

Curriculum Vitae: David Stanton

Name: David Stanton

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Principal Landscape Ecologist

ACADEMIC QUALIFICATIONS

BSc Hons: BSc – Biology and Earth Sciences (Hons Class 1-Geology) completed at James Cook University, 1993.

PROFESSIONAL CERTIFICATIONS

MEIANZ: Certified Environmental Practitioner – Ecology Specialist (Certification Number: 0906E)

PROFESSIONAL SUMMARY

David Stanton has a professional career that spans 26 years acquiring extensive experience in the disciplines of resource mapping (vegetation, geology and geomorphology), floristic assessment of terrestrial and marine ecosystems, groundwater dependent ecosystems and conservation planning. His expertise has been utilised by sectors which include mining, infrastructure, government and indigenous organisations and his work has been undertaken in Queensland, the Northern Territory, north-Western Australia and Papua New Guinea. David's expertise is landscape scale ecology and ecological processes including the relationships between vegetation geology, geomorphology, hydrology and hydrogeology. He has published vegetation mapping of the Wet Tropics World Heritage area and the Torres Strait Island's on behalf of the Australian Government and has worked extensively on the management of floristic biodiversity in northern Australia. Vegetation mapping produced for the Wet Tropics Management Authority formed the core of the Queensland Herbarium's regional ecosystem mapping for the Wet Tropic Bioregion including contiguous areas of the Einasleigh Uplands from Cooktown south to Townsville. David has co-authored several technical papers on issues relating to landscape scale ecology and fire management.

PEER REVIEWED PUBLICATIONS

Jones C., Stanton D., Hamer N., Denner S., Singh K., Flook S., Dyring M. (2019). Field Investigations of Potential Terrestrial Groundwater Dependent Ecosystems within Australia's Great Artesian Basin. *Hydrogeology Journal*. Springer (1 -25).

Stephen M. Jackson, Mark Parsons, Marcus Baseler and David Stanton (2019). Landscape management of the mahogany glider (*Petaurus gracilis*) across its distribution: subpopulations and corridor priorities (13) (PDF). *Australian Mammology*. CSIRO Publishing.

Hempenstall, A; Smith, S; Stanton, D ; Hanson, J (2019). Melioidosis in the Torres Strait Islands, Australia: exquisite interplay between pathogen, host, and environment. *American Journal of Tropical Medicine & Hygiene*.

Stanton J.P., Stanton D.J., Stott M. & Parsons M. (2014). Fire Exclusion and the Changing Landscape of Queensland's Wet Tropics Bioregion 1. The Extent and Pattern of Transition. *Australian Forestry* V77 No.1 51 – 57.

Stanton J. P., Parsons M., Stanton D.J.& Stott M. (2014). Fire Exclusion and the Changing Landscape of Queensland's Wet Tropics Bioregion 2. The Dynamics of Transition Forests and Implications for Management. Australian Forestry V77 No.1 58 – 68.

Fell D.G., Stanton D. J (2015). Vegetation and Flora of Mabuyag Island, Torres Strait, Queensland. Memoirs of the Queensland Museum, Volume 8, Part 1.

Stephenson PJ, Burch AT, Stanton DJ & Whitehead PW (1998). *Three long lava flows in north Queensland. Journal of Geophysical Research*, 103, 27359 – 27370.

PUBLISHED VEGETATION MAPPING

Stanton J. P and Stanton D. J (2005) 'Vegetation of the Wet Tropical Bioregion of North Queensland', published at 1:50 000 scale in co-operation with the Wet Tropics Management Authority, Cairns, Queensland.

Stanton D.J, Fell D. F, Gooding D. O (2009). 'Vegetation of the Torres Strait and Kaurareg Islands'. 1:25 000 scale vegetation mapping produced in co-operation with Torres Strait Regional Authority, Australian Government.

PRESENTATIONS

IAVCEI (International Association of Volcanology and Chemistry of the Earths Interior) conference, Canberra 1993, "Using Remote Sensing to Detect Geochemical Heterogeneity within the Kinrara Lava Flow, McBride Lava Province, N.Q."

EIANZ conference 'Achieving Real Biodiversity Outcomes during the EIS Process', April 2010. The presentation was titled 'The Importance of Accurate Regional Ecosystem and Vegetation Mapping in the Assessment of Impact to Biodiversity'.

PROFESSIONAL AWARDS

Planning Institute of Australia, Queensland Division (2005) '**Award of Excellence**' for the Caboolture Shire Councils Bushfire and Hazard Assessment Study. The award was given in the categories of Disaster Mitigation and Biodiversity Conservation and Planning in recognition of work completed in the Caboolture Shire Vegetation Mapping Project, 2004.

Planning Institute of Australia, National Division (2006) '**National Award of Excellence**' for the Caboolture Shire Councils Vegetation Mapping Project. National winner in the category of 'Biodiversity and Conservation Planning'

ACADEMIC AWARDS

Geological Society of Australia Gold Medallion (1993) for outstanding academic achievement in studies of earth science.

PROJECT SUMMARY

GROUNDWATER DEPENDENT ECOSYSTEMS / GAS MIGRATION ASSESSMENT AND MONITORING

- **GDE Site Characterisation – Arrow Surat Gas Project:** GDE characterisation study including development of a study execution plan through to project implementation and development of GDE site conceptual models. A follow up field assessment integrated multiple lines of evidence (soil and twig isotopic signatures, leaf and soil moisture potential and sonic core drilling to enable a definitive statement on the groundwater dependence of each targeted ecosystem (Arrow Energy 2018, 2019 ongoing).
- **GDE Site Characterisation – Aeon Metals:** Field investigation of GDE's at the Waldon Creek Project, Gulf Plains Province near Doomadgee. Assessment included biophysical measurement of tree water usage, isotopic tracing of tree moisture sources and development of GDE conceptual models to support project approval under the EPBC Act (2020 ongoing).
- **GDE Assessment and Site Characterisation – QGC North Surat Basin Project:** GDE characterisation study including field investigation, isotopic sampling and plant stress

measurements to characterise the extent of GDEs in QGCs North Surat Basin Project. Utilised multiple lines of evidence including groundwater, soil and xylem isotope signatures, leaf and soil moisture potential to make a definitive statement on the groundwater dependence of vegetation at targeted ecosystem (for QGC on behalf of Aecom, 2019 ongoing).

- **GDE Characterisation_Isaac Downs Coal Project:** Identification, assessment and characterisation of GDEs subject to groundwater drawdown associated with development of a mining void. Assessment soil sampling, stable isotope characterisation of twig and soil moisture and measurement of leaf and soil water potentials.
- **GDE Characterisation – Waratah Coal Memalon Project:** Identification, assessment and characterisation of GDEs subject to potential drawdown impacts associated with the proposed Memalon Coal Project, Marlborough, Central Queensland (CDM Smith, 2018). Assessment utilised drill coring, stable isotope characterisation of leaf and soil moisture and measurement of leaf and soil water potentials.
- **GDE Peer Review:** Adani Carmichael Mine. Peer review of the Great Artesian Basin Springs Research Plan. Prepared in conjunction with Earthsearch for Adani Mining (March 2019).
- **Banksia Beach Borefield – Groundwater Dependent Ecosystem (GDE) Monitoring:** Monitoring of wet coastal heath to detect impacts of groundwater drawdown on vegetation composition, structure and ecology. Biannual reporting includes an analysis of NDVI datasets to support assessments of vegetation condition. Seqwater (2016 ongoing).
- **Condamine River Gas Seeps Vegetation Monitoring:** Assessment of the impacts of gas migration into soil on the health and vigour of intact riparian vegetation and adjacent grazing land on frontage of the Condamine. Required assessment of the current condition and status of vegetation, baseline characterisation of impacts as well as the implementation of a long-term vegetation monitoring program (Origin Energy 2016 ongoing).
- **Groundwater Dependent Ecosystem (GDE) Assessment – Arrow Energy Surat Gas Project:** A targeted quantified assessment of the groundwater dependency of ecosystems in Arrow Energy’s Surat Project tenements to inform federal requirements for the Groundwater and GDE Management Plan. The project required detailed assessment and integration of groundwater, geology and ecological databases plus characterisation and recommendations for an ongoing monitoring program (Arrow Energy 2016).
- **Groundwater Dependent Ecosystem (GDE) Assessment – Arrow Energy Bowen Gas Project Development Area:** An assessment of the potential groundwater dependency of ecosystems in Arrow Energy’s Bowen Gas Project tenements to inform federal requirements for a Groundwater and GDE Management Plan. The assessment focused on the potential groundwater dependency of ecosystems in areas contiguous with the North Goonyella, Suraji, Newlands and Suttor Creek Mining Lease areas
- with the focus on developing an ecological assessment program to monitor the effects of groundwater drawdown on vegetation condition (Coffey Environments 2015).
- **Sunshine Coast Regional Airport – GDE Assessment:** Assessment of the effects of altered groundwater hydrology on the ecology of wet heath and associated populations of the Endangered *Allocasuarina emuina*. Preliminary review of environmental conditions for the Sunshine Coast Airport Upgrade. Sub-contracted to BMT – WBM (June 2010).

MINESITE REHABILITATION MONITORING AND ASSESSMENT

- **MMG Century Rehabilitation Monitoring Project:** Implementation of a baseline monitoring program to assess rehabilitation progress on stabilised waste rock dumps. Prepared to identify trends in vegetation development toward the meeting of mine closure criteria. North-West Highlands (March 2014 ongoing).
- **Arrow Energy - Review of Environmental Authority Conditions for Rehabilitation, ATP 676:** A review of EA conditions for ATP 676 to assess the achievability of current EA requirements for vegetation rehabilitation. The review report was utilised for internal Arrow Energy purposes. Prepared with assistance from Vegetation Management Science (March 2014).

ENVIRONMENTAL IMPACT ASSESSMENT FOR LINEAR INFRASTRUCTURE AND WATER

- **Northern Australia – Northern Territory**

- **Burdekin Falls Dam Terrestrial Ecology Survey:** Provision 1:50 000 scale vegetation mapping and baseline floristic assessment to facilitate proposed raising of the Burdekin Falls Dam Weir. Einasleigh Bioregion, north Queensland. Contracted to Epic Environmental Pty Ltd, 2019.
- **PNG to Queensland Gas Pipeline Project, Weipa to Gove Pipeline Lateral Biophysical Assessment:** Preparation of floristic mapping (1:25 000 scale), landform and geomorphic analysis and threatened flora assessment of the proposed Weipa (Qld) to Gove (NT) Lateral sections of the proposed pipeline. Included assessment of several pipeline landfall options in the Gove Peninsula / Nhulunbuy region of the Northern Territory. Enesar 2006.
- **AGL Petronas Corporation –PNG to Queensland Gas Pipeline Project:** Provision of botanical and landform assessments along sections of the proposed pipeline easement. Large sections were completed using helicopter survey with foot survey at selected localities. The subsequent reports for these sections provided the information necessary for incorporation into a broader environmental impact assessment. Enesar, 2005, 2006. Sections investigated included:
 - Landfall on Cape York to the Jardine River
 - Charters Towers to Muttaborra.
 - Stonehenge to Windorah
 - South-west of Windorah to Cameron’s Corner on the QLD/ SA / NT junction.
- **TRIP Weir Project, Flinders River:** Floristic surveys over the 200 km² TRIP Weir Project inundation area and associated pipelines. Flinders River in the Gulf Plains Bioregional Area. Studies included assessment of potential threatened flora, review of RE Mapping and general floristic survey for the purpose of Environmental Impact Assessment. Stanbroke Holdings Ltd, November 2014 to May 2015.
- **Copperstring EIS:** Comprehensive floristic mapping (regional ecosystems and threatened ecological communities) at 1:40 000 scale of a 150 km² section of the Copperstring Powerline in the Mt Isa, Cloncurry and Selwyn Ranges sections of the proposed 1km wide study easement. Survey also included a flora and mapping survey of the Charters Towers, Pentland, Hughendon and Cloncurry sections of the proposed powerline alignment.
- **Wet Tropics – North-east Queensland**
 - **Ella Bay Integrated Resort Development:** Floristic baseline assessment of the proposed Ella Bay Integrated Resort development site within the Wet Tropics World Heritage Area.
 - **False Cape Development:** A detailed aerial photographic interpretation and classification of vegetation communities and regional ecosystems, including rare and threatened species search on the False Cape development site to the east of Cairns. HLA Envirosiences Pty Ltd, 2004.
 - **Powerlink –Cardstone Powerline Easement Study:** In conjunction with Peter Stanton, carried out an ecological and botanical assessment of the Cardstone – Kareeya powerline easement to determine the environmental impact of a proposed powerline upgrade. The study included a detailed aerial photographic interpretation and map at 1:25 000 scale. This formed part of a broader impact assessment commissioned by Powerlink through C&B Consultants. 2003.
 - **Main Roads Southern Access Planning:** Alongside Peter Stanton, mapped in detail the vegetation communities within the proposed access corridor south of Cairns using 1:7500 scale aerial photographs. The project assessed the presence of rare and threatened plant species and vegetation communities. Sub-contracted to Sinclair Knight Merz, 1997, 1998.
 - **Chevron Asiatic Gas Pipeline Project:** An aerial photographic interpretation of the botany of the Northern Cape York region. The project assisted in the location of a route for a proposed gas pipeline. Sub-contracted to NSR consulting group through Peter Stanton. NSR Consulting Pty Ltd, 1997.
- **Central Queensland**
 - **Connors River Dam and Pipelines Environmental Impact Assessment:** Provision 1:20 000 scale vegetation mapping, baseline floristic assessment and environmental impact assessment of the proposed Connors River Dam inundation area and proposed pipelines. Brigalow Belt North Bioregion. Contracted to Sunwater, 2009-2012.

- **South-east Queensland**
 - **Gateway Motorway Assets and Expansion Project:** Floristic mapping and assessment of habitats potentially impacted by the Gateway Expansion Project, Brisbane, over a 12 km stretch of road alignment (September 2014).
 - **Traveston Crossing Dam –Terrestrial Flora Survey:** Provision of baseline floristic assessment and supplementary 1:10 000 scale vegetation mapping for the purpose of assessment of environmental impact. Queensland Water, 2006-2009.
 - **Wyaralong Dam –Terrestrial Flora Survey:** Provision of baseline floristic assessment and supplementary 1:10 000 scale vegetation mapping for the purpose of assessment of environmental impact. Sub-contracted to BAAM Pty Ltd on behalf of Queensland Water, 2006-2009.
 - **Emu Swamp Dam and Pipelines – Terrestrial Flora Survey:** Terrestrial floristic assessment of the proposed inundation area and pipeline routes. Emu Swamp on the Severne River, Stanthorpe.

ENVIRONMENTAL IMPACT ASSESSMENT AND CONSTRAINTS PLANNING FOR MINING

- **Northern Australia / Northern Territory**
 - **Ergon Energy – Mua Island Floristic Analysis:** Preparation of dossiers for 18 threatened flora species recorded on Mua Island (Torres Strait) to assist infrastructure planning and facilitate protected plant surveys. The report required comprehensive review of databases, compilation of ecological information and species photographs (contracted to Ergon Energy, 2016).
 - **MMG Century – Phantom Hills Prospect Floristic Baseline Survey:** Baseline floristic survey and vegetation mapping over the 150 km² Phantom Hills Prospect. North-west Highlands Bioregion (2014 Ongoing), 50 km east of the Queensland / Northern Territory border. Prepared for MMG Century.
- **Brigalow Belt**
 - **Arrow Surat Basin Advanced Exploration Project – Ecological Surveys:** Intensive floristic and vegetation mapping surveys over Arrow Energy's advanced project tenements in the region between Miles and Cecil Plains. Assessments were undertaken over a 2500 km² assessment area (contracted to Arrow Energy, 2016 – 2017).
 - **Arrow Bowen Basin Advanced Development Project – Ecological Surveys:** Intensive floristic and vegetation mapping surveys over Arrow Energy's advanced project tenements to the north of Moranbah. Detailed surveys were completed over a 450 km study area including the Roy's Hill and Lancewood gasfield development areas which are contiguous with the North Goonyella Mine ML boundary. Survey included comprehensive desktop assessments as well as the provision of both dry season and wet season survey reports. Contracted to Aecom Pty Ltd and GHD Pty Ltd on behalf of Arrow Energy (November 2014 to June 2015).
 - **Arrow Energy – Daandine Lease (PL230):** An assessment of EPBC values as they relate to flora and threatened ecological communities for Arrow's Daandine Lease (PL230) in the Surat Basin. Sub-contracted to Ecosmart Ecology 2014.
 - **Arrow –Surat Gas Project Supplementary EIS Study:** Preparation of a supplementary terrestrial ecology study including bio-condition assessments at selected sites and habitat mapping for the 80 flora and fauna species listed under state and federal legislation. Habitat mapping was undertaken for the purpose of biodiversity offset planning. Prepared for Coffey Environments, June 2013.
 - **Supplementary EIS Assessment of Arrow Energy's LNG Facility Site, Curtis Island (SEQ):** Review of EIS chapter and terrestrial ecology assessment of the proposed site facility to inform requests for supplementary information. Included assessment of terrestrial flora and fauna on mainland and island portions of the project. Prepared for Coffey Environments, June 2013.
 - **Acacia Coal / EPC1230:** Floristic baseline survey, preparation of 1:50 000 scale regional ecosystem and EIS assessment of the EPC 890 Resource Area to the south of Blackwater.

Mapping was undertaken to accurately identify the distribution of regional ecosystems across the EPC to inform requirements for ecological offset (October 2013).

- **Coffey Environments / Moultrie ESA Mapping:** Preparation of 1:50 000 scale regional ecosystem mapping over the Hillalong Resource Area, north-west of Nebo. Mapping was undertaken to accurately identify the distribution of Environmentally Sensitive Areas over the Mineral Development Lease (Coal). Revised mapping facilitated ecologically sensitive planning for a forthcoming exploratory drilling project (August 2013).
- **Arrow Bowen Gas Project:** Floristic impact assessment including detailed baseline ecological assessment of the Arrow Energy's 7800 km² petroleum lease and exploration tenements in the Northern Brigalow Belt, Queensland. The project involved revision of regional ecosystem mapping over a selected 1 000 km² area at a scale of 1: 40 000 for the purposes of constraint analysis. Contracted to Arrow Energy, 2012.
- **Surat Gas Project EIS - Arrow Energy:** Floristic impact assessment including detailed baseline ecological survey of the Arrow Energy's 8200 km² petroleum lease and exploration tenements in the Southern Brigalow Belt, Queensland. The project involved revision of regional ecosystem mapping over a selected 1 800 km² area at a scale of 1: 40 000 for the purposes of constraint analysis. Contracted to Coffey Environments, 2009 -2013.
- **Byerwen Coal:** Floristic survey and mapping assessment of the Byerwen Coal exploration lease including project 1:50 000 scale revision of mapping over the 60km² site. Byerwen Property in the Northern Brigalow Belt. Unidel 2010, 2012.
- **Curragh North Coal Development Project:** Provision of baseline floristic assessment, 1: 25 000 scale vegetation mapping and environmental impact assessment of the proposed Jellinbah development area (November, 2011).
- **MCG Resources:** Floristic survey and mapping assessment of the MCG Groups MLA's in the Blackwater area, the Brigalow Belt South Bioregion of central Queensland. The study area covered approximately 25 km² as smaller sections of the larger MDL 152 (Curragh Extended and Curragh South). Contracted to Tecsol (2012).
- **Papua New Guinea**
 - **PNG Biomass Project:** Assessment of the 250km² PNG Biomass (Markham Valley- Morobe Province) project for the purpose of forestry plantation. Assessment included detail floristic analysis, vegetation mapping and assessment of impacts against IFC Standards (BAAM P/L, Aligned Energy)
 - **Wafi-Golpu Gold-Copper Mine Project Terrestrial Flora and Fauna Assessment:** Floristic baseline assessment and environmental impact assessment for the Wafi-Golpu advanced exploration project. Contracted to BAAM Pty Ltd on behalf of Morobe Mining JV (February 2015 ongoing).
 - **Marengo PNG – Yandera Prospect Floristic Environmental Impact Assessment:** Ecological baseline study and Environmental Impact Assessment of habitats and species affected by development of the proposed Yandera Prospect, Bismarck Ranges, Marengo Province PNG. Included comprehensive analysis of ethnobotanical and faunal resources. Coffey Environments, 2012.
 - **Kantobo to Mubi River Road Project:** A survey of significant floristic values along an 11km section of proposed road alignment. The survey required assessment of floristic values associated with virgin lowland rainforest in the Southern Highlands/ Gulf Province, Papua New Guinea. Subcontracted to Coffey Environments, 2010.
 - **Solwara Project – East New Britain PNG:** Habitat assessment, floristic analysis and mapping of the 80km² lease area on the East New Britain Coast-Papua New Guinea. Included comprehensive analysis of ethnobotanical and faunal resources. Contracted to Coffey Natural Systems, 2008.
- **Central Queensland Coast**
 - **McFarlane Oil Shale Project-Central Queensland:** Detailed baseline botanical assessment and environmental impact assessment of the 252km² mineral lease area in the central Queensland Coast Bioregion. The project included 1:40 000 scale aerial photographic interpretation of regional ecosystems and vegetation communities. Contracted to URS Australia (2008 – 2009).

- **Supplementary EIS Assessment of Arrow Energy's LNG Facility Site, Curtis Island (SEQ):** Review of EIS chapter and terrestrial ecology assessment of the proposed site facility to inform requests for supplementary information. Included assessment of terrestrial flora and fauna on mainland and island portions of the project. Prepared for Coffey Environments, June 2013.
- **Stuart Oil Shale Floristic Impact Assessment:** Baseline floristic assessment, vegetation community/ regional ecosystem mapping and floristic impact assessment of the Stuart Oil Shale Project Area, Gladstone. Revision of RE mapping undertaken over a 120 km² area at 1:25 000 scale. Queensland Energy Resources (QER), 2012.
- **Red Mud Dams Vegetation Assessment:** Completion of an RE and vegetation community assessment of the Red Mud Dams area, Boyne Island. The map and complementary report was an aid to planning for future tailings disposal in the area. QAL (sub-contracted through BAAM Pty Ltd), 2005.
- **Desert Uplands**
 - **Eromanga Basin / Desert Uplands vegetation and floristic constraints analysis:** Provision of floristic and landform constraints analysis and mapping over a 5000km² ATP area to assist sensitive location of a proposed comprehensive seismic survey (500km of proposed survey line). Galilee Energy, 2010.

CONSERVATION PLANNING

- **North-eastern Australia**
 - **Wet Tropics Management Authority Vegetation Mapping Project:** A 1: 25 000 scale aerial photographic interpretation and complementary 1:50 000 map of the structural characteristics, vegetation communities and geology of the Wet Tropics Bioregion, an area of over 30 000 km². The project required the detailed classification of both remnant and non-remnant vegetation communities including classification of littoral communities including mangroves and samphire. The culmination of the project was the completion of 38 resource management reports for various regions within the project area plus production of spatial files for all terrestrial and mangrove ecosystems. During this time, expert advice was provided to the authority regarding management aspects of the World Heritage Reserve. The completed mapping product forms the basis for RE mapping and assessment within the Wet Tropics Bioregion (incorporated into Version 5.2 digital RE data produced by EPA). (1997 – 2012).
 - **Mandjalbaj Yidinji Lands Biodiversity Planning and Management Project:** Development of biodiversity and land management profile for the Mandjalbaj – Yidinji Lands, including all terrestrial vegetation communities, mangroves and saltmarshes. Biodiversity profile has been applied to guide land management programs for the 'Working on Country' ranger program. Contracted to Djunbunji Ltd. June 2013 ongoing. The program also included ranger training in mangrove identification and ecology and practical implementation of fire management across fire sensitive habitats.
 - **Torres Strait Island Biodiversity Planning Project:** Development of biodiversity and management profiles for 14 selected islands in the Torres Strait, Northern Australia. Biodiversity profiles are being applied to guide land management programs for the 'Working on Country' ranger program. Contracted to Torres Strait Regional Authority, Australian Government). November 2010 to December 2012.
 - **Torres Strait Islands Regional Ecosystem and Vegetation Community Mapping:** A 1:25 000 aerial photographic interpretation of terrestrial and mangrove vegetation communities, structural associations and regional ecosystems of the islands of the Torres Strait. Spatial data produced during the vegetation survey has been successfully incorporated into the Version 6.0 RE digital database produced by DERM. The survey and mapping project assessed a total land area of 860 km² within the Cape York Peninsula Bioregion (Contracted to Torres Strait Regional Authority, Australian Government).
 - **East Trinity Marine Wetlands Rehabilitation Project:** Completion of a detailed mapping and floristic survey of a reclaimed estuarine wetland, including mapping and categorisation of remnant primary and secondary mangrove and salt marsh communities. The study was

based aerial photograph interpretation (1:10 000 scale aerial photography). Department of Environment and Resource Management (DERM), 2002 to 2009.

- **Queensland Herbarium Non-Remnant Vegetation Classification:** An assessment of the remnant status of highly disturbed vegetation communities within the Wet Tropics Bioregional zone, relevant to the implementation of Queensland's "Vegetation Management Act" EPA, 2004- 2005.
- **Dawnvale Station Vegetation Mapping Project:** A land management report and detailed aerial photographic interpretation of vegetation within the Dawnvale Grazing Leasehold. The study was commissioned to assist traditional owners in their application for leasehold renewal. Centre for Appropriate Technology, 2001.
- **Mt Molloy Vegetation and Land Systems Mapping:** Report on the environs of the Mt Molloy Wetlands including a 1:25 000 aerial photographic interpretation of landform, geomorphology and vegetation. Mitchell River Catchment Management Group, 1999.
- **Brigalow Belt / Central Queensland**
 - **Newlands Nature Refuge / Wollumbi Brigalow Conservation Reserve ecological assessment:** Detailed vegetation mapping and floristic analysis of vegetation communities and regional ecosystems on the Newland Nature Refuge and Wollumbi Brigalow Conservation Reserve, Brigalow Belt North Bioregion (total area of 100km²). The study was commissioned for compliance with EPBC offset requirements. XStrata Coal / Footprints Ecology, 2009.
- **South-east Queensland**
 - **Seqwater Advanced Offsets Project:** Identification of suitable advanced habitat offsets within Seqwater's water infrastructure estate in south-east Queensland. Assessment included the identification habitats suitable for offset at Ewan Maddock, North Pine and Hinze Dam sites to the north and south of Brisbane (contracted to GHD, 2017).
 - **Caboolture Shire Council Vegetation Mapping Project:** Detailed 1:25 000 scale and 1:10 000 scale mapping of vegetation communities, land zones, and regional ecosystems of the Caboolture Shire Council (SEQ) using aerial photograph analysis. Total project area of 1200 km². The project included detailed floristic sampling of all intact communities identified and the development of a classification scheme to allow assessment of highly disturbed vegetation types. Contracted to Rob Friend and Associates, 2004.
 - **Reedy Creek Conservation Area (Agnes Waters):** Detailed 1:10 000 scale aerial photographic interpretation and map of the vegetation communities in the Reedy Creek Conservation Area relevant to conservation and fire management with a proposed eco-development site (Bush Heritage Trust, 2005).

BIODIVERSITY OFFSET PLANNING AND ASSESSMENT

- **MMG Century – Lawn Hill Station Biodiversity Offsets Project:** Habitat biocondition and vegetation mapping assessment of a 6km stretch of river frontage on Lawn Hill Creek contiguous with Lawn Hill National Park on the Queensland / Northern Territory border. The assessment provided baseline information to assist preparation of a biodiversity offset plan for Lawn Hill Station (July 2014).
- **Exco Resources Biodiversity Offsets Project:** Habitat bio-condition, ecological equivalence assessment, vegetation mapping and general floristic survey of a 42 km² portion of Lawn Hill Station to identify suitable habit for Purple-necked Rock Wallaby.

FIRE / ECOLOGICAL MONITORING PROJECTS

- **Mandingalbay Yidinji / Djunbunji Aboriginal Corporation Fire Monitoring Project:** Implementation of a fire monitoring program to assess the ecological impacts of both wildfire and traditional burning practice on MY Lands. Wet Tropics Bioregion, Yarrabah, Cairns (January 2014 ongoing).
- **Wet Tropics Phytophthora Mapping / Monitoring Project:** Contracted to map rainforest die back resulting from Phytophthora outbreak within the wet tropics rainforest communities. The study was completed with detailed 1:25000 aerial photographic interpretation over at risk' areas. James Cook University/Rainforest CRC (1999 - 2001).

FIRE PLANNING PROJECTS

- **Mandingalbay Yidinji / Djunbunji Aboriginal Corporation Fire Management Planning:** Development of a fire management strategy for Mandingalbay Yidinji Lands within the Wet Tropics World Heritage Area. Prepared for the purpose of engaging traditional owners in the on ground management of traditional lands (October 2013 ongoing) and direct ecologically sensitive application of fire to the landscape.
- **Fire Management Plan, St Marks College, Inala.** Preparation of a fire management plan to satisfy development application requirement for fire risk mitigation (May 2017).
- **Fire Management Plan, and Fuel Hazard Assessment, Cooyar Waste Dump:** Preparation of a fire management plan and fire hazard reduction strategy for the Cooyar Waste Dump, Cooyar, Prepared for the Toowoomba Regional Council. (September, 2016).
- **Reedy Creek Conservation Reserve Fire Management Plan:** Five-year review of the endorsed fire plan for the Reedy Creek Conservation Reserve, Agnes Water. Included recommendations to accommodate changes in the surrounding urban landscape whilst considering the results and lessons from the previous management period. Bush Heritage Trust 2014.
- **Torres Strait Island Fire Management Project:** Development of fire management plans for biodiversity conservation on Badu, Mua, Saibai, Boigu, Dauan, Mabuig, Mer and Erub Islands in the Torres Strait. Work was completed in conjunction with Peter Stanton. Contracted to Torres Strait Regional Authority (2012 -2013).
- **Cape York Fire Project:** A fire scar and floristic structural mapping project to assess changes in vegetation communities that have resulted from shifting fire regimes over the past 30 years. Project utilised current and historical aerial photography for interpretation. Balkanu Cape York Land Development Agency (April to June 2003).

LANDFORM / SOIL AND GEOMORPHOLOGY PROJECTS AND ASSESSMENTS

- **Mornington Wildlife Sanctuary Landform, Geology and Vegetation Community Mapping Project:** A 1: 50 000 aerial photograph interpretation and descriptive landform, soils geological and floristic mapping assessment of the Mornington Wildlife Sanctuary, Kimberley Region, North Western Australia. The report and complementary map provided a baseline study into the factors influencing the area's ecology and diversity. Assisted with preparation of vegetation maps for the property as well as preparation of a floristic inventory. Total survey and mapping area of 3 200 km². Contracted to Australian Wildlife Conservancy (2004).
- **Mt Zero Wildlife Sanctuary Landform and Geological Mapping Project:** A 1:25 000 scale aerial photographic interpretation, map, and descriptive report on land systems soils and geology of the Mt Zero/Taravale Wildlife Sanctuary, North Queensland. Total survey and mapping project area of 650 km².
- **Agnes Water Geomorphic and Land Zone analysis:** Provision of a geomorphic and soil assessment of a 300ha site south of Agnes Water. The study formed the basis for appraisal of regional ecosystems in the study area. EPA certified regional ecosystem mapping was successfully challenged. Mariner Awaken/ Midell Joint Venture, September 2009.
- **Geomorphological assessments on major river crossings on the proposed PNG to Queensland gas pipeline for the purpose of assessing crossing stability.**

GENERAL ECOLOGY, REHABILITATION, VEGETATION MANAGEMENT AND PROTECTED PLANT ASSESSMENTS FOR DEVELOPMENT

- **Stonemaster Quarry, Stapylton:** Preparation of an ecological assessment report (both flora and fauna values) for the Stonemaster Quarry, Stapylton (Gold Coast City Council LGA). Assessment included preparation of advice on requirements for ecological offsets for impacts to koala habitat and protected plant survey within a 'high risk' protected plant buffer (July 2018).
- **Protected Plant Surveys – Inland Rail Project:** Various surveys applying the Protected Plant Survey Guidelines to portions of the proposed Inland Rail Project between Oakey and Brisbane within 'high risk' protected plant buffers. Contracted to EMM to undertake the assessments on behalf of Inland Rail Project (June to August 2018).

- **Protected Plant Surveys for Telstra NBN, SEQ:** Various protected plant surveys for Telstra on behalf of GHD associated with construction of the NBN Broadband Network. Surveys were undertaken in the region between Stapylton and Ormeau, Gold Coast City Council (April to November 2017).
- **Ecological Assessment Report: Optus Receiver Station, Sunshine Coast:** Preparation of a flora and fauna habitat assessment for a proposed Optus receiver tower at Palmoors, Sunshine Coast. Assessment included preparation of an ecological offset plan for impacts to non-juvenile koala habitat trees (March 2018).
- **Koala habitat offset advice and offset plan for Our Lady of the Way School, Petrie:** Preparation of an advice statement and negotiations with the Moreton Regional Council in regards to an appropriate offset contribution for impacts to koala habitat trees.
- **Protected Plant Survey - Queensland Nitrates Pipeline Project:** Floristic survey along the 18 km length of the proposed Queensland Nitrates Gas Pipeline near Moura, southern Bowen Basin. Survey focused specifically on assessment of EPBC Act significance of vegetation communities encountered along the pipeline route as well as intensive searches for Protected Plants (following Protected Plants Survey Guidelines) within the project impact area. Contracted to Queensland Nitrates Pty Ltd (September 2014).
- **Vegetation Management Plan – Rehabilitation Plan, Hymix Concrete Batching Site, North Pine River:** Vegetation and Rehabilitation Management Plan for the 250 Bald Hills Road, a 10ha former industrial site adjacent to the North Pine River to be rehabilitated under court order. Duggan and Hede Pty Ltd for Hymix Australia.
- **Ecological Assessment Report – Yandina Waste Disposal Facility (Sunshine Coast Regional Council):** Floristic survey and assessment of vegetation condition at proposed waste disposal facility, Yandina on the Sunshine Coast. Prepared for Sunshine Coast Regional Council on behalf of Duggan and Hede Pty Ltd (August 2014).
- **Ecological Assessment Report – Warwick Landfill:** Floristic survey and general ecological assessment of the proposed extension of the Warwick Landfill Site. Prepared for Duggan and Hede Pty Ltd (November 2013).
- **Wooyung Developments, NSW –** Ecological assessment of a proposed Eco-Tourism Facility at Wooyung Beach, Northern NSW. Assessment of a 100ha development site including mapping and assessment of Critically Endangered Littoral Rainforest communities, listed under the Federal and State (NSW) legislation.

WATERWAYS MANAGEMENT PROJECTS

- **Redlands Waterways Reach Management and Riparian Condition Assessment:** A reach and catchment characterisation including riparian habitat assessment, for waterways in the Redland Shire Council area (SEQ). The project involved aerial photograph classification of reach, and field assessment of riparian habitats (Hydrobiology, 2011).
- **Caboolture Waterways Management Project:** Provided a reach and catchment characterisation, including riparian habitat assessment, for waterways in the Caboolture Shire area (SEQ). The project involved aerial photograph classification of reach, and field assessment of riparian habitats (Natural Systems, 2006 - 2007).

TIMBER RESOURCE ASSESSMENTS

- **Upper Bridge Creek Conservation Area Timber Assessment Report:** Provided an assessment of timber resources within the 160 km² Upper Bridge Creek Conservation Area to the north of Hopevale. Project facilitated negotiations between Traditional Owners and the Queensland Government to agree to terms of transfer to Conservation Reserve. Contracted to DATSIMA (Qld Govt, April 2015).
- **Timber Resources Assessment of the Connors River Dam Impact Area:** An assessment of timber resources within the proposed Connors River Dam area. Prepared as a component of the Connors River Dam Environmental Impact Statement for Sunwater (2011).
- **Timber Resources Assessment of the Traveston Dam Impact Area:** An assessment of timber resources within the Traveston Dam proposed impact area. Prepared as a component of the

Traveston Dam Environmental Impact Statement for Queensland Water Infrastructure (2007).

- **Wet Tropics Management Authority Timber Resource Assessment Project (2004):** A resource and timber assessment of freehold tenure within the World Heritage area to provide a means to adequately assess landowner compensation claims. Wet Tropics Management Authority, 2004.

EXPERT WITNESS

- Expert witness duties for Wilandspey / Martell /VS State of Queensland in relation to charges under the VM Act incurred through application of the Queensland Government Vegetation Thinning Code.
- Expert witness duties in the case of Burdekin Downs / VS State of Queensland in relation to a pending PMAV application. Duties included historical research, preparation of expert witness statements and representation in QCAT proceedings
- Expert witness duties for the case of Queensland Government versus Strathmore Station regarding charged breaches against the Vegetation Management Act. Duties included preparation of expert witness statements and representation in court.
- Provision of expert advice to Rob Friend and Associates / Iwasaki Resorts in regard to charged breaches against the Vegetation Management Act. Evidence was presented for the defence in Queensland Planning and Environment Court Proceedings.

EXPERT PANELS

- **Queensland Herbarium – Wet Tropics Bioregion Regional Ecosystems Classification:** Expert panel providing advice to the Queensland Herbarium concerning descriptions and classification of regional ecosystems in the Wet Tropics Bioregion. Advice was specific to the release of revised regional ecosystem mapping throughout the state relevant to the implementation of Queensland’s “Vegetation Management Act”. Queensland Herbarium, 2009.
- **Torres Strait Island Biodiversity Expert Panel:** Workshop and expert panel participation providing a framework for future assessment and monitoring of landscape function and biodiversity in the Torres Strait Islands. Expert input related in particular to geomorphic processes, floristic diversity and fire management.

SPECIALIST TECHNICAL TRAINING

Australian Groundwater School: Four-day intensive training course dealing with technical and management aspects of groundwater in an Australian context. Flinders University, Canberra, 2017.

PROFESSIONAL AWARDS

Planning Institute of Australia, Queensland Division (2005) ‘**Award of Excellence**’ for the Caboolture Shire Councils Bushfire and Hazard Assessment Study. The award was given in the categories of Disaster Mitigation and Biodiversity Conservation and Planning in recognition of work completed in the Caboolture Shire Vegetation Mapping Project, 2004.

Planning Institute of Australia, National Division (2006) ‘**National Award of Excellence**’ for the Caboolture Shire Councils Vegetation Mapping Project. National winner in the category of ‘Biodiversity and Conservation Planning’

ACADEMIC AWARDS

Geological Society of Australia Gold Medallion (1993) for outstanding academic achievement in studies of earth science.

OTHER RELEVANT PROFESSIONAL EXPERIENCE

Feb. 1995 - August 1997

Regional Exploration Geologist – Louisade Archipelago P.N.G: The position required the development of remote epithermal gold prospects on Placer Dome’s (now Barrick Gold Corporation) exploration tenements on Misima Island and regional areas. Major tasks included detailed geological mapping, remote sensing and

reconnaissance drilling (diamond core). The supervision of exploratory drilling on advanced gold prospects, including resource delineation drilling in the mine vicinity, was also required on a regular basis.

Feb. 1994 - February 1995

Exploration Geologist - Osborne Gold Mine: The major task was to supervise the Osborne regional exploration program during the construction phase of the Osborne Cu-Au Mine (Mt Isa Inlier). Project requirements included the planning and implementation of exploratory drilling programs to test geophysical targets, supervision of RC and Diamond Core drilling rigs, logging of RC chips and diamond core. Project management tasks included the planning of a regional exploration program around a budget of \$350K.

ADDITIONAL RELEVANT SKILLS, INTERESTS and CERTIFICATIONS

- Proficient in the Tok Pisin PNG language
- Professional experience as a Lifeguard for Queensland Surf Life Saving Association;
- Former Queensland representative swimmer and current record holder for the Magnetic Island to Townsville swimming race.
- Senior First Aid Certificate Current.
- Above Ground Coal Core and Coal Seam Gas inductions
- Advanced 4wd training certification current.

REFERENCES

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Dale Mundraby: CEO Mandingalbay Yidinji Aboriginal Corporation. Ph: 07 4056 8283. Email: dale@djunbunji.com.au