BugWise
Web2Spider
A tool for monitoring the diversity of web-building spiders
The Web2Spider Guide was created by Helen Smith, John Gollan, Matthew Bulbert.

All illustrations were prepared by Helen Smith. Illustrations labelled with “adapted from Main, 1976” were modified from:

“Main, Barbara York (1976). Spiders, Collins (The Australian Naturalist Library), Sydney.”

The illustrations were used with explicit permission of the author.

Images on the title page were provided by Matthew Bulbert, John Gollan and David Hain

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Scope of the document:

The *BugWise Web2Spider* method has been prepared by Australian Museum staff who work on spider behaviour, taxonomy and ecology. The method’s underlying assumption is that the number and different types of spider webs are closely linked to the number and diversity of web-building spiders. *Web2Spider* method has been designed so that: (1) users do not need an expert knowledge of spider identification; (2) specialised equipment is not required; and (3) it is more cost effective than traditional collecting techniques. The method can be easily modified and applied to meet any number of project objectives and/or educational aims. The current version of the *Web2Spider* method has largely been developed and tested in riparian habitats in the Upper Hunter Valley, New South Wales. The guide will also be useful in other areas and habitats, particularly in south-eastern Australia.

Also supplied with the *Web2Spider* guide is a glossary of terms and an example datasheet for recording data. The separate *Web2Spider Supplement* contains notes about the common spider species that make the web types identified in the guide. A DVD demonstrating the *Web2Spider* method is also available by emailing us at the address below. The DVD chapters provide suggestions for how to carry out web surveys, information on the various web-types, worked examples and some tips to prepare you for overcoming potential problems.

If you wish to comment on *Web2Spider* please visit our site at [www.bugwise.net.au](http://www.bugwise.net.au) and either email us or post a comment on the forum.

On the website, you will also find detailed information about spiders and their role in the environment via links on the BugWise resources page.

**Happy Hunting!**  
**The BugWise Team**
WEB KEY – START HERE

Choice A. Orb web: the main web is wheel-like, or part of a wheel...

Choice B. Other webs: are not wheel-like.

Go to page 2

Adapted from Main, 1976

Go to page 8

Adapted from Main, 1976
A. Orb webs

A1. DECORATED ORBS
- Silk patterns or debris woven onto web catching surface or flecks on support lines

A2. MISSING SECTOR & OFFSET ORBS
- Incomplete circle, or hub markedly off centre
- Missing sector narrow or most of the web
- Any objects are not attached to the catching surface

A3. PLAIN ORBS
- Complete circle or oval, hub often centrally placed
- No patterns or loose objects woven into web

Adapted from Main, 1976
A1. DECORATED ORBS

Decoration forms one or more straight lines

**Decoration of silk only**

**W1** Vertical web with an “X” or part of an “X”.

**W2** Vertical web with line up and down

Webs usually tidy and taut (unless damaged)

**W3** Sloping or horizontal web, hub may be offset

Barrier web often present

Extra decorations such as silk spots or flecks can be found anywhere on the web including the barrier web

Web silk may seem floppy and soft

Sometimes rather untidy web built onto remains of an earlier web

**Decoration of silk and remains of prey**

**W4** Line of debris and egg sacs

Silked bundles of prey debris are joined together and woven to the web surface

More decorated orbs on next page
A1. DECORATED ORBS (continued)

Decorations in various shapes
(all webs more or less vertical)

**W5** Compact “doily”

**W6** Meandering “S” or scroll

Decorations of silk only in W5. Often debris at centre of W6

**W7** Messy patch of silk and debris

**W8** Silk flecks, often on supporting lines

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May also have silk patches on web surface

Strong webs in open situations
Curled-leaf in missing part of web circle

**W9** Leaf at web centre
- Leaf suspended in a tangle of lines
- Web hub emerges from open end of leaf

**W10** Leaf away from web centre
- No tangle above web
- Leaf attached to top support line
- Web hub separate from leaf

**W11** Many radial lines, 20 to 40 in 90°
- Barrier webs often present
- Web silk often golden-yellow
- Debris may be present (on a separate line)
- Radial lines branch, making them numerous towards edge of web, 20-40 in 90° section
- Estimate 90° using hand.
- NB each branch line is counted

**W12** Sloping web
- Fluffy egg sacs may be present in a line through missing sector into web centre
- Radial lines less numerous (and do not branch), less than 20 in 90° section

More missing sector and offset orbs on next page
“Pie slice” and other webs

W13 Web approximately vertical

Web almost a complete circle or reduced to only a “pie slice”

Web hub opens directly from retreat

Retreat under a leaf or in a curled leaf or occasionally other debris or silk

W14 Fine signal line to tangled retreat in a plant

Signal line can be hard to spot – this kind of web is often given away by the tangle around the retreat

NB sometimes some catching spirals pass through the “missing sector” close to the edge of the web

W15 Offset orb, web more or less horizontal (shown from below)

Hub markedly offset from centre (often hidden under a leaf or attached to a twig)

A tangle of lines is often present near the hub

Sometimes so untidy that only a hint of radial structure remains

NB one of the decorated orb webs, W3, may also have an offset hub
A3. PLAIN ORBS

**W16 Many radial lines**
- Radial lines branch, making them numerous towards edge of web, 20-40 in 90° section
- Barrier web and debris may be present (on a separate line)
- Web may be distinctly oval

**Vertical** or slightly sloping webs

**W17 Web hub filled in**
- Radial lines less numerous (and do not branch), less than 20 in 90° section
- Web slope usually less than about 30°
- Sometimes with a few tensioning threads across the hole

**W18 Distinct hole at web hub**

**Horizontal** or strongly sloping web

**W19 Hole at hub**
- Slope usually greater than 30°
- Fine barrier web often present

**W20 Very small** web, pulled upwards into a cone
- Damp places such as rotten tree stumps

**NB** For a large web like a tent or cone, go to W25

Adapted from Main, 1976
B. Other webs

B1. LACE WEBS
- New parts of web have ladder-like or zigzag weave
- Old parts of web have a coarse and uneven weave
- Between leaves, on twigs or on tree surfaces

B2. SHEET & KNOCKDOWN WEBS
- Fine sheet – looks like a hammock or hanging mosquito-net
- Often with a knockdown web above or below

B3. TANGLE WEBS
- Few to many fine threads
- No sheet
- No defined pattern – messy looking

Figures adapted from Main, 1976
B1. LACE WEBS

Webs on rough **tree trunks** or **bark**

**W21** Funnel-like entrance holes

- Old webs join into overlapping fans
- Lace structure degenerates to a characteristic irregular pattern
- Old matted silk is coarse

Webs among **twigs, leaves, flower heads**

**W22** Web radiates from hole in dead twig

- Strap-like lacy spokes
- Spokes not joined into a fan

**W23** Web sections fan out. Silk retreat may be visible

- If web radiates from a twig hole it forms a lacy fan rather than spokes

**W24** Web around large or small **nest**

- Nest made from silked together leaves or debris
Knockdown web above and/or below sheet surface .......... (pp. 10-11)
No knockdown web, just lateral support lines ......................... (p.11)

With knockdown web

Sheet pulled up in one or more peaks and/or leaf or detritus retreat suspended in lines above sheet

W25 Irregularly woven sheet, very light and filmy

Both web types are commonly made in vegetation between leaves and twigs

Web often includes a retreat of detritus, a dead leaf etc

W26 Regular radial weave (may be finely meshed, look closely!)

Some webs may be much less dense

Several spiders may make webs close together with many connecting lines

W27 No distinct peaks in sheet and no retreat; small sheets or hammocks in low vegetation

May be small peaks where knockdown lines attach

Knockdown web above or below sheet

More sheet and knockdown webs on next page
(sheets with knockdown web continued)

**W28** Platform web: **knockdown** web above **sheet**; with **burrow**

- Sheet slopes into retreat burrow
- Retreat burrow opens on to top of sheet
- Retreat usually a burrow in the ground, but may be into wood crevice, grass tussock etc

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**Sheets with no knockdown web**

**W29** Filmy sloping sheet. **Retreat** opens **beneath sheet** (spider runs upside-down on underside)

- Retreat burrow often in rotting wood or under bark, sometimes in an earthen bank
- Filmy sheet slopes down from retreat
- Web often roughly triangular or trapezoid

**W29a** Densely woven sheet with broad funnel to substrate

- On rock faces under sheltered over-hangs, underside of logs etc
- Funnel often closed by sheet
- Beware, old abandoned webs may persist for many months.
B3. TANGLE WEBS

With a silk **retreat**, retreat may be tight silk or an untidy mess

**W30 Web** between leaves, twigs or branches

Retreat usually densely woven

Long lines often have evenly spaced sticky droplets

**W31 Long** lines always go down to a firm surface (e.g. ground or log)

Retreat in dense tangle, thimble-shape, usually under shelter

Sticky droplets near ends of long lines only

**W32 Without** a silk retreat

Spindle or asterisk-shaped egg sacs may be suspended in tangle

Sticky droplets on lines present or absent
GLOSSARY

A **barrier web**, also known as a labyrinth, is a haphazard series of silk lines in front of and/or behind an orb web. These are thought to help deter and detect predators. The lines may also help to disorient flying prey, making them more likely to fly into the orb, which is the catching part of the web.

**Catching surface**: the area of an orb web that is covered by spirals or switchbacks of sticky, stretchy silk. In missing sector webs, the missing sector is defined by not having this catching surface, although a tangle of lines may fill the gap.

**Debris** refers to the remains of the spider’s meals and sometimes small scraps of leaves and bark that are incorporated into webs and retreats. Some spiders join these bits in a line and hang it from the web, whereas others attach it to the surface of the web using conspicuous white silk. Retreats may also be made from, or incorporate, debris.

**Decorations** are silk patterns, or sometimes the silk-wrapped remains of the spider’s meals (debris), which are woven onto the surface of the orb web. If examined closely the silk patterns often zigzag.

**Fan**: indicating the shape of a hand fan. Extending out from a central point.

**Hammock**: what we have termed here a hammock web is a sheet web that is suspended like a trampoline or circus safety net. The main supports and stabilising lines are around the edge and below the sheet and the centre is lower than the edges. There is often a tangle below the sheet where the spider waits for prey.

**Horizontal**: see orientation

The **hub** is the central area of an orb web. This is typically an irregularly woven area where the radial support lines meet and are joined together. Some spiders eat away part of this area when they have finished making the sticky spiral.

A **knockdown** web is a tangle of lines above or below a sheet web which disorients or intercepts flying insects so they land or fall onto the sheet. Like barrier webs, knockdown webs probably also serve a protective function by preventing predators such as wasps from easily flying in.

**Lace** webs do not contain sticky silk, instead they capture prey by snagging. Each line is composed of many tiny fibres which are combed to produce an entangling fuzzy thread, rather like a fluffed out strand of wool or cotton. The web is constructed in a characteristic pattern of ladder-like sections with zigzag steps. New regions show this clearly, but as the web ages, this structure decomposes, and sometimes new layers are laid over the old. Eventually the structure of old areas of the web appears as a jumble of different-sized squares, rectangles and circles.

A **nest** can be considered as a glorified retreat. Here we are specifically referring to the densely woven home of a particular kind of spider. These are often solitary, in which case the nest may be small, but sometimes they live communally, and the large nest may contain up to one hundred or more spiders.

**Orientation**: vertical, horizontal or sloping. These are all terms used to describe how an orb web is positioned. Using a bicycle wheel as a model, ‘vertical’ would refer to the normal orientation with the bicycle held upright ready for use. ‘Horizontal’ would apply if the bicycle were lying on its side, or ‘sloping’ if it were angled from being leant against a low wall or post.

**Platform** webs are a kind of sheet web. The sheet is gently to steeply sloping up and out from the spider’s retreat, which is in a silk-lined burrow. The sheet is pulled taut into a smooth surface, which the spider runs on. This is the platform. Above the platform is a maze of knockdown lines.
Radials are the silk lines that radiate from the centre of an orb web to the outer frame or support lines like the spokes of a wheel. They are the framework on which the catching spiral is laid.

A retreat is a hideaway where the owner of the web may be lurking. This is typically a dead, curled leaf; a hole in a dead twig; or pieces of debris joined to form a tube, which is bound with silk. Sometimes the retreat is just a denser area of silk lines woven into a tunnel, which is usually against a twig or leaf. Often there is a protective tangle of lines around the retreat area, which can make it look like a separate web.

Sector: if you think of the radial lines that go from the centre of an orb web to the frame as being like the spokes of a wheel, then the area between each spoke is a sector (like a pie slice). ‘Missing sectors’ might be filled in with a tangle, but there are rarely any catching spirals through them. The catching spirals either form a U-turn to either side or end abruptly.

A sheet is a closely woven mesh of non-sticky silk lines. Sheet webs can be simply guyed out to the adjacent substrate, e.g. vegetation etc., or associated with a tangle of vertical or haphazardly orientated lines. The sheet part can be seen as a distinct flat or curving surface among the supporting lines. Dew, or a fine spray of water droplets, shows a sheet up clearly.

A signal line allows the spider to hide away from an orb web in relative safety, whilst allowing it to monitor the web in case prey flies in. The signal line is usually attached in the hub area at one end and can be followed to the spider’s retreat at the other. One leg of the spider can often be seen resting on the line.

Silk is composed of thin, strong protein fibres. Silks are produced by a number of invertebrates, including caterpillars such as the ‘silkworm’ and spiders. Whereas the caterpillars and other insects mostly use silk to make a nest or a cocoon, spiders have adapted silk for all kinds of purposes. These include the covering for egg sacs, for making secure retreats and, of course making webs. Spider silk is spun from the spinnerets, on the tip of the spider’s abdomen. Several different kinds are made, including combed fluffy silk (cribellate silk) which is used in lace webs, strong non-sticky threads like those that support orb webs and the sticky silk that is coated with viscous droplets and makes up the catching spiral on many orb webs.

Sloping: see orientation.

Spirals form the catching surface of a typical orb web. Sometimes there is literally one continuous spiral from the outer edge of the web into the hub. In other webs there may be breaks, or the catching thread may reverse direction once or many times. In most orb webs the spirals are made of sticky silk that is coated in glue-like droplets. A few kinds of orb webs have catching silk of a different nature (cribellate silk). This cannot be as highly tensioned as sticky silk, and so these webs often appear untidy and ‘floppy’.

A tangle is a more-or-less unstructured and haphazard collection of silk lines without other features like an orb or a sheet. As a guide, we have defined a simple tangle web as anything over five lines in roughly a 10 x 10 x 10 cm area. When tangles are a part of a different web type they usually have a special name; for example, a system of haphazard lines placed on either side of an orb or below it is usually called a ‘labyrinth’ or ‘barrier web’ and a similar tangle above a sheet web is often called a ‘knockdown web’.

Vertical: see orientation.
# Web-2-Spider Datasheet

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<th>Locality</th>
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## Tallies

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| **Wind codes** | 0 smoke rises vertically  |
|                | 1 slight smoke drift.     |
|                | 2 wind felt on face and leaves rustle. |
|                | 3 leaves and twigs in slight motion. |
|                | 4 dust raised and small branches move. |
|                | 5 small trees in leaf begin to sway. |
|                | 6 large branches move and trees sway. |

| **Weather codes** | Sunny S – shadows cast.  |
|                   | Overcast O – no shadow cast. |