



# Water notes



ADVISORY NOTES FOR LAND MANAGERS ON RIVER AND WETLAND RESTORATION



## Weeds in waterways

Across the south west of Western Australia, weeds are slowly, or in some cases quite quickly, encroaching upon riparian zones in rural and urban areas. The native vegetation on seasonally dry land around wetlands<sup>1</sup> and the adjacent dry upland is slowly being replaced by grasses and other weed species. In some rivers, lakes and swamps, aquatic weeds are invading water bodies and replacing native aquatic plants. Furthermore, many weed species are exploiting the opportunities for establishment in areas suffering from salinisation and waterlogging.

### Weeds along waterways

In the areas surrounding wetlands or along waterways, which are dry all year round or are seasonally damp, native trees, shrubs, sedges and grasses are being replaced by introduced annual grasses and other weeds. In agricultural areas this is mainly caused by the grazing activity of livestock and feral animals (rabbits mainly) and by frequent fires (Hussey and Wallace 1993, Pen 1994, Pettit and Froend 1994, 1995). In urban parklands, especially the dry sandy ones, frequent fires and human activity are the chief causes of this type of weed invasion.



Weed infestation of an urban drain.

L. Pen

### Common grass and herb weeds

The main understorey weed species along waterways and wetlands are annual pasture species, but in cooler, wetter, higher rainfall areas, some perennial grasses are also a problem. The main weeds are:

#### Annual

- Annual veldt grass (*Ehrharta longiflora*)
- Wildoats (*Avena barbata*)
- Shivery grass (*Briza minor*)
- Quaking grass (*Briza maxima*)
- Great brome (*Bromus diandrus*)
- Yorkshire fog (*Holcus lanatus*)
- Lupins (*Lupinus* spp.)
- Soursob (*Oxalis pes-caprae*)
- Rye grass (*Lolium* spp.)

#### Perennial

- Veldt grass (*Ehrharta calycina*)
- African love grass (*Eragrostic curvula*)
- Sweet vernal grass (*Anthoxanthum odoratum*)
- Paspalum (*Paspalum dilatatum*)
- Kikuyu (*Pennisetum clandestinum*)
- Perennial rye grass (*Lolium perenne*)
- Buffalo grass (*Stenotaphrum secundatum*)

### Aquatic weed invasions

Wetlands receiving large quantities of nutrient rich water from farmlands or urban stormwater drains are often being invaded by a number of aquatic weeds. The introduced bulrush, *Typha orientalis*, has invaded many lakes in the Perth metropolitan area and parts of the Swan and Canning Rivers, and in some cases has displaced the native tall sedge *Baumea articulata* (Froend *et. al* 1993). A number of species of submergent or emergent aquatic weeds (including *Hydrocotyle renunculoides* and *Hydrilla verticillata*), have become established along the lower

<sup>1</sup> In this article wetlands refers to any form of 'static' wetlands, such as a lake, swamp, palusplain or dampland. Waterways refers to any river, creek, drain or estuary.



Canning River, in a section of seasonally impounded water above the Kent St Weir (Klemm *et. al* 1993). Likewise, budding club-rush (*Isolepis prolifera*) is a troublesome weed along drains and impounded sections of streams.

The introduced bulrush and a number of other weed species, including wild aster (*Aster subulatus*), Italian rye grass (*Lolium multiflorum*), dock (*Rumex crispus*) and saltwater couch (*Paspalum vaginatum*), have replaced native samphire and rush communities along the Swan/Canning and Leschenault estuaries in areas flushed by stormwater (Brock and Pen 1984, Pen 1987, 1992, 1993 a & b).



*Watsonia* regrowth after a fire.

J. Oates

## Invasion of the garden escapees

In the high rainfall zones of the south west, particularly near urban areas or country towns, a variety of perennial, introduced plant species including vines, creepers, giant grasses, large shrubs and trees, threaten to replace the surviving native plant species of the more degraded wetlands; even those not subject to livestock grazing (Pen 1993). Many of these 'major weeds' are garden escapees and many were probably introduced with discarded garden clippings. They thrive in the moist environments of the Darling Range and coastal river valleys and basin wetlands.

Morning  
Glory



*Pampus* grass

Arum Lily



Blackberry

## Major garden escapee weeds

### Trees

- Coral (*Erythrina caffra*)
- Poplar tree (*Populus* spp.)
- White or silver poplar (*Populus alba*)
- Willow trees (*Salix* spp.)
- Cape lilac (*Melia azedarach*)

### Small trees and tall shrubs

- Caster oil bush (*Ricinus communis*)
- Edible fig (*Ficus carica*)
- Olive tree (*Olea europaea*)
- Victorian tea tree (*Leptospermum laevigatum*)
- Acacia longifolia (*Acacia longifolia*)
- Japanese pepper (*Schinus terebinthifolia*)
- Sweet pittosporum (*Pittosporum undulatum*)
- Buckthorn (*Rhamnus alaternus*)
- Taylorina (*Psoralea pinnata*)

### Vines and creepers

- Blackberries (*Rubus* spp.)
- Briar rose (*Rosa rubiginosa*)
- Blue periwinkle (*Vinca major*)
- Morning glory (*Ipomea indica*)
- Mile a minute (*Ipomea cairica*)
- Japanese honeysuckle (*Lonicera japonica*)
- Dolichos pea (*Dipogon lignosus*)
- Bridal creeper (*Asparagus asparagoides*)
- Common lantana (*Lantana camara*)

### Tall grasses

- Giant reed<sup>2</sup> (*Arundo donax*)
- Fountain grass (*Pennisetum setaceum*)
- African feather grass (*P. macrourum*)
- Elephant grass (*P. purpureum*)
- Giant bamboo (*Bambusa* sp.)
- Bamboo (*Bambusa* spp.)
- Pampus grass (*Cortaderia selloana*)

### Herbs

- Watsonia (*Watsonia bulbilifera*)
- Canna lily (*Canna X orchiodes*)
- Arum lily (*Zantedeschia aethiopica*)

## Plantation and orchard escapees

Plantation and orchard species (i.e. fruit trees) are coming up in riparian zones. The Monterey pine (*Pinus radiata*) is coming up along sections of the middle and lower Blackwood, along with a variety of fruit trees. Several generations of the Tasmanian blue gum (*Eucalyptus globulus*) are to be seen in the riparian zone of the lower

<sup>2</sup> Most people know this as 'bamboo', which it is not.



King River near Albany. With an increasing area being planted to pines, blue gums and fruit trees, the potential for escape of these species into rivers and wetlands is increasing.



Japanese honeysuckle & Morning glory on the Canning River. L. Pen

## Weeds and salinisation

Many wetlands in the south-west have become saline and waterlogged (at least seasonally) as a result of land clearing and this has caused the death of native wetland vegetation which had been associated with the former fresh or less saline conditions. In some cases, native salt tolerant trees and sedges are replacing the less salt-tolerant species, but in other areas they are not present, and weeds are becoming established (Pen 1994). Some of these species are tolerant of the conditions, such as the spiny rush (*Juncus acutus*), while others negate the high salinities of summer and autumn by simply dying or becoming dormant.

### Major saline area weeds

The main weed species which are annual on saline land along rivers include the following:

- Rye grass (*Lolium* spp.)
- Barley grass (*Hordeum leporinum*)
- Bearded grass (*Polypogon monspeliensis*)
- Atriplex (*Atriplex prostrata*)
- Wild aster (*Aster subulatus*)
- Saltwater couch (*Paspalum vaginatum*)
- Coast barb grass (*Parapholis incurva*)

The olive tree and the tamarisk (*Tamarix pentaphylla*) are known to be successful on saline rivers. Presently both species maintain limited populations along the Avon River.

## Native plants behaving like weeds

Sometimes species which appear to be behaving like weeds are actually native plants. A good example is bracken fern (*Pteridium esculentum*) which can be a serious weed on seasonally damp land next to rivers. Similarly, the tall golden wreath wattle (*Acacia saligna*) can form dense stands in the floodway and on sandy verges of south west

rivers. In fact some native species have in the past been thought to be introduced, because they were seldom found in relatively undisturbed sites. However, closer study proved them to be native. An example is the club rush (*Bolboshoenus caldwellii*) which is common along fresh rivers and behaves like an annual weed on saline salt-marshes on the Swan-Canning Estuary.

Some invasive aquatic species are also native. For example, the native bulrush *Typha domingensis*, can appear in disturbed sites. The attached and floating aquatic fern Nardoo (*Marsilea mutica*), forms large 'rafts' along the impounded section of the Collie River near Collie.

## Preventing weed invasions

Species which become weeds simply regenerate well under the conditions they find themselves in, usually conditions created by human activities, which seldom favour native plant species. Weed species are usually capable of producing highly viable seed or can regenerate from corms, bulbs, cuttings or broken off segments with rooting nodes. Therefore prevention of weed invasions must consist of keeping these species well away from rivers and wetlands, especially those species which reproduce by seed. All of the above species should not be planted in parklands and gardens adjacent to waterways and wetlands. As a golden rule garden and aquarium waste should never be discarded onto land adjacent or connected to waterways and wetlands.

The best preventative measure is vigilance and then the early removal of any new arrivals, before a major infestation can form.

Removal of weed infestations on wetlands should start from the edge of the infestation, working around towards the centre. On waterways, work should begin from the upstream end moving downstream, taking care to minimise the spread of cuttings which could take root downstream. For species which readily grow from cuttings, like willows, poisoning first and then removal of the dead plant is recommended.

For detailed information on weed management see further reading.



Pampus grass infestation on the Swan River.

J. Oates



## Further reading

Available at the Water and Rivers Commission library

Froend, R.H. Farrell, R.C.C. Wilkins, C.F. Wilson, C.C. and McComb, A.J. (1993) *Wetlands of the Swan Coastal Plain. Volume 1: The Effect of Altered Water Regimes on Wetland Plants*. Environmental Protection Authority and Water Authority of Western Australia.

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Pen, L.J. (1994) *Condition of the Kalgan River foreshores 1992/93*. Waterways Commission Report No. 52.

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Hussey, B.M.J. Hobbs, R.J. and Saunders, D.A. (1989) *Guidelines for bush corridors*. Surrey Beaty & Sons, NSW.

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For further information on any particular issue please contact the Restoration & Management Section at the Water and Rivers Commission.