NSW SCIENTIFIC COMMITTEE

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Dear Ms Ravallion,

Thank you for the opportunity to comment on the Draft PAS Review report and for the briefing provided by Grant Bywater and Beth Rickwood at the Committee's meeting.

The Committee has reviewed the Draft PAS review report and makes the following comments.

1) The report does not provide a transparent assessment of the strengths and weaknesses of the Priorities Action Statements. It therefore has limited value in guiding changes to the PAS pursuant to the review, as described in the Act. As it is currently presented the review implies that the PAS was an overwhelming success and that there is little need for modification, certainly not the fundamental overhaul that is proposed in the early PAS 2 documentation. The Committee considers that the review would have more value if it contained an executive summary that explicitly stated the strengths and weaknesses of the program over the last three years. For example, the review states that under PAS, recovery actions have been developed for 93% of all threatened species, however the development of these recovery actions does not reflect actual on-ground actions that may affect populations of these species, and 49% of NPWS staff stated that these recovery actions were too broad to be useful.
2) The review contains very little data to support the assertions that have been made. In part this reflects one of the weaknesses of PAS which we understand PAS 2 hopes to correct, i.e. that the program failed to collect useful data on the nature and effectiveness of recovery actions. There are other assertions, however, for which supporting information could easily be provided, and this would greatly strengthen the value of the review. In particular the review asserts that a weakness of the earlier recovery planning process was that "*during the period in which PAS was introduced, the majority of investment was being directed towards Recovery Plan development, with limited resources allocated to species recovery action*". From this statement it would seem that there is some knowledge of the allocation of the budget amongst these competing priorities. This is the sort of information that should be presented to make the review objective. The review should assess whether PAS was successful in directing a greater proportion of the available resources to recovery actions. The

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allocation of resources amongst planning and implementation is an important benchmark to establish before embarking on a revision to the PAS. It will help address the important question of whether the PAS 2 process succeeds in delivering more resources to recovery action.

3) There is a lack of clarity in the review in distinguishing initiatives that were taken as a result of PAS compared with those initiated as a result of the earlier recovery planning process that it sought to improve upon, or even with actions that may be considered normal operations such as weed control. This is highlighted by the specific case studies used as examples of PAS achievements. Three of the four examples had existing recovery plans and it is possible that many of the achievements resulted from those plans, rather than as a consequence of PAS. The fifth example, Cumberland Plain Woodland has had a recovery plan prepared as a result of PAS, but as we made clear in our comments on that plan, we do not share the Department's view that the Growth Centres are a triumph in threatened species recovery.
4) The Committee understands the enormity of the task of implementing recovery actions on a state wide basis and the need for continuing review and modification of recovery strategies. Describing the weaknesses of PAS should not be considered a criticism of the work of the Department, but as a means of guiding future program development. We consider that that the review needs to be more explicit in outlining the strengths and weaknesses. One of the strengths of PAS that should be mentioned explicitly is that it has been inclusive in recognising the actions of a wide range of stakeholders in protecting species across their range. The efforts of particular community groups and local councils in enhancing the prospects of survival of local populations in "their patch" gets the same level of recognition (a tick) as does a major departmental recovery program. The Committee considers it important that future development of the PAS does not lose sight of contributions from diverse stakeholders across the geographical range of a species.

The above comments provide background to several issues which we believe require careful consideration in further development of the PAS. We have previously provided the Department with advice in this regard (see Appendix 1) and we are pleased that some of our suggestions have been addressed in more recent documentation on the PAS 2 program. There are elements, however, that we consider require further attention, particularly in the context of the policy intent of developing a "Red List" for New South Wales and the application of the concept of recovery within the documentation for PAS 2.

5) We support the intent of broadening understanding of threatened species issues and engaging new stakeholders in recovery programs. The strategy states that the proposed Red List will help achieve this by linking the NSW program to the internationally-recognised and respected IUCN Red List program. For this to be successful, the similarities of the two Red Lists should be apparent. The fundamental attribute of the IUCN Red List is that is provides risk assessment of species, with the probability of extinction ranked using the categories of Critically Endangered, Endangered, Vulnerable, etc. The proposed New South Wales Red List appears to

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group species according to their different management streams, and the current documentation is ambiguous as to whether it will include a numerical ranking of priority for recovery based on PAS 2. The Committee considers that the concept of a NSW Red List will be confusing unless the conservation status is the primary means of classifying species within each management stream. Without such a classification system, the NSW Red List would bear no relationship to the internationally-recognised IUCN Red List.

6) We strongly oppose any intention to include a numerical league table of species based on PAS 2 determinations. Apart from such determinations having questionable validity (see below) such a ranking would erode the IUCN Red List concept. If considered desirable, the NSW Red List could include a field for each species listing its "Conservation Cost Effectiveness" using a scale of "high, moderate, and low" but this must be a subsidiary field to its conservation status.

7) The objectives of the TSC Act are 'to promote the recovery' and 'prevent the extinction' of threatened species. Consequently we are concerned by the continued use of the recovery objective of "ensuring that at least one population is viable in 100 years time". Not only is this a bold precedent in terms of lowering the bar for biodiversity conservation in New South Wales but it contradicts the most recent advice of many scientists currently dealing with how best to conserve biodiversity under a changing climate. Firstly, one of the objectives of the TSC Act is to conserve biodiversity, including genetic diversity, but by abandoning a target of conserving species across their ranges, the new conservation target is giving up on conserving genetic diversity. There are many aspects that must be considered in attempting to determine the minimum number of populations that must be conserved to protect a species in the long-term. These include population size, distance between populations, gene flow and species traits. Ensuring the viability of one population over a century as a means of reducing extinction risk is not consistent with accepted principles of conservation biology. Secondly, given the considerable uncertainty in both species' responses to climate change and the nature of climate change in specific regions, scientists recommend conserving populations in different climatic zones, on different edaphic or micro habitat areas where they occur. The intent of this is to maximise the resilience and adaptive capacity of species to threats resulting from climate change and its interaction with existing threats. This is particularly important for most landscapes in NSW where there has been extensive clearing and fragmentation of habitat, impact of exotic species and changes to natural disturbance regimes. It is important to recognise that while population and species numbers can be increased using appropriate management actions once genetic diversity is lost, it cannot be replaced, leaving species at risk of inbreeding and population decline. We understand that there is a cost/benefit trade-off between designing programs that have a high probability of conserving fewer species and those that have a lower probability of conserving more species. We are unaware of any consensus position amongst scientists in this regard and would therefore advocate an approach that does not commit the agency to a single path with what is considered a high risk of failure. We

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consider that the benefits of the PAS 2 approach can still be obtained without adopting this controversial conservation target. The language used in the Framework document 'i.e. viable in nature' and 'to recover a species to a position of viability in nature for 100 years' is not consistent with the aim of minimising the number of populations that are subject to recovery actions. At a very minimum, those species with existing ongoing broad across-species recovery planning should not be compromised under the PAS 2.

8) We strongly support the attempts of PAS 2 to develop detailed actions for species' recovery, including identification of specific sites, actions and methods for individual species and associated estimated implementation costs. Compiling and databasing the necessary data for development of recovery plans will be expensive and it is important to design the program so that it will continue to be useful as conservation targets are refined. Much of the cost of the program will come from co-ordination of expert interviews and we consider it sensible to maximise the benefit from these interviews. Rather than restrict expert assessment to the "minimum number of populations" approach we think experts should be asked to consider two options: (i) conserve the species, and (ii) conserve a viable population of the species. This approach would therefore also consider the impact on genetic diversity. The Department may still decide to purse the viable population approach, but the data will still be available in the event that other targets are shown to be of greater conservation significance.

9) While we consider that potential conservation benefits and implementation costs are fundamental considerations in determining conservation priorities, we **strongly recommend** against developing ranked league tables. We think that such tables would inevitably be misunderstood and misused as the primary decision-making criteria. Although the review states that the Prioritisation Tool should be used to inform decision-making, it also states that "*investment should be directed towards species at greatest risk of extinction*" and with greatest cost/benefit outcome. This clearly implies that the calculated Priority Status will be used as the main determinant of funding. Conservation managers should make informed decisions using all criteria, rather than be lured by a narrow, simplistic and highly inaccurate metric. It will be useful for managers to evaluate cost and benefit scores in their decision-making but any synthesis that discriminates species on a finer ranking than *low, medium,* and *high* cost-effectiveness is applying false precision to highly unreliable data. Our experience is that there is negligible data for most species to support expert opinion both on survival probability over a given time frame and the probability benefit of particular actions. While the process of evaluating likelihoods is a useful one, the actual scores have very little meaning and it would be totally inappropriate to construct league tables on this basis. There are many examples to show that when bureaucrats are given ranked lists it is impossible to attract funding to entities whose rank is lower than an arbitrary threshold. In the case of threatened species, there are many other criteria that would justify actions for particular species that may not happen to score highly using the PAS 2 method.

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10) We also strongly support the inclusion of monitoring actions in the planning for each species. Those monitoring actions **must** monitor species populations and numbers of individuals, rather than simply monitor what actions have been put in place under any recovery plan. It is only with empirical data on numbers of individuals and populations that any assessments of change can be made, along with the relative success of various actions.

11) We do not agree that the methodology outlined in the Framework paper reflects an adaptive management program, as suggested in the text. We suggest that for a number of example taxa at least, there needs to be a range of actions trialling several alternative management strategies to control or minimise a threat and that the success of each should be monitored. The current focus of the scheme is to choose 'the best' option rather than to accept that there is much uncertainty about what is 'best' and that often a range of alternatives need to be trialled.

12) We suggest that in addition to the current seven streams in the framework, there is a need to include additional streams or to broaden some of the existing streams. For example, the stream 'iconic' should be broadened to be 'iconic and indicator species'. In this group taxa would be a priority if they highlight particular management strategies or recovery success that may be applicable to a wide range of similar taxa. These may include issues ranging from threat management to community involvement. For example, fire plays a crucial role in the survival and life histories of many threatened plants. There are some good working examples of how an understanding of the impact of fire on a threatened plant species has been incorporated into species recovery and the fire planning process.

13) We support the inclusion of consideration of extinction risk via IUCN criteria in the current framework of PAS 2. However, we caution the use of the simplistic way extinction risk has been interpreted in the application of the criteria. The 'Recovery Benchmark' is stated as '*To recover the species to a position of viability in nature for 100 years; and to prevent any increase in extinction risk of the species that would cause it to be uplisted on the TSC Act schedules*'. Threat categories in the IUCN guidelines and the TSC Act do not imply that all species at a particular threat category (e.g. Endangered) are at the same extinction risk, but rather that they are in the same grouping. A species may be Endangered at time point 1 and almost, but not quite Critically Endangered at time point 2 , and hence still be in the Endangered category, even though its extinction risk has increased between time periods. In no way could this be presented as '*prevent any increase in extinction risk*' or as '*extinction risk is static or declining*'. We feel the 'Recovery Benchmark' should be modified to simply state '*To recover the species to a position of viability in nature for 100 years; and to prevent any increase in extinction risk of the species*'.

14) We believe that funding for 'data-deficient' species should also be considered as a priority for the Department, rather than simply the identification of these species as priorities for survey and research by other institutions.

15) The review states that the "Keep watch" group includes rare species which have no recognised threats. The NSW Scientific Committee operates under listing criteria set

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out in the Threatened Species Conservation Regulation 2010, which are consistent with the IUCN assessment criteria. The only criterion which would allow species with "*no recognised threat*" to be listed under the TSC Act is one for which the number of the species must be extremely low, moderately low, or low, to qualify for listing as critically endangered, endangered or vulnerable, respectively. The Committee is guided by the IUCN conventions for assigning populations to particular size categories, and the recommended thresholds are fewer than 50 individuals, 250 individuals or 1000 individuals respectively, for these three categories. Any species whose numbers have been reduced to this size are vulnerable to very real genetic and stochastic threats associated with small population size. Species assigned to the "Keep watch" group on this basis should not, therefore, be listed in the schedules, and so rather than classify them as such, the Department should make nominations to have them removed from the schedules.

16) We believe that PAS2 needs to outline the criteria that will be used in identifying threatened species as a priority for funding when community and other stakeholder involvement is high. It is likely that there may be considerable community pressure to move certain species into the 'iconic' stream as they are perceived to get a greater level of funding and management in this category.

17) We also think it would be helpful to provide information on the process for reviewing the species in each of the seven streams. For example, when a 'data-deficient' species has been the subject of an intensive study, is there a means of determining whether there is enough information to place it into another stream and if so, when will this occur? Similarly, it would be useful to explain how a 'keep watch' species may move to the priority list or 'ex-situ' stream once the nature of a threat is identified.

We hope these comments assist you in your review of the Priorities Actions Statement. Please do not hesitate to contact me if any matter requires clarification.

Yours sincerely

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NSW SCIENTIFIC COMMITTEE

Appendix 1: Scientific Committee comments on the Priorities Action Statement 2 (PAS2) and the proposed process for the prioritisation of species

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Dear Tom,

The Scientific Committee was pleased to be given a briefing by Grant Bywater on the Priorities Action Statement 2 (PAS2) and the proposed process for the prioritisation of species.

The Scientific Committee supports the concept of developing schemes to assist with prioritisation of recovery planning effort. As the prioritisation project around PAS2 is beginning, it is timely to provide some suggestions to enable the scheme to be better integrated into the management of biodiversity and threatened species and communities, along with clarifying the objectives and outcomes of the PAS 2 prioritisation project.

As a result of meetings with the Scientific Committee, a half day session at the Royal Botanic Gardens with two committee members (Bob Makinson and Tony Auld) and the seminar by Richard Malony at Hurstville, the Scientific Committee feels that the role of the project needs to be clearly placed in a broader context of the range of strategies that seek to conserve biodiversity and in

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particular threatened species, populations and ecological communities. The current documentation is somewhat unclear on this issue and could be taken to suggest that the Project is the major and only pathway that the conservation of threatened species will be dealt with in NSW. For example, only 1 objective of the *Threatened Species Conservation Act* is presented. The first objective of the *TSC Act* 'to conserve biological diversity and promote ecologically sustainable development' is ignored, yet this objective sets the broad framework of biodiversity conservation that the *TSC Act* is concerned with. As well, the *Project* currently does not deal with populations, ecological communities, generalist species or species whose distribution is mostly outside of NSW. For these groups (and for those threatened species also considered under the *Project*) a focus on funding for amelioration of threats across the landscape (as opposed to solely at key sites of threatened species) will be needed in addition to any funding for species that are outcomes of the *Project*. At the same time, there will be other key conservation aspects that need funding, including: species and communities that highlight key recovery planning issues (eg. Fire management, feral pest management) that may be applicable to a broad range of functional types of organisms, irrespective of the outcomes of the *Project*; iconic species; etc.

Consequently, the Scientific Committee suggests that in the literature supporting the *Project*, it is clearly pointed out that the conservation of threatened biodiversity in NSW will require a diverse range of strategies. This reflects the high level of uncertainty in both available knowledge on species and the likelihood of successful implementation of management actions. These broad strategies should include:

a) broadscale threat amelioration;
b) conservation of species across their ranges to maximise adaptive capacity in relation to a changing climate;
c) targeted conservation of selected species or functional types of plants and animals that demonstrate key recovery planning issues;
d) prioritisation of key actions to enhance the likelihood of securing some populations of threatened species (the *Project*);
e) investigation of the distribution and abundance for a range of poorly known species;
f) investigation into best practise management initiatives to resolve how to ameliorate some complex threats;
g) developing a capacity to respond to novel threats that may cause a rapid decline in biodiversity (eg Myrtle rust); and
h) encouraging actions for which strong community or scientific support exists. Contributing to existing projects on lower-priority species will sometimes be more effective than supporting new actions for priority species. The probability of sustaining recovery actions should be included as a criterion in interpreting any assessment of priorities.

Concerning the *Project* detail itself, five main issues are of concern to the Scientific Committee in relation to the *Project*. These are:

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1) the need to clarify that the *Project* only seeks to secure one to a few of the extant populations of a species, as opposed to securing the species across its distributional range;
2) assumptions concerning the possible benefit to species from management actions (and how these are being interpreted in relation to extinction risk);
3) the need to resource the gathering of data for the many taxa for which there is currently insufficient data to reasonably utilise the scheme;
4) the need to incorporate quantitative monitoring schemes to access the success or failure of management actions on populations of species;
5) Over-reliance on 'expert opinion'.

These issues are discussed below.

Clarification that the Project only seeks to secure one to a few of the extant populations of a species, as opposed to securing the species across its distributional range

The *Project* aims have been modified to maximise the number of species that are secured in 300 years (as opposed to the previous intent of 50 years). This is supported by the Scientific Committee. To achieve this the *Project* seeks to only secure the minimum number of populations necessary in any one species (assuming successful implementation of recovery actions) that would lead to a stable or possibly increasing population at the site(s) or at least one of them. This is not equivalent to the recovery of a species across its range, nor is it sufficient to meet one of the key objectives of the *Threatened Species Conservation Act*, ie conservation of diversity at the species and genetic levels. Firstly, this re-enforces the need to adequately place the context of the *Project* more clearly in the overall strategies for conservation of threatened biodiversity (see above). Secondly, the draft approach assumes that it is far more beneficial to have a few populations of more species adequately conserved than alternatives of protecting fewer species, but ensuring protection across their range. The case for this assumption has not been discussed and it is not necessarily a generally accepted view. As the number of remnant locations is a key factor in extinction risk (IUCN 2001, 2010), protecting a few and ignoring the rest of the populations within a species is likely to significantly increase the risk of extinction in a species. It also is contrary to conservation efforts in relation to a changing climate and the conservation of genetic diversity. Frankham (2005) recognised this flaw in his statement that 'If genetic factors are ignored, extinction risk will be underestimated and inappropriate recovery strategies may be used'

The change from a target of security over 50 years to one over 300 years mirrors the current New Zealand approach. The rationale behind the change is sound (to incorporate concerns about conserving genetic diversity, climate change impacts and stochastic events), however it does not necessarily equate with conservation across the range of a species, nor does it explicitly capture maximising the conservation of genetic diversity. The Scientific Committee feels that a productive

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way forward is to have a workshop discussion within DECCW (but involving both DECCW scientists and externals) before the policy of 'protect less of more' is adopted.

Assumptions concerning the possible benefit to species from management actions

The Recovery objective of the *Project*, although based on the study by Joseph et al. (2008), appears overly idealistic and illustrates the need for better integration of the factors that contribute to extinction risk when making risk assessments of species. The assigning of a 95% probability of viability as a result of the identified critical actions (and the corresponding interpretation that this equates to a future extinction risk of less than 5%) is not realistic. For a species, extinction risk is assessed at the species level (as opposed to only a few populations) via several different pathways under both IUCN (2001) and the TSC Act (see TSC regulations 2010). For many taxa, critical management actions can, and hopefully should, reduce the extinction risk, but the degree that this can happen in any one taxon will depend on a range of factors such as life history, the nature and extent of threats, chance events, the spatial distribution of species and threats etc. Where there are existing detailed models of the impact of management actions on extinction risk it is quite clear that a reduction to <5 % over a 50 year, or even longer, time frame is unlikely. Further, Joseph et al (2008) define benefit as the difference in the probability of the species being secure in 50 years with and without management. They make NO assumptions that any management action must lead to a reduction in extinction risk to <5%.

An alternative would be to estimate the likely benefit of management actions as a % reduction in extinction risk, rather than assume extinction risk will always be reduced to 5%. This will remove the bias in the current estimate of benefit score and allow more realistic cross species comparisons. There are several threatened taxa for which there are existing published models of population viability, including for some under alternate management options. These should be examined to assist with interpretation of the % reduction in extinction risk. Examples include Akcakaya et al (2004), Brook et al. 1997, 2002, Keith 2004, MacKenzie and Keith 2009, McCarthy et al 2004, Regan et al 2003. At a minimum, the *Project* should acknowledge this limitation and implement an adaptive framework whereby any recovery projects funded by the scheme have sufficient monitoring (see below) so that the % reduction in extinction can be quantified or estimated.

Many species with a very highly restricted distribution will always have an extinction risk greater than 5% (and often much greater) even after all conceivable management actions are implemented. There are also uncertain, but real, risks in relation to climate change impacts along with the emergence of novel threats.

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Funding the gathering of data for the many taxa for which there is currently insufficient data to reasonably utilise the scheme

For many taxa we know little about their distribution and abundance and cannot be confident of the nature or degree of benefit of management actions. In the Tasmanian application of the prioritisation scheme we note that of the 318 taxa examined, 31 were excluded as they were best dealt with by other states and 45 (45/287=16%) were data deficient. We would expect a similar if not much higher % for NSW taxa. As a consequence some funding is needed to allow quantitative data collection on the poorly known species, so that they may be included in a future iteration of the *Project.*

Need to incorporate quantitative monitoring schemes to access the success or failure of management actions

A key component of any scheme that attempts to prioritise resources is a well designed monitoring of outcomes. Given the large uncertainty in the likelihood of success of 'critical management actions', a quantitative assessment is needed for population trends and the degree of amelioration of threats. For most threatened taxa in NSW, there is no effective monitoring of populations and only limited assessment of threat mitigation. Such data are needed to test the benefit predictions made in the *Project.*

Over-reliance on 'expert opinion'

The *Project* is constructed so as to be heavily dependent upon so-called 'expert opinion'. The most successful conservation management studies in the literature are based on well researched and published data. Expert opinion should not be a substitute for the pursuit of informative, quantitative data for which to base management actions. This is the essence of adaptive management. The *Project* needs to:

1. Recognise the limits of data available on threatened species and on what management actions will best lead to recovery. There can be no 'expert opinion' when such data are lacking;
2. Recognise that if 'expert opinion' is utilised to develop a framework, there needs to be rigorous testing of the assumptions of the framework outcomes (in this case, particularly benefit and likelihood of success scores). Without this testing being a critical part of the scheme there will be little learning by ongoing adaptive management.
3. Keep the assessments of individual experts separate, rather than using consensus data, so that variance amongst experts and the consequent variation in priority can be determined.

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4. Make 'critical management actions' and other components of the *Project* available for public and peer review.

Previous schemes utilising 'expert opinion' in DECCW such as the Threatened Species Profile Database (TSPD) are fraught with data that is not precautionary, contradicts the published literature, contains simplistic ecological assumptions and as a consequence may lead to perverse outcomes. Such databases also become a 'black box' that avoid public and even scientific scrutiny. That this TSPD database 'will provide the framework for identifying critical actions' is consequently of great concern and may undermine the integrity of the *Project.*

The Scientific Committee is happy to discuss any of the issues raised.

Yours sincerely

Dr Richard Major

Chairperson

Scientific Committee

Cc: Grant Bywater

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