RESOURCE MANAGEMENT

Development of a riparian zone decision support system for production forest environments

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"RIPARIAN ZONES" are strips of land adjacent to streams, lakes and wetlands which separate them from the main part of the catchment. Appropriate management of the riparian zone can help avoid adverse effects caused by activities in the catchment on the water quality, habitat and stream life within the watercourse.

In early 1997, through publications and workshops, end-users including the forestry industry, regional councils and the Department of Conservation identified riparian zone management as an issue of moderate-to-high priority, as a research gap, and as a high priority for technology transfer in relation to forest productivity.

Work with end-users

Since mid-1997, Forest Research, NIWA and Liro have been working with end-users to assess the issues facing industry in riparian management. This has involved a questionnaire, a series of workshops, and an international literature review and bibliography summarising the current state of knowledge of riparian management in production forest environments. The aim is to provide a basis for developing a riparian zone decision support system for production forest environments.

Decision support systems (DSS) are structured systems designed to provide information and/or analytical tools to assist effective and efficient decision-making. They may include texts, guidelines, field checklists, decision trees and/or computer programs (e.g.,

spreadsheets, databases, expert systems).

Preliminary work on the riparian zone DSS has been based on responses to the questionnaire sent out to interested parties and potential end-users of a DSS, and on written and verbal input from industry representatives.

Approximately 140 questionnaires were sent out. Sixty-nine were completed and returned. Key findings were:

- Over 80% of respondents thought that there was a need for a DSS.

- Over 90% of respondents rated as "very important" the need to include in a DSS the ability to answer "When is a riparian buffer required?"

- The inclusion of *procedures* for identifying environmental values and design options was also rated as very important.

- *Values* considered high priority for inclusion in a DSS (greater than 80% of respondents) were water quality, aquatic ecosystems and downstream effects. (See graph below.) These would often be site-specific.

- Over two-thirds of respondents wanted both broad guidelines and detailed information in a DSS. Less than 40% thought the system needed to be computerised.

A strong concern from end-users was that any DSS should allow the inclusion of site-specific factors and

clearly identified management objectives.

Two workshops for potential end-users of a DSS were held in December 1997 in Rotorua and Christchuch. The main points raised were:

- Riparian zone management must be seen in the context of forest management.

- Riparian management is one of several tools available to minimise impacts.

- Defining values to be protected in a particular catchment is of key importance.

- Another key issue is how best to manage sites being afforested to allow development of desirable riparian attributes.

- Information needs to be easy and quick to read.

- Recommendations for riparian management practices should be simple.

- In regard to the presentation of a DSS, reports and training were seen as the most important modes. Interactive computer packages were not identified as a priority.

- Fundamental knowledge and management options were picked as the most important types of information required.

- Most potential end-users of a riparian zone DSS thought the research should focus on functions of riparian zones (e.g., sediment trapping, bank stability, instream factors) and management practices.

Progress

Research into the functions and management of riparian zones will be necessary to fill many of the information gaps. The study has received a further two years of funding to carry out some of this research which will include:

- measuring the effects of slope and vegetation on the sediment trapping ability of riparian areas;

- determining effects of riparian vegetation on stream life.

To guide the on-going development of the DSS and the new research, an end-user working group has been formed. It comprises representatives of the forest industry, farm forestry, regulatory authorities, Department of Conservation, Ministry of Agriculture and Forestry, and the Forestry Environment Research Group.

Completion of the riparian DSS is expected to take several years. An outline structure is now under review by the end-user group and will be finalised over the next year. Research to provide information for the DSS will begin shortly. ∎

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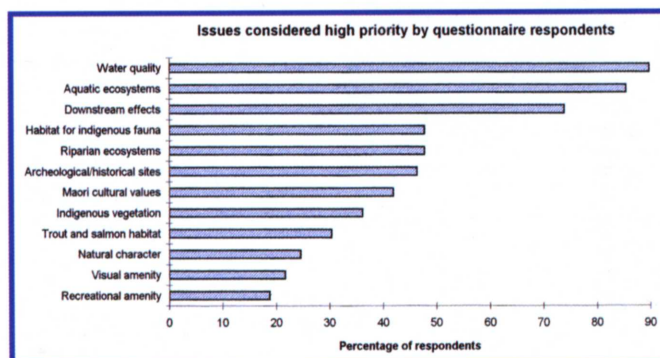
Photographs

top: *Riparian vegetation left alongside streams during harvesting can provide shade that helps control water temperature changes and algal growth, and maintain inputs of leaf litter for the aquatic food web.*

far left: *An example of precautions taken by a forestry company to prevent damage to a sensitive riparian area.*

Issues considered high priority by questionnaire respondents

Water quality
Aquatic ecosystems
Downstream effects
Habitat for indigenous fauna
Riparian ecosystems
Archeological/historical sites
Maori cultural values
Indigenous vegetation
Trout and salmon habitat
Natural character
Visual amenity
Recreational amenity

Percentage of respondents