ACTEW Water

Murrumbidgee Ecological Monitoring Program
Observation Report - Spring 2013

January 2014

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1. Introduction

This report is a component on the Murrumbidgee Ecological Monitoring Program (MEMP) for the spring 2013 sampling run, which is being undertaken on behalf of ACTEW Water. This report provides a summary on site specific and overall conditions observed by the field team during this sampling run.

2. Summary of the 2013 spring sampling run

2.1 Angle Crossing

Sampling of the Angle Crossing sites was conducted on the 28th & 29th of November 2013. Weather conditions during sampling were mainly fine with some cloud present on the 29th, with Canberra maximum temperatures recorded at 31.6°C and 21.8°C respectively (BOM, 2013). During the spring period, flows were relatively stable with the exception of two high flow events occurring in mid-September and mid-November (Figure 1). The larger of the two occurred on 18 September, which peaked at 20,000 ML/d; and the second event occurred on the 14th of November, which peaked at approximately 3,100 ML/d. and although flow levels had significantly reduced by the time sampling was conducted, flow volumes were higher than the previous two sampling runs.

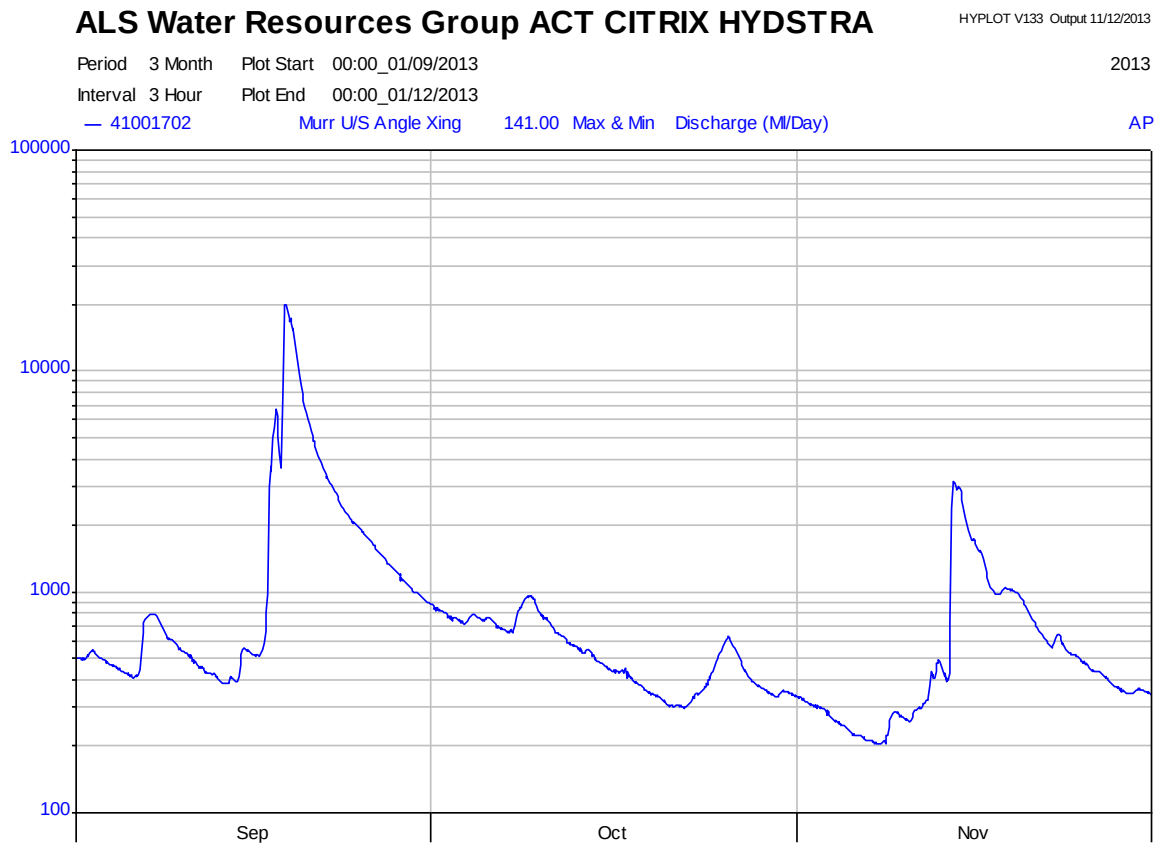

Figure 1. Hydrograph of the Murrumbidgee River at upstream Angle Crossing (41001702) and Lobb's Hole (410761) for spring 2013

All sites appeared to be in relatively good condition. The in-situ water quality parameters (pH, EC, DO & turbidity) were all within the ANZECC & ARMCANZ (2000) guidelines at the Angle Crossing sites, with the exception of pH at three of the sites (MUR 18, 19 & 28).The nutrient results from the grab samples collected at site are currently still pending from the ALS Canberra laboratory.

The streamside scans of the riffle samples from the Angle Crossing sites were dominated by black fly larvae (Simuliidae) and non-biting midges (Chironomidae). Although these tolerant taxa were highly abundant, several sensitive taxa were also present in most samples. These taxa included: stream horses (Coloburiscidae: SIGNAL-2=8), Leptophlebiidae (SIGNAL-2=8) and Gripopterygidae (SIGNAL-2=8) (Plate 1). The streamside scans of the edge samples were dominated by water boatmen (Corixidae).

*Myriophyllum spp.*was abundant in the stream at MUR 15 & 23. Due to the higher flow levels, the edge habitat which was sampled at MUR 16 was different than during previous runs, with additional habitat being sought along the far left bank and at a sandy beach area approximately 50m upstream of the riffle site. Across all Angle Crossing sites two riffle and two edge samples were collected from each site. Site photographs are shown in Plate 2 on the following page. An unidentified turtle species was also recorded at MUR 15.

Plate 1. Photographs of a Gripopterygidae (left), and a Coloburiscidae and a Leptophlebiidae (right) collected at MUR 23 during spring 2013 sampling.

MUR 15 – looking upstream from the riffle habitat (350 ML/d)

MUR 16 – Looking upstream from the riffle habitat (350 ML/d)

MUR 18 – Looking downstream from the riffle habitat (350 ML/d)

MUR 19 – From the riffle habitat looking upstream across the crossing (440 ML/d)

MUR 23 – Looking downstream and across to the edge habitat (440 ML/d)

MUR 28 – Looking upstream (440 ML/d)

Plate 2. Photographs of the Angle Crossing sites during sampling, with flow values from the relevant gauging sites (41001702, 410761)

2.2 Burra Creek

Sampling of the Burra Creek and Queanbeyan River sites occurred on the 15th and 16th of October 2013. These dates were chosen to coincide with a scheduled APPLE run as part of the M2G infrastructure maintenance program. This scheduled run was postponed soon after sampling had been completed. Conditions during these two days were fine, with some wind, and maximum temperatures reaching 19.4°C & 23.3°C respectively (BOM, 2013). Base flow during the sampling period was slowly receding following a high flow event in mid-September, approximately a month prior to sampling commenced. This event peaked at over 10,000 ML/d in the Queanbeyan River, while reached over 2,500 ML/d in at Burra Weir (Figure 2).

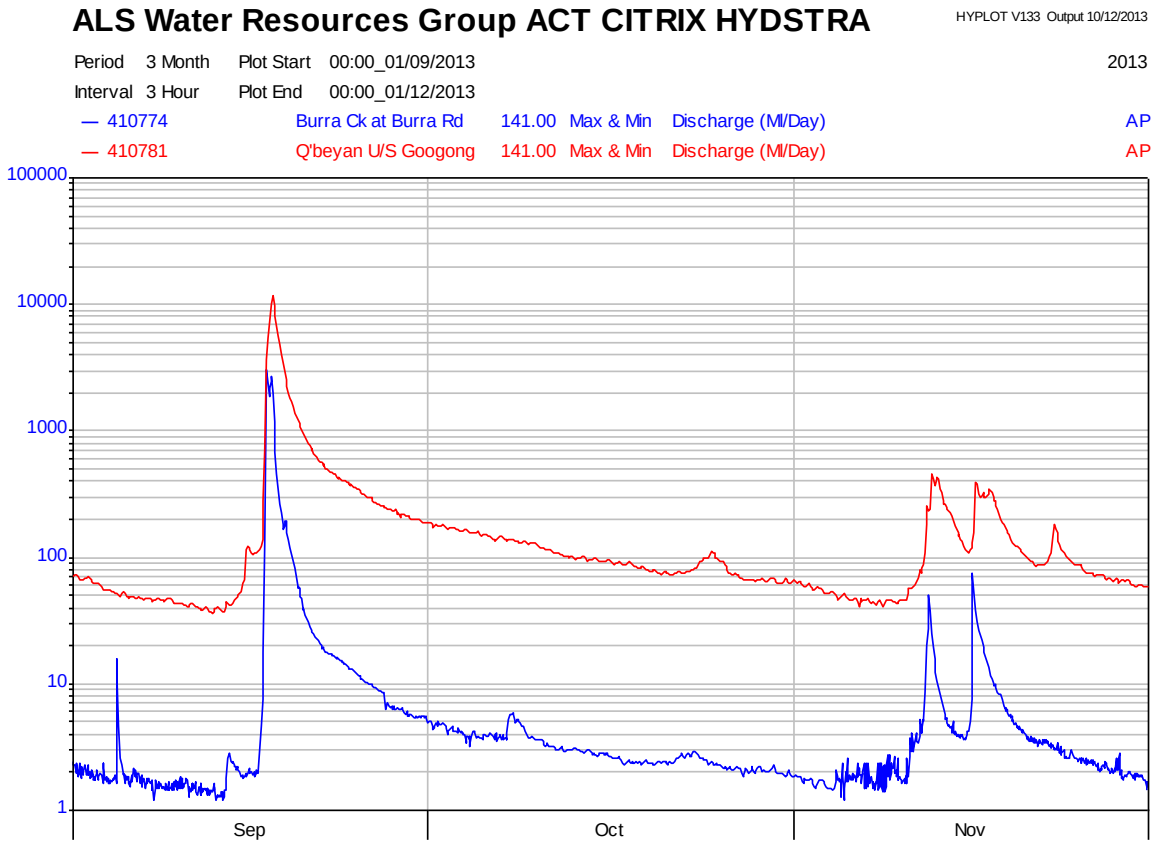

Figure 2. Hydrograph of Burra Creek at Burra Weir (410774) and the Queanbeyan River at upstream Googong Reservoir (410781) for spring 2013

Low flows were present during sampling in Burra Creek, although flows were higher than during autumn when BUR 1a was not able to be sampled due to the drying of the site. During spring sampling was possible at BUR 1a, however there was only enough riffle habitat present for a single sample, with the second riffle sample the only sample missed from this component of the MEMP for spring 2013.

Some of the sites showed evidence of the recent high flow event during September with high watermarks observed, and some new areas of erosion along the banks. This was more evident at BUR 1a where cobbles had been washed downstream and some changes in the substrate composition were observed, compared to previous sample runs. The September high flow event has removed a small cobble island in the south-eastern braid at Flynn's Crossing, with the river morphology in this section of the river now characterised by a bedrock cascade. Riffle sampling was

adjusted to this braid at QBYN 1 due to reduced flows in the north-western braid, potentially a result of the substrate movement mentioned above. Site photographs are shown in Plate 3.

There were a number of ANZECC & ARMCANZ (2000) guideline exceedances from the in-situ water quality in Burra Creek, while all parameters in the Queanbeyan River were within the guideline limits. Electrical conductivity was elevated above the guideline at all sites downstream of BUR 1a and was consistent with spring 2012. While the pH values exceeded guideline limits at all sites downstream of BUR 1c, which is an increase on the two exceedances from spring 2012. BUR1a exceeded the ANZECC & ARMCANZ (2000) trigger level for total phosphorus, which has increased since spring 2012. However, in comparison to this, total nitrogen levels have reduced since spring 2012 where all sites exceeded the trigger level, compared to only two sites in spring 2013.

The streamside scans of the Burra Creek sites presented an encouraging mixture of both sensitive and tolerant taxa in both habitat types. Edge scans of both BUR 1a & 1c appeared to show lower abundances of taxa, which may be related to the lower flows in this upstream section of the creek.

The streamside scan of the riffle habitat sample at QBYN 1 was dominated by the moderately tolerant black fly larvae (Simuliidae), but also the more sensitive family Gripopterygidae. While the streamside scans of the QBYN 1 edge habitat was dominated by stick caddis (Leptoceridae) and freshwater shrimp (Atyidae) with SIGNAL-2 scores of 6 and 3 respectively.

BUR1a – Looking upstream from the riffle habitat (2.8 ML/d)

BUR 1c – Looking upstream (2.8 ML/d)

BUR 2a – Looking downstream from the riffle habitat (2.8 ML/d)

BUR 2b – Looking downstream (2.7 ML/d)

BUR 2c – Looking downstream over the riffle habitat (2.7 ML/d)

QBYN 1 – Looking downstream at the riffle habitat (90 ML/d)

Plate 3. Photographs of the Burra Creek and Queanbeyan River sites during sampling, with flow values from the relevant gauging sites (410774, 410781)

3. Literature Cited

ANZECC & ARMCANZ (2000) National water quality management strategy: Paper No. 4. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Volume 1. The Guidelines. Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand.

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Document Status

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