

# Research and Development Fact Sheet

## Ecological Risk Assessment

### Target Problems:

While there has been much investment in researching the on-farm and downstream environmental impacts of irrigation in the past, little attention has been given to considering irrigation in a whole catchment context. Irrigators in particular are realising that not only does irrigation affect the surrounding environment but also that other catchment users and practices affect them. We need to know how irrigation activities interrelate with wider catchment processes, with the aim of minimising environmental impacts, raising awareness of unforeseen impacts and enhancing irrigation and catchment sustainability.

This can be achieved by using an ecological risk assessment (ERA) process. This is a relatively new technique that holds promise as a quantitative method for assessing the level of risk to the health of river ecosystems posed by multiple stressors (eg development of irrigation systems can stress the riverine environment by removing water, changing flow regimes and altering salt and nutrient flows in rivers). Risk assessment is a general term used to describe the array of methodologies and techniques concerned with estimating the likelihood and consequences of undesired events (e.g. an algal bloom; reduction in fish diversity).

The ERA process provides information about key risks and can be used to objectively develop strategies to address these risks (that is, to determine those management activities that will give the most improvement for a given investment).

### Project Outline:

An ecological risk assessment (ERA) research project has been set up by NPIRD (National Program for Irrigation Research and Development) to develop and test a generic framework for assessing the ecological risks associated with irrigation systems. The framework development and partial testing will be done by working with three case study irrigation systems – the Goulburn-Broken, the Ord (WA) and the Fitzroy (Qld).

The project will be implemented in three phases:

1. Problem formulation - identify likely ecological risks associated with irrigation systems and what is known about these risks
2. Further investigation - undertake specific studies to gather specific information required to complete the detailed ERA in phase 3
3. Detailed ecological risk assessment.

Another phase, to document the process and write up the generic framework runs parallel with the above three phases.

## Expected Outcomes:

The expected outcomes are as follows:

- Better understanding of the key ecological impacts of irrigation systems
- Development of a rational basis for prioritising activities to address ecological risks
- Development of a generic ecological risk assessment framework that can be applied to a range of irrigation systems.

## People Involved:

Project Manager :

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## Participating Organisations:

Goulburn-Murray Water is undertaking this project in close collaboration with the CRC for Freshwater Ecology. Technical and community input is also provided by the Goulburn Broken Catchment Management Authority.

## Technical Aspects:

Phase 1 of the project has been completed and a report prepared. This involved developing a list, and brief description, of likely ecological consequences (the risks) of development in the catchment on which irrigation is likely to have a significant impact. This list was developed at a workshop with relevant catchment stakeholders.

Priority ecological consequences identified included increased occurrence of blue-green algae (eutrophication); reduced native fish abundance and diversity (fish kills); spread of aquatic pest plants and animals; loss/decrease in structure and function of terrestrial/floodplain vegetation communities.

Conceptual models for each of these ecological consequences have been developed. A qualitative ranking of these consequences was undertaken based on its importance in the catchment, the impact of irrigation, the probability of the consequence occurring and the scientific knowledge of the consequence. The ranking will be undertaken quantitatively when better data is assembled.

Finally, knowledge gaps for each consequence have been identified. These knowledge gaps can be addressed in Phase 2 of the project.

It is proposed that Phase 2 activities will be undertaken over the next 1 to 2 years.

### ***For Further Information Please Contact:***

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