DesignFlow

Jason is an aquatic ecologist with expertise in water resource assessment and management. He has over 14 years experience working on the ecology of marine and freshwater ecosystems, particularly urban streams, lakes and wetlands.

His experience includes developing integrated approaches to urban water management and the innovative use of water sensitive urban design concepts within urban development projects at many scales. This includes the modelling of catchment runoff and the design of stormwater treatment and harvesting systems such as wetlands and bioretention systems.

He has specialist skills in ecosystem assessment and management, environmental impact assessment and statistical analysis of environmental data.

EDUCATION

Bachelor of Science (Hons)
Graduate Diploma Education

EMPLOYMENT HISTORY

DesignFlow	2009-
Ecological Engineering/ EDAW	2004-2008
Environmental consultant	1999-2004
CRC Freshwater Ecology	1993-1997
Melbourne University	1992-1993

SUMMARY OF KEY PROJECT EXPERIENCE

URBAN STORMWATER MANAGEMENT

Valley Lake Stormwater and Lake Management Strategy, Niddrie

Client: VicUrban

The development of stormwater and lake management strategy for the Valley Lake Estate. This involved catchment modelling and the design of stormwater treatment wetlands and bioretention systems. The potential impacts of stormwater inflows to the lake upon algal concentrations were modelled. The strategy also included the design of a lake water quality monitoring program, an algal bloom management strategy, and routine inspection and maintenance schedules for the lake.

Stormwater Treatment Strategy, Mandalay Estate, Beveridge, Victoria

Client: Metricon Homes Pty Ltd

The functional design of the stormwater and flood management system for the Mandalay Estate. The project involved the developing a calibrated catchment model, flood retardation basins and the design of stormwater treatment wetland systems and ornamental/storage lakes. The wetland system was designed to enable recirculation of water from the lakes system in order to manage lake water quality during periods of limited runoff.

Lake Water Quality Improvement Strategy, Balyang Sanctuary, Geelong, Victoria

Client: City of Greater Geelong

The development of the concept, functional and detailed designs for the improvement of water quality within the main lake at Balyang Sanctuary. The project involved retrofitting the lake with a wetland to treat stormwater runoff quality and to manage lake water quality during periods of limited runoff (via a lake recirculation system). Other modifications to the lake included improvements to lake hydraulics to minimise the development of algal blooms, and reforming the edges of the lake to provide a range of littoral habitats.

Lakes Edge development WSUD Strategy and Functional Design, Hamilton, Victoria

Client: VicUrban

The development of a strategy identifying WSUD initiatives for the proposed development to reduce potable water demand and treat stormwater runoff from the development. The strategy evaluated potable water conservation opportunities, involved catchment modelling and the design of stormwater treatment wetland systems. The functional and detailed design of the stormwater treatment systems was undertaken, including the stormwater diversion infrastructure and treatment wetland systems.

ECOLOGICAL DESIGN AND RECTIFICATION

Western Lagoons Habitat enhancement functional design, Werribee Treatment Plant, Victoria

Client: Melbourne Water

The project involved designing habitat enhancements to the Western Lagoons (RAMSAR) in order to provide an extensive range of waterbird habitats including ephemeral and permanent wetlands, and extensive areas of coastal saltmarsh. Several of the saltmarsh restoration areas were specifically designed to provide habitat for the Orange-bellied Parrot, a nationally endangered species. The functional design included detailed habitat design, saltmarsh hydrology and plant community re-establishment strategies, sediment sampling and analysis to detail sediment profiles and to identify contaminant levels; site cut and fill balances and project staging schedules.

St Peters Billabong Restoration Plan, Adelaide, South Australia

Client: Torrens Catchment Management Authority

An audit of the operation and condition of the St Peters Billabong system was conducted, and management options for improving the health of the system developed. The study included lake and groundwater testing, sediment analyses, catchment and groundwater modeling, field assessment and stakeholder workshops. Options were identified for restoring the billabong including the transition to a groundwater dominated system, sediment removal, lake re-configuration, alteration to stormwater inflows and restoration of aquatic vegetation.

Spavin Lake Restoration Plan, Sunbury, Victoria

Client: City of Hume

A Water Quality Improvement Strategy was developed in order to minimise the development of cyanobacterial blooms occurring in Spavin Lake. The study also considered improving aquatic habitat diversity, lake aesthetics and the quality of water released from the lake. A range of options for improving water quality within lake were developed including, extensive revegetation of lake with emergent and submerged macrophytes, decreasing lake hydraulic retention times, reducing turbidity and retrofitting the lake with a wetland recirculation system.

Bundaberg Botanical Gardens Lake System, Bundaberg, Queensland

Client: Bundaberg Regional Council

A review of the lakes system at the Bundaberg Botanical Gardens was undertaken in order to provide strategies to improve water quality and the overall health of the lakes system. This included a review of previous investigations, comprehensively reviewing of the operation of the lake system, associated infrastructure such as irrigation re-use system and artificial waterways. A range of strategies were developed to manage lake water quality including the restoration of lake vegetation and modifications to the existing lake-wetland recirculation system.

ECOLOGICAL ASSESSMENT AND MANAGMENT

Albert Park Lake, Melbourne, Victoria

Client: Parks Victoria

The use of stormwater harvesting to maintain water levels with Albert Park Lake was undertaken in order to assess the potential impacts on water quality and lake ecosystem health. The assessment considered the ecological processes within the lake which promote the development of cyanobacterial blooms and provided a range of solutions for managing lake water quality. This included stormwater and lake water treatment options, re-vegetating the lake with submerged vegetation and modifying the lateral wetlands within the lake.

Lake Wendouree, Ballarat, Victoria

Client: City of Ballarat

Water quality and algal biomass modelling was conducted to assess the impacts of adding recycled water to Lake Wendouree. A conceptual model of the lake ecosystem was developed based upon lake water quality, sediment chemistry and microbial activity (denitrification), and assessment of the aquatic macrophyte communities. The conceptual model was used in conjunction with the water quality modelling results to assess the ecological risks associated with the addition of reclaimed water to the lake ecosystem.

Lonsdale Lakes, Victoria

Client: Stockland Pty Ltd

Catchment and water quality modelling was conducted for the proposed estuarine lakes system, to assess the impact of urban stormwater runoff upon the ecosystem health, including the development of algal biomass within, and the quality of water discharged from the lakes system. The project also involved catchment modelling and the conceptual design of saline bioretention systems to treat stormwater runoff quality.

Aquatic plant biomass growth investigation in the Ord River irrigation system, WA

Client: Ord Irrigation Cooperative

Aquatic plant biomass growth within the Ord River Irrigation network was investigated. This involved monitoring benthic algal and water plant biomass development within the irrigation network, and assessing the impacts of point source discharges from a STP and sugar mill upon the aquatic plant growth. The project also reviewed the use and effectiveness of aquatic herbicides to control aquatic plant growth within the irrigation system.

AUDITS

Fairfield Lakes, Townsville

Client: Townsville City Council

An audit was undertaken to assess the operation and health of the lake system over the on-maintenance period in respect to the relevant water quality and environmental objectives outlined within the Lake Management Plans and Development permits. The assessment considered water quality an groundwater data, the operation of the saline recirculation system, risks to the health of the lake system and lake management objectives and activities.

REVIEWS

Review: The use of Lake Recirculation to manage algal biomass in lakes

Client: Water by Design

A review of manipulating lake detention times to reduce the risk of cyanobacterial growth in constructed urban lakes was undertaken. The review considered factors that influence urban lake health, shallow lake function and ecology, detention time design criteria for managing cyanobacterial growth, the use of constructed wetlands to manage lake detention times and alternative strategies for managing cyanobacterial growth.

POLICIES AND GUIDELINES

Townsville City Council Lakes Policy

Client: Townsville City Council

The Townsville Lakes Policy provides guidance for the design of constructed lakes within the Townsville City Council area. The development of the policy also included the provision of a guidance document outlining lake design considerations and supporting information relating to the lake function and health.

Maintaining WSUD Assets, Queensland

Client: Water by Design

The document provides practical and standardised maintenance advice to enable planning for and completion of maintenance of sediment basins, wetlands, bioretention systems and swales. The document defines performance indicators and provides recommended frequencies of inspection and routine maintenance tasks, practical reference tables, checklists and forms to use during inspections and maintenance.

Rectifying WSUD Assets, Queensland

Client: Water by Design

The document provides guidance for rectifying common problems in sediment basins, swales, bioretention systems and constructed wetlands. The guideline addresses common problems in under-performing or failing systems, steps for identifying the cause of the problem, options available to rectify the problem, how to determine if a system is beyond repair and options for how to deal with systems that cannot be rectified.