Request for all available mapping information on willows across Australia

'Because everything depends on knowing where the beast is'
National Willows Taskforce

At a glance

- The National Willows Taskforce is seeking the assistance of willow managers to collate all available mapping information on willows across Australia.
- The information requested will be used to support willow managers in effectively prioritising management of willows at the regional, state/territory and national levels.
- Once all available information has been collated, gaps and inconsistencies will be identified and a series of workshops and on-ground mapping work will be conducted to help address these gaps.
- A national weed risk management protocol will be used to objectively prioritise willow species and areas for management based on weed risk and feasibility of coordinated control.
- Regional maps indicating priority areas and species for control (based on risk and feasibility of control) will be provided to managers to help guide their investment in willow management.
- This paper outlines what mapping attributes are preferred, why this information is requested and how it will be used to benefit all willow managers.
- Although a list of preferred attributes is provided, any data you have will be useful. If you do not have information on all of these attributes, please just send us what you do have.
- This mapping information is critical if we are to achieve effective willow management; we cannot manage what we do not know.
- Please send any available mapping information to John Weiss Ph. 03 9785 0144, email John.Weiss@dpi.vic.gov.au or post to P.O. Box 48 Frankston VIC 3199.
- Comments or questions are welcomed and can be directed to the National Willows Coordinator Ph. 03 5226 4831 or email Sarah.Holland-Clift@dpi.vic.gov.au.

Introduction

Although a familiar and often well-loved icon of the Australian landscape, willows (*Salix* spp.) are among the most serious river bank and wetland weeds in temperate Australia. Willows infest thousands of kilometres of waterways and cause substantial economic and environmental impacts including reduced water quality and availability, increased erosion and flooding, reduced aquatic and riparian biodiversity and obstructed access to streams for fishing and aquatic sports. More than $10 million is spent annually on willow management across Australia, costing in the order of $35,000-150,000/km of densely infested waterways.

Willows are extremely promiscuous and can hybridise and spread by seed up to 100 kilometres from their initial source, highlighting the need for coordinated action across regions and States. At least 32 naturalised and 47 cultivated willow species, varieties and hybrids are present in Australia and the distribution, invasiveness and impacts of these willows are poorly understood.

The National Willows Taskforce was established in August 2005 in order to help coordinate the strategic management of willows across Australia. The National Willows Taskforce currently consists of:

- a community Chair,
- a State/Territory Government representative each from the ACT, QLD, NSW, Victoria, Tasmania and South Australia

- a representative each from the Nursery and Garden Industry Australia, the Victorian Catchment Management Authorities, NSW local government and rural land protection boards and the Weeds CRC and
- the National Willows Coordinator.

In May 2006, the National Willows Taskforce successfully gained funding through Round 2 of the Australian Government's Defeating the Weeds Menace Programme for a project titled 'Developing willow management priorities from the local to the national scale'.

Developing willow management priorities project

This project aims to assist willow managers in setting priorities for on-ground works that provide the greatest environmental and economic benefits, by addressing key questions such as:

Where should we prioritise our willow management efforts?

Should some willows be targeted as higher priorities than other willows?

If willows are not a problem in my area, will they likely become a problem and how do I make sure they don't spread here?

Given that willows can spread by seed across catchments, which areas and willows should we target?

Should all willows be restricted from trade and planting, or are some species 'safe'?

How can we influence State/Territory governments on legislation to actively control problem willows?

Are we using our resources most efficiently and targeting the most strategic areas?

The two major components to this project will be to:

a) determine the extent of willow infestations across Australia and

b) conduct detailed weed risk assessment of naturalised and non-naturalised cultivated willows.

This information will be used to undertake a standardised risk management process, which prioritises management of different species and areas based on weed risk and feasibility of control. From this we will produce

- detailed reports illustrating the weed risk of known willow taxa and priority areas and species for management
- interactive, easy-to-use maps of both current and potential distribution, useful for regional, state and national planning and
- a template database for additional and consistent data entry that can feed into state and national databases.

a) Determine the extent

Willows are known to be widespread and infest thousands of kilometres of waterways throughout Victoria, New South Wales, the ACT and Tasmania, with some willows also present in QLD, South Australia and Western Australia. However, detailed information on the distribution of willows in all of these states is seriously lacking and significantly impedes our ability to manage them effectively.

In the first phase of this project, we hope to collate as much information that exists on willows across Australia, so that we can add value to the mapping efforts that have already been made.

The first major step in this project is to collate all available mapping information on willows across Australia, hence the reason for this request.

Once this information has been collated, we will conduct a series of regional workshops across each State/Territory to train people in willow identification and management and to record additional known infestations onto regional maps. These workshops are planned to occur between October 2006 and March 2007. Anyone involved in willow management or with an interest in willows in a region will be invited to attend a workshop, including contractors, regional catchment management/river health officers, Landcare and Friends of groups, State and local government weeds and native vegetation officers and parks rangers.

To register your interest in attending a workshop, please contact the National Willows Coordinator (email Sarah.Holland-Clift@dpi.vic.gov.au).

In developing this project, we received offers of support from many willow managers across Australia, offering to provide mapping information and in-kind time to this project. We are extremely grateful for such support, as without such extensive support, mapping willows across Australia would be an impossible feat.

b) Conduct weed risk assessment

The weed risk management process is a standard process that seeks to obtain relative rankings on weed risk and control feasibility, as a decision support tool for allocating resources in weed management. Weeds are prioritised based on their intrinsic abilities to invade suitable ecosystems and their present and potential impacts on social, environmental or agricultural values.

This project will adopt a standardised risk management process in accordance with the National Post-Border Weed Risk Management Protocol, in order to objectively prioritise willow species, groupings and locations for coordinated control programs at the regional, state/territory and national levels. As part of this process, the weed risk of different willow species will be assessed based on three major components:

1. invasiveness, or rate of spread
2. current and potential distribution and
3. the current and potential impacts of the plant on land use and ecosystems.

The risk of a particular willow species will depend on a combination of its invasiveness and a "ratio" of its present and potential impact. Thus a less invasive plant may rank as a more important weed than a highly invasive plant, if for example:

- its overall area and / or the number of ecosystems it invades are greater;
- its present distribution is very insignificant but its potential distribution is very large;
- its impact is much greater.

In addition to assessing weed risk, the relative feasibility of reducing or minimising each of these risks through coordinated control programs will be examined. Coordinated control programs aim to achieve eradication or containment of a weed within the geographic area of interest, through locating and treating infestations and restricting movement of propagules. In simple economic terms, the total cost of a successful coordinated control program will be a function of three components:

1. total area infested,
2. annual control cost per unit area, and
3. number of years required to achieve the desired level of control.

By comparing weed risk and feasibility of coordinated control, willow species will be categorised and prioritised for various treatment actions for each region. Treatment actions can include preventing entry, eradication, containment, protecting priority sites/assets, targeted control, research, improve general weed management practices and no action. The desired outcome of this process is the efficient use of resources for willow management through targeting investment to those species and areas that pose high risks and have a high feasibility of coordinated control.

Willows that pose the highest risks and have a high feasibility of control will become the highest priority for management

Mapping information requested

In the first phase of this project, we hope to collate as much information that currently exists on willows across Australia, so that we can add value to (and not replicate) the mapping efforts that have already been made.

The following text outlines how we would prefer to receive the information and exactly what data we would like to obtain. However, we are flexible about what information we receive and how we receive it, as any data is useful.

Please send any available mapping information to John Weiss Ph. 03 9785 0144, email John.Weiss@dpi.vic.gov.au or post to P.O. Box 48 Frankston VIC 3199.

Comments or questions are welcomed and can be directed to the National Willows Coordinator Ph. 03 5226 4831 or email Sarah.Holland-Clift@dpi.vic.gov.au.

A) Data format

Data can be provided to us in a variety of formats, depending on which is easiest for you. Preferred formats include:

- Microsoft Excel or Access database (see attached template)
- Shape files

If it is easier for you to send your data in a different format, please contact John Weiss (03 9785 0144) to discuss.

B) Preferred list of attributes for data collation

The following is a list of attributes that, if available, we would like information on. This list incorporates a national list of core attributes for mapping Weeds of National Significance and several willow-specific attributes that will assist in prioritising management efforts.

If you do not have information on all of these attributes, please send us whatever you do have, as any data will be useful.

Any mapping data will be useful, so even if you do not have information on all of these attributes, please send us whatever you do have available.

Where possible, please include data on locations where willows:

- **Are present,**
- **Are not present,**
- **Have been treated or removed.**

List of attributes (1-19):

1. Data record number (unique identifier for the site allocated by the data custodian)
2. When was the site assessed (date)?
3. Who assessed the site/collected the information?
    a) Name and/or
    b) Agency/employer/group
4. Northing (or latitude) and easting (or longitude) at centre of site, including
    a) Latitude (Decimal Degrees S) OR Northing (metres N)
    b) Longitude (Decimal Degrees E) OR Easting (metres E)
    c) Zone (e.g. UTM 49-56)
    d) Datum (e.g. GDA94/WGS84)

    If determined from a map, also include:

e) Mapsheet name, number and scale

f) Edition, date of publication and publisher

Note: for decimal degrees - 6 significant figures preferred; for metres - 3 significant figures preferred.

5. Are willows present / not present?

If not present, have willows been removed from this site in the past?

If willows were previously removed, when was this done?

6. Species name (scientific (e.g. Salix fragilis) and common names (e.g. crack willow))

Include sub-species, variety or hybrids if known

If species name is not known,

a) Is the willow a tree or shrub form?

b) If the willow is a tree form, do the branches weep downwards?

7. Precision – how were the coordinates determined (e.g. a) – d) below)?

a) GPS (record the type or make and model of the system and note the accuracy)

b) map reading

c) prior records (such as a permanent sample plot record), or

d) another method (explain method).

8. Distance and direction FROM nearest town, city or geographic feature to the site

9. Extent of willows (area covered in hectare/s or metres)

10. Density of willows (choose from a), b) or c) below)

a) large dense infestation

b) scattered stand with isolated trees interspersed or

c) scattered individual trees

11. Is the willow male or female or both?

If you are unsure, leave blank.

12. Does it produce seed (only for females trees)?

13. Was the willow naturalised or deliberately planted?

If deliberately planted, when was the willow planted (date)?

14. Is the willow growing

a) completely in-stream (roots have full and continuous access to stream)

b) half in-stream, half on the bank (roots have part access to stream)

c) completely on the bank or away from waterway (roots have little to no access to stream)

15. Have the willows been treated and when?

a) If yes, what method was used and when (date)?

b) If follow up treatment has occurred, what method was used and when (date)?

Add further columns for additional follow treatments.

16. Purpose of visit to site (e.g. survey willows/assess native vegetation/Ramsar site etc.)

17. Land use category (e.g. Australian Land Use Mapping (ALUM) classification – see Attachment A)

18. Number of records (note any other records made of this same site)

19. Comments (any comments that may be of use for mapping, planning and management)

Comments could include

a) Factors that may affect the accuracy of the record (e.g. access, method of assessment, uncertainty about species name etc.)

b) Life stage/age of willows (e.g. seedlings, juveniles, adults)

c) Likely source of infestation

d) Other weeds in area

e) General observations

f) Description of photo-point

g) Impacts of willows, measured or anecdotal (e.g. encroaching into stream, reducing biodiversity of plants and animals, causing erosion etc.)

c) List of overlays requested (State/Territory Governments only)

Although we have a broad land use map for the whole of Australia, the National Land Use 1996/1997 - Australian Land Use and Management (ALUM), this is a very broad and large scale data set.

If available, we are also looking for State and Territory GIS data sets for

- Landuse (e.g. agricultural)
- Native vegetation (i.e. broad vegetation types or ecological vegetation classes) and
- Hydrological layers (i.e. rivers, stream, watercourses and water bodies)

We would prefer these layers at a maximum scale of 1:250,000 or better (ie 1:100,000), but whatever you have would be useful. If we do not get any suitable layers, we will use the ALUM layer.

How we plan to use this information

The mapping information will be used for the purpose of:

- feeding into regional, State and national willow distribution maps for use by Landcare groups, regional authorities, local and State Governments and the National Willows Taskforce in setting priorities for willow management
- being used in conducting weed risk assessment following the National Post-border Weed Risk Management Protocol
- being provided to the Australian Government for the purpose of incorporating the data into a National Weeds Mapping database, once one is developed.

The data sets will be aggregated and presented so that the privacy of individual properties is protected.

The data sets will be hosted on relevant regional, State and Territory databases and the complete data set hosted nationally by the National Willows Taskforce.

Any publication in which the reproduced data appears will include acknowledgment of the data source.

Each organisation will be given the opportunity to comment on publications (before public release) produced that include material they have submitted. A final copy of the publication will subsequently be provided.

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Comments or questions are welcomed and can be directed to the National Willows Coordinator Ph. 03 5226 4831 or email Sarah.Holland-Clift@dpi.vic.gov.au.

The National Willows Taskforce thanks you for your assistance in providing us with available mapping information on willows and taking us one step closer to improving and protecting our waterways for the future.

Appendix A Australian Land Use Mapping Classification

The Australian Land Use Mapping Classification ('ALUM'; Bureau of Rural Sciences 2002) is recommended when assessment of weeds of national significance includes land use. The ALUM classification was developed in collaboration with Commonwealth, State and Territory agencies involved in land use mapping. The primary and secondary levels in the classification are:

1. Conservation and natural environments
   - 1.1 Nature conservation (nature reserves, National Parks, other legally protected areas)
   - 1.2 Managed resource protection (land other than nature conservation reserves managed for biodiversity or landscape values; water catchments; traditional indigenous use)
   - 1.3 Other minimal use (defence land; stock routes, remnant native vegetation)

2. Production from relatively natural environments
   - 2.1 Grazing natural vegetation (essentially intact native vegetation used for grazing)
   - 2.2 Production forestry(native forest and vegetation managed for timber or other production)

3. Production from dryland agriculture and plantations
   - 3.1 Plantation forestry
   - 3.2 Grazing modified pastures
   - 3.3 Cropping
   - 3.4 Perennial horticulture (plants living more than two years)
   - 3.5 Seasonal horticulture (plants living less than two years)
   - 3.6 Land in transition (land use unknown, degraded, abandoned or under rehabilitation)

4. Production from irrigated agriculture and plantations
   - 4.1 Irrigated plantation forestry
   - 4.2 Irrigated modified pastures
   - 4.3 Irrigated cropping
   - 4.4 Irrigated perennial horticulture (plants living more than two years)
   - 4.5 Irrigated seasonal horticulture (plants living less than two years)
   - 4.6 Irrigated land in transition (evidence of irrigation but land use unknown)

5. Intensive uses
   - 5.1 Intensive horticulture (shade houses and glass houses)
   - 5.2 Intensive animal production (for example, feedlots and piggeries)
   - 5.3 Manufacturing and industrial
   - 5.4 Residential
   - 5.5 Services (commercial areas, schools, recreation areas, defence and research facilities)
   - 5.6 Utilities (including powerlines)
   - 5.7 Transport and communication (including roads and railways)
   - 5.8 Mines, quarries and tailings areas
   - 5.9 Waste disposal and treatment (including landfill sites)

6. Water
   - 6.1 Lake
   - 6.2 Reservoirs, dams, evaporation basins and effluent ponds
   - 6.3 River
   - 6.4 Channel or aqueduct
   - 6.5 Marsh or wetland
   - 6.6 Estuary and coastal waters