

MMCP Collaboration

Can we better mitigate against plant invasions through tailoring flow events in the Murray-Darling Basin?

This synthesis paper is a response to a question posed by the Murray-Darling Basin Officials Committee (BOC) in 2019, in relation to mitigating against plant invasions (e.g. weeds). The objectives of this theme within the MMCP is to help the BOC address specific questions as they arise. These question will have relevance to the on-going management of Basin Assets.

In the Murray-Darling Basin there are more than 100 non-native species recorded from riparian, floodplain and wetland vegetation communities.

Non-native plant species are:

- Introduced to an area outside their native range.
- Can be non-native from other countries or regions.

Traits

- Readily dispersed along waterways.
- Capable of growing in one or more vegetation communities.
- Tolerate or avoid anoxia.
- Tolerate or avoid hydraulic disturbance.
- Enabling underwater photosynthesis.

Management considerations

When designing environmental flows, careful consideration should be made of:

- Weed control.
- Longitudinal and lateral connectivity between invaded sites.
- Designing environmental flows (e.g. duration and depth of flood, duration of dry/interflood interval, and timing) to take advantage of the weaknesses in traits of non-native species at different stages of their life cycle.
- Applying integrated management techniques to support and enhance weed control (e.g. slashing or burning prior to flooding) and aid natural recruitment (e.g. erosion control).
- The quality of water being delivered for the environmental flow.



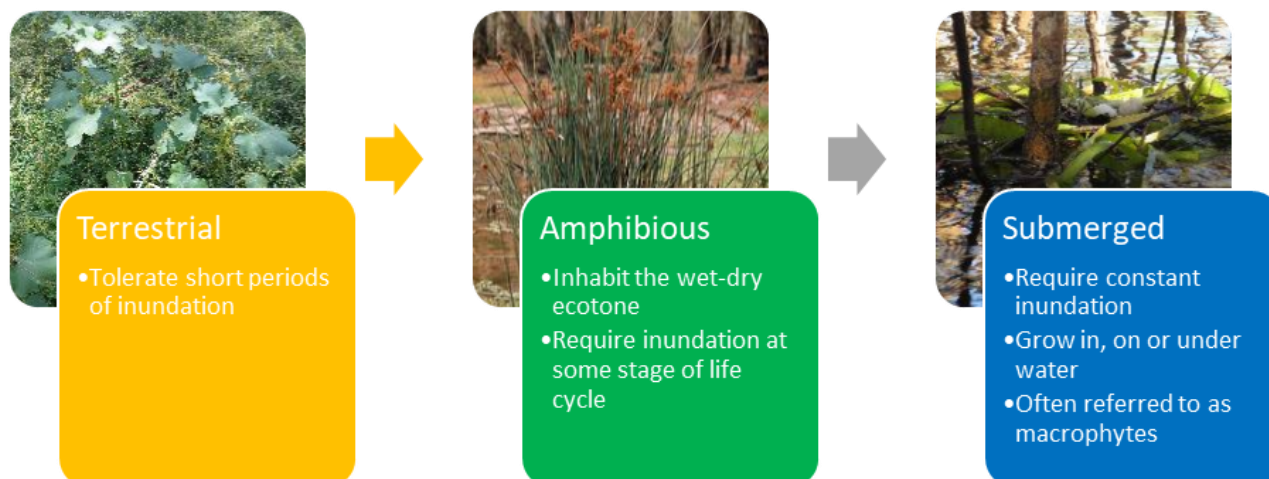
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Key functional groups based on life history



Functional group characteristics and management recommendations

Functional group	Characteristics	Management
Terrestrial plants	<ul style="list-style-type: none"> Typically invade during the inter-flood period, which is well accommodated by the current hydrological regime (i.e. prolonged dry periods). 	<ul style="list-style-type: none"> Are sensitive to inundation and can be effectively controlled by providing environmental flows.
Amphibious plants	<ul style="list-style-type: none"> Are well adapted to invading waterways, but due to their tolerance of both wet and dry conditions, can be difficult to manage using environmental flows. 	<ul style="list-style-type: none"> Integrated approaches (e.g. long periods of inundation to increase seedling mortality, and a combination of mechanical removal and herbicide treatment to increase the mortality of established plants). Partial submergence should be avoided as may promote rapid growth.
Submerged plants	<ul style="list-style-type: none"> Typically invade during prolonged periods of stable water levels, which is well accommodated by the current hydrological regime (i.e. ponding). 	<ul style="list-style-type: none"> Can be controlled by drawing down water levels and allowing the soil to dry. Integrated approaches (e.g. herbicide application, shading or physical removal (harvesting)) may enhance effective weed control.

Further information

MMCP Collaboration (MMCP) is a project supported by the Joint State Governments and the Murray-Darling Basin Authority to generate and adopt freshwater ecological knowledge through collaboration, to maintain research capability and contribute supporting science to underpin the Basin-Wide Watering Strategy.

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