

Appendices

Appendix 1 Curricula vitae of the independent reviewers

Appendix 2 Plans of the proposed design changes

Appendix 3 Relevant approval requirements

Appendix 4 Alternative design plans and clearing boundaries

Appendix 1 Curricula vitae of the independent reviewers

RHIDIAN HARRINGTON

CURRICULUM VITAE

POSITION:

Senior Ecologist, Biosis Research Pty. Ltd.

PROFESSIONAL AFFILIATIONS AND MEMBERSHIPS:

Birds Australia

Ecological Society of Australia

QUALIFICATIONS:

Bachelor of Science (Hons), James Cook University

Master of Science (Zoology), University of the Witwatersrand

Doctor of Philosophy (Zoology), University of Melbourne

EMPLOYMENT PROFILE:

2003	Senior Ecologist, Biosis Research Pty. Ltd.
2002-03	Project Officer, Black-eared Miner Recovery Team, La Trobe University, Melbourne
2002	Scientific writer, Institute of Land and Food Resources (ILFR), University of Melbourne
1998-01	Research coordinator/demonstrator, Melbourne University
1998-02	Research Assistant, Puckapunyal Army Reserve, Victoria
1995-96	Research assistant, Botswana National Parks
1993-95	Lecturer/Demonstrator, University of the Witwatersrand, South Africa
1992	Research assistant for OTC and National Parks Queensland, Australia
1992	Research assistant, Australian Centre for Tropical and Freshwater Research, Queensland
1987	Volunteer research assistant, National Park and Wildlife Service, Zimbabwe

FIELDS OF COMPETENCE:

- ✓ Terrestrial ecology
- ✓ Zoology
- ✓ Flora and fauna survey and identification
- ✓ Identification of Australian vertebrates
- ✓ Native vegetation classification and mapping
- ✓ Literature reviews
- ✓ Experimental design
- ✓ Expert evidence
- ✓ Statistical data analysis
- ✓ Environmental impact assessment
- ✓ Impact minimisation (mitigation) guidelines
- ✓ GIS mapping
- ✓ Project management

PROFESSIONAL EXPERIENCE:

Rhidian has over 12 years experience in applied conservation biology and consulting. A sample of key professional experience is presented below.

Project Manager/Ecologist, Route option assessment and targeted surveys and impact assessment for threatened species for proposed Pacific Highway Upgrade:

Woodburn to Ballina (2006-present for Arup and the NSW Roads and Traffic Authority).

- Project Manager/Ecologist**, baseline flora and fauna survey and assessment of environmental buffers of the Northern Exploration Drilling Area (Palm Creek), Weipa region, Queensland (2005 for Comalco Weipa)
- Zoologist**, impact assessment of subsidence on threatened animal species for the proposed West Cliff Colliery Area 5 - longwalls 31-33, Appin, NSW (2005 for BHPBilliton)
- Zoologist**, Targeted surveys and impact assessment for threatened species (Mallee Emuwren and Long-eared Bat) for the proposed Long Term Containment Facility, Nowingi, Victoria (2005 for Major Projects Victoria)
- Project Manager/Ecologist**, Targeted surveys and impact assessment for threatened species for proposed electricity adjustments associated with the National Highway Link F3 to Branxton, Kurri Kurri region, NSW (2005 for Energy Australia and the RTA)
- Project Manager/Ecologist**, Constraints assessment, route option assessment and targeted surveys and impact assessment for threatened species for the proposed Pacific Highway Upgrade: Tintenbar to Ewingsdale (2004-present for Arup and the NSW Roads and Traffic Authority)
- Project Manager/Ecologist**, Targeted surveys and impact assessment for threatened species for proposed modifications to a High Pressure Gas Pipeline, Stockrington Road, near Seahampton, NSW (2004 for GHD and the RTA)
- Project Manager/Ecologist**, Targeted surveys and impact assessment for threatened species for proposed modifications to the South Maitland Railway, Kurri Kurri (2004 for the RTA)
- Project Manager/Ecologist**, Targeted surveys for Koala and Yellow-bellied Glider and impact assessment for threatened species for the proposed Oxley Highway Upgrade, Port Macquarie (2004-present for the RTA)
- Project Manager/Ecologist**, Review of detailed road design in collaboration with road engineers to reduce impacts on threatened flora and fauna on the proposed National Highway Link F3 to Branxton (2004-present for the RTA)
- Project Manager/Ecologist**, Design of mitigation measures for threatened flora and fauna impacted by the proposed National Highway Link F3 to Branxton (2004-present for the RTA)
- Project Manager/Ecologist**, Translocation assessment for threatened flora and fauna impacted by the proposed National Highway Link F3 to Branxton (2004-05 for the RTA)
- Ecologist**, Targeted surveys and impact assessment for threatened species for the proposed Pacific Highway Upgrade, Moorlands to Herons Creek (2004 for Arup and the RTA)
- Project Manager/Ecologist**, Targeted surveys and impact assessment for threatened species for the proposed modifications to the *National Highway Link F3 to Branxton* (2004 for the RTA)
- Project Manager/Ecologist**, Targeted surveys for *Tetratheca juncea* and *Cryptostylis hunteriana* for the proposed F3 Freeway to Branxton Geotechnical Variation. (2004 for the RTA)
- Ecologist**, survey and statistical design to measure the impacts of mine subsidence for the Dendrobium Coal Project (2004 for BHPBilliton)
- Project Manager/Ecologist**, Targeted surveys for threatened avifauna and habitat along the Darling Anabranch and a proposed pipeline (2003-2004 for NSW Department of Infrastructure, Planning and Natural Resources)
- Project Manager/Ecologist**, Habitat assessment and eight part tests for threatened species along the Darling Anabranch. (2003-2004 for NSW Department of Infrastructure, Planning and Natural Resources)
- Project Manager/Ecologist**, Targeted surveys and eight part tests for threatened species for the proposed National Highway Link F3 to Branxton (2003 for the RTA)

- Project Officer**, Black-eared Miner Recovery Team (2002-2003 for La Trobe University, Melbourne)
- Scientific Writer**, Institute for Land and Food Resources (ILFR) (2002 for the University of Melbourne)
- Project Manager/Zoologist**, Environmental Baseline Survey of Khirthar National Park, Pakistan, (2000-2001 for Premier-Shell and the Sindh Wildlife Department, Pakistan)
- Chief Investigator**, studying the impacts of artificial water points on avifaunal distribution and abundance in the arid mallee habitat of southeast Australia (1998-2002 for *Birds Australia*)
- Research Assistant**, Kangaroo Census Team, Puckapunyal Army Reserve, Victoria (1998-2002 for the Department of Defence)
- Research Assistant**, aerial and ground census, wildlife monitoring and data analysis (1995-1996 for the National Parks Service, Botswana)
- Chief Investigator**, determining the causes of the roan antelope decline in Kruger National Park, South Africa (1993-1995 for the National Parks Service, South Africa)
- Lecturer in Ecology**, teaching and coordinating ecology and conservation biology for first year students (1995 for the University of the Witwatersrand, South Africa)
- Research Assistant**, fauna survey of Prudhoe Island Queensland (1992 for OTC and Queensland National Parks)
- Chief Investigator**, studying the importance of riparian vegetation to avifauna in the tropical woodlands of north Queensland (1992 for James Cook University)
- Research Assistant**, fauna surveys of the Burdekin River Floodplains, Queensland (1992 for Australian Centre for Tropical and Freshwater Research)
- Research Assistant**, research into savanna ecology, including soil erosion, and the management of Hwange National Park (1987 for the National Parks Service, Zimbabwe)

PUBLICATIONS:

Rhidian has been involved in publishing the following scientific papers.

- Harrington, R.** 2005. The distribution and abundance of avifauna around artificial watering points in the arid and semi-arid mallee environments of southeast Australia. *Journal of Arid Environments* (in prep.).
- Harrington, R.** 2005. Changes in vegetation structure and soil characteristics around artificial watering points in the arid mallee of southeast Australia. *Journal of Arid Environments* (in prep.).
- Harrington, R.** & Morgan, D.G. 2005. The relationship between vegetation structure and floristics, avifauna and distance to water in an arid mallee system. *Austral Ecology* (in prep.).
- Harrington, R.** & Morgan, D.G. 2005. Patterns of water utilisation by avifauna in an arid mallee environment. *Emu* (in prep.).
- Harrington, R.** & Morgan, D.G. 2005. The immediate effects of water point closure on avifauna in an arid mallee environment. *Journal of Arid Environments* (in prep.).
- Harrington, R.**, Ballentine, M. & Morgan, D.G. 2005. The relationship between changes in vegetation floristics and herbivore diets around artificial watering points in the arid mallee of southeast Australia. *Rangeland Journal* (in prep.).
- Yamada, K., Ansari, M., **Harrington, R.**, Morgan, D. and Burgman, M.A. 2004. Sindh Ibex (*Capra aegagrus blythi*) in Kirthar National Park, Pakistan: Sensitivity of a Habitat and Population Model. In: H.R. Akçakaya, M.A. Burgman, O. Kindvall, C.C. Wood, P. Sjögren-Gulve, J.S. Hatfield and M.A. McCarthy (Eds), *Species Conservation and Management: Case Studies*, pp 469-481. Oxford University Press, New York.

Harrington, R., Owen-Smith, N., Viljoen, P.C., Biggs, H.C, Mason, D.R. & Funston, P. 1999. Establishing the causes of the roan antelope decline in Kruger National Park, South Africa. *Conservation Biology* 90: 69 - 78.

CONSULTANT REPORTS:

Harrington, R. 2006. *F3 Freeway to Branxton Link: Design Review Report*. Report for NSW Roads and Traffic Association (RTA).

Harrington, R. and Wilkins, S. 2006. *Pacific Highway Upgrade Tintenbar to Ewingsdale Preferred Route Report – Terrestrial Ecology*. Report for Arup and the RTA.

Clarke, R., **Harrington, R.**, Smith, N. & Cartner, K. 2006. *Southern Exploration Drilling Area (Boyd Bay and Norman Creek) Flora and Fauna Baseline Survey*. Report for Comalco Weipa.

Smith, N., **Harrington, R.**, Clarke, R. & Cartner, K. 2006. *Northern Exploration Drilling Area (Musgrave) Flora and Fauna Baseline Survey*. Report for Comalco Weipa.

Harrington, R., Smith, N., Clarke, R., Beitzel, M. & Cartner, K. 2005. *Northern Exploration Drilling Area (Palm Creek) Flora and Fauna Baseline Survey*. Report for Comalco Weipa.

Harrington, R. and Wilkins, S. 2005. *Pacific Highway Upgrade Tintenbar to Ewingsdale Route Option Development Report – Terrestrial Ecology*. Report for Arup and the RTA.

Smith, N., **Harrington, R.** and Richardson, M. 2005. *West Cliff Colliery Area 5 – Longwalls 31-33: Impacts of Subsidence on Terrestrial Flora and Fauna*. Report for BHP Billiton.

Smales, I., Koehler, S., Miller, J. and **Harrington, R.** 2005. *Survey for Mallee Emu Wren *Stipiturus mallee* within 20 kilometres of the LTCF study area, Nowingi, Victoria*. Report for Major Projects Victoria.

Harrington, R. and Smith, N. *Electricity Adjustments Associated with the Proposed National Highway Link F3 Freeway to Branxton: Flora and Fauna Assessment*. Report for Energy Australia and the RTA.

Harrington, R. & Gorrod, E. 2005. *Gas Pipeline Realignment Terrestrial Flora and Fauna Impact Assessment, Stockrington Road, near Seahampton*. Report for GHD and the RTA.

Harrington, R. and Gorrod, E. 2004. *South Maitland Railway Flora and Fauna Impact Assessment: The proposed raising of the South Maitland Railway over the proposed National Highway Link F3 to Branxton*. Report for the RTA.

Harrington, R., Gorrod, E. and English, T. 2004. *Oxley Highway Deviation: Species Impact Statement*. Report for the RTA.

Harrington, R. 2004. *National Highway Link F3 Freeway to Branxton: Road Design Review*. Report for the RTA.

Harrington, R. and O'Sullivan, T. 2004. *National Highway Link F3 Freeway to Branxton: Fauna Mitigation Measures*. Report for the RTA.

Harrington, R., O'Sullivan, T. and Mueck, S. 2004. *National Highway Link F3 Freeway to Branxton: Options for the translocation of threatened fauna and flora*. Report for the RTA.

Harrington, R., Predavec, M., Harrington, S. and O'Sullivan, T. 2004. *Pacific Highway Upgrade Moorland to Herons Creek: Environmental Impact Statement - Terrestrial Flora and Fauna Report*. Report for ARUP and the RTA.

Harrington, R. 2004. *National Highway Link F3 Freeway to Branxton: Updated Additional Flora and Fauna Assessment - Threatened Species Assessment for Proposed Modifications*. Report for NSW Roads and Traffic Association (RTA).

O'Sullivan, T., **Harrington, R.** and Smith, N. 2004. *National Highway Link F3 to Branxton:*

Targeted Species Survey & Habitat Assessment for Geotechnical Investigation - Surveyors Creek to Branxton. Report for NSW Roads and Traffic Association (RTA).

- O'Sullivan, T., **Harrington, R.**, Smith, N. 2004. National Highway Link F3 to Branxton - Targeted Species Survey & Habitat Assessment for Geotechnical Investigation: F3 to Surveyors Creek Section. Report for NSW Roads and Traffic Association (RTA).
- Harrington, R.** 2004. *Darling Anabranche Environmental Flows Species Impact Statement.*
Report for EarthTech/Department of Infrastructure, Planning and Natural Resources.
- Harrington, R.**, Richardson, M., English, T., Miller, J., Taylor-Wood, E. and Bishop, K. 2004. *Darling Anabranche Environmental Flows Environmental Impact Statement - Terrestrial and Aquatic Flora and Fauna Assessment Report.* Report for EarthTech/Department of Infrastructure, Planning and Natural Resources.
- Harrington, R.**, Richardson, M., English, T., Mueck, S. and Bishop, K. *Darling Anabranche Pipeline Environmental Impact Statement - Terrestrial and Aquatic Flora and Fauna Assessment Report.* Report for EarthTech/Department of Infrastructure, Planning and Natural Resources.
- Harrington, R.**, Predavec, M., Richardson, M., English, T., O'Sullivan, T. & Harrington, S. 2003. *National Highway Link F3 to Branxton: Updated Additional Flora and Fauna Assessment.* Report for NSW Roads and Traffic Association (RTA).
- Harrington, R.** and Harrington, S. 2003. *Flora and fauna assessment of Lot 3, Holroyd High School, Greystanes.* Report for GHD.
- Harrington, R.** and Harrington, S. 2003. *Preliminary flora and fauna assessment of Lot 3, Holroyd High School, Greystanes.* Report for GHD.
- Harrington, R.** & Clarke, M. F. 2003. *Proposal for the translocation of Black-eared Miners from South Australia to NSW.* Unpublished report to Department of Environment and Heritage (DEH), South Australia.
- Harrington, R.** and Clarke, M. F. 2003. *Field management of the Black-eared Miner.* Unpublished report for the Department of Environment and Heritage (DEH), South Australia.
- Morgan, D.G. and **Harrington, R.** 2001. *Khirthar National Park Baseline Environmental Study. Chapter 5a: Fauna.* Report to the Sindh Wildlife Department and Premier-Shell, Pakistan.



Position	Director Design Manager - Civil
Qualifications	Bachelor of Science in Civil Engineering, majoring in roads and railways (1989)
Affiliations	Member, Institution of Engineers, Australia (1992)
Summary of experience	<p>Vlad heads the civil design in our Sydney office. He has over 16 years experience in road and civil infrastructure projects, with expertise covering design management, masterplanning and design. His speciality is design of all kinds of roads, ranging from private and local council roads through to high profile RTA arterial roads and freeways including intersections, roundabouts and grade separated interchanges. Vlad has given evidence in Land and Environment Court regarding road matters.</p> <p>Vlad worked previously at the RTA's Sydney Project Management Services Branch, providing design advice and support for many projects, from preliminary investigations through to concept design, detail design and construction phases.</p> <p>He also is an experienced user of MOSS / MX road and civil design software (13 years experience)</p>

Professional experience

1996 Hughes Trueman

Vlad has been involved in many large road and general civil projects in the capacity of client manager, design manager, design reviewer and advisor, masterplanner and designer. Projects include:

- WM7 - Western Sydney Orbital – On behalf of the RTA, responsible for review of both concept and detail design geometry of the entire project including 40 km of freeway, 15 grade separated interchanges and many intersections and local roads. Also road safety audit for the concept of the entire project and technical assistance during the tendering process. Numerous concept and detail designs related to the project.
- Anzac Bridge and approaches upgrade- Preliminary concept investigations and consideration of options, road safety audit, development of concept design and detail design. Also inspections and assistance during construction.
- Norwest Bld / Old Windsor Rd grade separated interchange- Preliminary concept investigations, and development of concept design. Also review of the detail design by others.
- Woodstock Ave / Rooty Hill North Rd intersection upgrade- Preliminary concept investigations, development of concept design and detail design
- New England Highway improvements (White Street Junction, Timor Road Junction and Maison Dieu Road Junction) – concept investigations, preliminary and detail design.

- Professional experience cont
- Five Ways Roundabout, Miranda – concept design
 - Avoca Drive (Empire Bay Roundabout), Gosford – concept design, preparation of REF and detail design.
 - Delhi Road Upgrade (M2 to Julius Avenue, East) – preliminary investigations, concept and detail design, documentation.
 - Victoria Park, Zetland - roads infrastructure masterplanning, including connection with the Eastern Distributor.
 - F3 Freeway upgrade, Hornsby to Calga - Feasibility concept investigations.
 - M4 Motorway upgrade, Cumberland Highway to Church Street - concept design.
 - M5 East Motorway, Marsh Street to General Holmes Drive - concept development.
 - The Horsley Drive, Carramar - concept development for 0.5 km of four lane divided carriageway urban road over a railway line.
 - Elizabeth Drive, Bonnyrigg - design and documentation of a 2 km length of four lane urban road, with three major signal T-junctions and bus and cycle lanes, in a flood prone area of Sydney.
 - Sunnyholt Road, Blacktown, Sydney - concept development and detail design of 1km six lane section, including signalised T-junction at Lalor Rd.
 - University of Western Sydney, Rydalmere - Detail design of internal roads and general civil works, including the signalised T-junction with Victoria Road.
 - Sydney Showgrounds, Homebush - detail design, roads and civil works.

1993-1996 RTA Project Management Services Branch

Working as a Road Designer in the Design Services Group, Vlad prepared preliminary layouts for road systems, intersections and grade separated interchanges, and concept and detail designs. He also audited concept and final designs prepared by external consultants and the RTA's internal design departments. Projects included:

- Great Western Highway upgrade, Linden to Woodford - design support during construction.
- Glebe Island Arterial - concept and detail design work.
- Metroad 3, Hume Highway/Roberts Road interchange - concept investigations.
- Homebush Bay Drive, Australia Avenue interchange - concept investigations.

1989-1992 Granit Construction Company – Road Design Section

This company is one of the largest civil engineering firms in south-eastern Europe, with over 6,000 employees.

As a Design Engineer, Vlad was the leader of the team responsible for all the road design work done in CAD. Large projects included the detail design of 22 km of national freeway and 4 grade separated interchanges.