PRACTICALITIES

LIVING DRAINS

by Emma Bramwell

Drains in general

MOST people are familiar with the network of drains that occur both in and around most urban and rural areas. Recently a friend asked me a question about the relevance of drains, and the importance of vegetation in open drainage channels. She was curious as to why their local city council had cleared all the vegetation from the edges of an open drain behind her property, when she was well aware of the importance of vegetation in reducing water flow and nutrient levels, and providing habitat for wildlife.

Drains are designed to carry and divert about 12% of a year's rainfall from surrounding areas. The spread of urban development has increased both surface run-off and groundwater levels, creating a necessity for drains to prevent water-logging. Within most urban areas the most common drainage system is a closed one, existing as a network of pipes lying below building developments. Open drains are also found in some urban areas, but are more common in rural areas, where they provide much the same function but are exposed at the surface and mostly unlined. Water entering drains is usually diverted to natural drainage channels that eventually flow to the sea, highlighting the importance of waterway management as a component of environmental protection.

Pollutants and nutrients

Depending on the soil type, which affects how quickly nutrients and pollutants filter through, quite often substances that are placed on the soil end up in waterways. This is particularly true in the 'bottomless sand pits' on areas of the Swan Coastal Plain, where almost anything liquid drains through. As a result it is very important for landholders to be aware of this when using fertilisers or disposing of

manure, and when planting or clearing vegetation around drains. It is also useful to be aware of what the local authorities are doing around your drains.

Unfortunately many people are not aware of the various substances that often enter drains along with water, and may only be aware of the obvious effects, such as algal blooms. The pollutants most likely to enter waterways include nutrients (mostly nitrogen and phosphorus), toxins (including petroleum products, pesticides and heavy metals such as lead from petrol), pathogens (from animal manures, septic and sewage wastes) and physical pollutants (plastic, oil, sediment), all of which have potential to cause death and disease in plants and animals.

Who's responsible?

Most local councils in the rural Perth area are very much aware of the importance of vegetation along open drainage channels, and subsequently they will clear vegetation only when overflow of drain banks occurs as a result of excessive growth. Drains are usually managed either by local government or the Water Corporation, or jointly managed by both depending on their situation.

Why is native fringing vegetation important?

There are a number of functions provided by native vegetation in and along watercourses. These include the natural removal nutrients, reduction of water flow to allow sediments to settle, reduction of water turbidity, prevention of bank erosion, and provision of shade and habitat for wildlife such as frogs, fish, birds and small mammals.

Introduced species of vegetation may also help to reduce water flow and prevent bank erosion, but offer little in the way of wildlife habitat, and often will grow excessively due to lack of natural pests, and as a result impede the function of the drain.

What can be done to improve a drain?

The most obvious response is to plant suitable species of native vegetation in and along the drain, but not so densely that the plants impede the flow of water. Ideally, a wide corridor (or buffer) of native vegetation would occur for the entire length of a drain. Reeds and sedges such as *Carex* spp., *Baumea* spp., *Isolepis* spp., *Lepidosperma* spp., and *Juncus* spp. are all found in the Perth region, and provide habitats for various invertebrates, frogs and fish. Vegetation along the banks may include small sedges and shrubs, gradually developing into larger shrubs such as the swamp peppermint *Agonis linearifolia*, and trees such as the paperbark *Melaleuca preissiana* further from the bank. Have a look at a nearby natural wetland or river to get some idea of the species of plants that grow there, make a note of the types growing in the water and along the banks, and find a nursery that can supply the appropriate species. Alternatively, planting a dense corridor of a mixture of locally native shrubs and trees on properties adjacent to drains will help to reduce groundwater and nutrient levels, and provide shelter for stock.

The actual physical appearance of a drain can be altered to make it more useful than just as a drain.

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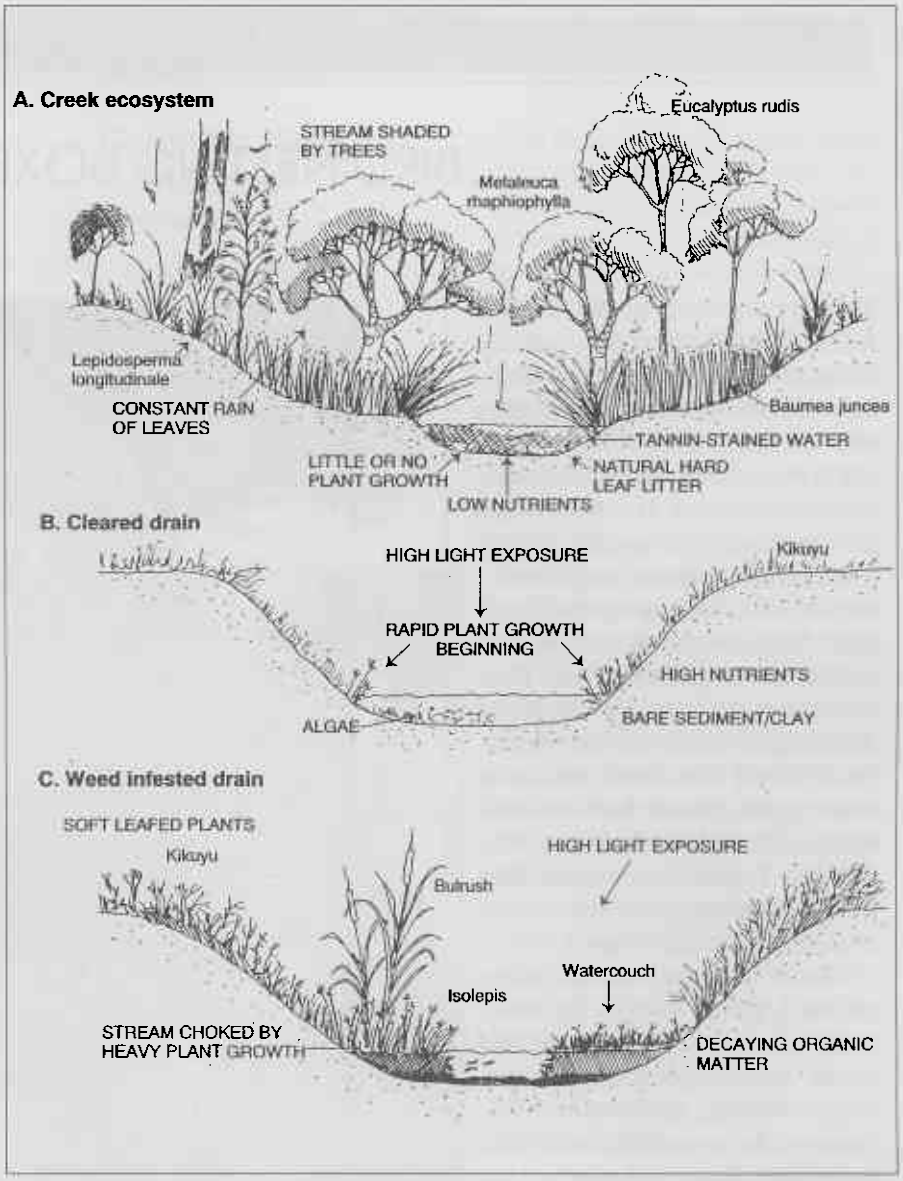
Where a drain rounds a corner, riffles may be created to prevent bank erosion and provide habitat for wildlife. Riffles may simply be a few large rocks deposited down the outside bank, or a log placed across the flow of water, but not impeding it. By slowing the flow of water, sediments and nutrients are able to settle, thereby reducing turbidity or potential eutrophication. The edges of a drain can be modified to have sloping banks rather than vertical walls, which will allow wildlife access to the water without becoming trapped. Sloping banks also provide shallow areas as habitats for frogs, gilgies and wading birds.



The environment of the natural creek ecosystem (A) compared to a cleared drain (B) and a weed infested drain (C)

Diagram courtesy of Luke Pen and Marg Scott from "Stream Foreshore Assessment in Farming Areas"

Before embarking on any project to improve the status of a drain, it is most important that contact be made with the relevant managing authority (the best place to start is the local council's Environmental Officer) to gain advice and permission.

Further information

The "Water Facts" series of information sheets produced by the Water and Rivers Commission are a good reference source, and contain information on various issues relating to waterway management and function. They are available on request from the Water and Rivers Commission, phone (08) 9278 0300. In one leaflet called 'Living Streams' (Water and Rivers Commission, 1998), several suggestions are made for the creation of habitats from open drainage channels.

In conclusion

The plant communities found in and around a waterway depend on several factors, including nutrient levels, soil type, and water regime. Over time, the clearing of an open drain may cause it to become deeper and wider as water flows faster, and more susceptible to invasion by fast growing introduced weed species. However while fringing vegetation is highly important, it cannot be allowed to impede the function of a drain, and therefore from time to time it might be carefully reduced by the managing authority to prevent a damming effect.

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