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Do you consider the main biodiversity threats identified in the Consultation Draft (see below) to be the most important in reversing the decline in Australia's biodiversity?

- climate change
strongly agree somewhat agree somewhat disagree strongly disagree not sure
- invasive species
strongly agree somewhat agree somewhat disagree strongly disagree not sure
- loss and fragmentation of habitats
strongly agree somewhat agree somewhat disagree strongly disagree not sure
- degradation of habitats
strongly agree somewhat agree somewhat disagree strongly disagree not sure
- unsustainable use of natural resources
strongly agree somewhat agree somewhat disagree strongly disagree not sure
- changes to the aquatic environment and water flows
strongly agree somewhat agree somewhat disagree strongly disagree not sure
- inappropriate fire regimes
strongly agree somewhat agree somewhat disagree strongly disagree not sure

Are there any other threats you think should be addressed?

Maximum 90 words

1) Agricultural intensification: General trajectories of increased use of irrigated cropping, intensification of grasslands, move from grazing to cropping - negative impacts on habitat value of agri-matrix, remnant vegetation condition, patch-landscape connectivity and matrix permeability. For instance, land-use change from botanically diverse natural and semi-natural pastures to cropping - this will not be picked up as loss of native vegetation (Brown & Dunlop, 2008). Particularly pertinent in relation to climate change threats and reduced landscape permeability. See Dunlop & Brown 2008 (section 8.3.3), Fischer et al. 2005, Biodiv. & Cons. 14; Maron & Fitzsimons 2007, Biol. Cons. 135; Attwood et al 2009 Biol. Cons.

Whilst it is feasible that agricultural intensification will be covered in unsustainable use of natural resources, it is a complex issue with an array of associated threats and economic drivers, that deserves to be addressed as a significant priority in its own right.

2) Movement of agriculture into Northern Australia: Alluded to in section A9.1, and related to habitat loss and fragmentation, but the drivers are specific and the locations as yet not subjected to broadscale intensive agriculture. Dunlop & Brown (2008) consider the limitations to large scale migration of agriculture in these regions, but mention there is a very powerful political lobby that is pushing for this to occur on a considerable scale (p.



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159), which could have significant impacts in terms of habitat loss if eventuates. Evidence of the current political and public furore is typified by the following media link:

<http://www.theaustralian.news.com.au/business/story/0,,25469218-5018010,00.html>



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2. Do you think that the proposed 'priorities for change' (outlined in the 'Making Enduring Changes' section) will be effective at delivering the Strategy's vision to ensure Australia's biodiversity 'is healthy, resilient to climate change and valued for its essential contribution to our existence'?

Maximum 90 words

On the whole, a good prioritisation - have made comments with regard to specific Priorities for Change, below:

P for C 1: (3.2.1) - This should not be restricted to 'natural' environments. The majority of land area in many regions is highly modified, and yet these altered habitats are a) habitats that contain high biodiversity, b) often situated in highly productive and preferentially cleared systems, c) sources of important ecosystem services for agriculture. Therefore, the actions should seek to include modified systems and habitats.

Related to this, it is important to better understand how biodiversity interacts with highly modified systems, which components of these systems are preferentially utilised by target taxa or assemblages, how these systems can be better managed for production/human habitat (etc) and biodiversity conservation, how depletions of biodiversity affect ecosystem service provision to productive systems, and what kind of incentives, legislation, communication approaches and funding mechanisms are most appropriate to encourage ecologically sympathetic land management.

Action 1.1.1 (p 22) - makes sense to use function as a basis for conservation, but may not lead to recovery of threatened or very rare (or depleted) species that no longer play a significant functional role in many systems. Also issues of functional redundancy (see for eg Fonseca & Ganade, 2001, J of Ecol, 89).

Action 1.1.2 (p22) add 'agricultural intensification' to list of threats - this may potentially be addressed in 'unsustainable use of natural resources' though;

Action 1.1.3 (p22) please clarify 'complementary land uses';

Action 1.1.3 (p22) - connectivity not just about conservation linkages - for instance, landscape permeability or 'matrix-softening'. See Fischer et al 2005, Biodiv & Cons, 14.; Donald & Evans, 2006, JAE, 43; Fischer & Lindenmayer 2002; Baum et al. 2004.

1.2.1 (p22) Threat-based approach is a good proposition, but requires more expansion, and would greatly benefit from example(s) of how to proceed from threat assessment, to threat amelioration/mitigation, to system/species recovery. See for instance R van Dam, R Bartolo & P Bayliss 2006. Ecological risk assessments of key threats to Australia's tropical rivers: Overview, proposed framework and methodologies for the Tropical Rivers Inventory and Assessment Project. Internal Report 517, June, Supervising Scientist, Darwin. Unpublished paper.

2) Mainstreaming (this is an excellent choice as a priority, incidentally):

Two main issues here:

1) Extensive literature to draw upon in relation to the decline of ecoliteracy and the implications for human health, societal/political ambivalence regarding the exploitation, degradation and diminishment of nature, and a broad societal lack of comprehension and critical thinking when an environmental issue does repeatedly grab the headlines (e.g. climate change). Needless to say the implications for the public willingness to fund nature conservation are considerable. (see Pyle, 2003, Oryx 37; Balmford et al 2002, Science, 295; Louv, 2007 'Last Child in the Woods'; Pergams & Zaradic, 2008, PNAS, 105, 2295-2300). Numerous issues related to ecoliteracy among different countries - e.g. role of Green party in northern Europe compared to Australia, membership of environmental NGOs in other countries compared to Australia (for instance, RSPB membership in UK 1.3 million).



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The reasons behind such differences may help to identify strategies to raise critically-low ecoliteracy levels among public in Australia.

2) There is a compelling and growing body of literature, evidence and more recently action in relation to the effects of nature on human physical and mental health. This would make an excellent basis from which to pursue some of the intentions of the strategy - far less ambiguous and conceptual than ecosystem service arguments for conservation. See anything by Jules Pretty (e.g., Pretty et al 2007, *Journal of Env Man & Planning*, 50; *Agri-Culture: Reconnecting People, Land and Nature*) & Louv's *Last Child in the Woods*. For a government agency perspective, try: 'Nature and psychological well-being'. London: English Nature, 2003. (Research report 533.)

Table 3.2: Some excellent strategies surrounding education here, a very commendable approach. In the 'Responsibilities' section would envision roles for education researchers, the popular media and marketing experts.

Another potential action in the mainstreaming biodiversity section could be to develop a national biodiversity-related accreditation scheme for agricultural producers involved in biodiversity conservation (e.g. through Environmental Stewardship of other C4oC stream). Such a product differentiation mechanism may a) allow participating producers to include such an affiliation in whole-of-business accreditation strategies such as ISO 14001 EMS; b) increase competitiveness in domestic markets, c) assist Australian producers in gaining access to environmentally discerning and restrictive markets such as Europe; d) (through the development of a-c) increase the number of landholders wishing to participate and undertake biodiversity conservation measures on-farm, e) be used as a domestic communication conduit of the role of Australian producers and their practices in conservation.

There are examples of how this has worked at various levels: i) Individual company level - e.g. Banrock Station wine; ii) NGO and international production - e.g. Audubon Society in US and 'bird-friendly' coffee in Costa Rica; iii) National government scheme and industry leader - e.g. Environmental Stewardship in UK and Waitrose Supermarket chain.

Section 3.2.3 Knowledge for all.

Table 3.3: You've identified one of the major issues in conservation action globally (3.1.4). The transfer (and possibly more importantly translation) of information between the very different players in the conservation sphere is a fundamental issue to be addressed. Central to this issue is the use of an 'evidence-based conservation' framework (Sutherland et al, 2004, *TREE*, 19), similar to the revolution in evidence-based medicine in the health world. In the research/policy interface, researchers should be enlightened as to the constraints placed upon policy makers and the process-based restrictions in which they operate. Researchers also need to consider if their research is relevant to policy. Policy makers (at all levels) on the other hand need to be aware of the latest evidence and research, the limitations of popular and persistent paradigms in ecology (the ongoing love affair with island biogeographical applications to terrestrial systems, and corridors as the ecological panacea for taxon dispersal, as obvious examples), and the perverse outcomes that can ensue from basing policy upon outdated or inappropriate information. Perhaps an approach to solving this could be the employment of govt. officers in a 'go-between' role who are able to report research findings and implications to policy makers and policy requirements and information gaps to researchers (perhaps this role is already being fulfilled). See reference Gibbons et al. 2008 (*Ecol. Man. & Rest.*, 9, 182-186) for further information.

Not sufficient to make information available - has to be interpreted and made relevant. See Sutherland et al 2004 (above) and information sources that land managers relied upon in their study.

Section 3.2.4 Getting results.

Table 3.4: Some salient points in this section and has very tangible links with the 'mainstreaming' section (which could perhaps be brought out more?). Point 4.2.2 is particularly well expressed.



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Sometimes feel that the links between actions and results in the tables could benefit from more detail - for instance, 4.3.1 - perhaps the 'action' should be to develop a communications strategy that sits over various jurisdictions and leads to complementary and collaborative actions and goals?

Objective 4.4 - please see comments above relating to accreditation. In order to better include the private sector and provoke behavioural change, need to find what is 'in it for them' - be this incentive scheme payments, ecosystem service arguments, improved market access, product differentiation, or a combination of all of these.

Do you think the six 'priorities for change' identified are the most important ones? If not what others would you suggest?

Maximum 90 words

See earlier section:

agricultural intensification - quoted repeatedly in the text for Fig. A9.1, but not in rest of strategy; possibly linked to this is risk of climate change-driven agricultural expansion into northern Australia.

Rather than provide a list of what may reflect my own biases, I would urge the authors to look at the following paper:

Sutherland et al (2009) One hundred questions of importance to the conservation of global biological diversity, Conservation Biology, (on line);

Whilst this is primarily aimed at research question formulation and is global in scope, the issues are sufficiently ubiquitous and cross-cultural to be applicable in Australia in many cases and the questions nicely frame the main biodiversity conservation priorities.



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Do you have any comments on the vision?

Maximum 90 words

Perhaps need more detail on how the different priorities may interact with one another, and unclear in some instances (even with actions/results/responsibilities sections) how implementation will occur, be funded, where will be trialled, etc, etc. Again, think that real or hypothetical case studies of implementation would be helpful.

If the strategy can lead to increased interest in and understanding of the natural world amongst the general public, better guided actions on private land, better engagement with the private sector and better organisation of jurisdictional responsibilities, then it will have achieved a great deal.



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3. Do you consider that the Consultation Draft:

- promotes a good balance between conservation on private and public lands?
strongly agree somewhat agree somewhat disagree strongly disagree not sure
- will facilitate a good mix of regulation and incentives?
strongly agree somewhat agree somewhat disagree strongly disagree not sure
- provides a good balance between marine and terrestrial issues?
strongly agree somewhat agree somewhat disagree strongly disagree not sure
- provides the necessary national framework to produce innovative conservation action?
strongly agree somewhat agree somewhat disagree strongly disagree not sure
- has a sufficient focus on institutional arrangements and change?
strongly agree somewhat agree somewhat disagree strongly disagree not sure
- provides sufficient emphasis on improving community awareness of biodiversity?
strongly agree somewhat agree somewhat disagree strongly disagree not sure
- addresses the need to implement conservation action at the appropriate scale(s)?
strongly agree somewhat agree somewhat disagree strongly disagree not sure
- is applicable to urban and rural environments
strongly agree somewhat agree somewhat disagree strongly disagree not sure
- provides a clear framework for balancing conservation, social and economic issues?
strongly agree somewhat agree somewhat disagree strongly disagree not sure
- adequately deals with the issue of climate change?
strongly agree somewhat agree somewhat disagree strongly disagree not sure



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Do you have any other comments on these issues?

Maximum 180 words

Would like to see greater emphasis on how to implement biodiversity conservation on private land - reserve system is generally acknowledged to be limited to certain vegetation associations (i.e. ones that don't compete with agricultural production) and is under-resourced in terms of on-site management. Need to find balances of legislation, incentive approaches, market approaches, information exchange, and means by which to best deliver each.

Too much emphasis on 'natural systems' - most systems modified to greater or lesser extent.

Would like to see better links between sustainable agricultural practices and biodiversity conservation - for instance, rotational grazing systems that have both biodiversity benefits (increased ratio of native grasses in sward) and production benefits (more palatable, drought resistant sward).

There is perhaps too little focus on urban ecology, in terms of its potential role as a mass communication device of the 'need for' and 'value of' biodiversity conservation - this could play a pivotal role in starting to gain ground in relation to priority 2 (mainstreaming biodiv).

Document is generally rather unclear about how will balance the conflicts between societal/economic demands and environmental demands - resolving some of these issues will be fundamental for implementation and turning actions into results. This is particularly the case in respect of increasing human populations and increased resource use.

Overall, some very good points and broad objectives in the strategy, but sometimes unclear that the means to deliver and the obstacles to implementation (and the means of surmounting those obstacles) have been identified.



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4. Do you think the Consultation Draft adequately covers the roles of Indigenous peoples in biodiversity management?

Maximum 270 words

Would urge the authors to make more explicit links between the decline of culture and heritage and the decline of biodiversity - e.g. loss of biodiversity is tantamount to loss of culture (see W.H. Hudson, 1892, 'The Naturalist in La Plata'; Carroll, 2003; Collar et al 2008, 'Birds and People').

Also links between extinction of species and extinction of languages - see Sutherland, W.J. (2003) 'Parallel extinction risk and global distribution of languages and species'. *Nature*, 423, 276-279. There is work being undertaken to communicate biodiversity information (e.g. birds) in Australian Aboriginal languages - see link:

<http://www.cdu.edu.au/sspr/carn/birdposters.htm>

Also, it would be interesting to begin making links between commercial farming of indigenous and bush foods and potential as habitat for declining fauna - e.g. native fig planting in SE Qld and Coxen's Fig Parrot. What research on this? Potential opportunities given enormous success (ecologically and commercially) of the Audubon Society endorsed 'bird-friendly coffee' from Costa Rica (and probably other regional examples of similar enterprises).



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5. Do you consider that the proposed arrangements for reporting on implementation will be effective in the monitoring and evaluation of the expected outcomes (results) of the Consultation Draft?

strongly agree somewhat agree somewhat disagree strongly disagree not sure

Do you have any suggestions for alternative reporting arrangements?

Maximum 270 words

seems to have addressed overall.

thoughts include:

6.2.2 Needs to be an incentive for industry to do this. e.g. accreditation to improve market advantages, and therefore perceive biodiversity as an opportunity for business rather than an impediment to business;

6.4 Adaptive management - a sound approach, as long as: i) changes are detectable; ii) findings are communicable and effectively communicated; iii) findings are geographically transferable and industry transferable (or the extent to which they vary among sites and practices is quantified) - this can be an issue, for instance, Whittingham 2007 (JAE, 44, 1-5) reported that agri-environment on-ground actions in the UK had different effects (+ve and -ve) on target species depending which part of the country they were adopted. Recommend an experimental (hypothesis-testing) approach to management (highly recommended over current practice of trial and error or applying some outdated management paradigm (s) developed in other parts of the country!!) especially where thresholds may have been exceeded and hysteresis constrains outcomes of management.

6.3.1 Perhaps more emphasis on the P.R. and attitudinal change elements of monitoring.

Always risk of a) insufficient funding directed at monitoring, leading to insufficient statistical power to detect change (false negative) and b) findings not effectively communicated back to land managers.



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6. To what extent is the Consultation Draft an appropriate national framework to achieve biodiversity conservation benefits, considering the different responsibilities, legislation and funding arrangements between governments.

Maximum 270 words

Overall comprehensive, and the mainstreaming of biodiversity is a major issue to address with regard to public and political willingness to fund expensive and difficult conservation actions and projects that will compete with other funding priorities such as education and health.

Jurisdictional conflicts and confusion over responsibility need to be addressed and clarified. Strategic targeting of future projects in relation to past projects may allay some of these issues. Also, there needs to be an urgent analysis, appraisal and aligning of regional, state and national targets and priorities.



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7. Is the Consultation Draft likely to encourage a good mix of public and private investment in biodiversity conservation?

strongly agree somewhat agree somewhat disagree strongly disagree not sure

If not how can the Consultation Draft improve in this area?

Maximum 270 words

Mainstreaming may lead to >public desire to conserve biodiversity.

Private may be more difficult. Needs to be strong emphasis on potential benefits of biodiversity conservation for private sector. This will require:



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- i) multi-industry and land use analysis of conflicts and opportunities for industries in relation to biodiversity;
- ii) Industry by industry analysis of where each is dependent on ecosystem services and the potential costs of losses or impairment (e.g. in relation to loss of biodiversity-driven function or in relation to climate change) of those services (i.e. cost of artificial substitution);
- iii) An analysis (possibly by bioregion) of the relative costs and benefits of the two overarching biodiversity conservation strategies ('land sparing' & 'wildlife-friendly farming'). See Green et al 2005 (Science - 'Farming and the fate of wild nature') and Maron and Cockfield 2009 (Ecological Interactions).
- iv) Development of government and industry endorsed accreditation schemes (see earlier comments);
- v) Continued development of incentive-based MBI approaches such as Environmental Stewardship - better integration of these approaches into agricultural industry;



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8. Is the Consultation Draft sufficiently clear about its role and how it will be implemented?

Maximum 270 words

This is an area where I think more attention may be required. There are some very good ideas in the strategy, but too often it seemed as if the actions and results were very broad (perhaps this is necessary in order to be interpreted by numerous organisations in a multitude of situations). This issue could probably be remedied through more detail in actions and results (perhaps undesirable due to the need to keep fairly generic and multi-purpose?), or through the provision of explicit examples of how certain actions and activities could lead to results through the involvement of various players. For instance, 1.1.3 - conservation linkages - requires more detail or examples?

Potential to bolster actions by indicating what are implications of undertaking an action and what are implications of not doing it - e.g. 1.1.3 - population isolation, inability to adapt to climate change, genetic bottle-necking, local extinctions through stochastic events, lack of recruitment, etc.

Responsibilities sections seem rather too generic in places and sometimes omit potential key players.



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9. Does the Consultation Draft reflect the best practice on biodiversity conservation?

Maximum 270 words

Some of the main drivers of threats are discussed (e.g. lack of public understanding of, and support for, biodiversity conservation), so a solid foundation established upon which to build.

In terms of best practice at a strategic 'priority selection' level, would be helpful to briefly mention how priorities were shortlisted, what criteria were used to score relative importance of these and what other issues were a) considered but not included, and b) deemed to be a subset of selected priorities. I'm in agreement with the authors that the priorities selected are of considerable importance, but would be good to see why these and not others?

Would be very useful to see a section that discusses what obstacles there are to implementation of actions and the delivery of the strategy, and what mechanisms and approaches could be used to overcome these obstacles.

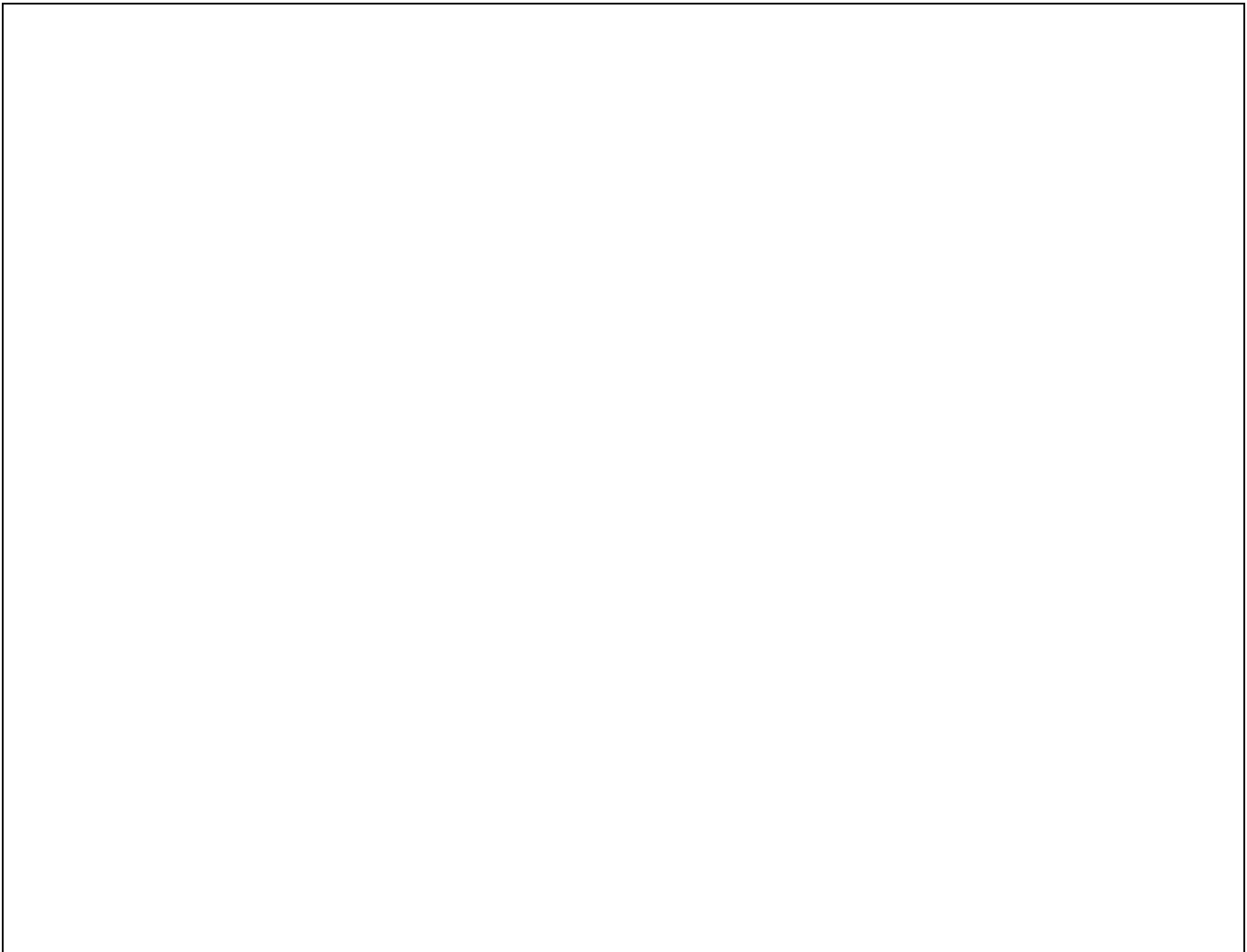
Threats section (A9) is very good and might be better integrated into the document as a whole (especially for land-use change scenarios under climate change).

Thought that figure A10.2 could be expanded upon and these principles included in broader text. Might be good to include in this the limitations of some corridors and the advantages to biodiversity and long-term sustainable production of ecologically sympathetic matrix management.



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10. Will the Consultation Draft effectively engage private sector interests in long-term biodiversity conservation?

Maximum 270 words

As discussed elsewhere in these comments, there need to be clearly identified incentives for the private sector to be involved (ecosystem services, MBIs, legislation, market-differentiation, etc.), particularly in times of a global recession, when industries are perhaps more likely to look upon environmentally-focussed activities as an obstacle or luxury rather than a necessity.

Again, the main strategies would appear to be:

Legislation;

MBIs and other incentive programmes;

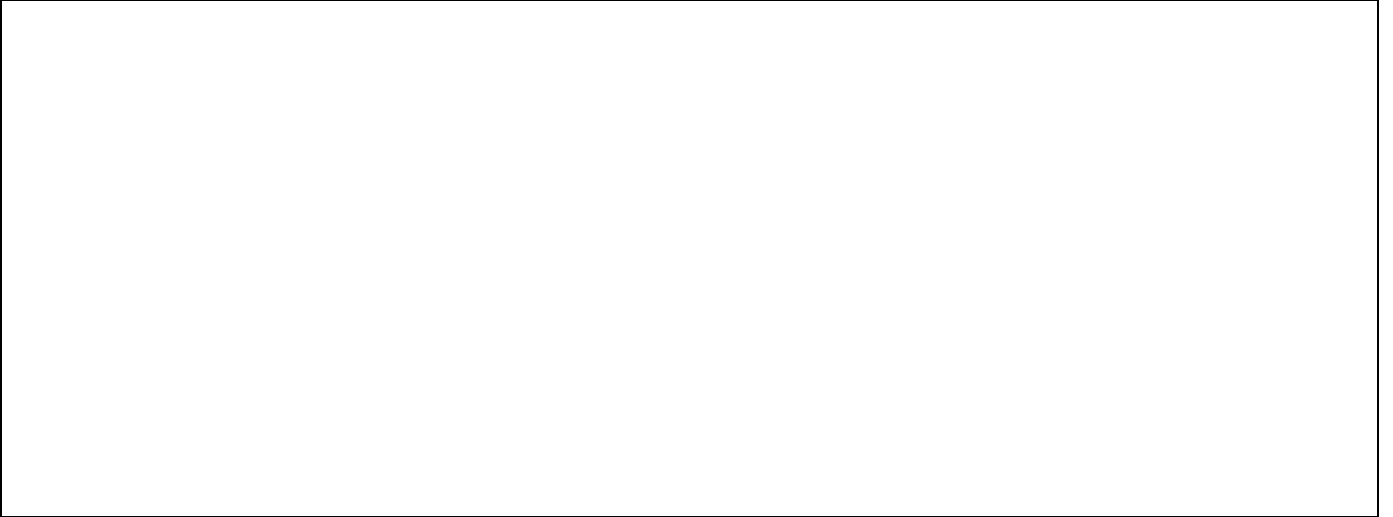
Product accreditation/differentiation - can be achieved through various means - e.g. through use of sustainable management practices, management of prominent habitats/species, donations and investment in wider conservation activities (e.g. BirdLife International's 'Species Champion' scheme for Crit. E. birds).

The strategy could perhaps include the identification of such 'hooks' for industry, the roles and responsibilities in delivering these approaches, and the risks (to biodiversity and industry) of not engaging the private sector in investment/contribution to biodiversity conservation. Ultimately, would be good to see some more strategies and avenues for communication and implementation identified.



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Do you have any other comments you wish to make on the Consultation Draft?

Maximum 360 words

Overall a good appraisal of a complex subject, and some very good recommendations for future action. Particularly encouraged to see identification of a) the threat of public dislocation from the natural world and b) the need to reconnect the public with nature for reasons of public well-being and for the long-term justification for and funding of conservation projects and actions. Given the numerous demands competing with conservation, this is potentially one of the fundamental battle grounds for the modern conservation movement.

Summarising my earlier comments, I feel the authors could expand on certain issues (mainstreaming for instance), include some other priorities/threats (e.g. agricultural intensification) and provide some detail or examples of implementation in the action/results tables.

Other than that, some minor comments on specific pages as follows:

pg. 8: unclear what is meant by 'ecosystem approach' - does this entail single ecological community, or 'whole-of-landscape'?

pg 9: 'enhance critical intact habitats to increase ecosystem resilience' - agreed, but resilience at large scales is also likely to be centred around managing modified habitats as well.

pg 10: Good that emphasised need for large-scale actions over realistic timeframes.

pg 14: most habitats are neither 'critical intact' nor 'critically degraded' - are these the priority areas in which to work?

pg.14: 'protection' alone is insufficient for many endangered spp. and ECs - need to manage threats, increase in number and extent, increase breeding success, etc.

pg. 17: 45% of terrestrial bird spp are endemic.

pg. 22: value in pouring \$\$ into critically degraded systems . . . see papers on triage approach to prioritising investment (e.g. Hobbs, et al. 2003; Ecol. Man. & Rest. Vol. 4; Supp. 1).

pg 92: Fig. A 10.2 - good diagram, but would like to see more in the text about the processes taking place in such a landscape, the management of threats, etc. 'Matrix management area' is very interesting and relevant, and requires explanation - influence of agri-matrix for species that primarily rely on native vegetation is becoming apparent (Fischer et al. 2005, Biodiv. and Cnservation; Haslem and Bennett, 2008, AEE; Sekerkioglu et al, 2005, Cons. Biol.; Sheahan 2009 (NSW DECC draft technical paper - 'Planning for catchment biodiversity targets at alocal landscape scale'), and the management of these areas may represent our best chance for integration of conservation and production.



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