



Glove box guide  
**waterplants**  
of the ACT region

An easy to use field guide to  
assist in the identification  
of selected waterplants  
of the ACT and  
surrounding  
areas

# Identifying Waterplants

How do you tell a weed water plant from a native? Many water plants show luxuriant growth, produce plenty of seed and have the ability to spread easily and may look weedy. However, WEEDS like Alligator Weed, Soapwort and Dense Waterweed are '*plants growing successfully in the wrong place*'.

Aquatics are easiest to separate on habitat (where they live) and form or habit (what shape they take), and then look at flowers to see where they belong.

We have chosen four categories, all non-woody plants:



- **Free-floating Plants** with their leaves on or above the water and their roots suspended in the water.
- **Instream Plants of Pools and Riffles** with roots in the soil, underwater leaves and above water leaves.
- **Mudflat and Emergent Plants** that can cope with inundation but grow happily on the bank.
- **Clump Forming Water Edge Plants** that form dense erect stands at the water's edge.

# free floating plants

Free floating plants usually dispense with stems. The roots are often very like root-tips only.

**Azolla** (*Azolla filiculoides* and *Azolla pinnata*) is a fern found in still backwaters, off-stream wetlands and farm dams. They have small feathery leaves, and often spread across the whole water surface, with greener plants in shaded areas and redder plants out in the sun. Sometimes they can be piled on the bank 30 cm deep by the wind.

Other common floating plants include the Duckweeds (*Spirodela punctata*, *Lemna trisulca* and *Wolffia australiana*) and floating Liverworts (*Ricciocarpus natans* and *Riccia fluitans*). These species all have tiny leaves. While all flourish in water with high nutrient content, they can be found in still parts of most waterways.



Figure: *Azolla filiculoides*

# Instream plants of pools & riffles

The **Water Milfoils** (*Myriophyllum crispatum*, *Myriophyllum variifolium* and the reddish *Myriophyllum verrucosum*) are common in shallow to moderately deep parts of rivers and creeks, and sometimes form beds at the margins of farm dams or pools in wetlands.



Figure: Feathery whorls of *Myriophyllum crispatum*

The submerged whorls of leaves are feathery; the above-water leaves are succulent.

Figure: Succulent above-water leaves of *Myriophyllum verrucosum*

All three common species enjoy rocky riffles and associated sandbars, with *Myriophyllum verrucosum* tending to be more common in spots with intermittent flow.



**Ribbon Weed** (*Vallisneria australis*) forms extensive beds of submerged strap-like leaves, very often covered with diatoms (tiny algae in their own glass houses) and silt, in rivers and lakes, and occasionally in farm dams and artificial wetlands. The spiral female flower-stalks are visible in spring and summer.

Figure: *Vallisneria australis* in the water



Figure: Strappy leaves of *Vallisneria australis*

## *Air Conditioning, Plumbing and Waste Management; all to keep things upright.*

*Have you ever seen the inside of a bulrush leaf or a milfoil stem? What about the spongy roots of water primrose?*

*Many water-plants have spongy tissue blankets around their roots and the bases of their stems. Others have stems with large air spaces within their cells right out to the tips. To remain cool, relatively dry and healthy, cells need a good regular supply of oxygen and rapid means of getting rid of excess water and stifling carbon dioxide.*

*The hollow stems and spongy roots do this job very well. At the same time they act like big air-filled tyres, providing both buoyancy and rigidity with minimum weight.*



**Water Buttercups** (*Ranunculus* species) are less common, have alternate leaves with long stalks and often palmate blades and favour higher altitude streams. Buttercups have a distinct bright yellow five-petalled flower.



Figure: *Ranunculus papulentus*



The **Stoneworts** (*Chara* and *Nitella* species) are highly specialised plant-like algae. They are made up of elaborate arrays of individual cells with nodes of branching cells at junctions.

Often they form dense carpets on the bottom of pools, and help filter and clarify waterways. Their sperm bundles are often bright orange, and fertile patches may resemble a forest of decorated Christmas trees.

Figure: *Nitella*

Pondweeds e.g. the conspicuous **Floating Pondweed** (*Potamogeton tricarlinatus*), grow in shallow to moderately deep water, with much of the plant below the surface. *Potamogeton tricarlinatus* has large, oval, bright green floating leaves, with parallel veins, and long translucent lance-shaped submerged leaves. The flowers are in a short greeny-brown spike that just pokes above the water.



Figure: *Potamogeton tricarlinatus*

**Curly Pondweed** (*Potamogeton crispus*), also very common, has only submerged leaves, that are short, straight, green and with wavy margins.

**Swamp Lily** (*Ottelia ovalifolia*) has similar floating leaves to Floating Pondweed, but with prominent cross veins, and large three-petalled flowers, white with purple centres.



Figure: *Ottelia ovalifolia*

### *Look out for this pest!*

**Dense Waterweed** (*Egeria densa*) from South America, has been collected locally. Except for the three-petalled white flowers, the plant is entirely submerged. There are usually four or five leaves per whorl, which are smooth-edged and curl back. The white flowers are large and conspicuous.



Figure: *Egeria densa*

### Similar native species

**Elatine** (*Elatine gratioloides*) is a weakly erect native of water margins, with *Crassula helmsii*, and may grow submerged. It has oval leaves in pairs.

### Treatment & Control

Control of *Egeria* is difficult; mowing of dense beds of aquatics for maintenance, as happens at Lake Burley Griffin and Queanbeyan, may help fragmentation and so promote their spread.

**Water Primrose** (*Ludwigia peploides* subspecies *montevidensis*) has similar leaves in and out of the water (up to 10 cm long) which are narrow lanceolate, with bright yellow flowers on long petioles and stems that root at the nodes. Common downstream of the ACT, it does well in the wetlands and river margins at Woodstock Reserve where the Murrumbidgee leaves the Territory. It has been introduced into the constructed wetlands of North Canberra and Gungahlin.



Figure: *Ludwigia peploides* subsp *montevidensis*



Figure: *Ludwigia peploides* subsp *montevidensis* rooting at the nodes of the stem and leaf including snorkel roots

## *Solar Power Systems*

*Plants solved their renewable energy needs with solar power when they first made Chlorophyll. This remarkable green pigment traps light energy, uses it to split water and recombine it and carbon dioxide into sugar rings. The process releases oxygen to light all the other biological fires!*

*The process is a tricky one – plants must collect just the right amount of sunshine but also avoid sunburn. The shine on most above water surfaces of aquatics works to reflect excess light. Submerged plants don't have the sunburn problem but they do need to get the light. They do this by having thin leaves that are easily moved and often cut into numerous segments. They also move the green bits inside cells around to get the most sunlight – put a whole cell from a stonewort under a microscope and watch the green beads streaming up and down.*



## Look out for this pest!

A notifiable Weed of National Significance **Alligator Weed** (*Alternanthera philoxeroides*) grows as a matted tangle of stems out from the bank of water bodies. The stems are only weakly erect, may root at each node, and have paired lance-shaped leaves with buds in each axils. The terminal flower-heads are white and papery, on long leaf stalks. It is also mildly poisonous.

The dense floating mats can fill a waterway in a short time. Sewage and agricultural run-off encourage rapid growth in sluggish or still water. There are small but persistent infestations in some urban wetlands in North Canberra and Gungahlin.



Figure: *Alternanthera philoxeroides*

### Similar native species

This species may be confused with native *Alternanthera* species. Lesser Joyweed (*A. denticulata*) is a scrambling plant of sandbanks, and has small sessile biscuit-coloured heads. Alligator Weed has broader leaves (10–20 mm, compared to 6–10 mm for the natives) and is much more robust.

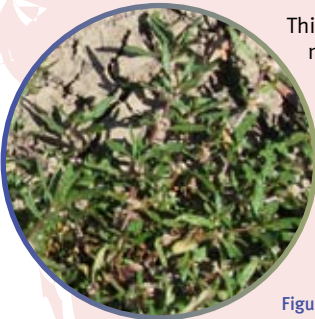


Figure: *Alternanthera denticulata*

### Treatment & Control

Control is undertaken by local government authorities and involves integrated mechanical, chemical and biological controls.

# mudflat and emergent plants

**Nardoo** (*Marsilea hirsuta* with wide leaflets and *Marsilea costulifera* with narrow leaflets) favours clayey grey mud in marshland or at the margins of waterways. This plant will take short periods of flooding, but generally has its 'four-leaf-clover' leaves on long stems among the spike-rush, the sneezeweed and the knotweed on stream edges. The Nardoo's are ferns, with very specialised reproductive fronds, the bean-like tops of which have been used for food.



**Water Stonecrop** (*Crassula helmsii*) is a weakly erect perennial herb with short, succulent, cylindrical, opposite leaves and tiny single white flowers. It makes a major contribution to sediment stabilisation in riffles and gravel bars, along with the other low growing herbs.

Figure: *Crassula helmsii*

## *Waterproofing and Hazard Reduction*

*Did you ever see rain in balls on Azolla? Or wondered how reeds and rushes stayed so clean and dry?*

*Commonly aerial structures in aquatic plants have a thicker than usual skin or cuticle – shiny and waxy – and combine this with domed, rounded or cylindrical shapes. Others have a cover of remarkable hairs that keep water and dust off the main surface. Just feel the leaves of common reeds – all those bristles keep off water and mud.*

**Spike Rushes** are sedges with tubular culms tipped with compact spearheads of tiny flowers. Some species prefer to be in deep water like *Eleocharis sphacelata*, which can get to 5 m in height. This species has cylindrical culms with evenly spaced pith inside.



Figure: *Eleocharis plana*

There are several other slender species that prefer the edges of waterways and marshy ground. The two common ones are *Eleocharis acuta* (culms tubular to three sided) and *Eleocharis plana* (culms compressed, slightly curved). Both species get to about 60–80 cm in height, and form quite dense stands round farm dams in shallows, and extensive meadows in marshy ground — great habitat for frogs and dragonflies! *Eleocharis* have a distinct papery seedhead at the tip of the culm.

Another sedge, often a little taller than the spike rushes, with distinct three sided (triangular) culms and single short bract above the cluster of spikes is *Schoenoplectus pungens*, only in NSW on the southern tablelands. This sedge grows to 90 cm in height. Many smaller types of sedge never grow more than 5–15 cm high, but cover much of the muddy edges of waterways and wetlands.

**Common Rush** (*Juncus usitatus*) has a tufted growth form and branching groups of flowers coming out about a little below the top of each cylindrical culm. This is a widespread rush, growing on the edges of watercourses.



Figure:  
*Juncus usitatus*





### Sneezeweed or Old Man Weed

(*Centipeda cunninghamii*) is an important stabilising plant on sandbars, often being one of the primary colonisers. It is a much-branched herb often with shallowly toothed leaves that are narrow at the base and wider at the top. It can be identified by the scent of the leaves, which is pine-like and minty. Although it is a daisy, it has a more or less prostrate habit. Sneezeweed is said to have antiseptic properties for cuts, abrasions and skin conditions.

### *Look out for this pest!*

**Water Speedwell** (*Veronica anagallis-aquatica*) is cosmopolitan and almost certainly exotic. It is a fleshy erect herb up to 1m high, with paired stem-clasping lanceolate leaves and large panicles of small flowers in all upper axils.

Growing rapidly at the water's edge, especially in clear water, it out-competes and crowds out local natives. It is rarely an overwhelming pest, but can become so, and is considered an important water weed in Victorian highlands.



Figure: *Veronica anagallis-aquatica*

### Similar native species

The **Australian Brooklimes** (*Gratiola peruviana*) (flowers sessile i.e. sitting on the stem without a stalk) and *Gratiola pedunculata* (flowers on stalks) are both natives with similar form that grow well in similar conditions. They have single tubular pink flowers that grow out of the leaf axil, but otherwise may be easily mistaken for Speedwell as they also have similar paired stem-clasping leaves.



Figure: *Gratiola peruviana*

### Treatment & Control

Manual removal, preferably before seed set is the common recommendation, see [http://www.sgaonline.org.au/invasive\\_veronicaanagallisaquatica.html](http://www.sgaonline.org.au/invasive_veronicaanagallisaquatica.html)

# clump-forming water edge plants

The **Tassel Sedges** (*Carex fascicularis* and *Carex gaudichaudiana*) are common and competitive tussock plants along waterways and in wet swampy paddocks. *Carex fascicularis* has the tassels of dangling flowerheads. *Carex* have long grass-like culms. The seeds in *Carex fascicularis* are more likely to stick into you if you run your finger along the fruiting heads. *Carex gaudichaudiana* usually has a long upper spike of male flowers, and so only has fruit on the lower, shorter heads. Even so these two are difficult to separate. In some places they are the dominant vegetation form.



Figure: *Carex fascicularis*



**Tall [Tassel] Sedge** (*Carex appressa*) is usually found further up the bank, and its spikes are erect and in the upper quarter of the culm. All three *Carex* have triangular culms.

Figure: *Carex appressa*

## Look out for this pest!

**Soapwort** (*Saponaria officinalis*) is a perennial herb from Europe with long above and below ground stems (runners) that will produce roots to spread. It produces large amounts of seed and strikes easily. It can densely cover large areas. Its leaves are 2–10 cm long and 6–30 mm wide, with three distinct, longitudinal veins. It has clusters of fragrant pink or white flowers.



Soapwort rapidly establishes in flood runners and sand bars following floods and after fires. While it stabilises the sand, it thrives in the moist conditions and overwhelms other less rapid growers. The runners are easily buried, and the leaves are sufficiently succulent to do well in unshaded areas.



Figure: *Saponaria officinalis* flower and seed

### Similar native species

There are no similar natives in the habitat. The native willow herbs are smaller, and the pink flowers are much smaller and less showy.

### Treatment & Control

Although the natural saponifier extracted from the leaves is of minor commercial value, the plant is a weed in waterways, not only in our region but in other parts of the world. This plant is a popular favourite in cottage gardens, but can readily escape into stormwater drains and so to our rivers.

Mechanical removal is required as herbicides have non-targeted side-effects in waterways.

Figure: *Paspalum distichum* dominating the river bank

**Water Couch** (*Paspalum distichum*) is a distinctive grass of moist soil and waterways. Occasionally weedy, it is generally one of the mixture of emergents with Water Primrose and the knotweeds.

It has a stem running across the soil and out into the water, with erect tillers terminated by distinctive V-shaped flower heads.



Figure: *Paspalum distichum* V-shaped seed head and foliage

There are several common knotweeds along our riverbanks and farm dams. **Pale Knotweed** (*Persicaria lapathifolia*) sometimes called Redshanks, is one tall common species that can form dense patches with other woody herbs in the damp riverbank a metre or so above the waterline. The Polygonaceae, the family that Knotweeds come from, have a special sheath at the base of leaves called an **ocrea**. It is a very useful feature that helps distinguish between similar species. Knotweeds

have seasonal growth flushes, and then have standing dead stems all through the cooler months. They can provide very good cover for riverbank animals of all kinds.



Figure: *Persicaria lapathifolia*

## *Drought and Flood Resistance, Multiplication and Reproduction*

*Aquatic plants may appear very fragile but they have developed some remarkable methods of beating disaster and rapidly recovering their numbers. Knotweed, Cumbungi and the sedges all bend with the flow in floods, then stand back up when the water level drops. Many aquatics, friend and foe alike, can happily be pruned back to a mud encased stolon or rhizome only to shoot from every available node when favourable conditions return. Seasonal species, like Common Reed, follow this behaviour as a matter of course.*

*The ability of Duckweed (Lemna and Spirodela) to cover a pond is speedy: one leaf, two leaves, four leaves, fragment... Swans and ducks help many plants fragment through their destructive grazing behaviour, and most pieces of Water Milfoil or Pondweed will quickly form new roots, settle and start a new patch.*

*Most water-plants, like Cumbungi, overproduce seed. It is the pollination mechanisms like that of Ribbon Weed that are really attuned to the aquatic environment. In Ribbon Weed the coiled stem of the female flowers is easy to see in the early summer. The male flowers are released from a packet at the base of the plant, rise to the top and sail across the surface of the water. The female plants create a tiny dip in the water surface down which male flowers sail. Once fertilized, the flower is pulled back down as the coil contracts, and the seedpod forms under water.*



## Look out for this pest!

**Purpletop** (*Verbena bonariensis*) is a very common weed of damp places. It is tall (0.6 – 2 m high) with narrow opposite leaves, a square stem and distinct dense terminal clusters of purple flowers. This species usually grows in combination with the weed Fleabane (*Conyza albida*), a tall scrappy-looking single stemmed daisy, and other tall single-stemmed weeds. Purpletop forms a dense thicket in deep soils along water courses. This concentration of herbage obscures the lie of the land and may lead to stock and personal injury, especially from soil slips and wombat holes.



Figure: *Verbena bonariensis*

### Similar native species

**Australian Gypsywort** (*Lycopus australis*) a tall native that also likes wet areas, may look very like Purpletop, but the flowers are white and in small groups in the axils of the leaves, not at the top like Purpletop. The knotweeds (*Persicaria* spp), are native emergents, and may also be part of the rank growth but have softer, less erect foliage, and drooping white or soft pink flowerheads

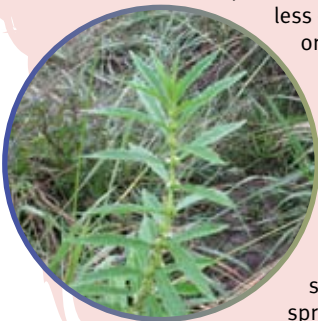


Figure: *Lycopus australis*

### Treatment & Control

Manual removal of Purpletop may be the safest and most cost effective management, but may have to be repeated for several years, and completed in spring, before seed-heads mature.

This applies to both Purpletop and Fleabane. Large, older plants may have to be cut and painted with herbicide (such as glyphosate), as hand pulling may be too difficult.

## Look out for this pest!

### Spearmint, Eau de Cologne Mint, Round-leaf Mint and more

(*Mentha piperita* and *spicata* cultivars). Mint spreads vegetatively by horizontal underground stems (rhizomes). They have opposite leaves with a distinct minty smell when crushed. Weed mints, all exotic, have terminal flowers (at the end of the stem).



Figure: *Mentha piperita* X *spicata*

### Similar native species

Native mints (*Mentha diemenica* and *Mentha laxiflora*) generally have axillary flowers (in the angle between the stem and the leaf). Gypsywort (*Lycopus australis*) in particular may resemble Spearmint in form and leaf.

### Treatment & Control

Weed mints can be carefully sprayed out with diluted herbicide or hand removed.

**Great River Rush or River Club Rush** (*Schoenoplectus validus*) is one of the common sedges that form dense thickets along river margins and the edges of backwaters and off-stream wetlands to a depth of about 1.5 metres.

River Rush has cylindrical culms with a very short bract at the tip above a branching flower-

head. *Schoenoplectus* stays dark green for most of the year, and provides great habitat for birds such as moorhens and swampheens. They use the reed-beds as cover for hunting, roost among the culms, and construct nests by collapsing the culms and effectively thatching them.



Figure: *Schoenoplectus validus*

The **Club Rushes** (*Bolboschoenus* spp.) are the other common genus that shares a similar niche to *Schoenoplectus*, and have triangular leafy culms. The three local species are similar in form and require careful examination to separate.

*Bolboschoenus caldwellii* is usually shorter (<1 m) than the other two, and its florets are in small clumps. *Bolboschoenus medianus* and *Bolboschoenus fluviatilis* are both tall (up to 2.5 m), have branching groups of florets and are best separated by examination of seed-heads. All are frequently grazed to a tuft of culms.



Figure: *Bolboschoenus medianus*

**Common Reed** (*Phragmites australis*) is a worldwide reed of waterways and damp areas. It is able to colonise areas from sand or soil with raised water tables into the sand bars and riffles of rivers and creeks and out to water about 1.5 m deep. It stabilises banks and waterways, forms the bar ends for chains-of-ponds, and promotes wildlife large and small. In autumn, the straw

coloured tassels wave above the brassy leaves and stems. The new growth comes through from September.



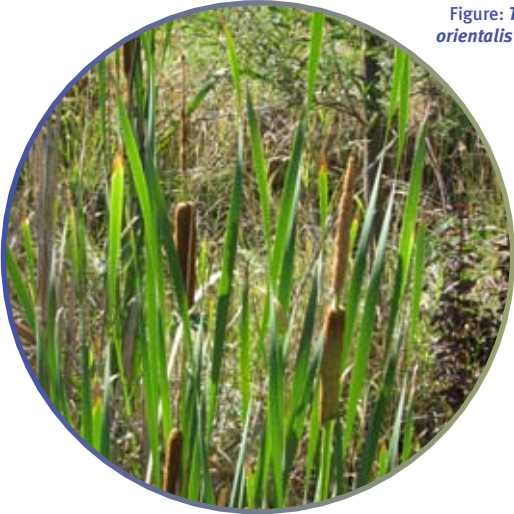
Figure: *Phragmites australis*



**Bulrushes** or **Cumbungi** (*Typha* spp.) form dense thickets in damp or waterlogged waterways, to a depth of 2 m. The rhizomes are perennial and the stems can stand for one or more seasons, but usually die back after flowering. It has a distinct cylindrical brown compact seed head like a sausage that sits on the top of a thick stem and dries to become woolly. Cumbungi can behave as a nuisance in irrigation areas and drainage lines, but provides habitat for birds such as reed warblers, moorhens, swamp hens as well as frogs, and as nurseries for fish fingerlings and tadpoles.



Figure: *Typha orientalis*



## Look out for this pest!

### Drain Sedge or Umbrella Sedge

(*Cyperus eragrostis*) is recognizable from its moderate size, rarely 'above the knee', and the yellow green of the leaves and culms and the yellow edged orange-brown spikelets (green when young). It grows at the edge of soaks, around pools and dams and along erosion lines. Drain sedge, an invader from the Americas, outcompetes the smaller native sedges. It seeds extensively and will spread rapidly.



Figure: *Cyperus eragrostis*

### Similar native species

Too tall and vigorous to be confused with the nut grasses, it might be confused with the much more slender native Dirty Dora (*Cyperus difformis*), which has green culms, short leaves and smaller brown flower clusters, or with *Cyperus exaltatus*, taller with rusty brown and green flower clusters. *Cyperus exaltatus* is native from the Yass area downstream onto the slopes and plains.



Figure: *Cyperus exaltatus*

### Treatment & Control

As this is often grown as an ornamental, or is used because of its vigour as a rapid bank stabiliser it can be tolerated, although its removal and replacement by local sedges is to be encouraged. This species can be carefully sprayed out with diluted glyphosate, or hand removed.

## *Look out for these pests!*

As well as the ones mentioned before, there are a suite of other exotics:

**Hemlock** (*Conium maculatum*) is a real pest in floodplains. It is recognisable from its large carrot-like leaves, with purple blotches on the leaf stalks and the bread plate sized umbels of flowers and seeds.

**Mustard Weed** (*Hirschfeldia incana*) will colonise broken ground anywhere. The wiry stems are persistent, and the seed appears to have good lasting qualities. Shading, by native trees and shrubs will eventually control this pest.

**Paterson's Curse** (*Echium plantagineum*) loves banks, flood terraces and swales.

Both **Common** and **Canadian fleabane** (*Conyza* spp.) can cover large areas of deep soils or spoil the mix in a *Pericaria* band on the strandline of reservoirs or farm dams and urban wetlands;

**Spiny Lettuce**, *Lactuca serriola*, is a biennial, and once established is very persistent. The spines or prickles are all over the plant, and may be irritating if they penetrate the skin.

**Skeleton weed** (*Chondrilla juncea*) and all the Thistles (*Carduus*, *Cirsium*, *Onopordum* and *Silybum* species) exploit dried up waterholes, then fill them with spiky, unpalatable greenery next time it floods.

... and the list goes on! All these are in the Molonglo Catchment Weed Information Pack.

Visit [www.molonglocatchment.com](http://www.molonglocatchment.com) for more information.

## Further reading

There is another local guide to riparian plants, *Down by the Riverside*, Falconer (2004), that has a greater emphasis on the plants above the immediate edge of the water body. It is very useful for the woody plants in waterways.

Two classic accounts of water-plants found in the region are Sainty & Jacobs (1981 and 1987, 2003). While the names and status of the plants were up-to-date when published, changes have occurred since and people may find it useful to compare the names used in the *Census of Vascular Plants of the ACT* (<http://www.anbg.gov.au/cpbr/ACT-census/>) to obtain the current name. Ashton (1973) *Aquatic Plants of Australia* is now well out of date but the descriptions and line illustrations are still useful. Klaphake's '*Sedges and Rushes*' is an accessible introduction. The various books by Nick Romanowski both on freshwater life and on wetland construction are worth consulting as are the pamphlets by Brock and co-workers. Romanowski has comments on the suitability of sedges and other emergents for grey-water treatment.

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