NATIONAL PROGRAM FOR Sustainable Irrigation

factsheet

Irrigation Ecological Risk Assessment Project

Irrigated agriculture is a major contributor to the economic and social well being of Australia. Each year it produces around $10 billion of agricultural output or 50% of the country's net agricultural profit.

However, the sustainability of this important activity is currently under serious challenge. Irrigation uses 75% of the water extracted from Australia's rivers and groundwater systems. It also contributes to the pollution load in these rivers.

In response to these challenges, National Program for Sustainable irrigation (NPSI) has established an *Ecological Risk Assessment Project* (ERA), the overall objective of which is to develop a generic framework for assessing the ecological risks associated with Australian irrigation systems.

This new decision support tool should help the Australian irrigation industry quantify and prioritise the ecological risks from their activities, and better focus management actions to minimise these risks. This information should also provide ways for regulatory authorities (such as environment protection authorities) to better determine what needs protection and to use this as the basis for licensing and monitoring requirements.

THE PROJECT

The project has four components, as follows:

- a coordinating linkage project being run by the Water Studies Centre (WSC) and CRC for Freshwater Ecology at Monash University
- three case studies located in irrigation regions on the Goulburn-Broken, Ord and Fitzroy rivers.

The key players involved in the case studies are:

Goulburn-Broken – Monash University, CRC for Freshwater Ecology and Goulburn Murray Water

Ord – Edith Cowen University and Rivers & Water Commission

Fitzroy – Central Queensland University and Department of Natural Resources & Mines.

The project is being undertaken in three phases.

Phase 1. This phase focused on problem formulation and was completed in mid 2001.

Phase 2. Undertaking further detailed investigations designed to provide specific information on key issues identified in Phase 1 is currently underway under Phase 2. A brief progress report on these activities is given below.

Phase 3. This final phase of developing the ERA protocol will be completed in 2004.

PROGRESS

A-two-day workshop was held at WSC Monash University in Melbourne on 17 and 18 June 2002 to review progress to date. The workshop had three objectives, as follows:

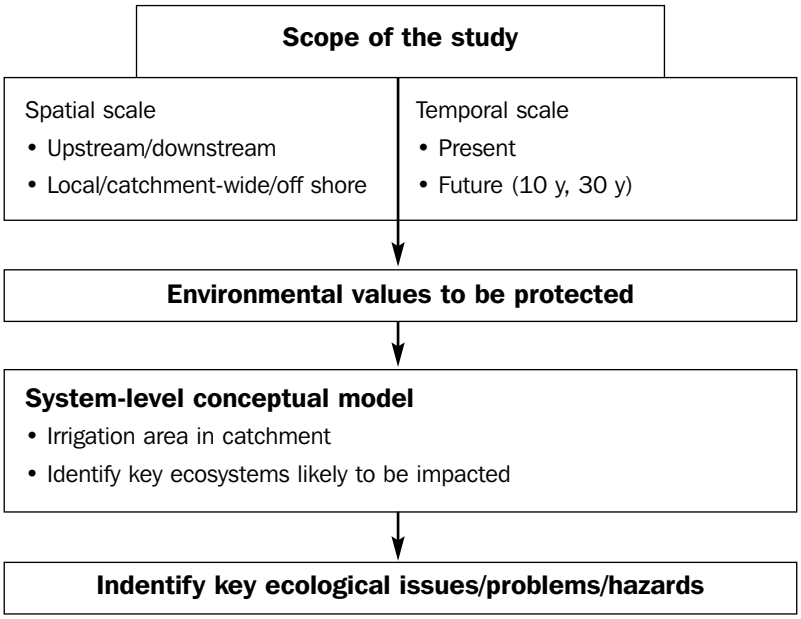
- to review the processes used and outcomes from Phase 1
- to review the progress of the Phase 2 case study investigations
- to review the very preliminary draft ecological risk assessment protocol being developed for Australian irrigation regions.

A report on the workshop outcomes is available on the NPSI and WSC websites.

Review of the problem formulation process

The steps involved in identifying the key ecological issues associated with each of the irrigation regions are shown in Figure 1. This process was derived from overseas protocols and the combined experience of the linkage team and the case study teams. The procedure has evolved over the 3 years that the NPSI ERA project has been underway, and is likely to be changed further before the final irrigation ERA protocol is completed.

Fig. 1: Problem formulation & hazard assessment



For all three case studies, stakeholder involvement (through workshops) was an essential component in deriving the key ecological issues.

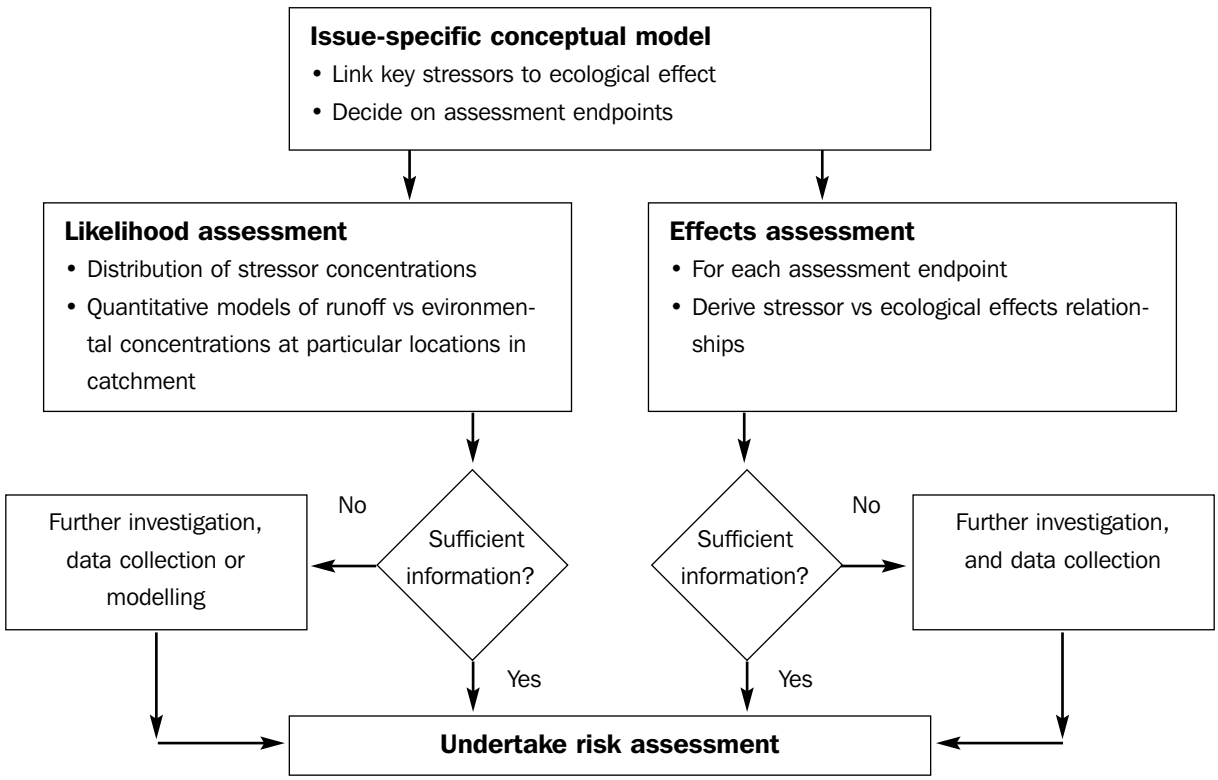
Once the list of key ecological issues relevant for a particular irrigation area is produced, it is then necessary to decide what information is needed to assess its risk. The information needed will generally involve (a) that related to the likelihood (probability) that an effect will occur, and (b) that related to assessing the consequences of an effect should it occur.

Figure 2 shows the steps involved in identifying the information needed to assess the risk to each of the key ecological issues identified.

In many cases, likelihood or effects information or both will be lacking, and more investigations will be required to gain this information. In those cases where it is not possible to do an investigation to generate the required new knowledge, it is important that the issue is not dropped from the list. In these cases it should be recorded that the risk cannot be estimated because of a lack of information.

Our experiences with this stage of the problem formulation process have been mixed. The workshop reviewed the process used to identify what we sought to achieve, what worked, what did not work and how we might have run these workshops differently to achieve better outputs.

Fig. 2: For each key issue



Further investigations program (Phase 2)

The Phase 1 studies identified a small number of priority ecological issues associated with irrigation in each of the three regions. In Phase 2, each of the case study teams is doing a detailed ecological risk assessment (including extra work where this is necessary) of the priority issues.

These assessments are now underway and progress was reviewed at the workshop. The reviews found the following:

Goulburn-Broken irrigation region

The Goulburn Broken team identified two ecological issues chosen for detailed risk assessment:

- the influence of irrigation on the abundance and diversity of native fish in the Goulburn River
- the influence of irrigation on the occurrence of blue-green algal blooms in the river.

Research into both these issues is currently underway.

Ord irrigation region

The Ord team identified two ecological issues for detailed risk assessment:

- influence of irrigation (and associated eutrophication) on biological diversity in the Ord River (to be determined by measuring changes in the macroinvertebrate populations),

- influence of irrigation on the occurrence of blue-green algal blooms in the lower Ord River and further downstream in the Ord estuary (this being undertaken in collaboration with CSIRO Land & Water).

Both these research projects have recently started.

Fitzroy irrigation region

The major ecological issue identified by the Fitzroy team for detailed risk assessment was the influence of irrigation runoff on biological diversity in the Dawson River. This is being determined by measuring changes in the macroinvertebrate populations.

This research project is currently underway.

A summary of what is being done in each of the projects is available from the WSC website (www.wsc.monash.edu.au/sresearch.htm).

MORE INFORMATION

For more information contact the following:

Professor Barry T Hart, Water Studies Centre, Monash University
<barry.hart@sci.monash.edu.au>
Murray Chapman, NPSI Program Coordinator <rplan@benalla.net.au>

or go to websites: <www.wsc.monash.edu.au> and <www.npsi.gov.au>