ADAPTNRM

ADAPTING TO AUSTRALIA'S CLIMATE FUTURE

Weeds and Climate Change: Key Messages

Weeds are one of the main threats to biodiversity and agriculture in Australia and under climate change are expected to become an increasing challenge for regional natural resource management (NRM).

The suite of weed species threatening a region are likely to change and some weed species may become more invasive. Understanding the drivers of weed abundance and distribution in future climates will help land managers and planners prepare appropriate response strategies.

The science of weeds and Climate Change

- Weeds have long been a problem in Australia, with a large and growing reserve of potential weeds from the 2,700 already established species.
- Under climate change, the 26,000 alien plant species already grown in Australia, though not yet established, could be an even larger reserve of potential weeds.
- While scientists and land managers have a long history of fighting weed invasions, often successfully, climate change will increase the challenge.
- Climate change will exacerbate the weeds threat mainly through new and changed levels of plant invasions.
- Australia's extensive experience in control provides a strong basis to develop adaptation responses to climate change.

Weed management planning under Climate Change

We provide a framework for climate adapted weed management planning.

The framework outlines a standard weed management plan that follows an adaptive management approach and includes consideration of altered risks and adaptation.

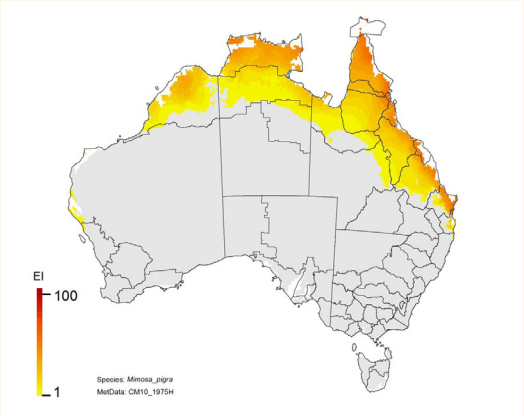
Each component of the framework is considered an iterative process, because the most effective responses to weed problems under climate change may not be known and outcomes may only be achieved after trying a range of options, assessing the responses, and making appropriate changes.

Each component under climate change may differ somewhat from a business-as-usual approach to weed management.

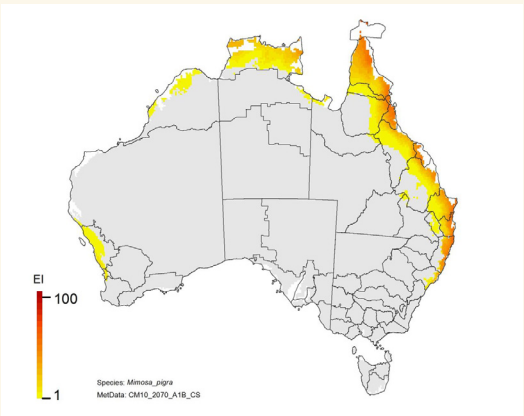
FIGURE 1

Weed Distribution Mapping:

Weed threats may increase in some areas but decrease in others



CURRENT CLIMATE (CENTRED ON 1975)



2070 PROJECTIONS (MK3)

NRM regions and projected climatic suitability (Ecoclimatic Index) for *Mimosa pigra* (*mimosa*) using CLIMEX modelling. Upper: current climate (centred on 1975). Lower: projections for 2070 based on CSIRO Mk3 global climate model (GCM), A1B SRES emissions scenario.

General components of weed management planning through an adaptation lens

Under climate change the component steps of planning may need to be modified to deal with new or changing situations.

Step 1. Assessment

- New weed threats from both inside and outside the region
- Existing weed threats that may get worse
- New weed threats from changing land use

Step 2. Strategy & Priorities

- An increasing number of potential weed problems may require stricter prioritisation to focus on weeds that impact what communities value
- Priorities may need to shift substantially over time as new threats emerge and values change

Step 3. Implementation Planning & Action

- The effectiveness of some existing weed control measures is expected to decrease
- New weeds may need new forms of control
- Control measures suitable for extreme events rather than average conditions may be a more robust approach

Step 4. Monitoring

- A cost-effective approach may involve greater monitoring for new threats rather than immediate control of any new species detected
- Widespread monitoring for new threats could involve high levels of community engagement

Step 5. Reflection

- Reflection may need to happen more frequently to ensure new threats detected by monitoring can be acted on quickly
- It may need to consider adaptation responses in other sectors or regions that affect weed distribution

The Weeds and Climate Change module

The Weeds and Climate Change module is delivered in three parts:

- The Weeds and Climate Change Technical Guide (PDF), available via the website
- *Weeds pages* on *adaptnrm.org* featuring a summary of key messages from the technical guide, and with links to:
- Supporting materials and information on invasive plant species, including maps and datasets, available through the CSIRO Data Access Portal *data.csiro.au*

Download Available

The Module 2 Weeds Technical Guide is available to download on: **WWW.ADAPTNRM.ORG**

Citation

Scott J.K., Webber, B.L., Murphy, H., Ota, N., Kriticos, D.J. and Loechel, B. (2014) AdaptNRM Weeds and climate change: supporting weed management adaptation CSIRO Land and Water. **ISBN 978-1-4863-0401-1**

CSIRO

An Australian Government Initiative

NCCARF National Climate Change Adaptation Research Facility

Climate Change in Australia — Impacts & Adaptation Information for Australia's NRM Regions