



GroundTruth

Water, Wetlands and Environmental Engineering

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Curriculum Vitae – Gary de Winnaar

Personal Details:

Name: Gary de Winnaar
Profession: Terrestrial and Aquatic Ecologist
Date of Birth: 24 February 1981
Marital Status: Married
Nationality: South African

Key Skills and Experience:

Over ten years of experience in professional consulting services while conducting assessments of aquatic and terrestrial ecosystems, and associated fauna and flora. Provided specialist input for a range of studies requiring solutions regarding practical and applied terrestrial and aquatic ecology, including abilities to integrate aquatic and terrestrial elements, survey fauna and flora, characterise and map biodiversity features (including sensitive habitats), conduct specialist GIS modelling and mapping, as well as identifying and assessing impacts to biodiversity and the environment. Particularly interested in the assessment of environmental flows to ensure that biodiversity patterns and processes are supported by sustained water flow. Managed and integrated specialist teams and inputs covering specialist fields such as terrestrial invertebrates, botany, and ecosystem services/resource economics, etc. Capable of addressing other areas of expertise, for example:

- Desktop and in-field mapping with abilities for spatial analysis using Geographical Information Systems (GIS) particularly for broad-scale and strategic applications;
- Application of biomonitoring tools and indices for assessing the ecological status of ecosystems;
- Knowledge of wide range of biological taxa, sampling methods and understanding of ecological interactions;
- Understanding the functionality of aquatic and terrestrial systems and how such ecosystems are affected by impacting activities, as well as providing guidance on mitigation, offsetting and rehabilitation;
- Spatial modelling and analysis of biodiversity and physical landscape features to facilitate site optimisation through explicit mapping of development constraints and opportunities; and
- Ecohydrology, including assessing and understanding flow requirements for sustaining functions and processes of aquatic ecosystems.

Education and Training:

- 2003 B.Sc. University of Natal, Pietermaritzburg - Majoring in Hydrology & Zoology
- 2004 B.Sc. (Honors) University of KwaZulu-Natal, Pietermaritzburg - Majoring in Hydrology
- 2009 M.Sc. University of KwaZulu-Natal, Pietermaritzburg - Majoring in Hydrology (*cum laude*)

Professional Memberships/Accreditations:

- Professional Natural Scientist (Pr.Sci.Nat) in Ecological Science - The South African Council for Natural Scientific Professions (Reg. No. 400353/13)
- 2010-2013 and 2013-2016 Department of Water and Sanitation (DWS) Accredited SASS5 Practitioner
- Member – Bat Interest Group of KwaZulu-Natal

Experience Record:

2008 to date: GroundTruth – Water, Wetlands and Environmental Engineering (GroundTruth)

Management of the biodiversity division within GroundTruth while providing support to the river and wetland divisions. Projects have covered a range of applications for mining industries, agriculture, developers, renewable and non-renewable energy sectors, linear developments, non-government organisations, and governmental departments. These have included studies for a number of mining houses such as AngloGold, Barrick Gold Corporation, Exxaro, Freeport McMoRan, Gécamines, GEM Diamonds, Phelps Dodge, Rockgate, Vedanta and Zimplats. , providing specialist input and services to industries, consultants, developers, non-government organisations, and regional and national government departments. Assessments have involved aquatic biomonitoring and water quality, terrestrial fauna and flora surveys (employing a range of sampling techniques), characterising ecological health and conditions, mapping of ecosystems, habitats and important/sensitive areas, assessment of ecosystem services, and environmental flows. Studies have also needed to be compliant with national regulations/legislation as well as international policies, notably the International Finance Corporation (IFC) Performance Standards. A key input from these studies has been the identification and assessment of project related impacts and providing recommendations for appropriate mitigation, rehabilitation and monitoring to ensure environmental benefits are properly achieved and sustainable.

2007 to 2008: Greenbelt Mapping

Ground-truthing and mapping of alien plant species and densities for the Working for Water alien plant programme to facilitate the planning and management of alien plant control in various areas of KwaZulu-Natal, namely Jozini, Impendle, South Coast, and Escourt/Mooi River.

2001 to 2005: University of KwaZulu-Natal

Involved with numerous research projects as an assistant for Professor Colleen Downs from the Schools of Biological and Conservation Sciences (including trapping and behaviour monitoring of Hyrax, Bushbuck telemetry tracking, rodent trapping, Cape Parrot and afro-montane forest surveys) as well as the department for Bioresources Engineering and Environmental Hydrology which involved various developing desktop and field-based studies.

Countries Worked in:

Democratic Republic of Congo, Guinea, Lesotho, Mali, South Africa, Zambia and Zimbabwe.

List of Selected Projects and Experiences:

- Environmental flows (E-flows) assessment for a hydroelectric project on the Kalungwishi River in the Northern Province of Zambia for ERM and Globeleq. Current.
- Forest offset management plan for BidVest Tanks in the South Dunes area of the Richards Bay Port, KwaZulu-Natal (South Africa). Current.
- Development of the Environmental Management Framework (EMF) for the Umgungundlovu District Municipality in KwaZulu-Natal (South Africa) with specialist biodiversity and surface water resources input. June 2017.
- Biodiversity study and impact assessment to inform the decommissioning of landfills areas at the Bayside Aluminium Smelter, Richards Bay, with an invasive alien plant assessment and protected plant survey. November 2016 and July 2015.
- Biodiversity baseline surveys to develop a relocation strategy and offset plan for Exxaro coal mine in Belfast, Mpumalanga, with focused Africa Grass Owl, Baboon Spiders and conservation site surveys. May 2016 and ongoing.
- Assessment of Terrestrial and Aquatic Ecology Associated with the Floating Power Plant in Richards Bay as part of the Richards Bay Independent Power Project. March 2016.
- Investing in Ecological Infrastructure to Enhance Water Security in the uMngeni River Catchment. November 2015.
- Surveys of aquatic macroinvertebrates as part of the routine monitoring at the Tenke Fungurume Mine in Katanga, DRC. October 2015.
- Assessment of riparian vegetation along the Orange River from Douglas to Alexander Bay using the Vegetation Response Assessment Index (VEGRAI) as part of the Joint Basin Survey 2 (JBS 2) for the Orange-Senqu River Basin Commission (ORASECOM). September 2015.
- Freshwater Aquatic Ecosystems Rehabilitation Plan for the Keystone Park Development, Hammarsdale, KZN. July 2014.
- Ecological study for the Cornubia Phase 1A Social Facilities Cluster to inform the Green Star rating process according to the Green Building Council of South Africa (GBCSA), KZN. March 2014.
- Assessment of aquatic ecosystems for the proposed Chimiwungo Extension Project at Lumwama, Zambia. August 2013.
- Biodiversity baseline study, including in depth surveys of fauna (mammals, birds, reptiles and amphibians) and flora, for the Kisanfu Copper Project, Southern Katanga, Democratic Republic of the Congo (DRC). July 2013.

- Biodiversity baseline study for the Falea Uranium Mine in Mali for Rockgate Capital Corporation. July 2013.
- Assessment of riparian ecosystems and sensitive fauna and flora associated with the Wekeweke River System for the proposed Shongweni Regional Retail/Commercial Development. June 2013.
- Assessment of fauna and aquatic ecology for the Gamsberg Zinc Mine, Northern Cape, with a follow on regional ant study of the Bushmanland Inselberg Region to determine the occurrence of undescribed *Messor* and *Camponotus* Ant Species Recorded from the Gamsberg Project EIA. April 2013 and October 2013.
- Assessment of Vegetation Response Assessment Index (VEGRAI) and Index of Habitat Integrity (IHI) for the DWA's River Health Assessment for the KZN region. June 2012.
- Biodiversity study to inform the Basic Assessment for the Candover-Mbazwana, Mbazwana-Gezisa Eskom Distribution 132kV powerlines and Mbazwana and Gezisa 132/22kV Substations, northern KZN. May 2012.
- Biodiversity Sector Plan for Ezemvelo KZN Wildlife for the uMgungundlovu District Municipality, KZN. November 2011.
- Assessment of Ecosystem Goods and Services to inform land-use management and closure planning for the Siguiru Gold Mine, Guinea. October 2011.
- Terrestrial and aquatic biodiversity study for the Mongbwalu Project, North-eastern Democratic Republic of Congo (DRC), including in-field surveys, with employment of sampling methods, to determine the diversity of fauna (mammals, birds, reptiles and amphibians) and flora. August 2011.
- Assessment of terrestrial and riparian systems for Tongaat Hulett's Development: uShukela Highway (eastern portion) and Inyaninga and uShukela Highway (western portion). January 2011.
- Environmental Impact Assessment (EIA) for the proposed Eskom Venus-Sigma 765 KV transmission line (EIA: 12/12/20/1397/1) and Sigma-Hector 2 X 400 KV Transmission Lines (EIA: 12/12/20/1397/3): Specialist Fauna Report. October 2010.
- Rehabilitation plan for wetland and terrestrial vegetation associated with the proposed Hope Children's Home on Portion 84 of Clifton Farm no. 939, eThekweni Municipality Outer West, KZN. May 2010.
- Sani Pass Road Upgrade: Baseline Biodiversity Assessment of the Aquatic Ecosystems of the Sani Pass Region, Southern Drakensberg, KZN. January 2010.

Publications:

- Hughes CJ, de Winnaar G, Schulze RE, Mander M, Jewitt GPW. Mapping of Water-related Ecosystem Services in the uMngeni Catchment using a Daily Time-step Hydrological Model. *Water SA*, In Press.
- Graham PM and de Winnaar G. Guidelines to determine buffer widths for freshwater wetlands in KwaZulu-Natal. *Water SA*, In Press.
- Jewitt G, Zunckel K, Dini J, Hughes C, de Winnaar G, Mander M, Hay D, Pringle C, McCosh J and Bredin I (eds.). 2015. Investing in ecological infrastructure to enhance water security in the uMngeni River catchment. Green Economy Research Report No. 1, Green Fund, Development Bank of Southern Africa, Midrand.
- de Winnaar G and Jewitt, GPW. 2010. Ecohydrological implications of runoff harvesting in the headwaters of the Thukela River basin, South Africa. *Physics and Chemistry of the Earth* **35**: 634-642.
- de Winnaar G, Jewitt GPW and Horan M. 2007. Identification of potential runoff harvesting areas using GIS. *Physics and Chemistry of the Earth* **32**: 1058-1067.
- Dickens C, Graham M, de Winnaar G, Hodgson K, Tiba F, Sekwele R, Sikhakhane S, de Moor F, Barber-James H, van Niekerk K. 2008. The impacts of high water flow releases from an impoundment on in-stream ecological