



**Institute of Foresters
of Australia**

SUBMISSION ON DRAFT REPORT (RELEASED JUNE 2014) ON ACTIVE AND ADAPTIVE CYPRESS MANAGEMENT IN THE BRIGALOW AND NANDEWAR STATE CONSERVATION AREAS



SUBMISSION BY THE INSTITUTE OF FORESTERS OF AUSTRALIA (IFA)
NEW SOUTH WALES DIVISION

AUTHORS: NICK CAMERON, VIC JURSKIS, ROSS PEACOCK, RON WILSON

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The Institute of Foresters of Australia (IFA) welcomes the opportunity to provide a submission to the draft report released by the NRC in June 2014 outlining findings and recommendations to improve the management of the Brigalow and Nandewar State Conservation Areas.

The Institute of Foresters of Australia in general supports the draft recommendation of the NRC that active adaptive management approaches be implemented to enhance environmental outcomes across the State Conservation Areas, and in doing so, seek secondary commercial benefits to off-set management costs and deliver social and economic benefits. The IFA, as documented in our submission on the terms of reference, fully supports the optimizing of environmental, economic and social values of the Conservation Areas. The IFA also supports the cross tenure integration of management, which includes the public forests within the Conservation Areas and State Forests and ideally would be extended to the private forest estate. The main shortcoming of the analyses however is that the NRC has not given adequate weight to the argument that ecological thinning alone will not address the basic issue of woody vegetation thickening and landscape vegetation pattern homogenization. To do so requires on-going intervention by grazing and/or hazard reduction burning.

The following submission is supplementary to the Institutes submission to the NRC on its terms of reference which is available at

<http://www.nrc.nsw.gov.au/content/documents/Submission%20-%20Review%20of%20forest%20management%20Brigalow%20Nandewar%20State%20Conservation%20Areas%20-%20Institute%20of%20Foresters%20of%20Australia.pdf>

The Institute of Foresters Australia (IFA) is the peak professional body for forest scientists, forest educators and forested land managers in Australia. We are a non-profit organisation with 1200 members who are committed to the principles of sustainable forest management and the processes and practices which translate these principles into outcomes.

The IFA has a long history of involvement and interest in the science and sustainable management of the public and private native forests in NSW. Our submission includes contributions from IFA members who are senior foresters from the public and private sectors who are working or have worked in these forests for many years, both in management and scientific research capacities.

Cover image: Typical White Box (*Eucalyptus albens*) - White Cypress Pine (*Callitris glaucophylla*) shrubby open forest of the Brigalow and Nandewar between Quirundi and Tamworth. The shrubby-grassy woodland is thickening with White Cypress Pine . Photograph A. Rolhauser from Thönnell *et al.* (2010).

Institute of Foresters of Australia
PO Box 576, Crows Nest NSW 1585 Australia
Phone: (02) 9431 8670 | Fax: (02) 94318677
Email: ifa@forestry.org.au | Web: www.forestry.org.au
ABN 48 083 197 586 | ACN 083 197 586

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1. ACTIVELY MANAGE THE STATE CONSERVATION AREAS

The NRC recommends that:

1(a) interventions such as ecological thinning and targeted grazing be implemented in combination with existing management practices (prescribed fire and pest management) to maintain and improve environmental outcomes including encouraging regeneration of eucalypts; improving habitat for animals; improving groundcover and soil health; and reducing risk of intense wild fires. Any ecological thinning should be guided by the principles set out in Table 24.

Supported: Ecological thinning, targeted grazing, bushfire hazard reduction, enhanced pest animal and weed control should be targeted strategically to landscapes where the conservation goals are most likely to be enhanced by these interventions. However, the report does not make it clear that ecological thinning cannot solve the basic problem of woody thickening and homogenization in the absence of ongoing intervention by grazing and/or burning. Insufficient weight has been provided in the recommendations on how to integrate the different available ecological enhancement hazard reduction options with the proposed management practices and the interaction of fire generally with the management of these landscapes. Existing prescribed burning practices have not achieved desirable socioeconomic or environmental outcomes. Specifically, long intervals between burning and moderate to high intensity prescribed burns reinforce the problems of woody thickening and three dimensionally continuous fuels that cannot be ignited under mild conditions but explode into firestorms under severe conditions. Gains from ecological thinning are therefore at risk from ongoing woody thickening and periodic major wildfires and more attention needs to be provided to protecting the public's investment in ecological restoration from wildfire loss.

Genuine documented examples of ecological thinning in Australia are rare, most of the cited examples are simply non-commercial thinning with an expectation of some positive ecological outcomes.

Ecological thinning should not be confirmed only to the Cypress overstorey, it should also be considered for other species such as *Allocasuarina luehmannii*.

The IFA acknowledges and supports the view that a key objective for management of the Conservation Areas is to improve the ecological health of the forests and therefore fauna habitat. For Cypress forests, which are generally dominated by a shale tolerant species which is very slow to self-thin, and with a significant area currently as over-stocked stands, active management with mechanical thinning which can produce timber suitable for local timber processors is recommended.

The recommendations in the NRC draft report provide for a very un-even production of thinnings ranging from 1,000 to 23,000 tonnes per year. The reasoning behind this is the patchwork nature of the forest where treatment varies depending on the density of the Cypress stands. The problem with this approach is that to effectively harvest the timber and sell to industry processors, it will require some form of smoothing of timber production so that the purchasers can have reasonable certainty of supply. Otherwise there will be no investment in equipment, staffing, marketing and sales.

With a cross tenure integrated management approach the Conservation Areas could be managed to produce timber in a more regular pattern, such as 5,000 tonnes per year for 5 years, then 2000 tonnes per year for 3 years, then 5,000 tonnes per year for 5 years etc. This can be achieved while meeting the key objectives for management, i.e. conservation, but putting more effort into planning to produce a more reliable supply of timber. The other tenures would then be better able to vary their production to accommodate the needs of the target timber processors.

The IFA believes that producing timber for sale to industry from ecological thinnings will go some way towards meeting the economic and social objectives for these areas.



Figure 1 Tall Woodland dominated by *Eucalyptus microcarpa* with *Eucalyptus populnea* subsp. *bimbil* and *Callitris glaucophylla*. Dense understoreys of *Callitris glaucophylla* and *Allocasuarina luehmannii* may benefit from an ecological thinning regime. Photograph S. Lewer.

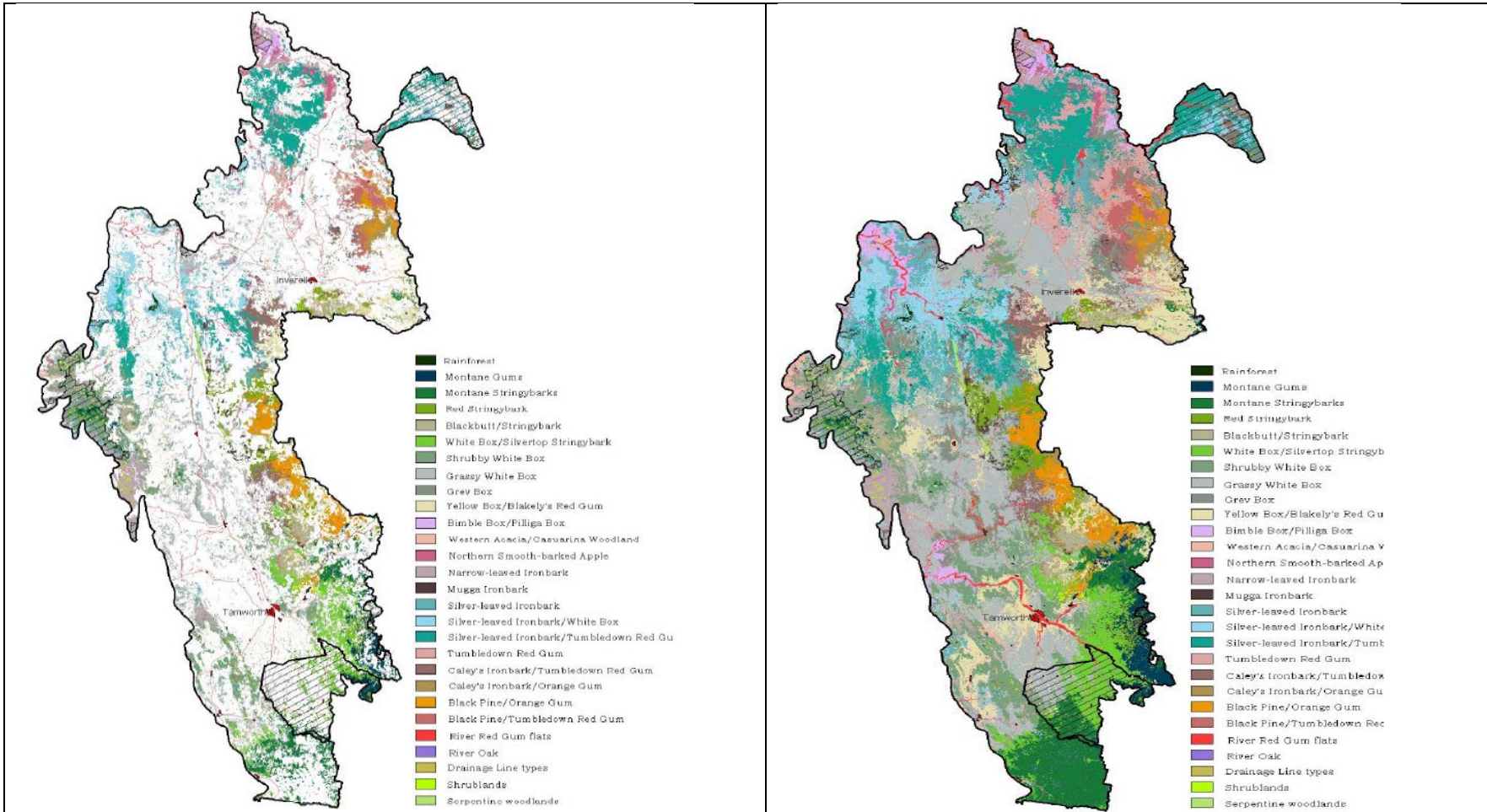


Figure 2 Example of the extent of vegetation fragmentation in the eastern Brigalow with extant (left) and predicted potential vegetation (right). Landscape principles will need to be incorporated in the management planning process to ensure that public investments in ecological thinning, targeted grazing, bushfire hazard reduction, and enhanced pest animal and weed control are strategically placed in landscapes where conservation goals are most likely to be enhanced by these interventions. Source: Thönnel *et al.* (2010).

2. IMPLEMENT INTERVENTIONS IN LINE WITH PRINCIPLES OF ADAPTIVE MANAGEMENT

The NRC recommends that:

2(a) the NSW Government develop and implement an Adaptive Management Plan for the Brigalow and Nandewar State Conservation Areas, based on the adaptive management framework set out in Table 7

2(b) monitoring, evaluation and reporting in the Adaptive Management Plan should capitalise on the cost efficiency opportunities provided by spatial data technologies and build on the spatial analysis undertaken by the NRC for this review.

Supported: Active and adaptive management regimes should be designed and implemented with an explicit adaptive feedback process accompanied with public monitoring and reporting of outcomes.



Figure 3 *Diuris tricolor* is a threatened terrestrial orchid found in *Callitris glaucophylla* grassy woodland in the Brigalow and Nandewar areas. The species prefers sandy soils and grassy open areas and moisture-retaining litter which are vulnerable to rabbit and goat disturbance. Active management of understorey habitats in areas of known occurrence is likely to assist the species recovery but on-ground monitoring will be required to test this assumption. Photograph S. Lewer

3. DEVELOP PLANS OF MANAGEMENT FOR STATE CONSERVATION AREAS

The NRC recommends that:

3(a) consistent with the overarching Adaptive Management Plan, new or revised plans of management for State Conservation Areas should be developed. It is proposed that the 23 State Conservation Areas in the assessment region be consolidated into a smaller number of functional groups to streamline planning and administration processes. Any such groupings should be subject to consultation with relevant National Parks and Wildlife Regional Advisory Committees

3(b) the Office of Environment and Heritage prioritise the development of plans of management for the four State Conservation Areas identified as being priority areas for active management (Goonoo, Pilliga, Pilliga West and Trinkey State Conservation Areas).

Supported: The Institute of Foresters of Australia strongly supports the proposed simplification of the existing process of developing Plans of Management for the twenty-three State Conservation Areas. The proposal to include the expanded National Parks and Wildlife Regional Advisory Committees in a consultative role in the development of these Plans of Management is supported providing the Regional Committee's can provide *timely* feedback and additional resourcing is provided to NPWS Regional Managers to accelerate the rate management plan development.



Figure 4 Tall Woodland on low sandy rises dominated by *Eucalyptus sideroxylon* with a dense understorey of *Callitris glaucophylla* and *Acacia deanei* subsp. *deanei*. Typically, this plant community is in poor condition with the canopy layer significantly cleared or thinned. Active management of the understorey may accelerate overstorey restoration but is unlikely to have any direct economic benefit from thinnings sales. Photograph S. Lewer.

4. SEEK COST RECOVERY AND SHARING OPPORTUNITIES TO IMPLEMENT ACTIVE AND ADAPTIVE MANAGEMENT

The NRC recommends that:

4(a) where active and adaptive management is undertaken to enhance environmental outcomes, the NSW Government seek secondary commercial benefits, as appropriate to off-set costs, improve long-term sustainability of the program and deliver social and economic benefits to local industries and communities

4(b) the NSW Government explore the use of a 'goods for services' scheme as an effective means of cost recovery when implementing an ecological thinning program

Supported: Opportunities for delivering secondary commercial benefits from active management will need careful consideration however the general principle is sound. The existing evidence from the River Red Gum thinning trial in south western NSW, where some \$600,000 of public funding is reportedly being spent annually suggests however the secondary commercial benefits to the regional economy are not matching this public investment and the scientific and ecological outcomes of the thinning trial are severely limited by the limited area treated. In designing a goods for services scheme evidence should be gathered from the previous commercial thinning operations and compared with the current River Red Gum thinning trial in south western NSW to assess in terms of its history of public investment versus public benefit. Locally based Foresters are reporting outcomes such as very low intensity thinning, removing young trees which would otherwise grow into dominant trees, and a focus on leaving trees which had hollows for habitat. Much of the thinning material is planned to be left on site, where it will become a fire hazard, and otherwise where firewood is to be collected, it is to be put into a place for free collection by the public. The timber produced however is not suitable for a traditional firewood producer. There is no thought to commercial sale or generating or generating ongoing employment from the thinning program.

Where commercial objectives and cost recovery is being sought a land manager with commercial acumen should manage this activity, for example Forestry Corporation of NSW via a joint management agreement.

The River Red Gum scenario above is relevant because a similar outcome could develop in the Brigalow and Nandewar where ecological thinning is proposed but does not achieve the objectives set out in the NRC draft report. Development of thinning systems to achieve environmental, economic and social values is complicated and needs management by an organization which has the necessary skills and incentives.

The NRC suggestion to trade ecological outcomes to supply timber “outputs for services”, may be successful. It could also be done very badly, hence a risk of compromising the active management approach to conservation areas. This suggestion will need very careful consideration of terms of incentives and outcomes monitoring.

Outsourcing the work of ecological thinning under strict conditions, with some of the principles described here is considered the most suitable way to proceed.

5. AMEND LEGISLATION TO FACILITATE ACTIVE AND ADAPTIVE MANAGEMENT

The NRC recommends that:

5(a) the Adaptive Management Plan for the State Conservation Areas be a legislative requirement, to be completed by the Office of Environment and Heritage within a specified time and approved by the Minister for the Environment, and include specific, measurable and spatially explicit management targets

5(b) approval of plans of management for each State Conservation Area be devolved to relevant National Parks and Wildlife Service regional managers

5(c) the Brigalow and Nandewar Community Conservation Area Act 2005 (NSW) and existing State Conservation Area plans of management be amended to expressly provide for the commercial use of residues from ecological thinning

5(d) the Protection of Environment Operations (General) Regulation 2009 (NSW) be amended to allow the use of native forest bio-material obtained from trees cleared in accordance with the Brigalow and Nandewar Community Conservation Area Act 2005 (NSW) to be used for electricity generation

5(e) the NSW Government seek Australian Government amendments to the Renewable Energy (Electricity) Regulations 2001 (Cth) to recognise the use of ecological thinnings residues under the Renewable Energy Target.

Supported: Zone 3 State Conservation Area management plans should determine wood supply levels using ecological criteria with flexibility to increase or decrease supply in accordance with adaptive management principles. Zone 3 wood supply levels currently assumes a base level of wood supply, both in terms of haulage distance to processing facilities, volumes and specifications will be maintained from state forest. Evidence provided recently to the NRC from the regional processing industry is questioning this assumption based on a observed run down in log specifications.

Zone 3 ecological thinning plans need to provide for a minimum sawlog commitment to ensure that harvesting operations can at least be semi-commercial. While some level of public investment in thinning is inevitable considering the limited commercial returns predicted, a scenario where public investment is limited to a short term one to two year program needs to be avoided.

The NRC draft report did not provide detail about the additional sawlogs which would be produced and how they would be sold. It appears any additional sawlogs would go to either Baradine or Gunnedah sawmills. There is no need for any more traditional sawmilling capacity in the region given the current log supply difficulties from State Forests.

The IFA is concerned with the NRC draft report focusing on a proposal for a 5 MW biomass plant producing electricity. While this may be a possible outcome, the idea of a larger single plant is certain to raise concerns amongst the community. The charcoal plant proposed by NSW Government

in 1999 , initially in Pilliga, then the south coast, became a focus for protest and the idea was abandoned.

The IFA submission suggested as an alternative that small plants producing heat and power have been developed in the US and Europe and these seem to be well accepted by the communities. In Victoria the Beaufort Hospital outside Melbourne has now installed a biomass plant for heat and power based on wood waste and it has been a successful development to date.

IFA suggests that there are more options than the 5 MW electricity plant proposed and that a well-functioning cross tenure management group should be charged with investigating biomass applications in the general area.

6. REVIEW GOVERNANCE ARRANGEMENTS IN THE STATE CONSERVATION AREAS

The NRC recommends that:

6(a) current governance arrangements be revised to reduce the duplication of advisory bodies. In particular, the NSW Government should consider using the National Parks and Wildlife Regional Advisory Committees, with membership expanded to include adaptive management expertise, to provide advice during the development of the Adaptive Management Plan

6(b) accountability for the Adaptive Management Plan be provided through the Office of Environment and Heritage's internal accountability systems, and supported by an independent review process

6(c) a Regional Officers Working Group be established to facilitate cross-tenure operational collaboration between land managers and to consider land management that is occurring on other land tenures within the Community Conservation Area.

Supported: Revising governance arrangements is supported provided the National Parks and Wildlife Regional Advisory Committees are adequately resourced and are committed to providing timely advice.

More detail should be provided on which of the OEH internal accountability systems will apply to monitoring management plan outcomes.

7. SPECIFIC COMMENTS ON DRAFT RECOMMENDATIONS TEXT

Draft report page 46 figure 9

The generalized model correctly identifies that absence of frequent mild fire is the major environmental problem that necessitates active intervention to achieve better outcomes. The paragraph following the figure fails to identify the two key drivers of relative dominance by Cypress or eucalypt. These are edaphic factors and differing survival strategies. Cypress has a competitive advantage on highly drought prone sites such as sandy rises (White Cypress) or rocky hills (Black Cypress) because of prolific seeding, rapid development of deep roots and extreme drought tolerance. Eucalypts have an advantage on heavier soils through their lignotuberous habit which allows seedlings to resprout after more frequent fires in more continuous grassy fuels and less frequent extreme droughts (e.g. Forestry Commission of, N.S.W. 1988, Lacey 1973, Jacobs 1955).

Draft report page 66 figure 18

The indicative future state model fails to identify loss of mature and rare, over-mature cypress during droughts due to competition from dense 'regeneration', and interception/evaporation of precipitation by dense regeneration. The model incorrectly identifies lack of "woody debris" as a potential environmental problem. Fallen timber was very limited in woodlands under Aboriginal management and there is no evidence that any rare or endangered biota rely on fallen timber in Australian woodlands, whereas there is evidence that some rare biota are disadvantaged by accumulation of litter shrubs and fallen timber (e.g. Jurskis 2009, 2011b).

Draft report page 76 Ecologically and culturally sensitive areas

No information is provided to support the suggestion that active management should be excluded from sensitive areas. The IFA suggests that active intervention should be targeted towards sensitive areas. For example 'regeneration' litter and fallen timber should be cleared from around all over-mature trees to protect them from drought and fire.

Draft report page 83 Recommendation 1 (a)

As for P 3. Table 19 incorrectly implies that existing prescribed fire arrangements are ecologically appropriate. It also fails to indicate that appropriate prescribed fire could help to achieve Additional Objective 3 – reducing stress on trees (Jurskis 2005)

Draft report page 84, 85 Table 20

The table implies that ecological thinning has potential benefits not available through grazing or burning, specifically improving habitat for and promoting native biota. In fact thinning is merely a potential initial solution for problems caused by absence of burning or grazing and is not a long term solution in itself. Thus burning and/or grazing are equally or more important and beneficial in the long term.

Draft report page 88 Table 21

The table incorrectly identifies reduction of “coarse woody debris” as an ecological risk. Fallen timber was very limited in woodlands under Aboriginal management and there is no evidence that any rare or endangered biota rely on fallen timber in Australian woodlands, whereas there is evidence that some rare biota are disadvantaged by accumulation of litter shrubs and fallen timber (e.g. Jurskis 2009, 2011a).

Draft report page 91 Table 22 Increase coarse woody debris

The statement that “coarse woody debris is one of the most important resources for native fauna in forest ecosystems” is highly debatable (e.g. Jurskis 2011a). In any case the rare and threatened fauna in these former woodland ecosystems are those that have been adversely affected by loss of over mature trees, grassy groundcovers, bare ground and very open vegetation structure. All these features are threatened by accumulation of litter and debris (e.g. Jurskis 2009, 2011a). The species likely to benefit from debris are common and/or widespread species as acknowledged in the table.

Draft report page 92 figure 22

Illustrates that old greys, as for hollow bearing eucalypts, survive where they have not been crowded by ‘regeneration’. Clearing and burning rather than thinning around all mature and over mature trees would be ecologically appropriate.

Draft report page 93 Table 23 coarse woody debris

See previous comments

Draft report page 93 Table 23 Reducing nutrients and litter

Rather than a risk this is an environmental benefit. Accumulation of nutrients, especially nitrogen, and litter in the absence of fire or grazing (or through pollution or deliberate fertilizer application) is a major environmental problem in Australia and globally (Jurskis *et al.* 2011c).

Draft report page 96 Table 24 Principle 6 coarse woody debris

See previous comments.

Draft report page 97 Grazing

The major environmental problem to be addressed by active management is woody thickening and loss of diversity in the absence of frequent mild fire. The long term solution is application of an appropriate fire and/or grazing regime. The major environmental benefit is control of woody regeneration especially cypress. This positive impact is not “restricted to highly productive soils”. Lunt *et al.* 2007 Table 1 indicate that potential benefits of excluding grazing from Cypress are small. Lunt *et al.* 2007 Figure 2 Left hand side shows that grazing is a good solution to the problem of cypress ‘invasion’. The IFA recommends that report be modified to more accurately reflect the positive benefits and low risks.

The report states that grazing will not promote vegetation structure and diversity if the target species is “unavailable to livestock (for example tall trees and shrubs)”. This overlooks the important point that grazing can prevent the establishment of tall trees and shrubs. The long term option for active management must include either frequent mild fire, grazing or a combination.

Draft report page 99 Lessons from previous grazing strategies

The strategy of Wilson *et al.* (1997) had a high priority on protecting commercial timber and ‘regeneration’. Active management in State Conservation Areas should have a high priority on controlling regeneration. Therefore the relative merits of sheep as against cattle may be higher.

Draft report page 99 Improved prescribed fire.

The generalized model (Figure 9 page 46) correctly identifies that absence of frequent mild fire is the major environmental problem that necessitates active intervention to achieve better outcomes. The report emphasizes the potential role of ecological thinning in dealing with this issue, but fails to emphasize the critical role of burning (and/or grazing) in maintaining improved structure and diversity outcomes achieved by thinning or preventing the problem from developing in other areas.

A major challenge with implementing appropriate fire management is the document *Guidelines for Ecologically Sustainable Fire Management. Guidelines* (Kenny *et al.* 2004) which specifies minimum and maximum intervals between prescribed burns based on disproven ecological theories that low intensity fires will extinguish obligate seeding plants if the intervals between the fires are shorter than the time taken for the plants to reach sexual maturity. These guidelines give precedence to maturation periods for obligate seeders over the requirement to manage fuel loads within acceptable hazard reduction limits. The guidelines for semi-arid woodlands specify that the minimum interval “should be at least 5-10 years ... and that some intervals longer than 40 years would be appropriate”. The result is that major wildfires occur every couple of decades and that prescribed burning is a minor component of the fire regime. The draft NRC report indicates that wildfires made up 60% of the fire regime over the previous nine years and had a disproportionate impact on the environment as a result of their severity.

The long term active management strategy cannot achieve the desired outcomes without incorporation of more frequent mild burning and/or grazing. The IFA proposes that there must be a recommendation to remove the “Guidelines” from the relevant legislation/regulations so that effective management for socioeconomic and environmental enhancement can occur (e.g. Jurskis 2011b, 2013).

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