even more critical and urgent.

Although no longer directly involved in Koala management, I am still committed to the conservation of the Koala and feel strongly that an improved understanding of the Strzelecki population is essential for the conservation of the Koala in southern Australia.

For these reasons I have committed to making an in-kind contribution to this project, and feel that I have a unique and important perspective that will be of great strategic and practical benefit to the project. This will involve input to both APAI projects and formal co-supervision of APAI-2, attendance at 12 meetings per annum for three years, plus un-specified telephone and email discussions, at an estimated value of $12 000 per annum for three years.

I certify that no part of the cash contribution is drawn from funds previously appropriated from government sources for the purposes of research, evaluation and/or consultancy activity; and I have read and understood the requirements in the standard *Linkage Projects* Funding Agreement, about Partner Organisation written agreements, including the requirement to enter into arrangements regarding intellectual property. The above statement is a requirement of the ARC, however, my participation in this proposal is in the form of an in-kind contribution only so the part refering to a cash contribution is irrelevant.

Yours sincerely

P Menkhorst

Peter Menkhorst

PART G - Partner Organisation Details (Parks Victoria)

G1. Organisation contact details

Title

Mr

Family Name

Antos

First Name

Mark

Position

Environmental Scientist - Fauna

Phone

(03) 8627 4855

Email Address

mantos@parks.vic.gov.au

G2. Organisation postal address

(The postal address will be filled out for you automatically. To update the organisation's postal address, please contact the ARC at rms@arc.gov.au.)

Postal Address Line 1

Level 10

Postal Address Line 2

535 Bourke St

Locality

Melbourne

State

Victoria

Postcode

3000

Country

Australia

G3. Other organisation details

(Other organisation details will be filled out for you automatically. To update these details, please contact the ARC at rms@arc.gov.au.)

Australian Business Number (ABN)

95337637697

Organisation type

State and Local Government

G4. Has a successful eligibility exemption been granted by the ARC for this Partner Organisation?

	Pre-submission Issue Identifier
1	
2	

G5. Attach a letter of eligibility and support for this proposal including Partner Organisation certification.

(Please attach a PDF of the Partner Organisation certification letter, signed by the CEO or delegated officer. Refer to the Instructions to Applicants for details of the required content for this letter.)

Parks VICTORIA

535 Bourke St
Melbourne VIC 3000
Telephone: 8627 4857
Facsimile: 9629 3196
Email: tvarcoe@parks.vic.gov.au
Website: www.parkweb.vic.gov.au
A.B.N. 95 337 637 697

5 May 2010

Program Co-ordinator (Linkage-Projects)
Australian Research Council
GPO Box 2702
CANBERRA ACT 2601

Involvement of Parks Victoria (PV) in ARC Linkage Grant Application LP110100162 "The Strzelecki Koala: a unique population under threat?"

This letter offers the support of Parks Victoria for abovementioned ARC Linkage Project with Monash University.

Parks Victoria manages Victoria's park and reserve network, an estate that spans over four million hectares across the state of Victoria. Our terrestrial parks and reserves encompass a broad range of different ecosystems and span all of Victoria's different bioregions. Although Parks Victoria manages only a modest proportion of the Strzelecki landscape, we are supportive of research projects that operate on a landscape scale and help inform us how processes outside our reserves can influence the land and ecosystems we manage.

Parks Victoria manages a large area of koala habitat and many koala populations throughout the State. Considerable effort and resources are expended in managing and monitoring some of these populations, especially in more fragmented habitats. Our current knowledge of populations in the Strzelecki Ranges is scant and the proposed research project will fill a very important gap.

Parks Victoria will support the current project through providing $3000 of in kind support per annum over the three years of the project. The in kind support will consist of the following;

- Access to staff and the information they can provide re PV-managed land
- Access to PV-managed land as required
- Access to relevant mapping and GIS layers that PV holds
- Limited temporary storage and work space at PV work centres if required

We are aware of the grant conditions and accept them. I certify that no part of the cash contribution is drawn from funds previously appropriated from government sources for the purposes of research, evaluation and/or consultancy activity; and I have read and understood the requirements in the standard *Linkage Projects* Funding Agreement about Partner Organisation written agreements, including the requirement to enter into arrangements regarding intellectual property.

A written agreement with Monash University covering project resources, intellectual property and the involvement of personnel in the project will be drawn up before the commencement of the study.

We look forward to collaborating with Monash University on this important project

Yours sincerely

Healthy Parks Healthy People

Tony Varcoe
Manager, Research and Management Effectiveness
Parks Victoria
Level 10/535 Bourke Street
Melbourne Victoria 3000
e-mail: tvarcoe@parks.vic.gov.au

Healthy Parks Healthy People

PART G - Partner Organisation Details (GHD Pty Ltd)

G1. Organisation contact details

Title

Mr

Family Name

Cyphers

First Name

Stephen

Position

Spatial Scientist

Phone

(03)51765876

Email Address

Steven.Cyphers@ghd.com

G2. Organisation postal address

(The postal address will be filled out for you automatically. To update the organisation's postal address, please contact the ARC at rms@arc.gov.au.)

Postal Address Line 1

Level 15, 153 Castlereagh Street

Locality

Sydney

State

New South Wales

Postcode

2000

Country

Australia

G3. Other organisation details

(Other organisation details will be filled out for you automatically. To update these details, please contact the ARC at rms@arc.gov.au.)

Australian Business Number (ABN)

39008488373

Web page address

http://www.ghd.com.au/

ANZSIC

Non-Store Retailing

Organisation type

Australian Private Company

G4. Has a successful eligibility exemption been granted by the ARC for this Partner Organisation?

	Pre-submission Issue Identifier
1	
2	

G5. Attach a letter of eligibility and support for this proposal including Partner Organisation certification.

(Please attach a PDF of the Partner Organisation certification letter, signed by the CEO or delegated officer. Refer to the Instructions to Applicants for details of the required content for this letter.)

CLIENTS|PEOPLE|PERFORMANCE

19 April 2010

Dr. Wendy Wright
Monash University
Gippsland Campus
Churchill Vic 3842

Our ref: 31/01010/00/13390

Dear Wendy

GHD In kind support for ARC Linkage PhD project: Strzelecki Koala: a unique population under threat.

I am pleased to be able to offer in-kind corporate support on behalf of GHD to an Australian Research Council linkage grant being submitted by Monash University, HVP Plantations Pty Ltd., and International Power Hazelwood. The linkage grant application to the ARC aims to:

- Assess the genetic diversity of the koala population in the Strzelecki Ranges relative to other populations in Australia
- Asses the spatial distribution of this diversity across the Strzelecki Ranges

GHD will provide in-kind support in the form of: remote sensing and spatial analysis of landform, loan of GPS data collection equipment, access to specialised software and contribution of technical expertise to the project. Steven Cyphers a spatial scientist and Victorian service line coordinator with GHD in our Gippsland regional office. Steve will be point of contact for the ARC project and assisting technically.

Developing public private partnerships with University research projects are key service line initiatives in both our NRM and Spatial service lines within GHD and this project will foster relationships and collaboration across the panel members while supporting the PhD candidate to the highest standard.

GHD currently (and has been for many years) supports Monash University students in the form of scholarships, cadetships and guest lecturing services. Monash students also use GHD's laboratory as part of their curriculum, carrying out industry practical sessions. GHD provides an annual scholarship/award to high performing students, and sponsors up to 3 students at any one time through their education, providing vacation work, financial assistance and mentoring. This is proving to be beneficial to both GHD and talent pool of students at Monash Gippsland.

It is anticipated that Steve will be able to contribute up to 4 hours per month to the project and will liaise with the research group established in this PPP and the research candidate at Monash University. GHD's support is equivalent to approximately $5000 per annum over three years. This grant of support would represent $15000 of in-kind support as our industry contribution to this ARC linkage project.

I certify that no part of the cash contribution is drawn from funds previously appropriated from government sources for the purposes of research, evaluation and/or consultancy activity; and I have read and understood the requirements in the standard Linkage Projects Funding Agreement about Partner Organisation written agreements, including the requirement to enter into arrangements regarding intellectual property.

GHD Pty Ltd ABN 39 008 488 373 Cnr Hazelwood Drive & Lignite Court Morwell VIC 3840 Locked Bag 5 Morwell 3840 VIC Australia
T 61 3 5136 5800 **F** 61 3 5136 5888 **E** mwlmail@ghd.com.au **W** www.ghd.com.au

Yours sincerely

Steven Cyphers

Spatial Scientist
03 5136 5876

Jon McNaught

Manager Gippsland Region
Senior Mechanical Engineer

PART G - Partner Organisation Details (Loy Yang Power Station)

G1. Organisation contact details

Title

Mr

Family Name

Elkington

First Name

Richard

Position

Executive General Manager (People & Positioning)

Phone

(03) 51 73 2530

Fax

(03) 51 73 2591

Email Address

relkingt@loyyangpower.com.au

G2. Organisation postal address

(The postal address will be filled out for you automatically. To update the organisation's postal address, please contact the ARC at rms@arc.gov.au.)

Postal Address Line 1

Barton's Lane

Locality

Traralgon

State

Victoria

Postcode

3884

Country

Australia

G3. Other organisation details

(Other organisation details will be filled out for you automatically. To update these details, please contact the ARC at rms@arc.gov.au.)

Australian Business Number (ABN)

62077985758

Organisation type

Australian Private Company

G4. Has a successful eligibility exemption been granted by the ARC for this Partner Organisation?

	Pre-submission Issue Identifier
1	
2	

G5. Attach a letter of eligibility and support for this proposal including Partner Organisation certification.

(Please attach a PDF of the Partner Organisation certification letter, signed by the CEO or delegated officer. Refer to the Instructions to Applicants for details of the required content for this letter.)

LOY YANG power

To whom it may concern, 30 April 2010

Monash University ARC Linkage Grant application
The Strzelecki Koala: a unique population under threat

Loy Yang Power is Victoria's largest energy producer supplying up to 2260 MW of electricity into the National Electricity Market from its Loy Yang A Power Station and mining in excess of 30 Million tonnes of brown coal from Loy Yang Mine. This coal is then supplied to various customers including Loy Yang A and B Power Stations.

The land area owned by Loy Yang Power covers in excess of 6000 ha and Loy Yang Power has long embraced, through its Corporate Social Responsibility and Environmental Policies programmes such as flora and fauna studies, heritage assessment and plantation development and has established relationships with a wide range of community groups.

Of particular interest, in the immediate vicinity of Loy Yang Power's operations, is the community locally known as "Traralgon South" which includes the areas of Traralgon South, Callignee, Koornalla and Balook. In past years, Loy Yang Power has had a close working relationship with "Friends of Tarra-Bulga National Park". Of particular interest was the clear link between temperate rain forest and its ultimate evolution, over eons, to the valuable brown coal resource that we see today.

Given our close identification with and support for our neighbours in the Traralgon South community, Loy Yang Power recognises the importance of effective management of our native forest and plantation estates together with the maintenance of the habitat of the Strezlecki Koala.

Loy Yang Power enthusiastically supports the ARC Linkage Grant funding proposal and commits to the provision of a cash component of $2000 per year for 3 years to cover the costs of DNA sequencing . In addition, our in-kind support of $2000 per year for 3 years will provide consultancy and administration support.

I certify that no part of the cash contribution is drawn form funds previously appropriated from government sources for the purposes of research, evaluation and/or consultancy activity; and I have read and understood the requirements in the standard Linkage Projects Funding Agreement about Partner Organisation written agreements, including the requirement to enter into agreements regarding intellectual property.

Yours sincerely,

Richard Elkington
Executive General Manager, People and Positioning

ACN 077 985 758
LOY YANG POWER MANAGEMENT PTY LTD
PO BOX 1799 TRARALGON 3844 VICTORIA AUSTRALIA
Tel +61 3 5173 2000

PART G - Partner Organisation Details (Victorian Department of Sustainability and Environment)

G1. Organisation contact details

Title

Mr

Family Name

Incoll

First Name

Ryan

Position

Group Manager - Biodiversity - Gippsland

Phone

51722509 / 0429397770

Email Address

Ryan.Incoll@dse.vic.gov.au

G2. Organisation postal address

(The postal address will be filled out for you automatically. To update the organisation's postal address, please contact the ARC at rms@arc.gov.au.)

Postal Address Line 1

8 Nicholson St

Locality

east Melbourne

State

Victoria

Postcode

3002

Country

Australia

G3. Other organisation details

(Other organisation details will be filled out for you automatically. To update these details, please contact the ARC at rms@arc.gov.au.)

Organisation type

State and Local Government

G4. Has a successful eligibility exemption been granted by the ARC for this Partner Organisation?

	Pre-submission Issue Identifier
1	
2	

G5. Attach a letter of eligibility and support for this proposal including Partner Organisation certification.

(Please attach a PDF of the Partner Organisation certification letter, signed by the CEO or delegated officer. Refer to the Instructions to Applicants for details of the required content for this letter.)

Department of Sustainability and Environment

71 Hotham St
Traralgon 3844
Telephone: 03 51397722
Facsimile: 03 51397733
ABN 90 719 052 204

4 May 2010

Dr Wendy Wright
School of Applied Sciences & Engineering
Monash University
Gippsland Campus
Northways Road
CHURCHILL VIC 3842

Dear Wendy

DSE In-kind support for PhD project: Strzelecki Koala – ARC Linkage Proposal

I understand that Monash University Gippsland, HVP Plantations and International Power Hazelwood are submitting a Linkage Grant application to the Australian Research Council for the project *The "Strzelecki Koala" - Assessing vulnerability and developing management strategies.*

The key aims of the project include:

(i) to understand and compare the genetics of koalas found in the Strezlecki Ranges with populations in other parts of Victoria and Australia
(ii) to assess the distribution of koalas in the Strzelecki Ranges.

These activities are consistent with several of the objectives of *Victoria's Koala Management Strategy* (DSE 2004), in particular Objective 7 (Action 14) and Objective 2.

The VKMS highlights the significance of the South Gippsland Koala population in Victoria and the importance of establishing estimates of population size in key areas, such as the Strzelecki Ranges

DSE will provide in-kind support to the project by supplying spatial data from the biodiversity unit and also logistical and liaison support from Erica Forest Management Officer, Kate Hill.

The spatial data available to the project includes flora and fauna records, vegetation information, fire history and an assortment of other base layers. This support is equivalent to approximately $1500.

It is anticipated that a contribution of 2 hours per month can be provided by Kate in order to support the student in identifying sites within Erica district where known populations of koalas persist, current koala relocation and release areas and also to facilitate any contact with local shelter operators. This support is equivalent to ~$3000 over the three year duration of the project.

The support for this proposal is in the form of an in-kind contribution only. I have read and understood the requirements in a standard Linkage Projects Funding Agreement, particularly as they relate to Partner Organisation written agreements, including the requirement to enter into arrangements regarding intellectual property.

"I certify that no part of the cash contribution is drawn from funds previously appropriated from government sources for the purposes of research, evaluation and/or consultancy activity; and I have read and understood the requirements in the standard Linkage Projects Funding Agreement about Partner Organisation written agreements, including the requirement to enter into arrangements regarding intellectual property"

In regards to the compulsory paragraph above, the support for this proposal is in the form of an in-kind contribution and no cash will be provided. I have read and understood the content of a standard Linkage Project Funding Agreement as provided by Monash University. Intellectual property to be provided by DSE would only be permitted for use by the project and remains the property of DSE.

DSE commends this project to the Australian Research Council and wishes the project every success during the application process.

Yours sincerely

Ryan Incoll
Group Manager - Biodiversity
Gippsland

letter support Wendy Wright koalas revised 4may10.doc

H1. Research support for all participants

(For each participant on this Proposal, provide details of research funding (ARC and other agencies) for the years 2009 to 2013 inclusive. That is, list all projects/proposals/fellowships awarded or requests submitted involving that participant for funding. Please refer to the Instructions to Applicants for submission requirements.)

Part H – Research Support

Description	Same research area	Support status	Proposal /Project ID	2009	2010	2011	2012	2013
Current application: **Hogan, F., Taylor, A., Wright, W., Mosse, J & Menkhorst, P**. The Strzelecki Koala: a unique population under threat? ARC Linkage Projects, LP11 round 1, 2010	Yes	R	LP 110100 162			74	74	74
Zhu, X., **Wright, W**., Chandler, T. & Tang, Y. *Enhancing natural resource management through mapping coupled social-ecological spaces* ARC Discovery Projects DP11, round 1 2010	Yes	R	DP 110101 150			181	192	171
Zhu, X., Tang, Y., **Wright, W**. & Di, B. *Modelling and mapping habitat potential of protected wildlife and plant species in Jiuzhaigou National Nature Reserve* Monash University-Sichuan University Strategic Funding Initiative for Joint Research and Education Programs 2009-2010	Yes	C			10			
Hatten, A., Loyn, R. and **Menkhorst, P.** Identifying and managing critical habitats for shorebirds in the Western Port Ramsar site. Caring for Our Country Community Coastcare Grants 2009.	Yes	C	CC 084728	136	91			
Carthew, S. **Taylor, AC**, Cooper, S. Conservation genetics and socio-ecology of marsupials in fragmented populations of south-eastern South Australia: towards a regional biodiversity management plan. ARC Linkage 2009	Yes	C	LP0668 987	51.5				
Weaving, M. White, J. Cooke, R. and **Hogan, F**. Frogmouths in the City - supporting our native wildlife to survive in a rapidly urbanizing world. Australian Geographic Society 2009	Yes	C			2.8			
Weaving, M. White, J. Cooke, R. and **Hogan, F**. Spatial ecology of the tawny frogmouth in an urban landscape. Holsworth Wildlife Research Endowment 2009	Yes	C			5.4	5.4		

Description	Same research area	Support status	Proposal /Project ID	2009	2010	2011	2012	2013
Menkhorst, P. and Van der Ree, R. Strategic Fuelbreaks Monitoring Program for EPBC-listed fauna. Department of Sustainability and Environment, Land and Fire Management Division. 2009	No	C			100	100	100	100
Appleton, R. Kee, J., Kelsall, J, McDonald, A. & **Wright, W**. *Strzelecki Warm Temperate Rainforest restoration- Macks Creek catchment* Caring for our Country Open Grants 2008-2009	Yes	P	OG 081286	105	-	-	-	-
Dutta, D., **Wright, W**. & Adeloju, S. C*limate perturbation and coastal zone control zone systems in the Asia Pacific region: Holistic approaches and Tools for Vulnerability Assessment and Sustainable Management Strategy* Asia Pacific Network for Global Change Research Annual Regional Call for Research Proposals (ARCP) 2007	No	P		45	-	-	-	-

PART I - Statements on progress of ARC-funded Projects (LP110100162)

I1. For each participant on this Proposal, please attach a statement detailing progress for each project/Fellowship involving that participant who has been awarded funding for 2009 under the ARC Discovery Projects, Linkage Projects or Fellowships scheme.

	Project ID	First named investigator	Scheme	Statement
1	LP0668987	Carthew	Linkage	

LP0668987 PROGRESS REPORT January - December 2009

Research objectives

In south-eastern South Australia and western Victoria native forests have been severely fragmented, leading to a series of isolated forest patches surrounded by either agricultural land or pine plantations. Our project aims to investigate how this fragmentation has impacted population processes in key native species using a powerful combination of fine-scale genetic and ecological analyses. The outcome will be comparative data on the population dynamics and ecology of each species, and the degree of connectivity among patches and habitat characteristics that influence this. These data are crucial for the development of appropriate management and landscape restoration strategies for biodiversity conservation.

Progress in 2009

We have made significant progress in this funding period. Intensive field sampling of target species continues. To date, samples from two forest bat species - *N. gouldi* (n = 153) and *N. geoffroyi* (n = 491) have been collected by PhD student Fuller from a continuous forest and four native forest patches surrounded by either pine plantations or agricultural land. DNA has been extracted and microsatellite optimisation for the two species continues.

Two additional datasets have been generated for common ringtail possums. Sampling of native forest patches within pastoral land was undertaken by Lancaster, with 188 possums from seven patches sampled and genotyped at 15 microsatellite loci (Lancaster *et al.* 2009). This new dataset will complement the existing pine dataset (296 possums from seven native forest patches surrounded by pine) to examine the effects of different land use (plantations vs agriculture) on population connectivity and genetic health of the species. Analysis of common ringtail possums in native forests surrounded by pine have identified populations in small, isolated patches as being most susceptible to losses of genetic diversity and genetic isolation. Populations in larger patches appear to have retained levels of variation comparable to those in continuous forest. One large native forest patch has been visited each breeding season for three consecutive years (concluding in October 2009), which will allow the first exploration of the species' mating system. Fifty pouch young from 28 mothers, as well as 77 additional possums including candidate fathers have been genotyped.

Additional sugar glider samples obtained are currently being genotyped at nine microsatellite loci. Results from these data will form a publication on the effects of forest fragmentation on the social structure and mating system of this species. A microsatellite library has been developed for the southern brown bandicoot (*Isoodon obesulus*) and markers are currently being optimised to add to the pre-existing panel of eight. Preliminary field work has yielded approximately 50 samples from this species. This will be augmented by PhD student Li You when she commences field work in March 2010.

McLean completed her honours project in May this year. She collected samples from 85 yellow-footed antechinus (*A. flavipes*) across seven patches embedded in pine and three sites in continuous forest. Genetic diversity within patches was similar to that of continuous forest populations, although there was some evidence of reduced connectivity among patches.

Lancaster and McLean both presented some results of their work at an International Ecology conference (Intecol, Brisbane) in July 2009.

2009 Publications

1. Lancaster ML, Cooper SJB, Carthew S, Taylor AC (2009) Microsatellite markers for the Common ringtail possum (*Pseudocheirus peregrinus*) and their amplification in other Pseudocheirids. *Molecular Ecology Resources* 9: 1535-1537.

2. Carthew SM, Horner B, Jones KMW (2009) Do utility corridors affect movements of small terrestrial fauna? *Wildlife Research* 36: 488-495.

PART J - Additional Details (LP110100162)

J1. Other agencies

Have you submitted or do you intend to submit a similar Proposal to any other agency?

Other Agency Submission

No

If Yes, please select one of the following:

Other Agency Name

Not applicable for this candidate

If Other is selected above, please enter the full name of the agency:

Not applicable for this candidate