



Water notes

Water notes for rivers management

Natural Heritage Trust



ADVISORY NOTES FOR LAND MANAGERS ON RIVER AND WETLAND RESTORATION

Long-term management of riparian vegetation

Healthy riparian vegetation is an essential component of every wetland, creek and river. The vegetation plays an important role in the maintenance of good water quality within the waterbody and provides habitat for many fauna species.

Unfortunately, most fringing vegetation is heavily infested with weeds, which are often very vigorous in the rich, damp soils surrounding waterbodies. Restoration projects that aim to rehabilitate riparian vegetation need to take into account long-term management to ensure their success.

A common problem with wetland rehabilitation is the initial decision to restore a large site. Often it is beyond the resources of the land manager or group to maintain the area for the long period of time it may take for the site to become stable and look after itself. If a project is not carefully planned, the follow-up maintenance of the site can remain exhaustingly high for a long time.

The following guidelines will help to ensure that maintenance of the project site is reduced to a minimum as quickly as possible.

Initial site preparation

Part of the preparation involved in a revegetation project is estimating the resources to which you have access and the amount of follow-up work you will need to do. If resources are not available for follow-up work, it is often not worth starting the project, as the rapid growth of wetland weeds will quickly destroy all the initial work.

¹ A selective herbicide only kills plants from a particular family. For example, Fusilade® will only kill grasses, leaving other species untouched.

For most well planned projects, the first three years will require fairly intensive maintenance and the work should decrease every year after that. However, a low level of maintenance will always be needed. This usually takes the form of constant vigilance for new outbreaks of weeds, so they can be controlled at the earliest stage.

Weed assessment

Weeds found at the site should be listed and categorised into the following levels of difficulty of removal:

- High Priority – weeds that regenerate quickly and strongly from root stock (eg Bulrush, Nutgrass, Blackberry, Bamboo) or rapidly invade and smother native plant communities (e.g. *Juncus microcephalus*, *Isolepis prolifera*).
- Medium Priority – weeds which cannot be removed with a selective herbicide¹ (e.g. Fleabane, Nightshade, Bushy Starwort, Stinkweed).
- Low Priority – weeds that can be removed with a selective herbicide (eg grasses), or weeds that are not effective competitors with native species (e.g. Dandelions).

Weed control

Seek advice from a weed management consultant (herbicide applicator) before you start your project.

It is essential to have good control of the high priority weeds before planting a project site. This may mean a year of weed control, with three to four treatments.

The medium priority weeds also require good control before planting. These are the weeds that are most likely to increase your long-term maintenance of the site, and it is worth putting a lot of initial effort into control. Herbicide is quick, cheap and effective, however use of herbicide in wetlands is restricted and needs to be carefully planned. Once planting has occurred, manual control of weeds is often the only option. If insufficient labour resources are available to carry this out, the project site will deteriorate.

The low priority weeds may not need treatment at all, though they may require hand removal in situations where they are out – competing native germinants. Grassy weeds can be left in place until plantings have become established as they are easily removed with a selective herbicide (NB: selective herbicide cannot be used over or near water). It should also be noted that removal of a weed is often followed by a succession of new, more tenacious species and that early removal of grasses often creates bigger weed management problems.

Plant selection, density and timing

Correct selection of plant species and adequate planting density can greatly reduce long-term maintenance. In very weedy sites, quick growing species which spread by rhizome can be chosen to out-compete unwanted species within a growing season. If clumping species are chosen in preference, it is important that the density is high, so that total cover is quickly achieved. Clumps or strips of sedges may be an option in high erosion sites. The extra cost in plant purchase will minimise the long-term cost of weed control.

Shading reduces the growth of many weed species. In very weedy sites, tree and tall shrub species can be planted after the first weed control effort. Tree guards placed over these plantings will allow herbicide control to continue at the site, while the plants grow to create the shade necessary to reduce the weed problem in the long-term.

Plantings need to be timed so that plants are put in when entering their period of maximum growth. Many wetland species achieve their maximum growth during spring and summer. If they are planted in winter, their dormancy will give many winter-growing weeds a competitive edge. It is preferable to carry out weed control in winter or early spring followed by planting as this will give native species a whole growing season's advantage over many weeds.



Before - this area has been cleared of Typha and Blackberry and is now ripe for a variety of weeds to invade. L. Taman



After – the cleared area has been planted very densely with a variety of wetland plants. The vigorous growth of these plants after 18 months is shading the site and out-competing potential weeds. L. Taman

Mulching

Many weeds that depend on germination from seed will be prevented from regenerating through the provision of a thick layer (10cm) of good quality mulch. Often the mulch layer can be created by slashing weeds that have been previously sprayed. Large, dense weed infestations are excellent for this purpose, as are thick beds of grass such as Kikuyu. Mulch from soft-leaved species will probably only give cover for six months, whereas hard-leaved or woody species will last twice as long. Mulch is less effective in areas that are regularly flooded in winter, as the mulch will rot quickly or be washed away. However, if initial weed control is carried out in spring, the mulch will still prevent germination of weeds over the first summer.

Maintaining plantings

Once a site has been prepared and planted, it should be checked every two weeks for the first six months. This will allow early detection of germinating weed species, monitoring of the success of plantings and maintenance of tree guards if these are used. Plantings in the drier bushland zone surrounding waterbodies will have a higher success rate if watered over the first summer. If this is not possible, overplant the area, as a mortality rate of 25% can be expected in the first summer. In a dry spring, losses of 50-60% can be experienced. Seedlings that survive the first summer should be self-sufficient from that point on.

The effectiveness of the first planting should be monitored and the results used to determine the level of top-up planting to be carried out in the second year. Excessive deaths of particular species may have been caused through planting in the wrong hydrological zone.

Weed control and timing

Regular, timely weed control is essential in the second and third year of the rehabilitation project if the future maintenance of a site is to be minimised. Regular inspections to the site should be carried out, not only to monitor the reappearance of the weeds initially present, but also to detect invasions of new weed species.

Timing of weed control is crucial to success. Annual weeds must be removed before seed set, so there is no increase in the amount of weed seed at the site. Weeds such as Arum Lily must be treated before mid-August to prevent the development of daughter tubers, which will result in new plants even if the parent plant is killed. Herbicide treatments must be carried out at the peak growth time of plants, so that uptake is maximised and herbicide use minimised.

There are several sources of information on the timing of weed control. One of the most comprehensive publications is *Managing Perth's Bushlands* (Scheltema and Harris 1995). Information can also be obtained from the Department of Agriculture, the Environmental Weeds Action Network (EWAN) and the Association of Australian Bush Regenerators (AABR).



Before – an area of dense Blackberry invasion along Bennett Brook, precluding any regeneration of over or understorey. L. Taman



After – Bennett Brook three years after clearing of Blackberry and dense planting. The site is now sustainable, requiring minimum maintenance. L. Taman

Timetable maintenance

Once plantings are well established and good weed control is achieved, the need for maintenance of the site will decline. Even though there will be a reduction in the amount of resources needed to maintain the site, there will always be a need to monitor the area four to five times a year. Seasonal changes in the environment as well as unexpected events such as fire, flood or increased human use can alter conditions at a site and allow increased weed invasion.

It is demoralising when three years of hard work is wasted through the failure to carry out adequate monitoring and maintenance of a site.

Adding diversity

It is possible to add further diversity to a site when it has reached a fairly stable state and most of the weeds are under control. Using a small amount of resources, additional species can be added to a site either by planting, transplanting or direct seeding. These may include plants that do not compete well against weed species, such as native grasses and annuals.

References and further reading

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