

Impact Assessment Record

Scientific Name: *Salix fragilis*

Common name: Willows

QUESTION	COMMENTS	RATING	CONFIDENCE
Social			
1. Restrict human access?	Willows can form dense thickets several metres thick, with densely spaced stems (FEIS, 2000) that could be major impediments to access waterways. <i>S. fragilis</i> is a thicket-forming species (Cremer, 1995). <i>S. fragilis</i> also have extensive roots, which can grow out into the stream (Cremer, 1995), “trapping silt and layering new roots over the top of the old ones...creating a broad shallow stream” (Muyt, 2001) and “block[s] streams, drains and culverts (Webb, Sykes & Garnock-Jones, 1988). They are a major impediment to access waterways.	H	MH
2. Reduce tourism?	<i>S. fragilis</i> can grow instream and has roots that encroach into streams(Cremer, 1995), trapping silt and reducing channel capacity to create a shallow stream that boats and swimmers can no longer use have block the passage of boats (see Q. 5).	H	MH
3. Injurious to people?	No reference to human injury found in any reference. Toxicity rated as ‘none’ for the species summarised in the USDA Plants Database (2006) including <i>S. purpurea</i> , <i>S. exigua</i> , <i>S. nigra</i> , <i>S. xsepulcralis</i> , <i>S. alba</i> . Presume no toxicity for any <i>Salix</i> .	L	MH
4. Damage to cultural sites?	As semi-aquatic species, confined to stream banks or beds or moist locations (Carr, 1996; Carr et al, 1992; Cody, 1996; Davis, 1982; Howard, 1988; Ladson et al, 1997; Maloney et al, 1999; Munz, 1963; Voss, 1972; Webb, Sykes & Garnock-Jones, 1988) willows are unlikely to grow near enough to cause structural or visual damage to cultural sites. However, during floods, senescent trees can drop large branches or trunks into waterways and a build up of material behind these snags can destroy bridges (ARMCANZ, 2001). Major damage to buildings can occur when streams change route because they have become clogged with mats of willow roots. A Tasmanian Landcare group was formed in response to flooded homes, the cause of which was attributed to stream blockages by willow roots encroaching into streams (Sarah Holland-Clift pers. comm.).	H	MH
Abiotic			
5. Impact flow?	<i>S. fragilis</i> are able to grow in streambeds (Webb, Sykes & Garnock-Jones, 1988) and so can have serious impacts both to surface and subsurface water flow. They can also put roots out into the water (Cremer, 1995), “which can grow out into the stream trapping silt and layering new roots over the top of the old ones...creating a broad shallow stream” (Muyt, 2001) and “can decrease channel capacity, exacerbate flooding and change flood patterns” (Purtle et al, 2001b).	H	MH
6. Impact water quality?	As deciduous plants (Carr, 1996), all shrub and tree willows have mass autumn leaf fall, which leads to decreased oxygen levels (Ladson et al, 1997). Intense shading by willows, which tend to have more dense canopies than native species decreases water temperature (Ladson et al, 1997).	H	MH

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7. Increase soil erosion?	“Willows encroaching into the centre of streams interrupt the flow of water which results in stream flows being directed into watercourse banks, causing erosion. In severe cases, willows can create complete blockages, causing the stream to change course” (Purtle, 2001b). <i>S. fragilis</i> are capable of encroaching into streams (Webb, Sykes & Garnock-Jones, 1988).	H	MH
8. Reduce biomass?	As woody plants that can form dense thickets, or large shrubs or trees (Carr, 1996), willows are capable of increasing biomass where they replace lower or less dense vegetation as they commonly do in disturbed sites (Cremer, 1999).	L	MH
9. Change fire regime?	Willows are low flammable/combustible trees (Carcaillet et al, 2001), likely to greatly change the frequency and intensity of fire risk.	H	H
Community Habitat			
10. Impact on composition (a) high value EVC	Basin = East Gippsland – Cann River (ISC=excellent); CMA = East Gippsland; CLIMATE potential = VH; Several suckering species have been recorded forming dense thickets that exclude sunlight and most other species, including <i>S. cinerea</i> , (Cremer, 1999) and <i>S. fragilis</i> (Henderson, 1991). <i>S. fragilis</i> have formed monotypic stands along kilometres of riverbank (Kennedy, Ganf & Walker, 2003). Potential to form monocultures excluding all other species within a layer.	H	MH
(b) medium value EVC	All Victorian waterbodies are assumed to be high value EVCs.	L	H
(c) low value EVC	All Victorian waterbodies are assumed to be high value EVCs.	L	H
11. Impact on structure?	Several suckering species have been recorded forming dense thickets that exclude sunlight and most other species, including <i>S. cinerea</i> , (Cremer, 1999) and <i>S. fragilis</i> (Henderson, 1991). <i>S. fragilis</i> have formed monotypic stands along kilometres of riverbank (Kennedy, Ganf & Walker, 2003).	H	H
12. Effect on threatened flora?	No information found.	MH	L
Fauna			
13. Effect on threatened fauna?	No information found.	MH	L
14. Effect on non-threatened fauna?	Intense shading decreases primary production in waterways, impacting on invertebrates and fish (Ladson et al, 1997). Reduce indigenous vegetation which would otherwise provide habitat (especially tree hollows) and pollen and nectar food sources (Ladson, 1997) “Dense shade and mat-forming willow roots suppress and kill indigenous understorey [which is] important habitat for insects, birds and mammals. Bare banks beneath willows provide little protection for frogs,	MH	MH

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	water rats, snakes, lizards and other fauna. Willows do not provide nectar for native birds... Willows also have few hollows, important habitat for over half of our woodland birds and mammals" (Purtle et al, 2001b). Reduction in habitat for fauna, leading to reduction in numbers of individuals but not to local extinction.		
15. Benefits fauna?	Possoms graze and defoliate isolated trees (ARMCANZ, 2001). <i>S. exigua</i> "stands provide excellent cover for numerous wildlife species" in America (FEIS, 2000). Other thicket-forming species that might also provide habitat include: <i>S. cinerea</i> (Cremer, 2001), <i>S. fragilis</i> (Cremer, 1995), <i>S. purpurea</i> (Cremer, 1999) <i>S. x rubens</i> (Cremer, 1995), <i>S. viminalis</i> (Webb et al, 1988). Willows are capable at most of providing some assistance as either food or shelter to desirable species.	MH	MH
16. Injurious to fauna?	No reference to animal injury found in any reference.	L	H
Pest Animal			
17. Food source to pests?	The palatability of this species is unknown.	M	L
18. Provides harbor?	<i>S. exigua</i> "stands provide excellent cover for numerous wildlife species" (FEIS, 2000). <i>S. fragilis</i> is also a thicket-forming species (Cremer, 1995) that might harbour foxes and rabbits include.	H	MH
Agriculture			
19. Impact yield?	Species present as agricultural weeds: <i>S. alba</i> in NZ and USA, <i>S. babylonica</i> and <i>S. cinerea</i> in NZ, <i>S. exigua</i> in USA, <i>S. nigra</i> in USA and <i>S. fragilis</i> is a principal agricultural weed in NZ (Holm et al, 1979). As willows are associated with waterways and not recorded as invaders of pasture or crops, their ability to form dense thickets that impede access to waterways for irrigation is likely to be the only impact they have on agriculture. Willow root mats reduce access to flowing water for irrigation purposes (Sarah Holland-Clift pers. comm.). <i>S. fragilis</i> (Cremer, 1995) is a thicket-forming and instream species which may reduce access to waterways for irrigation. They are likely to have a minor impact on the quantity of produce.	ML	MH

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20. Impact quality?	Generally willows are valued for shade and browsing for livestock (Besaans, 1995).	L	MH
21. Affect land value?	“Fibrous willow roots and dense willow foliage trap large amounts of silt which can decrease channel capacity, exacerbate flooding and change flood patterns...Willows encroaching into the centre of streams interrupt the flow of water which results in stream flows being directed into watercourse banks, causing erosion.” (Purtle, 2001b). Whilst risk of floods and erosion may cause decrease in land value in some incidences, with a state wide view, this is likely to be negligible.	L	MH
22. Change land use?	Willows are associated with waterways and not recorded as invaders of pasture or crops in the extensive literature. Whilst control may be required (see Q. 23) there is little risk that land use would need to change as a consequence of their invasion of agricultural land.	L	H
23. Increase harvest costs?	Some willow control to maintain waterways for irrigation may increase harvest costs by a minor amount. This is likely to be for the thicket-forming species and those able to grow instream such as <i>S. purpurea</i> (Cremer, 1999). In the Jerilderie area 80% of farmers are donating a rebate to fund a project manager for willows in Yanco Creek, because their root mats reduce access to creek water for irrigation (Sarah Holland-Clift).	MH	MH
24. Disease host/vector?	Not found in the extensive literature.	L	H

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Revisions

Date	Revised by	Revision
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