

Principles of river and stream improvement for wildlife

Land for Wildlife Note No. 8

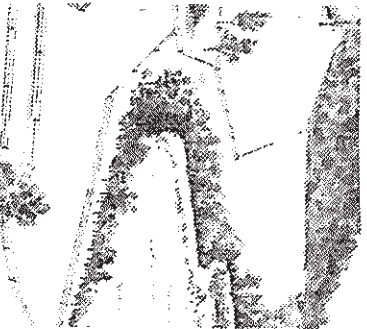
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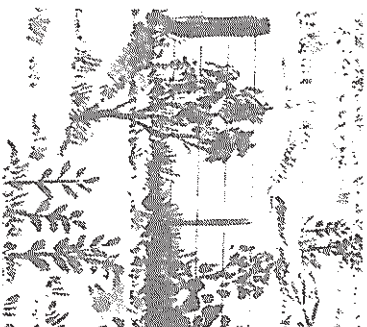
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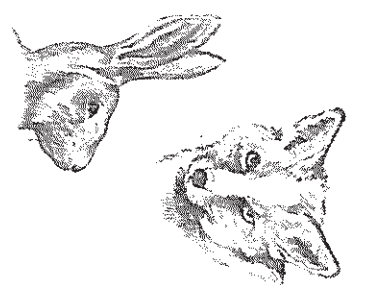
There are many potential benefits to landholders and wildlife from adopting a more environmental approach to the management of river and stream frontages (see LFW Note No. 9 for some examples). Of course, maximum benefits are achieved if landholders work together within a catchment. If you must begin alone, others are likely to follow your example when they realise the benefits of your action. The simple four step process described here may be suitable for watercourses on your property. Steps 2 & 3 must be carried out simultaneously. This process may not be sufficient in cases of extreme erosion. As each situation is unique, this Note concentrates on some general principles and potential actions. More information can be obtained from Regional offices of the Department of Conservation and Environment (DCE).



1. Fence out stock



2. Regenerate/plant local natives



3. Control pests plants/animals



4. Leave ground litter/river structure

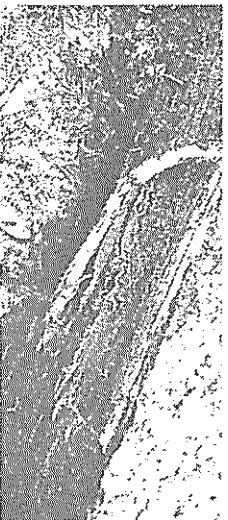


Rivers can be beautiful places. They carry one of our most important resources.

1. Fence to exclude stock

Fencing is necessary to restrict stock access and so avoid soil disturbance caused by trampling, a major cause of bank erosion, and to prevent stock from eating the vegetation, including any new seedlings. Short periods of light grazing, to reduce summer fire hazard from long grass or in times of drought, may be acceptable. Leave access to the stream for tankers in case of fire. You might pipe water to troughs for animals or leave some access points unfenced if provision is made to prevent erosion at these points such as with gently-sloped gravel walkways.

The recommended minimum width of a stream buffer is 20 metres.



Freshwater Blackfish lay their eggs inside submerged hollow logs. Riverside and in-stream vegetation contributes to the overall health of river systems.

2. Encourage natural regeneration or plant local natives

Vegetation will bind the soil, thus helping to prevent or arrest erosion and the detrimental effects of sediment in streams and water storages. Natural riverside vegetation from your district is adapted to the local soils and climate and is resistant to most local pests and diseases. It is therefore the most appropriate vegetation for local wildlife. Riverside vegetation is vitally important to the maintenance of instream life.

Ground cover is equally as important as larger shrubs and trees in controlling erosion and providing habitat for wildlife. So, where appropriate (see over), you should revegetate with a diverse range of native plants that occur along local rivers and streams. A species list may be available for your area from the Department of Conservation and Environment or your local field naturalist club.

Careful observation of the local natural riverside vegetation is a useful introduction to planning revegetation works and is highly recommended.

CASE 1: Stream frontage has moderate-good natural vegetation with a range of native species.

ACTION: The protection offered by fencing and pest plant and animal control will probably allow native plants to regenerate naturally. A natural balance will be achieved over time with animal populations matched to the characteristics of the vegetation without need for any further work on your part. Interference in the natural system must always be balanced against the benefits of leaving it alone. Proceed to Step 3.



CASE 2: Stream frontage has some natural vegetation remaining (eg. mature native trees) but it is in poor condition. You believe action, beyond fencing, is required to restore the vegetation.

ACTION: Natural regeneration is the preferred method to use initially where there is an available seed source. It may occur without assistance following fencing. If no natural regeneration occurs within one or two years, soil compaction or competition from weeds may be the cause. Light scarification and/or mulching with natural litter (beware of encouraging weeds and erosion) or a **controlled light burn** may solve these problems. Burning is a better way of reducing competition than chemical methods because chemicals are not introduced into the environment, and potentially the water supply. Also, root systems remain intact to prevent erosion. Native seed fall will occur largely in summer, from December till February. Note that eucalypts may not flower and set seed every year. These techniques should firstly be applied to select areas, representative of the area under management, to see if they are appropriate, before using over wider areas. A controlled burn must be conducted in accordance with fire regulations. Do not burn areas that would not burn naturally. Be aware that seedlings and small bushes are likely to be killed by fire. The local CFA or DCE may be able to assist. Warm autumn or spring rains will provide the stimulus for germination. A controlled burn will assist with the germination of hard-seeded natives such as wattles (the fire cracks the seed coat allowing water to enter for germination) and help reduce competition from other plants. A suitable strategy might be: a. fence, b. allow grass to grow over spring, c. burn off grass (late summer), d. scarify lightly (if necessary) immediately after and wait for autumn germination. Dispersing native seeds before the burn could supplement existing species.

It may be necessary to supplement the existing vegetation with additional local native species. A diverse understorey and ground layer will benefit wildlife and the health of trees. Remember that plants will do best if planted in similar situations to that in which they grow naturally (soil type, aspect, dampness, shade, associated species). It may be best not to remove introduced species, such as willows, until the native vegetation is well established.

CASE 3: No natural vegetation remaining along stream.

ACTION: If natural regeneration is not an option, direct seeding or plantings of seedlings grown from local native seeds, appropriate for the location and soil type, is the second best option.

3. Control pest animals and plants

It may be necessary to plan for the use of alternative pest management strategies in the area under revegetation to that of an open paddock. Pressure fumigation, 1080 bait trails and other techniques can be used to control pest animals in these areas, where necessary. There are a range of techniques, compatible with conserving environmental quality, that are available for pest and weed control. Consider environmental effects before using any chemical method. Chemicals may kill microscopic soil flora and fauna, thereby reducing soil quality, with subsequent effects on above-ground vegetation. Overspray into streams can kill fish and stream invertebrates. Contact your local DCE office for specific advice (the equipment may also be available for hire).

The method you use must be carefully considered so that native wildlife is not affected. Pest animals, such as rabbits, can prevent successful regeneration by eating seedlings or stripping bark. Individual plant guards may be required, in conjunction with a rabbit control program where this is a significant problem. Insects may also require control. Foxes are very skilled at catching native wildlife and are known to kill Platypus. An on-going program to reduce pest animals and plants should be developed, preferably in conjunction with neighbouring landholders. Local Land Care groups may be able to offer additional support and advice on this aspect of management. If native wildlife is the cause of your problem, assistance is available. Contact your Regional DCE office or the Wildlife Damage Control Officer, DCE, P.O. Box 137, Heidelberg, 3084.

4. Leave ground litter and river structure

Ground litter (leaves, twigs, branches, logs) reduces the impact of rainfall, hence helping to prevent and control erosion. It provides nourishment for the soil, which in turn supports a range of plant species. Ground litter also provides important wildlife habitat. Snags in streams and the emergent roots of riverside vegetation are very important in providing habitats and spawning sites to fish. Some species, such as River Blackfish and Murray Cod, deposit their eggs in hollow submerged branches. The major source of instream fish habitat, such as snags and wood debris, is bankside vegetation. Riverside vegetation will drop litter into the stream thus providing a source of food for many small stream animals and ultimately larger consumers like the Platypus. Shade from bank vegetation buffers a stream against high summer water temperatures, and the associated reduction in dissolved oxygen levels, which may directly kill fish or increase stress leading to greater susceptibility to disease. If there is a weir in the stream or other barrier that cannot be removed, ensure that it has a "fish ladder" to allow migrating species access to feeding and breeding areas upstream. Rocks and logs provide moist sites for germination of seedlings, thereby contributing to the on-going maintenance of the habitat. They also provide refuge for many ground-dwelling animals. Alteration to or removal of streambed substrate has adverse effects on native fish. Substrate (eg. gravel, pebbles, cobbles, boulders) supplies attachment sites for aquatic invertebrates and is used by fish as spawning sites and nursery grounds for juveniles. Riffles provide the main oxygenation sites for the stream. Riverside structures are also very important to many aquatic invertebrates and amphibians whose life-cycles involve an emergent phase, and to their predators. Remember that expert local advice on all of the above is available from Regional Offices of DCE.

Financial assistance

Financial assistance is available to combat stream erosion control, and for associated revegetation and fencing. Contact the River Management Unit, Rural Water Commission of Victoria, 590 Orong Road, Armadale, 3143 or your local Dep't of Conservation and Environment office for details.

Further reading

Bush Regeneration: Recovering Australian Landscapes, Buchanan, R.A., (1989), Dep't of Technical and Further Information, N.S.W.
The State of the Rivers (1983), Revegetating Victorian Streams (1982), Guidelines for Catchment Management (1987), Guidelines for River Management (1979), State Rivers and Water Supply Commission, Victoria.
Rivers and Streams Special Investigation Report, (1989) Land Conservation Council, Victoria.
Environmental condition of Victoria's waterways, Mitchell, P., (1989), Office of Water Resources.
How to collect native tree seed easily, Greening Australia booklet.
Farm birds: Nature's pest controllers, Greening Australia booklet.
Treegrowing Notes, Pest plant Notes, Soil & Water Notes; Department of Conservation and Environment, Victoria.
To save wildlife habitat