

## PROFESSIONAL PROFILE

Dr Grant Wells is an expert in the field of plant restoration ecology and the design and execution of vegetation surveys and mapping. Dr Wells' survey experience extends across 'life of project' assessments from baseline flora and vegetation surveys for environmental impact assessment, to operational compliance monitoring and rehabilitation for mine closure. He has held roles in government, research, industry and consulting, including five years with the Botanic Gardens and Parks Authority.

Dr Wells' baseline survey experience extends across several of Western Australia's bioregions. He has taxonomic expertise in Pilbara, Gascoyne, Murchison, Coolgardie and Great Victoria Desert regions. Dr Wells has prepared numerous reports on vegetation surveys and mapping for project approvals, health monitoring of vegetation and rehabilitation assessments. Most of these reports have been subject to review by government agencies and the general public.

Dr Wells has particular expertise in auditing and development of rehabilitation monitoring systems including provision of quantitative KPIs and completion criteria for revegetation, development of plant restoration procedures including identification of appropriate analogue communities and species lists for revegetation, seed germination ecology and topsoil management.

## QUALIFICATIONS

Ph.D., Botany, University of Western Australia (2000)

## EMPLOYMENT HISTORY

2013 – present	Principal Botanist at Phoenix Environmental Sciences
2004 – 2015	Managing Director and Senior Environmental Advisor at G&G Environmental Pty Ltd
1999 – 2004	Restoration Ecologist, Plant Science Division at Botanic Gardens and Parks Authority, Kings Park
1996 – 1999	Environmental Consultant at Argyle Diamond Mines

## TECHNICAL EXPERTISE

- Level 1 and 2 flora and vegetation surveys
- Targeted Threatened Rare and Priority flora surveys
- Vegetation type and condition mapping
- Design, implementation and auditing of rehabilitation, restoration and revegetation programs
- Development of completion criteria for revegetation
- Vegetation health and weed monitoring
- Taxonomic identification of vascular plant specimens
- Data analysis and interpretation

## SELECTED PROJECT EXPERIENCE

- Level 2 flora and vegetation survey and rehabilitation plan for the Clampton Gold Project Flora, Clampton Mining, 2014, (Goldfields)
- Level 2 flora and vegetation survey of Extension Project, AAMC, 2014 (Pilbara)
- Level 2 flora and vegetation survey for Pannawonica Project, Red Hill Iron, 2014 (Pilbara)
- Targeted flora survey of pipeline, Extension Hill, 2014 (Midwest)
- Level 2 flora and vegetation survey of the Wonmunna Area. Ascot Resources, 2014 (Pilbara)
- Searches for threatened and priority flora, and vegetation of conservation significance in selected areas associated with the Wonmunna Area. Ascot Resources, 2014 (Pilbara)

- Assessment of flora rehabilitation at Murrin Murrin operations, Minara Resources, 2013 (Murchison)
- Vegetation Health Monitoring at the Roy-Valais, Charlie, Korong and Grey Mare Borefields. Minara Resources, 2013 (Murchison)
- Development of revegetation assessment procedures, KPI's and completion criteria for Kalgoorlie Consolidated Gold Mines mine closure plan, 2013 (Murchison)
- Assessment of vegetation establishment on rehabilitated waste-dumps, Leonora operations, St Barbara Ltd, 2013 (Murchison)
- Third party peer review of rehabilitation assessment procedures reports for the Kalgoorlie Consolidated Gold Mines 'Super-pit' operation, 2012 (Murchison)
- Flora and vegetation survey of a proposed mining area and associated haul road at Mount Lucky for Minara Resources Ltd, 2011 (Murchison)
- Assessment of vegetation establishment on rehabilitated waste-dumps Southern Cross operation, St Barbara Ltd, 2011 (Coolgardie)
- Development of revegetation assessment procedures, KPI's and completion criteria for St Barbara Leonora operation, 2011 (Murchison)
- Assessment of rehabilitated landforms at the Crescent Gold Laverton operations, 2011 (Murchison)
- Flora and vegetation survey of the FerrAus Ltd King Brown deposit infrastructure area and FerrAus Pilbara Project to King Brown deposit services corridor, 2011 (Murchison)
- Desktop flora and vegetation assessment of the BSF1 – BSF2 rail alignment Fortescue Marsh section for Roy Hill Infrastructure Pty Ltd, 2010 (Pilbara)
- Evaluation of the potential to establish a seed orchard for Triodia species for Rio Tinto, 2010 (Pilbara)
- Desktop level 1 flora and vegetation survey of the northern section of the rail corridor and level 2 flora and vegetation surveys for the FerrAus Ltd Pilbara project, 2010 (Pilbara)
- Flora and vegetation survey of the FerrAus Ltd process and rail load out infrastructure area and Python and Gwardar deposits, 2010 (Pilbara)
- Flora and vegetation survey of a proposed transport corridor at the Murray Hill project for Hancock Prospecting Pty Ltd, 2009 (Pilbara)
- Assessment of vegetation establishment in rehabilitated areas at the Range River Gold Indee Gold project, 2009 (Pilbara)
- Desktop fauna survey of the tenement M26/242 Silver Lake resources, 2009 (Murchison)
- Flora and vegetation survey of a proposed borefield for the Roy Hill 1 iron ore project, 2009 (Pilbara)
- Fauna, flora and vegetation survey of the proposed Barcon sand mines, 2009 (Coolgardie)
- Development of completion criteria and key performance indicators for revegetation at the Crosslands Resources Ltd, Jack Hills operation, 2009 (Midwest)
- Flora and vegetation survey of the Golden Terrace South tenement for Pacrim Energy Ltd, 2009 (Murchison)
- Flora and vegetation survey of the Golden Terrace North and E37/727 tenements for Pacrim Energy Ltd, 2009 (Murchison)
- Development of revegetation assessment procedures, KPI's and completion criteria for Minara Resources Murrin Murrin operation, 2008 (Murchison)
- Survey for priority flora at GDP 2108 at the FMG Christmas Creek tenement, 2008 (Pilbara)

- Flora and vegetation survey of the proposed gas pipeline corridor from Port Hedland to the Moly Mines Spinifex Ridge project, 2008 (Pilbara)
- Flora and vegetation survey of the proposed Canning A borefield and an access corridor to the Moly Mines Spinifex Ridge project, 2008 (Pilbara)
- Preliminary flora and vegetation survey for phreaphytic flora at the proposed De Grey borefield for Moly Mines, Spinifex Ridge project, 2008 (Pilbara)
- Third party peer review of Ecosystem Function Analysis reports for the St Barbara Mines Leonora operation, 2008 (Murchison)
- Third party peer review of Ecosystem Function Analysis reports for the St Barbara Mines Southern Cross operation, 2008 (Coolgardie)
- In association with Landloch Pty Ltd, Rally Environmental PTY LTD and Minara resources Ltd development of key performance indicators for derivation of initial bonds on disturbed land; assessment of ecosystem restoration; derivation of a schedule of bond relief, 2008 (Murchison)
- Flora and vegetation survey of the Woodie Woodie borefield to Spinifex Ridge project proposed pipeline corridor, 2007 (Pilbara)
- Vegetation Health Monitoring in the Roy-Valais, Charlie and Korong Borefields of the Murrin Murrin Nickel Cobalt Project, 2007 (Murchison)
- Flora and vegetation survey of the proposed expansion of the Mandurah abattoir, T&R pastoral, 2007 (Swan Coastal Plain)
- Flora and vegetation survey of proposed mining areas and a tailings storage facility at the Monarch Mining, Davyhurst operation, 2007 (Murchison/Coolgardie)
- Survey for priority flora at GDP 1256 at the FMG Cloud Break tenement, 2006 (Pilbara)
- Assessment of vegetation establishment on rehabilitated mesas at the Pilbara Iron, Pannawonica operation, 2006 (Pilbara)
- Review Argyle Diamond Mine spinifex restoration trials, 2006 (Kimberley)
- Assessment of the quality of vegetation communities in restored areas with provision of recommendations for future management for Gold Fields Australia, 2006 (Murchison)
- Assessment of fertiliser treatments on native plant establishment of rehabilitated waste dumps for Sir Samuel Mines, 2005 (Murchison)
- Evaluation of the restoration processes at Iluka Resources Eneabba Mineral Sand Operation, 2002 (Kwongan)
- Urban bushland restoration within Kings Park and Botanic Gardens, 2004 (Swan Coastal Plain)
- Review of the scientific literature on the effect of fire on biodiversity for the Environmental Protection Authority, 2003
- Post-mine restoration at the Straits Resources Ltd. Nifty copper mine, 2001 (Great Sandy Desert)
- Spinifex grass restoration at the Argyle Diamond Mines, 1994-2000 (Kimberley)
- Mine closure restoration at the BHP Beenup Titanium Mineral Sands mine, 1999 (South-west)
- Optimising seed longevity in storage with Iluka Resources Capel and Eneabba Operations, 2000 (Kwongan/South-west)
- Revegetation of salt affected agricultural land utilising dessication and salt tolerant treatments in broadcast seed and planted tubestock with CALM, 1999 (South-west)

- Reinforcement of an urban *Banksia* woodland remnant with the Friends of the Cockburn Wetlands Education Centre Inc., 1999 (Swan Coastal Plain)
- Seed viability assessment of Australian native plant species for AMIRA project P556 with the University of Queensland, 1999
- Management of a seeding program to establish native species in rehabilitation areas at the Argyle mines, 1996 (Kimberley)

#### SELECTED PUBLICATIONS

- Wells, G. B., Hopper, S. D. and Dixon, K. W. (2004) Fire regimes and biodiversity conservation: a brief review of scientific literature with particular emphasis on south-west Australian studies. Report to the Environmental Protection Authority, Perth Western Australia.
- Wells, G. B., Zawko, G., Rossetto, M. and Dixon, K. W. (2003) A molecular approach to provenance delineation for the restoration of hummock grasslands (*Triodia* spp.) in arid-tropical Australia. *Ecological Management and Restoration* **4**, S60–S68.
- Wells, G. B. and Dixon, K. W. (1999). Post-mining restoration of spinifex species in the arid-tropical zone. Report No. 200, Mining and Energy Research Institute of Western Australia (MERIWA), Perth, W. A.
- Wells, G. B. (1999) Biology and restoration ecology of spinifex grasses (*Plectrachne* and *Triodia* spp.) with special reference to the Argyle Diamond Mines (Western Australia). PhD Thesis, Department of Botany, University of Western Australia, Perth, W. A.
- Wells, G. B., Davidson, P. J., Dixon, K. W. and Adkins, S. W. (1999) Defining seed quality of Australian arid zone hummock grasses (*Triodia* and *Plectrachne*). 3RD Native Seed Biology for Revegetation Workshop, Perth, Western Australia. May, 1999.
- Wells, G. B. (1998) Seed Viability. In: *Proceedings of the Seminar on Direct Seeding* (The Friends of Shenton Park Bushland Inc., Eds), Perth, Western Australia. April, 1998.
- Wells, G. B. and Dixon, K. W. (1997) Rapid propagation of spinifex. *Australian Horticulture* **February 1997**.
- Wells, G. B. (1995) A striking success. *Environ-News* **May 1995**.