

Weed of
National Significance

WILLOWS

(*Salix species*)



Weed: crack willow (or possibly an unidentified hybrid) just before leaf fall



Weed: black willow
Note the conical upright form

Why are willows weeds?

- Highly invasive, spreading primarily via vegetative reproduction and also via seed
- Cause environmental degradation, especially of riverine and wetland habitat, often establishing impenetrable thickets along watercourses
- Altered water quality (temperature and oxygen content) due to shading and leaf drop
- The dense roots prevent native plant growth, both on the land and in the water, thus reducing the habitat for insects, fish and birds
- Dense thickets of willows with multiple stems divert stream flows and create erosion, especially on small narrow rivers
- Reduced river access for boating, canoeing, rafting and fishing as the plants block access both to the river and along its course

Description

There are hundreds of different types of willows across the world. None are native to Australia. This sheet focuses on the species which have been declared noxious in NSW and are declared pest plants in the ACT. This includes all species except **weeping willow** (*Salix babylonica*) and two types of sterile **pussy willow** (*S. x reichardtii* and *S. x calodendron*).

Plant: species vary markedly. All are deciduous and woody. They can be trees or shrubs, single or multi-trunked, 4-20m high with smooth or rough bark. Species relevant to the Molonglo catchment are described in more detail below.

Leaves: usually long, narrow with finely toothed edges and a paler underside. Two exceptions are **pussy willows** (*S. cinerea*, *S. caprea*) which have broader oval leaves, and **black willow** (*S. nigra*) which can be identified by the leaf being a similar dark green on both sides

Seeds: fluffy white, with a parachute, is spread easily by wind and water after flowering in November

Flowers: numerous, fluffy, white, held in catkins, appearing before (or with) the leaves in spring. Originally only one sex of willows was introduced into Australia. Since the introduction of both male and female species, willows have been able to produce viable seed. Male flowers have stamens (short antennae like protrusions), female flowers have bulbous green ovaries

Some of the more common species found in the Molonglo Catchment are described below.

- **Crack willow** (*S. fragilis*): tree to 20m tall, usually multi-trunked, erect habit with a broad crown, *exposed roots are a distinctive pink/red colour*, branches break off easily at the base making a 'crack' sound, rough ridged bark
- **Black willow** (*S. nigra*): tree to 20m tall, leaves are the same colour on both sides, conical upright form (especially when young but broadening with age), comes into leaf long after weeping and crack willows (up to [approx] 1 month), deeply ridged grey bark on trunk and large stems
- **Golden upright willow** (*S. alba* var. *vitellina*): tree, 15-20m tall, very yellow bare stems in winter, broad crown, exposed roots are white, rough ridged bark, branches don't snap off at the base (if you try it you'll tear away some bark)
- **Tortured willow** (*S. matsudana* 'Tortuosa'): tree to 14m tall, easily identified due to its twisted, contorted branches and leaves
- **Pussy willows** (*S. cinerea*, *S. caprea*): shrub, to 10m tall, multi-stemmed, broad oval leaves and short, very fluffy catkins, ridges can be seen in the wood when the bark is peeled back
- **Basket willows** (*S. rubens*): tree to 16m tall, multi-stemmed, round/spreading crown, narrow leaves with finely toothed margins, grey-green to gold bark.
- **New Zealand hybrid willows** (*S. matsudana* hybrids): to 20m tall, single stemmed, narrow upright form with brown or grey-green fissured bark
- **Purple osier** (*S. purpurea*): shrub to 8m tall, multi-stemmed, round crown, grey bark is smoother than most willows

Jackie Miles/Max Campbell



Weed: female crack willow flowers (catkins)

Jackie Miles/Max Campbell



Weed: male pussy willow (*S. caprea*)
Note the short fluffy catkins

Dispersal via

- Spread from sparse ornamental/erosion control plantings, to become densely established on many rivers and creeks in southeast Australia
- Vegetative reproduction when branches break off/hang onto the ground and grow roots
- Layering - when a tree falls over, or the branch tips touch the ground, the plant sends up new shoots
- Seed spread in water and on the wind. Black willow is known to seed prolifically resulting in mass germination in suitable conditions

Status

The following refers to all willows, except weeping willow and two types of sterile pussy willow - *Salix x reichardtii* and *S. x calodendron* (these three species have not been declared noxious).

Willows are class 5 noxious weeds in all council areas within the Molonglo Catchment. There are a number of requirements for Class 5 weeds including that the plant must not be sold, propagated or knowingly distributed. In addition, all requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with.

In the ACT, willows are class 2 and 4 Pest Plants which must be suppressed and whose supply is prohibited. Willows have been listed as Weeds of National Significance due to their invasiveness, potential for spread and socioeconomic and environmental damage.

Look-alikes

There are no similar native species. The introduced poplars look a little similar. Refer to the poplar fact sheet for information and photos.

Control methods

Willows should no longer be planted. Control needs to be carefully staged to avoid causing erosion. Native vegetation should be encouraged to establish as an alternative. 'Long stem' tubestock is an easy and effective way to establish natives in areas that may usually be difficult to revegetate. The Lake Burley Griffin Willow Management Plan provides sound advice on willow control and many of the recommendations are relevant and useful to areas outside of the geographical boundaries to which the Plan relates.

When planning control, it is useful to be able to determine the sex of an individual tree (via the flowers). For example, if you had a dense infestation of willows spreading primarily by seed and only a couple of the plants were female, you would direct your resources to controlling the female species first. The Weeds of National Significance Willow Identification guide produced by the National Willows Taskforce provides detailed information on how to differentiate between male and female willows.

For advice on what time of year to implement the following management options, see the Molonglo Catchment Weed Control Calendar.

Hand pull seedlings. Larger plants can be treated with chemicals via a range of methods including cut and paint, stem injection and spraying. Apply chemicals when the plant has all its leaves (i.e. summer/early autumn). Ensure each stem is treated to avoid plant recovery. As willow control often requires the use of chemicals in, or directly adjacent to, water courses, it is essential that you use a herbicide registered for use in these situations. Seek advice on chemical application from your Council Weeds Officer or local 'bush friendly' nursery. Always use chemicals as directed on the label.

If willows have been removed and piled in an adjacent area for burning, you should consult the Rural Fire Service for permits and advice; in urban areas also contact the local council/control authority.

While weeping willow is not listed as noxious it is safer not to plant it, as it is capable of hybridising with other willows to produce viable seed.

The willow sawfly, a small insect that recently arrived in Australia, has been known to defoliate willows. The long term impact of the sawfly is not yet known.

There are various legislative requirements for the removal and control of willows and other weeds along watercourses. Consult your local Council Weeds Officer or Parks, Conservation and Lands before conducting any control. The regulations exist to ensure that the control is conducted safely, reducing the potential for environmental degradation and damage to infrastructure downstream of the control site.