



Department of  
Primary Industries  
Office of Water

# Environmental flow response and socio-economic monitoring

South Coast - progress report 2010





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The NSW Office of Water manages the policy and regulatory frameworks for the state's surface water and groundwater resources, to provide a secure and sustainable water supply for all users. It also supports water utilities in the provision of water and sewerage services throughout New South Wales.

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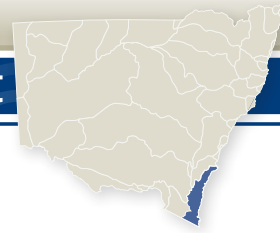
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# contents

What is the purpose of this report? .....	4
Why do we need to monitor water sharing plans? .....	4
What water sharing plans are currently in place? .....	5
What has influenced the water sharing plans' operations in 2009–10? .....	6
What environmental issues are addressed by the water sharing plans? .....	6
What ecological monitoring is occurring? .....	7
Which plan provisions are we monitoring? .....	9
What has ecological monitoring told us so far? .....	9
Socio-economic monitoring .....	10
What ecological monitoring is planned for 2010–11? .....	13
What socio-economic monitoring is planned for 2010–11? .....	13
What is planned for future water sharing plans? .....	13
Future priority needs for ecological monitoring and evaluation activities on the South Coast .....	14
Want more information? .....	15





# Introduction

## WHAT IS THE PURPOSE OF THIS REPORT?

This report provides an update on the monitoring and evaluation activities undertaken in 2009-10 to assess the ecological and socio-economic performance of water sharing plans adopted on the NSW South Coast. It provides an interim assessment of outcomes from the investigations and identifies priority needs for future monitoring and evaluation activities.

## WHY DO WE NEED TO MONITOR WATER SHARING PLANS?

Water sharing plans provide water to meet environmental and socio-economic needs, and spell out the rules governing access to water. The South Coast contains a number of important environmental assets and supports a valuable irrigation industry. Important environmental assets include several threatened species, including a fish (Australian grayling), five frog species (giant burrowing frog, green and golden

bell frog, Littlejohn's tree frog, south bell frog and stuttering barred frog) and eight bird species (Australasian bittern, black bittern, black-tailed godwit, comb-crested jacana, little tern, osprey, regent honeyeater and sanderling) and one endangered ecological community (freshwater wetlands on coastal floodplains). The South Coast rivers are also rich in native fish species and many are home to platypus. There are also 14 national parks and 2 nature reserves located in the area, including South East Forest National Park, Wadbilliga National Park and Deua National Park.

It is important to know whether the water sharing plans are meeting their environmental objectives, so that their effectiveness can be reviewed at the end of their 10-year period of operation. The information collected will be used to make informed decisions on how the plans might be improved when they are renewed. To achieve this, the NSW Office of Water undertakes ecological monitoring and evaluation activities focused on specific clauses and performance indicators within the plans.



**FIGURE 1**

Photo-point monitoring site on Wandella Creek at Motbey Crossing.

## WHAT WATER SHARING PLANS ARE CURRENTLY IN PLACE?

One water sharing plan on the South Coast is currently gazetted, being the Water Sharing Plan for the Wandella Creek Water Source 2003 (Figure 2).

Three more plans are proposed for the South Coast in 2010–11 to cover the Bega Brogo Regulated, Unregulated and Alluvial Water Sources, the Murrah–Wallaga Unregulated and Alluvial Water Sources, and the Towamba Unregulated and Alluvial Water



Sources. More details of these plans can be found on the NSW Office of Water's website [www.water.nsw.gov.au](http://www.water.nsw.gov.au) go to Water Management > Water Sharing Plans.

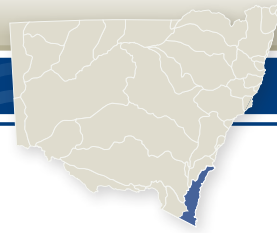
**FIGURE 2**

Location of the current water sharing plan on the South Coast.



## LEGEND

-  Wandella Creek Water Source
-  Major storage reservoirs



# available water determinations

## WHAT HAS INFLUENCED THE WATER SHARING PLAN'S OPERATION IN 2009–10?

### Unregulated rivers – water availability

Annual allocations to all categories of access licences for the Wandella Creek Water Source were 100 per cent, although the low flows in some streams may have meant that not all of this was extractable.

## WHAT ENVIRONMENTAL ISSUES ARE ADDRESSED BY THE WATER SHARING PLANS?

### Unregulated rivers water sharing plans

The Water Sharing Plan for the Wandella Creek Water Sources sets cease-to-pump rules to protect very low flows and daily flow sharing rules to protect a proportion of

flows for the environment. For more information on the water sharing plans visit [www.water.nsw.gov.au](http://www.water.nsw.gov.au) go to Water Management > Water Sharing Plans.

Bega River



# ecological monitoring

## WHAT ECOLOGICAL MONITORING IS OCCURRING?

### Unregulated rivers water sharing plans

The NSW Office of Water established a program to assess the ecological outcomes of the 20 water sharing plans for unregulated water sources that were gazetted in 2004. The first aim of ecological monitoring is to determine whether the environmental objectives of the plans are being achieved.

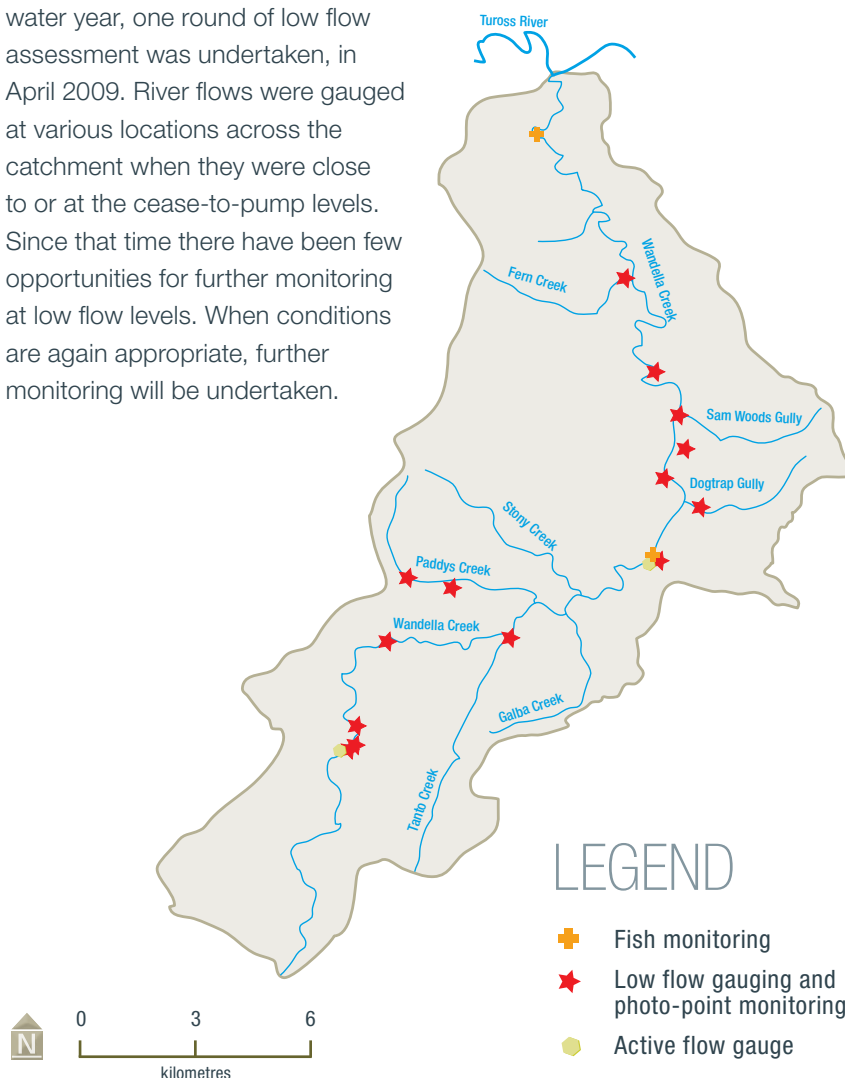
A monitoring program has been established in the unregulated river sections covered by the Water Sharing Plan for the Wandella Creek Water Source. This consists primarily of a field verification study to assess the adequacy of the cease-to-pump levels in meeting the plan's environmental objectives. Initial work has involved the establishment of photo-point monitoring sites (Figures 1, 3 and 4) and an assessment of the catchment hydrology during periods of low flow. Depending on the results of these initial studies, more detailed monitoring of vulnerable

habitats may be undertaken during the life of the plan.

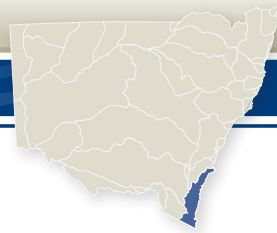
Up to the end of the 2009–10 water year, one round of low flow assessment was undertaken, in April 2009. River flows were gauged at various locations across the catchment when they were close to or at the cease-to-pump levels. Since that time there have been few opportunities for further monitoring at low flow levels. When conditions are again appropriate, further monitoring will be undertaken.

FIGURE 3

Monitoring sites for the Water Sharing Plan for the Wandella Creek Water Source.







Fish sampling has been undertaken as part of the predictive ecological modelling for all existing unregulated water sharing plans. This new

approach will try to determine whether water extraction has impacted the fish communities in the Wandella Creek Water Source. One

round of sampling was undertaken in May 2010, and another was planned for April 2011 at the two locations shown in Figure 3.



**FIGURE 4**

Photo-point monitoring site  
at Fern Gully Creek, April 2009,  
in the Wandella Creek Water Source.



# plan provisions being monitored

## WHICH PLAN PROVISIONS ARE WE MONITORING?

### Unregulated rivers water sharing plans

Water Sharing Plan for the Wandella Creek Water Source

#### Clause 13: Performance indicators

The performance of the plan is assessed against changes in:

- (a) low flows
- (b) moderate to high flows
- (c) the ecological condition of the water source and dependent ecosystems
- (d) the economic benefits derived from water extraction and use.

#### Clause 17: Flow classes for the water source

The sharing of daily flows is based on flow classes set by the plan.

#### Clause 45: Total daily extraction limits

The plan sets a total daily extraction limit for each flow class established in clause 17.

#### Clause 74: Amendment of very low flow provisions

The Minister may vary the very low flow levels set in clause 17 within a small range following field verification that the natural function of pools and natural very low flows are protected.

## WHAT HAS THE ECOLOGICAL MONITORING TOLD US SO FAR?

### Unregulated rivers water sharing plans

Hydrological assessment of very low flows in Wandella Creek Water Source

Flow gauging on 7 to 8 April 2009 indicated very low flows of less than 1 megalitre per day (below the current cease-to-pump level) at some sites in the catchment.

Low flow field observations demonstrated that many sections of Wandella Creek either were dry or had flows that were unmeasurable during April 2009. The lack of flowing surface water habitat could have significant ecological

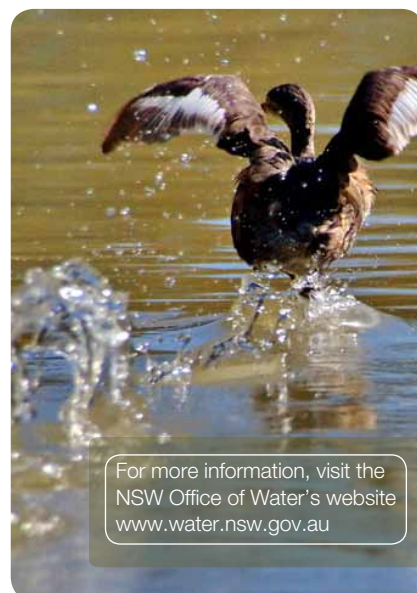


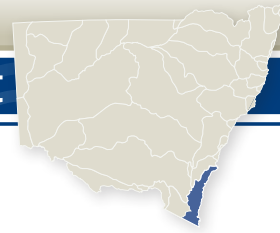
Image courtesy of Tracy Fullford

For more information, visit the NSW Office of Water's website [www.water.nsw.gov.au](http://www.water.nsw.gov.au)

implications in the longer term, but as this occurred during drought, further investigations are required.

The predictive modelling of fish communities is still in progress, and results are yet to be analysed.

Further information on monitoring of unregulated river water sharing plans can be found at [www.water.nsw.gov.au](http://www.water.nsw.gov.au) go to Water Management > Monitoring > Unregulated Rivers.



# Socio-economic monitoring

In 2005, the NSW Office of Water began a statewide project to monitor changes in the NSW irrigation industry following the introduction of water sharing plans. The project is designed to:

- monitor key social and economic changes at the farm and regional levels arising from water sharing plans
- provide data for the NSW Office of Water's review and evaluation of water sharing plans
- provide data for the Natural Resources Commission's review of water sharing plans
- provide a benchmark for other economic and social monitoring exercises in natural resource management.

The project was developed after extensive consultation with stakeholders, including the NSW Irrigators' Council and the Primary Industries and Economic Development Standing Committee of the NSW Natural Resources Advisory Council.

The project reports on changes in a number of identified social

and economic indicators. The data are primarily collected in a 20-minute telephone survey of irrigators who respond to an invitation to participate. A sample size of approximately 10 per cent of eligible irrigators is targeted for each survey. Additional customised data from the Australian Bureau of Statistics' agricultural census are also used.

The first of the surveys, in 2006, targeted irrigators in areas where the first 31 water sharing plans were implemented in July 2004. These plans included all major regulated rivers in NSW, and represented approximately 80 per cent of the extractive water use in NSW. The 2006 survey collected baseline data reflecting the socio-economic conditions of farms in these areas.

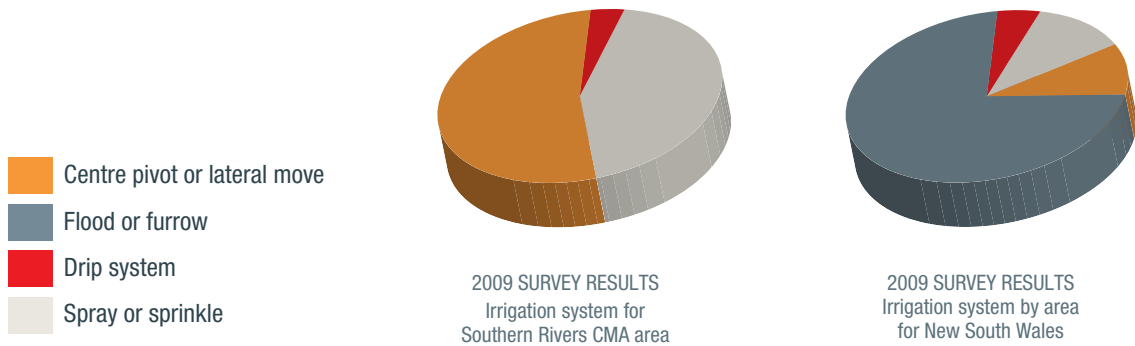
For reporting purposes, the results of the irrigation surveys are tabulated by catchment management authority (CMA) areas. The South Coast data are reported for the larger Southern Rivers CMA area, which includes parts of the Greater Metropolitan Water Sources.

The 2006 survey included only two water sharing plan areas from the South Coast and Greater Metropolitan catchments, covering Wandella Creek and the Kangaroo River water sources. The survey included 15 responses from a population of 82 irrigators. Because of the small sample size, it was not possible to report separately on each catchment for the 2006 survey.

In 2009, the survey targeted irrigators in areas where water sharing plans were implemented after 2004. This survey covered irrigators whose water sources are predominantly unregulated rivers or major inland groundwater systems and represented approximately 20 per cent of the extractive water use in NSW. The 2009 survey covered 10 water sharing plan areas in both catchments:

- Bega River Regulated, Unregulated and Alluvial Water Sources
- Clyde/Jervis Unregulated and Alluvial Water Sources
- Tuross River Unregulated and Alluvial Water Sources

**FIGURE 5** Proportions of irrigation systems used by respondents in the 2009 survey in the Southern Rivers CMA area and statewide.

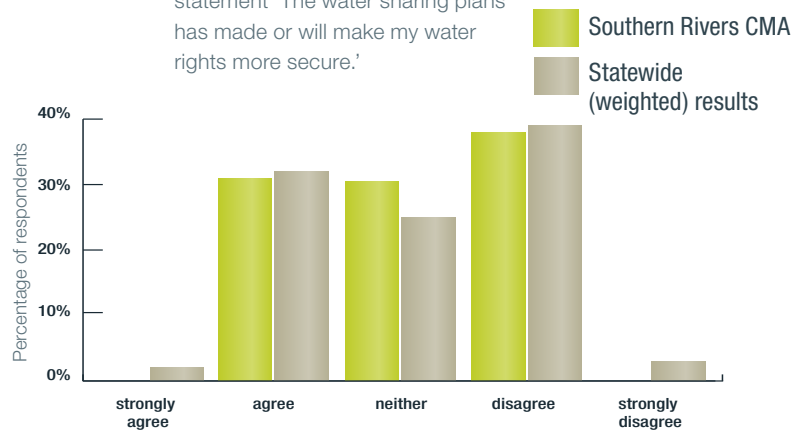


Source: 2009 Irrigators survey, NSW Office of Water 2010.

- Murrumbidgee Unregulated and Alluvial Water Sources
- Towamba Unregulated and Alluvial Water Sources
- Deua Unregulated and Alluvial Water Sources
- South Coast Groundwater Water Sources
- Snowy–Genoa Rivers Unregulated and Groundwater Water Sources
- Greater Metropolitan Region Unregulated Water Sources (excluding the Hawkesbury–Nepean Water Sources)
- Greater Metropolitan Region Groundwater Water Sources (excluding the Hawkesbury–Nepean Water Sources)

The 2009 survey population in the Southern Rivers CMA area was 1,133, with a total entitlement of 88,741 megalitres. There were 123

**FIGURE 6** 2009 survey response to the statement 'The water sharing plans has made or will make my water rights more secure.'



Source: 2009 Irrigators survey, NSW Office of Water 2010.

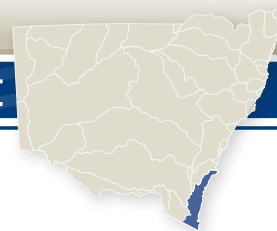
responses to the survey, representing an entitlement volume of 8,906 megalitres or approximately 10 percent. The 2009 survey showed:

- The median irrigation farm size was 47 hectares, with a 25th to 75th percentile range of 17 to 150 hectares. The statewide median was 81 hectares (25th to 75th percentile range 28 to 81 hectares)

■ Figure 5 shows the types of irrigation systems in the Southern Rivers CMA area and compares them with the statewide results

■ Figure 6 shows the irrigators' responses to the statement 'The water sharing plan has made or will make my water rights more secure'



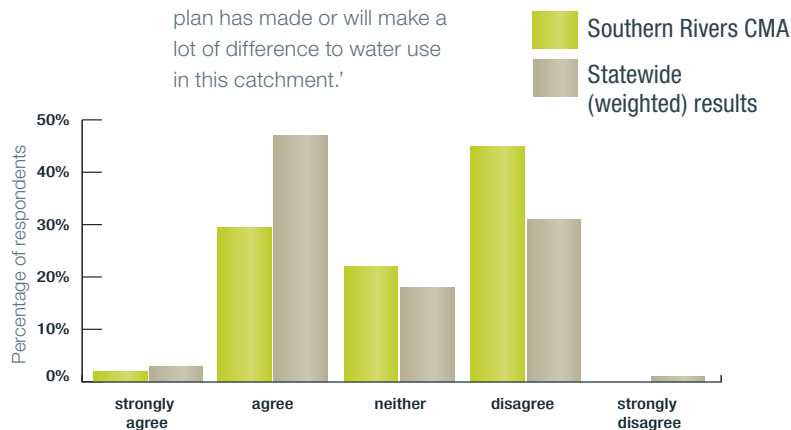


- Figure 7 shows the irrigators' responses to the statement 'The water sharing plan has made or will make a lot of difference to water use in this catchment'
- Irrigators derived 23 per cent of total farm income from irrigated crops and pastures. The statewide average was 30 per cent
- 43 per cent of irrigators employ non-family members on the farm. The statewide average was 45 per cent
- Full-time employment of family and non-family members (excluding casuals) per irrigation farm was 1.7 equivalent full-time (EFT) positions. The statewide average was 2.1 EFT positions
- The ratio of water entitlement to EFT employee was 50 megalitres entitlement per EFT employee. The statewide ratio was 136 megalitres entitlement per EFT employee
- 6 percent of irrigators had used their water entitlement as security for a loan. The statewide average was 17 percent.

Detailed reports of the 2006 and 2009 surveys are available at [www.water.nsw.gov.au](http://www.water.nsw.gov.au)

**FIGURE 7**

2009 survey response to the statement 'The water sharing plan has made or will make a lot of difference to water use in this catchment.'



Source: 2009 Irrigators survey, NSW Office of Water 2010.



An abundance of life in the waters of Clyde River

# monitoring plans for 2010-11

## WHAT ECOLOGICAL MONITORING IS PLANNED FOR 2010-11?

### Unregulated river water sharing plans

Photo-point monitoring and low flow gauging will be repeated should suitable low flows occur. Analysis of the predictive modelling for fish communications is continuing.

## WHAT SOCIO-ECONOMIC MONITORING IS PLANNED FOR 2010-11?

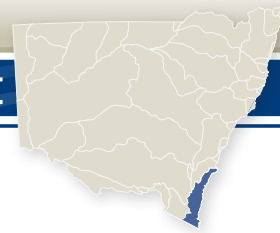
The NSW Office of Water commissioned the Australian Bureau of Statistics to customise the 2006 agricultural census data to the water sharing plans' boundaries and related water sources. The data will be used to ground-truth components of the survey data set. They will also provide additional socio-economic data to be used to monitor the performance of plans against their stated objectives.

The third of the planned series of irrigator surveys was undertaken in 2010, targeting the irrigators surveyed in 2006. The results will be compared against the benchmark surveys, and will be used to report against the water sharing plans' performance reporting requirements.

## WHAT'S PLANNED FOR FUTURE WATER SHARING PLANS?

Six additional water sharing plans covering the South Coast are currently being developed for:

- Clyde Unregulated and Alluvial Water Sources
- Bega Brogo Regulated, Unregulated and Alluvial Water Sources
- Murrah-Wallaga Unregulated and Alluvial Water Sources
- Towamba Unregulated and Alluvial Water Sources
- Tuross Unregulated and Alluvial Water Sources
- Deua Unregulated and Alluvial Water Sources.



## FUTURE PRIORITY NEEDS FOR ECOLOGICAL MONITORING AND EVALUATION ACTIVITIES ON THE SOUTH COAST?

In accordance with Macro Water Sharing Plans - the approach for unregulated rivers. Report to assist community consultation, 2nd Edition (DWE 2009; available

at [www.water.nsw.gov.au](http://www.water.nsw.gov.au)), high-priority water sources are identified as being at high risk to instream environmental value by water extraction.

During the development of the water sharing plans for the Clyde Unregulated and Alluvial Water Sources, the Bega Brogo Regulated, Unregulated and Alluvial

Water Sources, the Murrumbidgee Unregulated and Alluvial Water Sources, the Towamba Unregulated and Alluvial Water Sources, the Tuross Unregulated and Alluvial Water Sources, and the Deua Unregulated and Alluvial Water Sources, a number of high-priority water sources were identified in Table 1.

**TABLE 1** Identified high-priority water sources on the South Coast.

WATER SHARING PLAN	WATER SOURCE
Bega Brogo Regulated, Unregulated and Alluvial Water Sources	Bega River (mid Bega River)
	Brogo River
	Wolumla Creek
	Candelo Creek
	Tantawangalo Creek
	Sandy Creek
	Bemboka River
Murrumbidgee Unregulated and Alluvial Water Sources	Murrumbidgee River
	Upper Murrumbidgee River
	Narira Creek
Deua Unregulated and Alluvial Water Sources	Deua River
	Araluen Creek
Towamba Unregulated and Alluvial Water Sources	Pambula River (Pambula Lake)
Tuross Unregulated and Alluvial Water Sources	Tuross River
	Bumbo Creek
	Swamp Creek



Information on water sharing plans and socio-economic assessment is available at [www.water.nsw.gov.au](http://www.water.nsw.gov.au) go to Water Management > Monitoring.

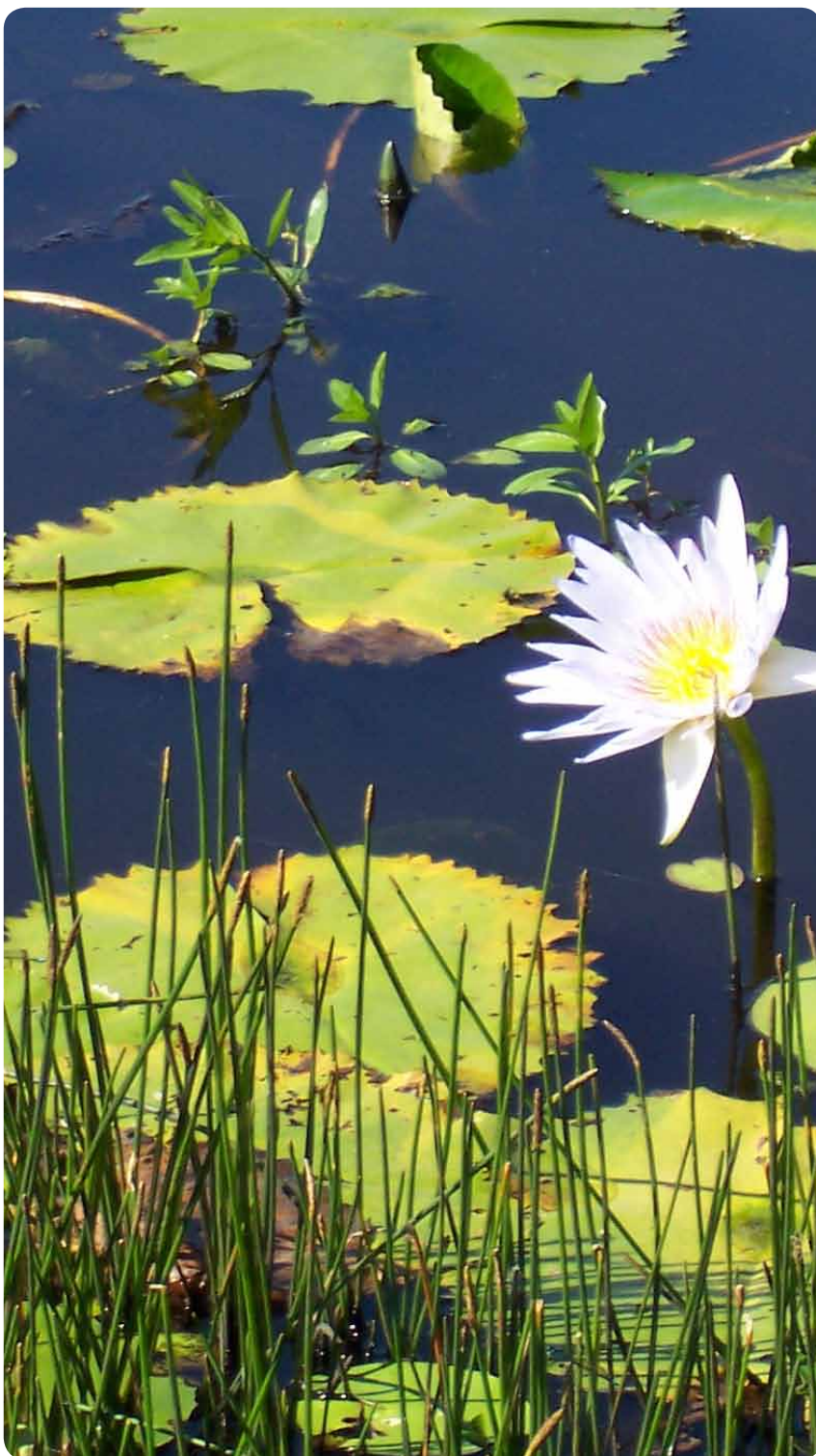


Image courtesy of Nick Cook