

# Cypress forest management in the Brigalow Nandewar State Conservations Areas

## Working definition of key concepts

### What is adaptive management?

**Adaptive management** has been described as ‘**learning by doing**’.<sup>1</sup> It allows managers to learn about the effectiveness of different actions as they manage, rather than waiting to have complete knowledge about something before they implement it.

Over time, adaptive management helps to **reduce uncertainty**, and increase confidence in the best ways to manage for desired outcomes in a **coherent** and **accountable** way.<sup>2</sup>

**Active adaptive management** is management based on the balance of best available evidence *and* explicitly considering how management interventions can affect the rate of learning.<sup>3</sup> It has been described as “**learning by doing, and doing to learn.**”<sup>4</sup>

Under this type of adaptive management, planners and managers plan for learning and intentionally manipulate the system at hand to test responses and accelerate their learning.<sup>5</sup> Managers typically accept short term risks and negative impacts to maximise positive returns and outcomes over the long-term.<sup>6</sup>

### What is active management?

In the context of land or conservation management, the Natural Resources Commission (NRC) considers **active management** as any intentional intervention or activity by humans to reach a desired environmental, social or economic objective or outcome.

Under previous tenure as State Forests, the State Conservation Areas (Zone 3) in the Brigalow Nandewar Community Conservation Area were actively managed with silviculture treatments to improve timber resource values. Current reserve management in SCAs employ interventions such as prescribed fire regimes and pest and weed control to support conservation and cultural objectives.

The NRC has previously recommended that all white cypress forests and associated woodlands in south western NSW should **be actively and adaptively managed** across all tenures, including:

- non-commercial thinning

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<sup>1</sup> Duncan, D.H. and Wintle, B.A. (2008) Towards Adaptive Management of Native Vegetation in Regional Landscapes, in C. Pettit, W. Cartwright, I. Bishop, K. Lowell, D. Puller and D. Duncan (eds) *Landscape Analysis and Visualisation: Spatial Models for Natural Resource Management and Planning*, Springer Verlag, Berlin. Pp. 159-182.

<sup>2</sup> Kofinas, G. (2009) Adaptive Co-management in Social-Ecological Governance, in F. Stuart Chapin III, G.P. Kofinas and C. Folke (eds) *Principles of Ecosystem Stewardship – Resilience-Based Natural Resource Management in a Changing World*. Springer Science and Business Media, NY USA. pp 77-101.

<sup>3</sup> Hauser, C. (2008) Planning adaptive management – why there’s no time like the present. Applied Environmental Decision Analysis (AEDA) Info Sheet # 3.3 accessed at [http://www.aeda.edu.au/docs/info\\_sheets/3.3\\_PlanningAdaptiveManagement.pdf](http://www.aeda.edu.au/docs/info_sheets/3.3_PlanningAdaptiveManagement.pdf)

<sup>4</sup> Shea, K., Possingham, H.P., Murdoch, W.W. and Roush, R. (2002) Active adaptive management in insect pest and weed control: intervention with a plan for learning, *Ecological Applications*, 12(3) 927-936.

<sup>5</sup> Parma, A.M., Amarasekare, P., Mangel, M., Moore, J. Murdoch, W.W, Nooburg, E., Pascual, A., Possingham, P, Shea, K., Wilcox, C. and Yu, D. (1998) What can adaptive management do for our fish, forests, food and biodiversity? *Integrative Biology, Issues, News and Reviews* 1: 16-26.

<sup>6</sup> Hauser, C.E. and Possingham, H.P. (2008) Experimental or precautionary? Adaptive management over a range of time horizons. *Journal of Applied Ecology* 45, 72-81.

- ecological thinning
- livestock grazing
- prescribed fire management
- improvements to silviculture practices (on State Forests).<sup>7</sup>

The NRC will use and consider these previous recommendations for active management, and weed and pest control as a starting point for this review. However, the NRC will explore any other active management interventions that could be applied to the SCAs in the Brigalow and Nandewar region.

### **What types of thinning are there?**

Forestry silviculture promotes timber production. A particular silviculture system is applied to cypress forests on State Forests to address the unique ecological characteristics of cypress, particularly its tendency to form dense stands of regrowth.

The **cypress silviculture system** incorporates three distinct phases:

- **Non-commercial thinning** is where dense stands of small cypress regeneration are thinned to reduce competition, eliminate growth-locked stands and promote tree growth. In the long term this helps to ensure merchantable timber is available in the remaining cypress timber resource.

This type of thinning is generally applied to cypress that has grown in the State Forests during the 1950s and post-1950s periods (often referred to as cohorts).

- **Commercial thinning** is where cypress timber is thinned to extract merchantable timber, while at the same time creating a more open canopy that can promote further growth of remaining trees and regeneration of a new cypress cohort.

This type of thinning is generally applied to the 1890s cypress cohort, and in some cases advanced 1950s cohorts.

- **Commercial harvest** is where large, merchantable cypress timber is harvested on a large scale, after a new cohort of young trees is well established. The harvest reduces competition and promotes further growth in the new cypress cohort.

Timber harvesting is generally applied to the 1890s cypress cohort, where non-commercial thinning was applied in the late 1800s and early 1900s.<sup>8</sup>

**Ecological thinning** involves the selective removal of trees (usually regrowth or suppressed trees) to achieve specified ecological outcomes.<sup>9</sup> Ecological thinning could be undertaken in many different ways including reducing stocking levels to a uniform, predetermined level across moderately large areas, creating small open gaps within larger areas of dense regrowth and reducing stocking levels (and/or creating gaps) around specified features (for

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<sup>7</sup> The NSW Government has approved a scientifically based monitoring grazing study in river red gum and cypress parks and reserves. More information available at <http://www.environment.nsw.gov.au/policies/grazingstudy.htm>

<sup>8</sup> NRC (2010) *Regional Forest Assessment – South West Cypress State Forests Assessment Report*. Natural Resources Commission, Sydney.

<sup>9</sup> *Ibid.*

example, large trees).<sup>10</sup> Each of these approaches will have different impacts on forest structures, processes and biodiversity.

The NRC has previously recommended that ecological thinning could be applied to white cypress forests where clearly defined outcomes could be reasonably expected.<sup>11</sup>

**Thinning** can also be applied to dense stands of white cypress on private land to improve or maintain environmental outcomes.<sup>12</sup>

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<sup>10</sup> *Ibid.*

<sup>11</sup> *Ibid.*

<sup>12</sup> As a routine agriculture management activity under the *Native Vegetation Regulation 2013*. The activity must occur on specified land where white cypress has been declared as an invasive species, and carried in accordance with any specific conditions.