GOULBURN BROKEN
CATCHMENT MANAGEMENT AUTHORITY

HEALTHY LANDSCAPES – LAND AND WATER



ISSUE

The Goulburn Broken Catchment covers 2.4 million hectares in Victoria and extends from the seasonally snow-covered Alps around Mount Buller to the extensive floodplain of the Murray River. Since European settlement over two thirds of the catchment has moved into private ownership and cleared for agriculture and urban purposes. The catchment now is home to over 204,000 people with a gross value of agriculture in 2012-13 of $1.5billion. Tourism based on the catchment's natural features is growing and currently contributes $1.1billion to the regional economy. The catchment has a natural productive advantage due to its climate and proximity to Melbourne. However, the potential that this natural productive advantage creates for the Goulburn-Broken and Victoria depends on access to high-quality land and water.

Land clearing for agricultural and urban purposes has led to significant economic growth but also disrupted the water balance resulting in more and more land being degraded by salinity, waterlogging and flooding, and a serious decline in water quality due to increases in salt and nutrients. Two key drivers of the water imbalance existed – the first was the clearing of the land and the second was how the cleared land was being managed. By the late 1980s it was recognised that the decline in land and water quality had reached a threshold.

Without action the future of the Goulburn Broken catchment with its irrigated and dryland agriculture, processing industries, urban communities and river and land based ecosystems was threatened.

Salinity of the land and water

When the catchment first began taking action in the late 1980s, production losses due to salt-affected land in the irrigation area alone were already estimated to be 25 per cent or $47million a year. Without any remedial works the area affected by salinity was expected to increase to 55 per cent by 2020 equating to $120million a year by 2025, resulting in a loss of 3,500 jobs (all 1989 values).

In the dryland area 7,000ha of land was already salt affected in 1989 with production losses estimated to be in excess of $500,000 a year and the loss in value of the land estimated to be in excess of $3 million. Without any remedial works the salt affected dryland was expected to grow by between two and five per cent a year leading to production losses of between $7.91-$24.6million a year by 2040 (all 1989 values).

Salt moves through the catchment in the streams and the groundwater from the upper dryland areas via the rivers and streams, through the irrigated land and ultimately into the Murray. In 1989, 71,000 tonnes of salt per year was flowing into the Shepparton Irrigation Area from the dryland part of the catchment. Without any works this was expected to increase by 10 per cent over 40 years and not only accelerate the salinisation of the irrigation area but also the Murray River. Under the Salinity & Drainage Strategy (1988), limits for salt disposal were set to protect water quality in the Murray and significant changes needed to occur if the Goulburn Broken catchment was going to be able to comply.

Water logging and flooding

In the 1980s only 35 per cent of the irrigated land in the Goulburn Broken Catchment had surface drainage and unregulated earthworks had blocked natural drainage lines and diverted river flows. As a result, water logging and flooding was a major issue on over 65 per cent of land in the irrigated area increasing salinity but also reducing agriculture production, damaging town infrastructure, the road network and killing native vegetation. In 1989 the total Net Present Value of losses in the irrigation region due to poor drainage were estimated to be between $165-$195 million a year. Between $50-$80 million of this loss was due to reduced agricultural production and the remaining loss due to increased road construction and maintenance costs.

Nutrient pollution

In the 1990s, decreasing water quality in the Goulburn Broken catchment's streams and water bodies was reflected in an increasing incidence of toxic blue green algal blooms. 'Black water' events were recorded, each resulting in significant fish deaths. Goulburn Broken was not alone and in the 1990s water quality strategies and guidelines were developed at a National, Murray Darling Basin and State level. The water quality in the rivers and water bodies began to be assessed and in the lower part of the catchment were found to be outside the guidelines and overall, to be causing either a marked or serious decline in natural aquatic ecosystems. Without intervention, water quality was expected to continue to deteriorate with phosphorus levels expected to increase by 18 per cent by 2025.

The water quality issues didn't finish at the catchment boundary with the Goulburn estimated to be contributing 58 per cent of the sediment up-stream of the Murrumbidgee junction whilst only contributing 37 per cent of the flows.

INTERVENTION

Since those early days an integrated package of catchment-wide works has been progressively implemented to bring the catchment back from the threshold by restoring the water balance as far as possible and managing what can't be restored. Ultimately, the integrated package ensured that the land and water assets and hence the economy and the biodiversity were being protected.

In the irrigation area the key catchment-wide works have included the installation of 48 public and 308 private groundwater pumps to draw the groundwater down to keep salt out of the root-zone for agriculture and the environment. Drainage lines have been restored and 230km of regional drains and 450km of community drains have been installed. At critical points near the outfall of drains, 34 drainage diversion dams have been constructed to divert nutrient rich water away from the rivers and back onto farms. Significant changes to restore the water balance have also happened at a farm level across the irrigation region. Whole farm planning has been used to ensure the estimated 112,604 ha of improved irrigation infrastructure and 3,480 re-use systems have reduced the estimated percentage of the applied water (and associated nutrients) running off farms into the region's drains and waterways from 20 per cent in 1994 to less than 5 per cent now.

In the dryland area the key catchment-wide works have included re-vegetation with trees and perennial pastures of recharge areas, which with good management, has led to the rehabilitation of these areas where possible. Over 26,000ha of priority recharge and 2,300ha of discharge areas have been revegetated to intercept rainfall and salts. Soil erosion management works has been completed across over 3,600ha to stabilize gullies, farm land and stream banks. Finally, over 80,000ha of land was protected from erosion during the drought through the use of stock containment areas.

OUTCOMES

So with 25 years of work has salinity, water logging and flooding been kept at acceptable levels? Is the quality of the water meeting our Basin obligations and is it good enough for fish to live in the rivers? And, finally what is the progress towards restoring the water balance? Well we think the following has been achieved.

In the irrigation area, the remedial works mean that over 52,000ha of land has been protected from salinity and over 64,000ha of land has been protected from waterlogging. This equates to annual benefits of $3.46 million of agricultural production each year and a $2 million in environmental benefits and reduced road costs.

The salt leaving the catchment is now within agreed limits and will remain that way into the future. In addition, the overall catchment water quality condition has moved from 'very poor' to 'satisfactory' and with the substantial reduction in total phosphorus exported from the catchment into rivers and streams the catchment is within long-term targets. This means that the natural ecosystem is healthier and fish numbers are increasing.

The water balance is not restored but is largely managed so that it can be kept away from critical thresholds. Our understanding of what drives the water balance is now quite sophisticated. The climate has an overwhelming impact. We know that wet years and big rainfall events, particularly in spring and summer, are still an issue. We know the impact that changing land use and the size of the irrigation footprint has on the water balance. And finally, we know what is critical to monitor so we can know when and how we need to respond.

Most importantly, the move from poor-quality land and water to reliable high-quality land and water provides confidence. Confidence to invest in productivity improvements and in new, higher value enterprises. Farmers have seen the opportunities that government water saving and infrastructure upgrade projects could create and have invested an estimated $161 million in irrigation upgrades over the last four years generating an expected regional benefit of $28 million a year.

The catchment has seen this confidence reflected in the processing sector with recent (2017-18) multi-million dollar upgrades by Fonterra at its Stanhope factory and Australian Consolidated Milk's purchase of a 7ha site at Girgarre to build a milk processing plant. The region now has a steady demand from external investors to develop and invest in large farms that can capture the efficiencies needed to be successful in the long term.

Councils and the State Government see the opportunities for further tourism development using the natural features by building recreational infrastructure such as bicycle paths and supporting new and evolving businesses.

The community is seeing the opportunities that the improved environment is providing with the Goulburn Broken catchment now the most popular inland fishing destination in Victoria.

NEXT CHALLENGES

The investment in restoring the water balance in the Goulburn Broken has provided the infrastructure and knowledge needed to manage for healthy soils and water. What infrastructure and actions are required will change from year to year depending on rainfall. To maintain healthy land and water requires on-going adaptive management. In dry periods, the groundwater pumps, nutrient harvesting systems and regional drains will barely be needed and it is easy to think salinity and nutrient pollution are solved. The challenge is to ensure private and public infrastructure, monitoring and the expertise is maintained during these drier periods. In the wetter years all the infrastructure, monitoring and expertise will be needed to keep the water table down, the nutrients and salt out of the rivers and provide the confidence needed for investment in continuing productivity growth and economic development.