

Water Quality

Monitoring Strategy

The City of Ryde is continuing to implement a biological and chemical water quality monitoring program targeting the 5 main creek systems within the City.

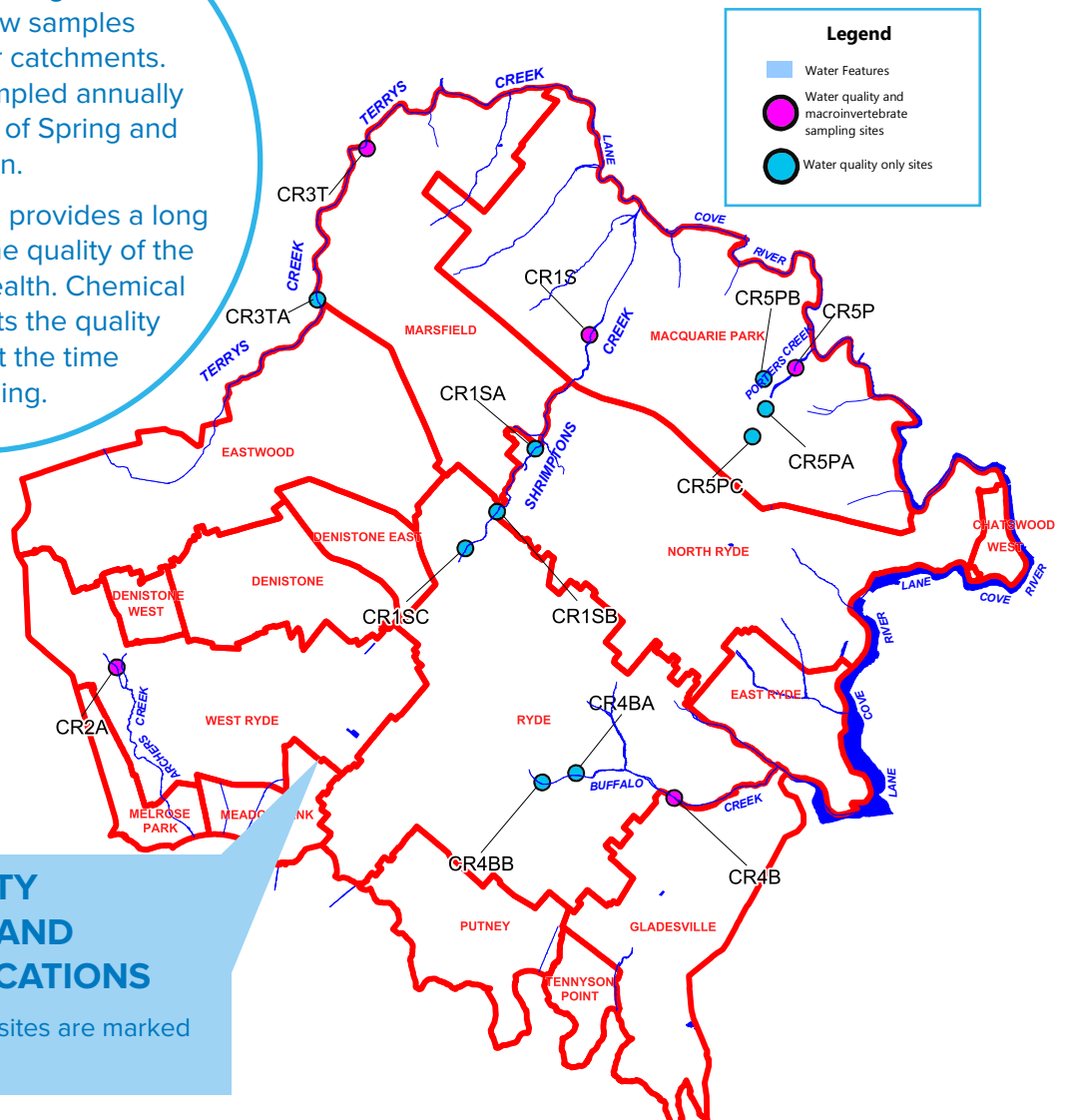
1. TERRY'S CREEK
2. SHRIMPTONS CREEK
3. PORTERS CREEK
4. BUFFALO CREEK
5. ARCHERS CREEK

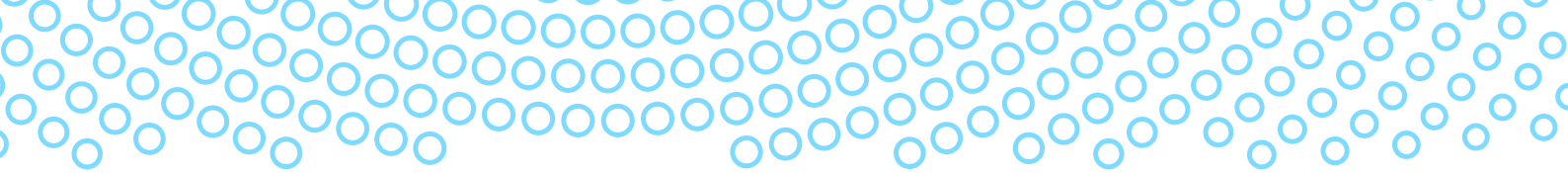
The program began in 2004 and now samples 14 sites in 5 water catchments. These sites are sampled annually during the months of Spring and Autumn.

Biological monitoring provides a long term indication of the quality of the water and creek health. Chemical monitoring reflects the quality of the water at the time of sampling.

WATER QUALITY MONITORING AND SAMPLING LOCATIONS

Location of sampling sites are marked on the map above.





Terrys Creek, Ryde

INTRODUCTION

Water quality monitoring is carried out by the City of Ryde to inform environmental management and on ground works, programs and projects.

The program provides:

- Data to Council and community on the physical and chemical water analysis of five major creeks within the City of Ryde LGA during dry weather and one wet weather event per year
- Assessment and monitoring at 5 core sites across each creek and measurement totalling 14 sample sites across the City
- Information on the diversity and abundance of macroinvertebrate communities within these five creeks in the study area
- Environmental and ecosystem health data which will assist in monitoring the effect of future developments, creek restoration, stormwater management, bushland rehabilitation and general urban influenced activities within the catchment through undertaking Rapid Riparian Assessments along the creek banks
- On-going information to assist the direction of future water quality monitoring plans, stakeholders internal and external to Council to continuously continuously work towards improved waterway health

Biological and chemical monitoring enables the City of Ryde to:

- Build on the baseline data captured to enable temporal evaluation and long term analysis of the health of creeks and catchments to inform the strategy
- Inform and provide direction and monitor potential infrastructure works within the LGA, i.e. in-stream or riparian rehabilitation and stormwater treatment projects
- Build on the known taxa list for each catchment and to aid in the identification of key indicator taxa

MANAGEMENT THEMES

The program is built around 3 key management themes:

1. Continued water quality monitoring of Ryde's 5 core waterways will build on previous monitoring to:

- Measure and collect aquatic macro invertebrates and chemical data at 5 core sites across Ryde and water chemistry only at 9 satellite sites seasonally in both Spring and Autumn.

Water quality results for each creek are to be gauged against Australian and New Zealand Environment and Conservation Council (ANZECC 2000) guidelines for Aquatic Ecosystems (Lowland River in South Eastern Australia) AND Recreational Water Quality and Aesthetics (Secondary).

Although the ANZECC (2000) recommended guidelines are for slightly disturbed ecosystems they do provide an indication of water quality compared to other systems within South Eastern Australia

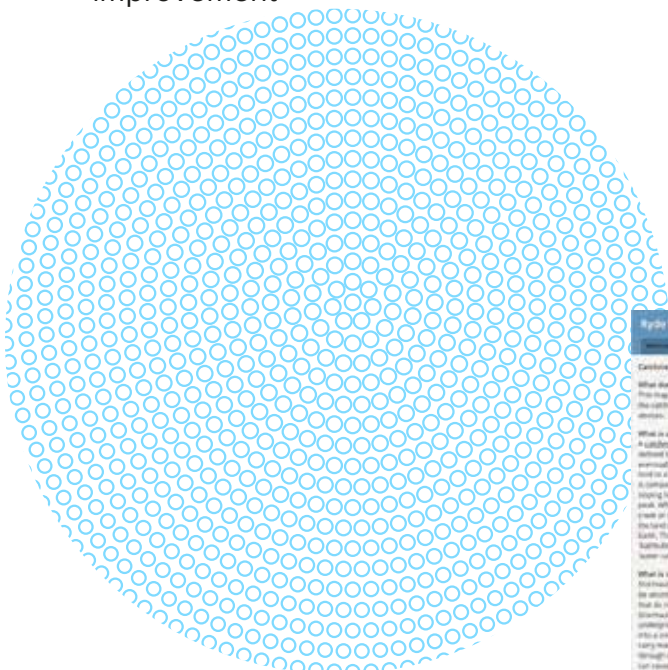
- Use findings to guide future water quality improvement works across council departments for managing threats and impacts and identifying opportunities for improvement

2. Use water quality monitoring data collaboratively to assist in managing surface run off, riparian zones, habitat and ecosystems threats across council and externally;

- Coordinate through a cross council and stakeholder engagement approach strategy, for improving water quality through on the ground works such as riparian vegetation planting, infrastructure, erosion, weed and in stream habitat quality as per objectives of the Parramatta River Coastal Zone Management Plan
- Identification of opportunities to improve stream way health through collaborative projects including Water Sensitive Urban Design and pervious surface
- Liaise with Sydney Water and Council Staff to identify and report major pollution incidences impacting our local creeks

3. Improving knowledge of water quality in our catchments through community and stakeholder education

- Continue to liaise with and participate in stakeholder catchment groups for improving waterways in Ryde; Parramatta River Catchment Group, and work towards meeting goals outlined in the Parramatta Parramatta River Catchment Group Master Plan and Parramatta River Coastal Zone Management Plan
- Build local waterway education and knowledge to students and community through providing water quality monitoring data (in an interactive format on the Waterinfo site) and other water quality promotion.



KEY STRATEGY ELEMENTS

The program enables Ryde to:

1. Evaluate chemical and biological water quality monitoring bi-annually to provide a snapshot of creek health;
2. Provide detail on where, when and how often samples should be taken from creeks within the LGA, based on site data, catchment position and accessibility and interpret this data utilising the Waterinfo site and Ryde's mapping system (LIS);
3. Prescribe techniques used for sampling macro invertebrates at each site based on standard protocols and identify a standard suite of analyses to determine status and trends in water quality including Taxa Richness and Signal-SF.
4. Interpret findings to work across council departments to implement project works that will improve overall creek health into the future.
5. Influence stormwater infrastructure plans, creek rehabilitation, environmental health monitoring, GIS integration, bush regeneration, planning (e.g. riparian zones), community and internal environmental education, water sensitive urban design and other relevant aspects of Council operations and mandates that affect the regions stream quality.

6. Align Council within a wider context of the greater catchment under the CMA Catchment Action Plan and Parramatta River Coastal Zone Management Plan to manage the catchment in a way that will improve river health, protect biodiversity and encourage best practice water and land management.
7. Record changes to riparian and bank condition across time through Rapid Riparian Assessment to identify areas towards future improvement works
8. Assess the influence that capital infrastructure or water sensitive urban design has on creek health by recording works completed within the water quality monitoring report.

Key Sampling Techniques

Biological

The streams are sampled using a fine net and hand picking from trays/rocks. Samples of each organism found are preserved in vials provided later for identification in the laboratory.

Chemical

Probe measurements are also taken at each site for dissolved oxygen and nitrogen phosphorus, temperature, Ph, conductivity and turbidity.



Rapid Riparian Assessment Scores

The Rapid Riparian Assessment (RRA) used for this monitoring program follows the methodology developed by Findlay et al. 2011. The RRA method utilises a range of physical parameters which are scored to ascertain the condition of the riparian system at a sample site. These include: site features (e.g. land use, litter, sewer line and odours), channel features (shape, pool and riffle sequences, large wood debris), depositional features (benches, islands and channel bars), erosional features (bedrock exposure, undercutting, knick points), riparian vegetation (buffer depth) and vegetation structure (type, weed infestation).

The overall condition of the site can be categorised according to one of six states of condition: Excellent (greater than 60), good (27 to 59.99), fair (-6 to 26.99), poor (-39 to -6.99), very poor (-72 to -39.99) and severely degraded (-73.99 or less).

This data assists to inform Council towards enhancement works within our Bushcare and Water Quality improvement works.



REPORTING REQUIREMENTS

- Baseline data on macroinvertebrate composition identified at the family level for each core site sampling from the same 3 edge habitats at each core site
- Collect indicator species at each of the core sites
- Collect chemical measurements at each of the core sites measuring the following parameters; Ph, temperature, dissolved oxygen, turbidity, total dissolved solids, faecal coliforms, total kjeldahl nitrogen, total nitrogen, ammonia and conductivity
- Imaging and data management services to enable analysis, interpretation and reporting on the data gathered and assessed against appropriate criteria
- The ability to pursue an integrated strategy so that water quality data can show change and becomes of value by being used to inform creek and waterway improvement programs
- Legislative requirements and suggested recommendations for future program enhancement for Council pertaining to water quality standards, environmental flow and sampling frequencies
- Spatial coordinates for mapping purposes
- Recording of completed stormwater infrastructure works or water sensitive urban design impacting on our identified creeks
- Rapid Riparian Assessment to monitor riparian change and influence waterway protection and enhancement works towards water quality improvement.

PROGRAM OUTCOMES

The overall outcome of the Water Quality Monitoring Strategy is to improve creek health through data collection, analysis and interpretation by informing strategic direction for future monitoring programs.

Outcomes from the Water Quality Monitoring Program and the Strategic Overview of the Water Quality Monitoring Program, Parramatta River Catchment Group and the Riparian Study (conducted 2012) continue to assist Ryde in future planning for our waterways. This includes recommendations on stormwater infrastructure plans, creek rehabilitation, regulation, environmental health monitoring, bush regeneration, planning, education, water sensitive urban design and other relevant aspects of Council operations and mandates that affect creek health.



Educational Signage for the Shrimptons Creek Bioretention System at Santa Rosa Park



Trim Place Mural promoting litter reduction in waterways