Assessing the effects of water sharing plan rule changes

There are currently 56 water sharing plans in force under the Water Management Act 2000*. A number of these are currently being reviewed for consistency with the Basin Plan 2012, or as required under the Act.*

For those plans being reviewed, rule changes may be proposed to:

- meet environmental and other water management objectives
- address potential or emerging risks to water resources
- align plans with advances in scientific understanding
- meet changes in legislative requirements or in the operating environment.

Types of effects

We can group the potential effects of proposed rule changes into social, environmental, economic or cultural effects. These groupings will often overlap. For example, social effects—be they positive or negative—often flow from economic effects. Likewise, social, cultural and even economic effects can be associated with environmental effects.

Examples of the types of effects in each group are:

- **Social**—effects on tourism, recreational water uses, local community amenity values
- **Environmental**—effects on fish, riparian areas, threatened species conservation, wetlands
- **Economic**—effects on floodplain and irrigated agricultural industries such as cotton production, employment
- **Cultural**—effects on cultural heritage sites, Aboriginal use of water for cultural purposes, health and wellbeing.

Effects can vary in nature and can be:

- positive (for example, healthier waterways) or negative (for example, reduced employment)
- tangible (for example, effects on agricultural productivity) or intangible (for example, effects on community cohesion)
- direct (for example, a reduction in water availability) or indirect (for example, the social benefits of tourism)
- quantifiable, partly quantifiable or only able to be described qualitatively.

These effects are also experienced differently by different people or groups within the community or by different communities, and perhaps at different times and stages of the implementation of the rule change.

Effects can also be felt in connect water sources, such as those downstream of the area where the rule changes will apply.

Process for assessing the effects of rule changes

The NSW Department of Industry takes an iterative approach when developing the preferred options for changes to water sharing plan (WSP) rules. The process involves analysing options to deliver water management objectives, including an initial analysis of changes to the quantum and pattern of water availability for extractive and non-extractive uses. The social, economic, environmental and cultural effects of the changes are then identified and assessed (see Figure 1).

Various analytical tools and other assessment techniques are used, including water modelling and assessments, stakeholder and community engagement and feedback, ecological assessments and socio-economic analysis.

Where rule changes are likely to have significant negative effects, cost-benefit analysis can be used to further evaluate the effects of options being considered.

Consultation with the community and stakeholder groups is important when assessing the socio-economic, cultural and environmental effects of change in water management regimes. Consultation helps identify potential issues, differing values, opportunities and constraints, and available alternatives at a water plan area level. It means local knowledge and the views of those affected can inform the decision-making process.

The process outlined in Figure 1 and the following sections assists in planning, informs decision-making on proposed rule changes, and helps identify appropriate strategies to manage or minimise negative effects.

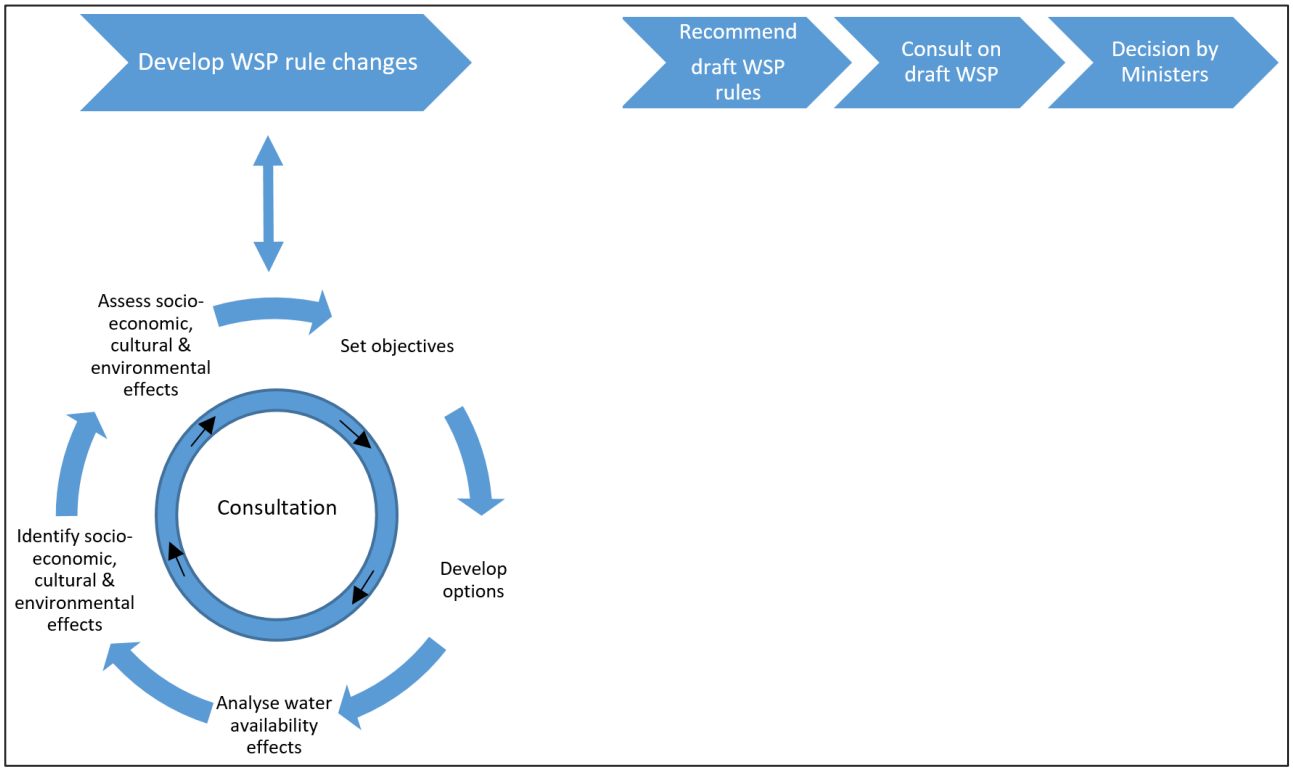

Figure 1. Process for assessing effects of rule changes under water sharing plans.

Step 1. Develop water sharing plan rule changes

Potential rule changes are developed through an iterative process that considers the potential environmental, social, cultural and economic impact of the change.

Set the objectives

The objectives for water management must be consistent with legislation, regulatory and policy settings, and interstate agreements (for example the *Basin Plan).* Objectives are developed based on expert advice with input from the community through consultation and engagement processes.

For example, the Natural Resources Commission conducts a review of water sharing plans prior to their ten year expiry period to assess plan performance against objectives. This review includes stakeholder consultation and considers where changes may be required to improve environmental, social and economic outcomes of the plan.

Generate management options to meet objectives

Possible options (rule changes or other options) are identified to meet the objectives or targets. More than one management option is generally identified for each element under consideration to ensure that an adequate range is considered.

Generating options involves taking into account the social, economic, cultural and environmental objectives in the water plan area, and in some cases between areas.

This step generates a range of options and provides the foundation for subsequent socio-economic, cultural and environmental assessment. Options are developed in consultation with the community and other stakeholders and subject matter experts.

Assess the effects of options on water availability

The first step of any analysis of options is to look at the 'water' effects. That is, how do rule change options change the water available for consumptive uses and instream values?

Using existing water sharing plan rules as the base case, the water effects of options will be assessed. This process includes:

- **assessing the effects on long term average annual use**
  Does the proposed change affect the long term availability of water for use and, conversely, the amount of water left in the water source over the long term?

  Water modelling is often used to measure effects on water availability over the long term, for example the period of climate record. Effects are measured from 'whole of water source' and licence category or rights perspectives, not from each individual user's perspective.

- **assessing changes in the timing and pattern of water for use.**
  Does the proposed change affect when and how much water can be used by particular categories of licence holders or other rights holders and, conversely, the timing and pattern of water left in the water source?

  Water modelling can be used to quantify the effects of rule changes on the pattern of water flows over a number of time scales and flow conditions (e.g. annual, seasonal, event-based, flow ranges). Again, the effects of these changes can be viewed from the perspectives of extractive water users (including basic landholder rights, town water supply, and different categories of licences); cultural water values and water for the environment. Geographically differentiated effects may also be considered.

Identify and assess the socio-economic, cultural and environmental effects of rule change options

Once the water availability effects of potential water management rule change options have been identified, the likely socio-economic, cultural and environmental effects need to be considered.

Socio-economic, cultural and environmental effects of potential options are identified through interagency, community and stakeholder engagement. In order to understand the effects, it is necessary to get the views of a broad range of representatives, including extractive water users, Aboriginal and environmental groups and others.

Engagement mechanisms employed by the department include:

- interagency working groups
- stakeholder advisory panels
- public consultation
- targeted stakeholder consultation
- expert opinion.

The aim is to understand the nature of the effects of the different options, and how these effects are expected to be distributed in the plan area and between plan areas.

The assessment of options against identified objectives may involve two phases—preliminary assessment and detailed assessment.

The preliminary phase assesses the identified impacts and further defines the characteristics of the different options. This process should help to determine if the socio-economic, cultural or environmental effects are significant. Where this is the case, a more detailed examination should follow.

The preliminary assessment principally involves a qualitative comparison of the relative effects of the options, using current management rules as a baseline, and is informed through consultative processes.

Where this qualitative assessment indicates effects may be significant, a more detailed examination of socio-economic, cultural and environmental effects should follow. This may involve a more detailed cost-benefit analysis of rules, or combinations of rules.

Assessing options—cost-benefit analysis

Cost-benefit analysis helps decision-makers in government compare options and identify the best means to improve social welfare. The *NSW Guide for Cost Benefit Analysis*, which you can download from treasury.nsw.gov.au/finance-resource/guidelines-cost-benefit-analysis, promotes a consistent approach to undertaking cost-benefit analysis. The guidelines help evaluate all feasible options to achieve policy objectives. The guide states that:

'Cost-benefit analysis (CBA) is an evidence based method for systematically organising and presenting information to help government understand all the impacts of policies and projects, including economic, social and environmental impacts. CBA helps decision-makers identify the best means to improve social welfare and assess competing proposals.'

Cost-benefit analysis provides a framework for considering the social, economic, cultural and environmental impacts to the community (net gain or loss) of proposed water sharing plan rule changes and how the impacts are distributed through the community (who is better or worse off and by how much). Both quantitative and qualitative data are used to measure and account for these impacts.

Step 2. Draft recommendations on the package of rule changes based on evidence gathered

Recommendations of the package of rule changes are incorporated into a draft water sharing plan. The justification for each proposed change will:

- provide a rationale for the recommendation, including supporting information such as water modelling, qualitative feedback from consultation or results of any cost benefit analysis
- address any legal requirements for making the decision.

Step 3. Consult on proposed rule changes/draft water sharing plans

The public exhibition of draft water sharing plans provides water users and the public the opportunity to make submissions in relation to the proposed changes.

Step 4. Decision by ministers

New water sharing plans or amendments are made by the Minister for Regional Water, with concurrence from the Minister for the Environment. A summary of the assessment of the socio-economic, cultural and environmental effects of changed water management arrangements will be provided to the Ministers to allow them to take due regard of the potential effects. Ministers will also be given information about feedback from any consultation that has occurred.

Example assessment

Table 1 shows the process as it has been applied to the first flush rule options for inclusion in an amended Water Sharing Plan for the Barwon-Darling Unregulated River Water Source, and in the Barwon–Darling Watercourse Water Resource Plan.

Table 1. Example of assessment process—Barwon–Darling first flush option.

Process steps	Example
1. Develop rule changes	Barwon Darling first flush rules
a. Set the objectives	To better manage the resumption of flows after an extended dry period to help maintain ecological assets during critical times, improve longitudinal connectivity between refuge pools, and deliver downstream social and cultural benefits.
b. Generate management options to meet objectives	A number of options were developed and tested with stakeholder advisory panels and the Interagency Working Group. Each option had a number of scenarios.
c. Assess the effects of options on water availability	Hydrological modelling of first flush options was undertaken to identify what components of the options are having an effect and identified thresholds where: • there were potential improvements in instream outcomes likely (e.g. degree of change in events or days when flows would not be permitted to be pumped) and • potential impacts on existing entitlement holders (degree of change in events or days when flows would not be permitted to be pumped) were likely to be acceptable or unacceptable. The modelling looked at specific examples of how flows would be altered by first flush protection schemes. The modelling was undertaken to look at impact on flows at a number of scales: • the long term (period of record) • annual changes • event based changes The modelling investigated changes in the total events, total days, average and median days per event and average and median gaps between events when pumping would be restricted under each option. The modelling also looked at a range of metrics to understand changes to volumes and timing of entitlement holder access and how those changes may alter the timing and total area of cropping. No Planned Environmental Water (PEW) impacts were identified at a conceptual level for the options. If a negative impact is subsequently identified, more detailed modelling will be done. If a negative impact on planned environmental water is likely, these options will be excluded.

Process steps	Example
d. Identify and assess socio-economic, cultural and environmental effects of options	The options for the Barwon–Darling first flush rule are being developed through the environmental water interagency working group and the Barwon–Darling Stakeholder Advisory Panel. Informed by the modelling, this process identifies the potential socio-economic, cultural and environmental effects of the first flush rule options. It is also the process by which the preliminary assessment of these effects is undertaken. To assist the assessment of the rule change options, a more detailed cost-benefit and socio-economic analysis of the short-listed options for the first flush rule is being undertaken. This analysis will include assessment of: • **Economic costs**—including the impact that proposed changes to water sharing plan rules will have on irrigated agricultural production in the Barwon–Darling and downstream • **Environmental benefits**—including improvements to environmental quality, protection of native fish and improvements in river health • **Cultural benefits**—work done as part of NSW Department of Industry's Nation by Nation consultation and other programs will be examined to identify and consider the water-dependent values and uses of First Nations people in the Barwon–Darling • **Social benefits**—benefits that improved environmental or waterway condition provides to communities. These could include improvements to societal and economic outcomes for local residents, better physical and mental health from access to water-based activities, and recreational and tourism values.
2. Draft recommendations on rules	The development and assessment of water sharing plan rules will be finalised in the first half of 2019, and the proposed final package of rules will be included in the draft water resource plan and draft water sharing plan for the Barwon–Darling.
3. Consult on proposed rule changes/draft plan	Drafts of the Barwon–Darling Watercourse Water Resource Plan and a new Water Sharing Plan for the Barwon–Darling Unregulated River Water Source will be formally placed on public exhibition in the second half of 2019. Public consultation meetings will be held and submissions sought.
4. Decision by ministers	A summary of the assessment of the socio-economic, cultural and environmental effects of changed water management arrangements will be provided to the ministers to allow them to take due regard of the potential effects.