

RIVER FLOW MODEL

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The aluminium river model is used for various groups to discover the ways rivers flow, how they are changed by agricultural land use and how they should be managed.

The model was developed after it became apparent that many restoration courses involved numerous PowerPoint, overhead and lecture presentations that often left participants feeling overwhelmed by the amount of information they felt they had to absorb. For many people this is a satisfactory way to learn but there are those of us who learn best by seeing, touching and discussing. In other words being involved. The model exposes people to common situations they can identify with and make the processes of restoration and management clear. Each section is two metres long and 80cm wide. We generally use four sections (eight metres) but have used six sections at major shows (twelve metres).

During early stages of the model development about four years ago, a six metre by two metre length of black plastic was used on sloping ground to simulate stream flows. This was cheap and very successful but it was not possible to use this when the site was level.

An adjustable model was required so various degrees of slope could be used to change velocity so average and major flows can be demonstrated. Changing slope also allows the group to simulate situations of waterlogging and salinity (dryland and wetland). To make the model more appealing to adults a raised model was more appropriate as it is at waist level. A raised model is also more appealing at public displays.

The model which uses various amounts and types of soil provides a tool that allows groups to discover how problems are caused in waterways and the restoration principles suitable to solve them. A hose is used to provide flowing water which can be adjusted to represent different amounts of flow. At shows water is recycled via a pump setup.

The model can demonstrate 19 different issues and a user's handbook is being written. The conference workshops covers the following aspects of the model.

- **The Energy of Flowing Water-** Flowing water has the energy to move particles of sand and form channels. When the flow has no constraints on it environmental problems we are familiar with arise.
- **Erosion in Streams-** The reason banks collapse and erode can be demonstrated. The effects of erosion may be wide, shallow and steep- banked streams.
- **Drains-** Drains are straight channels designed to shift water from one area to another as quickly as possible. Comparisons between rivers and drains are learnt from the model.
- **Sedimentation-** The movement of soil particles is revealed. Moving particles usually end up being deposited further downstream. The result of this becomes evident and shows how major problems in a section of stream may be the result of damage further upstream.
- **Using logs in Streams.** Logs, usually from stream vegetation prevent water eroding banks by directing water to the middle eof the channel. They can also be used to slow flow and assist in the formation of pools. Placement of logs is tried to see positive and negative results of this.
- **Building Riffles.** The effect of riffles in controlling velocity and direction is studied. Riffles with logs are critical in protecting or developing river pools. With the model different riffle designs can be tested and the need to adjust and maintain structures is demonstrated.
- **The Importance of Root Mass Along Streams.** Sedges and trees protect the stream banks. The amount of root mass required along a stream is discovered.
- **The Process of Stream Destruction.** A healthy stream can be modelled and effects of bad practice studied. Removal of vegetation, unlimited stock access and bad land usage contribute to stream degradation.
- **Using the Model for Displays at Shows and Expos.** The river model is ideal for display purposes at shows where it can be used to engage the public in awareness and conversation.
- **Using the Model with School Groups.** Because of its size the model comfortably caters for groups of thirty students. Different strategies including peer tutoring work ideally with the model.
- **Demonstrating the above with an alternative plastic sheeting models.** All of the activities covered in the workshop can be carried out with a piece of black builder's plastic. This is highly successful in a school group situation.
- **Using models to learn about other environmental issues.** Similar models can be used to explore issues including stormwater damage and water erosion problems along roads.