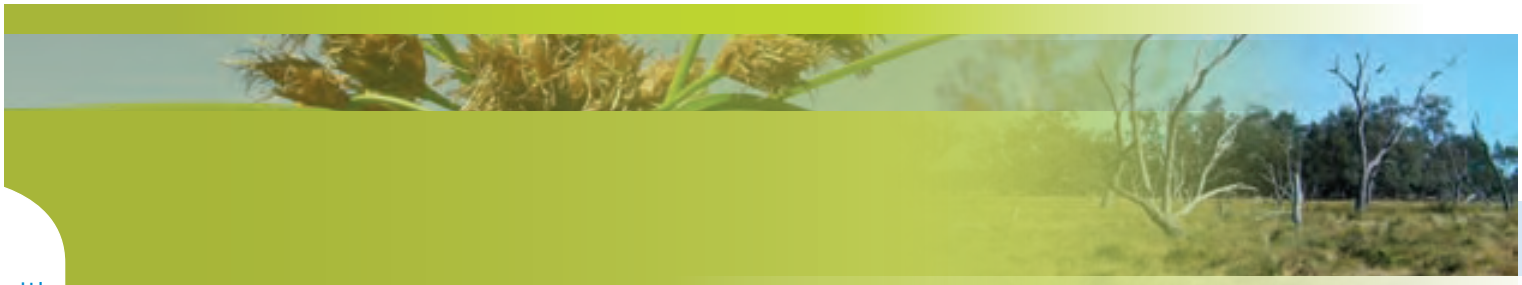

Managing a dry climate

Contents

Introduction

Many people are sceptical about the concept of climate change. Regardless, it is clear that:

- the Gwydir Wetlands and Macquarie Marshes are receiving less water than pre-regulation; and
- recent years have seen below average rainfall across the Gwydir River and Macquarie River catchments.

Current climate modelling indicates that flooding will continue to occur, but that flooding will be less frequent than would normally be expected. As a result, modelling indicates that the Gwydir Wetlands and Macquarie Marshes are likely to contain:

- less permanent or semi-permanent wetlands; and
- more temporary and episodic wetlands.

Grazing management must adapt to increasingly variable climatic conditions.

Managing a drying climate

In NSW, climate experts expect that the state is likely to face hotter and drier conditions than would normally be expected. Some of the key issues for grazing practices in NSW are (Hacker *et al.* 2007):

- Pastures in the rangelands and parts of the wheat sheep zone are likely to be more severely affected by climate changes because of increased water evaporation (Harle *et al.* 2007).
- Pastures used for the extensive livestock industries in the drier parts of NSW may be expected to show increased variability in quantity.
- Increasing variability of rainfall and the effects on river flow and runoff means that wetting regimes will change. This is likely to result in reduced feed availability.
- Changes in climate could influence the distribution and impacts of animal parasites.

Gwydir Wetlands

CSIRO modelling of climate change predictions across the Gwydir region indicates (CSIRO 2007):

- a reduction in average surface water availability by 10%;
- a reduction in average river inflows of 2%;
- in relation to the Gwydir Wetlands the report indicates wet and dry scenarios. Best estimates are that:
  - average and maximum periods between smaller flood inundation events may not change greatly;
  - average annual flooding volume may fall to 53 percent lower than the pre-regulation volume; and
  - changes in flood volume will negatively impact on wetland vegetation and affect the use of these wetlands by breeding waterbirds.

Macquarie Marshes

CSIRO modelling of climate change predictions across the Macquarie-Castlereagh region indicates (CSIRO 2008):

- a reduction in average surface water availability by 8%;
- a reduction in average runoff of 1.5%;

Anecdotal evidence suggests that flood water can spread further and on less overall flow volume if wetland vegetation is maintained. This may occur because thick wetland vegetation appears to slow water movement and re-directs water around wetlands.

Groundcover helps to slow water evaporation.

- in relation to the Macquarie Marshes the report indicates wet and dry scenarios. Best estimates are that:
  - average periods between important inundation events will increase by 10%;
  - expected flood events may be 5% less and the size of larger floods could reduce by 16%; and
  - changes in flood volume will negatively impact on wetland vegetation and affect the use of these wetlands by breeding waterbirds.

Results of a drying environment

It is likely that there will be considerable changes to plant communities in the Gwydir Wetlands and Macquarie Marshes as wetting regimes change. Drying may mean:

- River Red Gum woodlands may die;
- reed bed edges may be lost and be replaced by chenopod shrubs;
- Lignum shrublands may contract; and
- increased presence of less desirable species (e.g. Black Roly-poly) as wetland plant communities change to floodplain plant communities.

Recommendations

In grazing businesses, climate change means graziers will need to operate with flexibility. This will probably mean reviewing and changing current grazing practices, for example:

- Forecasts indicate that future flood events will be larger, but occur less often. As a result graziers should use inundation events wisely with consideration given to careful grazing to allow for the wetland to be in the best possible condition for the next flood event.
- Stocking rates should be carefully considered, that is 'hope for the best, but plan for the worst'.
- Stock watering points must be adequate in terms of their number, location and volume of water available.
- Supplement 'core' breeding stock with additional stock on a short-term basis to take advantage of good seasons.
- Investigate opportunities for alternate feeding of livestock (e.g. fodder crops in non-wetland areas) when wetlands are wet (e.g. Oat paddocks nearby).

Grazing stock can be managed, but once damaged, wetland areas will become more difficult to rehabilitate effectively with climate change. This will impact on future profits and long-term viability of properties.

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