



Improving outcomes for threatened species and ecological communities considered by the Commonwealth approval process.

1: Suggestions from EAD officers

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Montage of species and ecological communities of regulatory interest downloaded from the Species and Threats database (SPRAT).

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Acknowledgement of Country

We acknowledge the Traditional Owners of Country throughout Australia and their continuing connection to and stewardship of land, sea and community. We pay our respects to them and their cultures and to their Ancestors, Elders and future leaders.

Our Indigenous research partnerships are a valued and respected component of National Environmental Science Program research.

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1. Executive summary

- This is the first of a series of reports from the National Environmental Science Program (NESP) Resilient Landscapes Hub Project 1.7 Initiative Research: 'Improving conservation planning especially for threatened species and ecological communities that trigger the EPBC Act' (Australian *Environment Protection and Biodiversity Conservation Act 1999*).
- The research, which was co-designed in 2022 with relevant officers from the Australian Department of Climate Change, the Environment, Energy and Water (DCCEEW), used online workshops to seek anonymous input from participants working in the then Environmental Approvals Division (EAD) of DCCEEW¹ on what they believed to be the most important aspects for improvement in statutory conservation planning instruments, specifically Conservation Advices for threatened species and ecological communities.
- The participants made a total of 94 suggestions for changes to the practice of developing Conservation Advices and to the format and contents of these statutory instruments.
- Although relevant EAD officers are routinely invited to comment on conservation planning documents, the participants considered that the process needed to be improved to better accommodate the other demands on their time.
- The suggestions on format and content mostly refer to the need for clarity, comprehensive details and rationale for the information in Conservation Advices including information about: habitat, habitat critical to the survival, important populations, threats, climate change and severe weather impacts, the primary conservation objective, conservation and management priorities, survey and monitoring priorities, information and research priorities.
- Sixteen of the format and content suggestions reflected practice at the time of the workshops and another 32 were approved for implementation in future Conservation Advices in September 2023.
- Officers of the DCCEEW Protected Species and Ecological Communities Branch (PSECB) in the Biodiversity Division indicated their intention to reconsider the remaining suggestions when developing subsidiary documents to the proposed new environmental laws, noting that not all the EAD suggestions may be appropriate for incorporation in statutory conservation plans.
- The EAD participants made suggestions that need further consideration including:

¹ EAD is now known as the Nature Positive Regulation Division.

- the development of systems to enable them to play more active and meaningful roles in the development and revision of statutory conservation planning instruments
 - the treatment of uncertainty and data deficiency, cumulative impacts, wide-range species, important populations, climate change and survey and referral guidelines in conservation planning instruments
 - whether additional information (e.g. actions to be avoided) should be provided in the conservation plans of species and ecological communities with known or anticipated regulatory interest or whether such information should be required in all statutory conservation planning documents
 - the desirability of developing a factsheet or including a labelled section in each relevant conservation planning document that provides a summary of the information regulators need and where to find further details.
- The proposed adoption of a digitised conservation planning instrument with strong regulatory standing that can be updated with contemporary data and information provides an opportunity for DCCEEW to reconsider the balance between (i) information in the conservation planning instruments for threatened species and ecological communities and (ii) generic guidelines.

2. Introduction

This is the first of a series of reports from the NESP Resilient Landscapes Hub Project 1.7 Initiative Research: 'Improving conservation planning especially for threatened species and ecological communities that trigger the EPBC Act'.

The EPBC Act gives effect to Australia's obligations for threatened species and ecological communities under the *United Nations Convention on Biological Diversity* 1992 (CBD, 1992), in accordance with the Commonwealth's responsibilities under the 1997 *Heads of Agreement on Commonwealth and State roles and responsibilities for the Environment* (Council for Australian Governments, 1997).

Chapter 5 of the EPBC Act enables the making of 2 types of statutory conservation plans for listed threatened species and threatened ecological communities: Conservation Advices and Recovery Plans. Conservation Advices must be produced for all species and ecological communities listed as threatened, apart from species listed as Extinct or Conservation Dependent (EPBC Act s266B (1)). Recovery Plans are discretionary.

The matters to be included in a Recovery Plan are prescribed by the EPBC Act (s270). The EPBC Act is less prescriptive regarding Conservation Advices (s266B), and their contents have gradually become more comprehensive since Conservation Advices were introduced in 2007. Since 2018, changes to the contents and format of Conservation Advices have been recorded in a 'Conservation Advice template' and the associated 'Guidance for populating the Conservation Advice template' document. Conservation Advices are now the most frequently available statutory conservation planning instrument. For example, in April 2023, there were 2011 species and 100 ecological communities listed under the EPBC Act; 1,671 had an approved Conservation Advice in place and 710 had a Recovery Plan in place (Species Profile and Threats Database [SPRAT] accessed 21/4/23).

Along with 8 other Matters of National Environmental Significance (MNES), threatened species listed as Extinct in the Wild, Critically Endangered, Endangered or Vulnerable and ecological communities listed as Critically Endangered or Endangered receive statutory protection under the EPBC Act (EPBC Act s18). Any action that may have 'significant impact' on a listed threatened species or ecological community is prohibited without approval from the Minister. When approving actions that may have a significant impact on one or more threatened species or ecological community, the Minister 'must not act inconsistently with' Recovery Plans and 'must have regard to' Conservation Advices (EPBC Act s139).

Listed threatened species and ecological communities entities are considered in EAD processes in relation to the impacts of proposed actions more often than any other MNES. For example, the then Australian Department of Agriculture, Water and the Environment *Annual report 2020–21* (DAWE 2021) lists 269 MNES matters examined in relation to impacts of proposed actions that year. 152 (57%) were considered on the basis of at least one 'listed threatened species or ecological community'.

In order for the Minister to know that an action requires assessment, they must be made aware of the proposed action. In the first instance, a proponent must submit a 'referral' to the Australian Government. This referral is a self-assessment of whether the proposed project

(action) is likely to have a 'significant impact' on a MNES. EAD uses this referral to decide whether further, more rigorous assessment is required. If the action is assessed as likely to have significant impact on a MNES, then it will be declared to be a 'controlled action' that requires Commonwealth environmental impact assessment (EIA) and approval. This process is colloquially known as 'triggering the Act'.

Sometimes a relevant MNES is identified during the approvals process only. It is thus possible for an entity of regulatory interest to be considered in both the referral and approvals processes associated with an action, the referral process only or the approvals process only.

In this report, we refer to listed threatened species and ecological communities as 'entities of regulatory interest' if they have been considered during either the referral or approvals process associated with an action.

In 2019, the then Australian Department of the Environment and Energy commissioned the Australian National University to help it identify ways of improving the efficiency and effectiveness of the EIA process under the EPBC Act. In response to concerns expressed by officers of the EAD about the adequacy of existing documents for use in a regulatory context, the resultant report (Macintosh et al. 2019) recommended that 'The statutory documents prescribed under the legislation should be consolidated and redrafted around the needs of regulatory decision-makers, including through the incorporation of additional information'.

This research aimed to guide improvements in Conservation Advices to support positive conservation outcomes for listed species and ecological communities in the EPBC Act approvals process, from the perspective of EAD officers, by identifying and exploring specific elements of the concerns identified by these officers.

3. Methods

This research was co-designed in 2022 with officers of the PSECB and EAD of DCCEEW and conducted in accordance with James Cook University, Human Ethics Approval H8872.

We used a participatory approach to seek input from EAD officers on what they believed are the most important aspects for improvement in statutory conservation planning instruments. We envisaged that the outcomes of this research could be used to guide the future development and improvement of conservation planning documents, in combination with other information and perspectives. The potential improvements could be applied to any species or ecological community, but we assumed that they would be most important for entities that are frequently considered in projects that require approval from the Australian Government under the EPBC Act. Hence, we focused on considering entities of regulatory interest.

We made considerable effort to ensure that the participation of EAD staff was voluntary and that their input was anonymous. The acting Communication Manager, **National Environmental Science Program** of the Science Partnerships Branch at DCCEEW obtained a list of 151 EPBC assessment officers in EAD and individually emailed them with details of this project, inviting them to participate on a voluntary basis. She received positive responses from 55 EAD staff (henceforth 'participants') and assigned them to one of 4 90-minute online workshops (hereafter 'participatory workshops') scheduled for 16 and 18 November 2022 (2 on each date), depending on their availability. In addition, all participants were invited to an introductory online workshop (hereafter 'introductory workshop') on 11 November 2022. All workshops were scheduled during working hours. We were then advised of the details of only those who had agreed to participate. No information about participants/non-participants was disclosed to EAD staff.

Participants were provided with a Project Information Sheet (Appendix 1). They were also advised verbally and by email that they could opt out at any time and that if they had provided specific input and would like that input removed, it would be done prior to sharing summarised information.

3.1 Introductory workshop

The 24 participants who attended the introductory workshop, facilitated by Carwardine, were asked verbally during that workshop to keep the input of their colleagues and their names confidential, a request that was repeated at each subsequent participatory workshop. To ensure anonymity, participants were advised to keep their video cameras off, join via Microsoft Teams from home if possible, and use an avatar.

The main purpose of the introductory workshop was to explain the research objectives and the process of the subsequent participatory workshops. During this workshop, attendees also participated in two exercises, using Mentimeter software (Mentimeter 2022). The software enabled Carwardine to use interactive polling and word clouds to identify the aspects of Conservation Advices that participants considered (i) most important and (ii) most in need of

improvement. Each participant was asked to pick their top 5 matters (without ranking) from each of the following lists plus any extra matters they identified:

- for species: taxonomy; description of species; species distribution including map; populations (subpopulations and important populations); habitat (general and critical); ecology/behaviour/life history, reproduction; threats; listing category and criteria; conservation objective and management priorities; research priorities; cultural and community significance and engagement; survey and monitoring protocols; offset options; anything else (nominate what)
- for ecological communities: description of the ecological community and area it inhabits; key diagnostics; condition classes, categories and thresholds; spatial distribution and map; habitat critical/high value areas/buffer zones; threats; offset options; conservation objectives and existing management plans; priority actions for conservation and research; cultural significance and guidelines; listing category and criteria; flora and fauna species lists including threatened species; survey protocols and restoration standards; anything else (nominate what).

3.2 Participatory workshop

As a follow up to the introductory workshop, all participants who had expressed interest in the project were emailed and advised of the arrangements for the participatory workshop that they had elected to attend based on their availability. Each participant was allocated 2 of the following recent Conservation Advices for species to read:

- *Hirundapus caudacutus* **White-throated Needle-tail** (2019)
- *Leucochrysum albicans* subsp. *tricolor* **Hoary Sunray, Grassland Paper-daisy** (2021)
- *Melaleuca deanei* **Deane's Melaleuca** (2021)
- *Petauroides volans* **Greater Glider Southern and Central** (2022).

Each participant was also allocated to read an advice for one of the following for ecological communities:

- **Coastal Swamp Sclerophyll Forest of NSW and south-east Qld – combined forest/wetland** (2021)
- **Tuart (*Eucalyptus gomphocephala*) Woodlands and Forests of the Swan Coastal Plain ecological community** (WA) (2019).

These Conservation Advices were recommended by relevant PSECB officers as high-quality examples that reflected recent practice and were downloaded from SPRAT in November 2022.

The allocations were specified for each workshop in a manner that resulted in each of the Conservation Advices listed above being read by 2 workshop groups. Attendees were advised that these recent Conservation Advices were background only for their workshop to

prompt their generic responses and that these exemplars would not be considered specifically.

Carwardine facilitated each 90-minute participatory workshop, which was conducted using Miro software (Miro 2022). Miro was used as a digital whiteboard that each allowed participant to anonymously create and post notes to answer questions about the aspects of Conservation Advices for species and ecological communities that had been deemed important and in need of improvement at the introductory workshop. Participants were asked to list aspects of Conservation Advices to answer the following questions.

- What do you see as the strengths of Conservation Advices?
- How could they be improved?

Each of the 4 participatory workshops was attended by 3–5 EAD officers but all participants who had expressed interest in attending a particular workshop were also given several days to provide further anonymous input. As a result of the imperative for anonymity, we are unsure how many people contributed in total.

The Miro software provided a record of each workshop that was downloaded as a PDF file. Marsh synthesised the comments as a list of suggested improvements grouped as much as possible under the topics in the DCCEEW Conservation Advice template (September 2022 version), with the addition of headings for some cross-cutting matters and the omission of headings that did not elicit comments.

The resultant list of aspects identified for improvement was provided for comment by email to all the EAD officers who had expressed interest in the project and revised in response to their comments about rewording and aspects that should be included/omitted. The revised list was then circulated to the PSECB directors via the head of that branch with 16 suggestions that reflect current practice recused to encourage the directors to concentrate on proposed changes. The head of PSECB and the directors of that branch discussed how they might use the material and provided verbal advice to Marsh on their conclusions, noting that not all the EAD suggestions may be appropriate for incorporation in a statutory planning instrument, and that some may be better suited to guidance documents.

4. Results

4.1 Aspects of conservation planning instruments considered important and in need of improvement

The participants who attended the introductory workshop considered the following aspects of Conservation Advices for both species and ecological communities to be important and in need of improvement: general and critical habitat, offset options, survey and monitoring protocols, important populations/sub-populations and high-value areas, conservation objectives, and management priorities and plans. Buffer zones, condition classes, categories and thresholds and key diagnostics and restoration standards were also identified for ecological communities using the same criteria (Figure 4-1).

On the basis of these results, the topics and related aspects summarised in Box 4-1 were considered at the 4 participatory workshops along with several cross-cutting issues. Participants generally conflated their comments about the strengths of modern Conservation Advices and how they could be improved across species and ecological communities. Suggestions for improving the process of developing and revising Conservation Advices are summarised in Appendix 2. Suggestions for improving the content of Conservation Advices are summarised in Appendix 3.

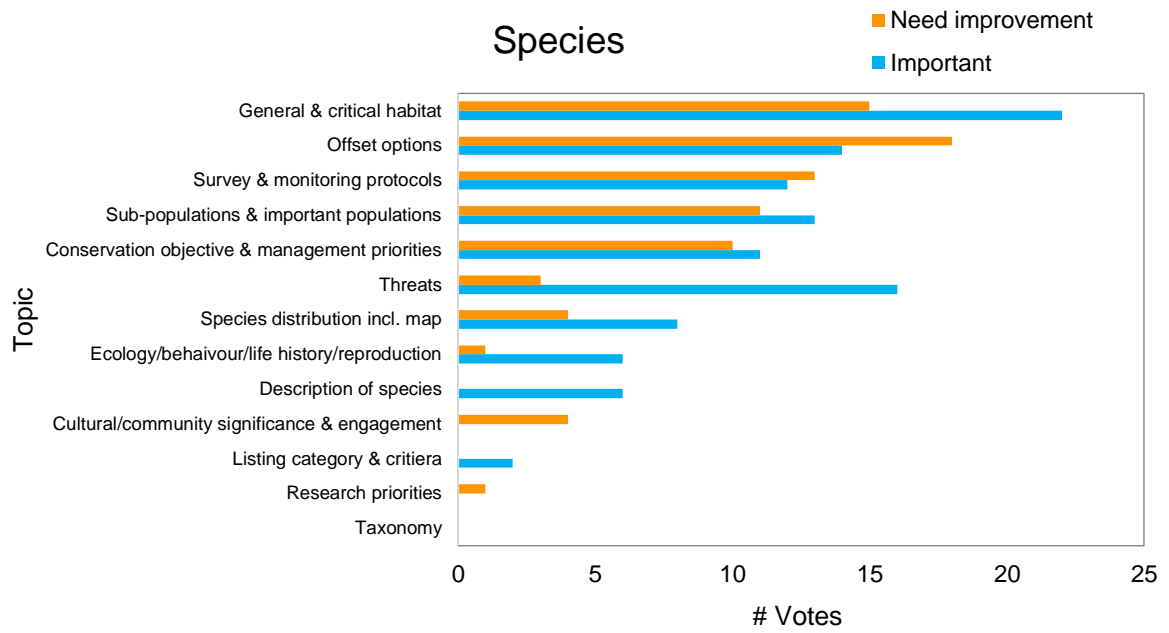


Figure 4-1. The number of votes received from the Environmental Approvals Division officers who participated in the introductory workshop for the importance and need of improvement of various topics covered by Conservation Advices for threatened species.

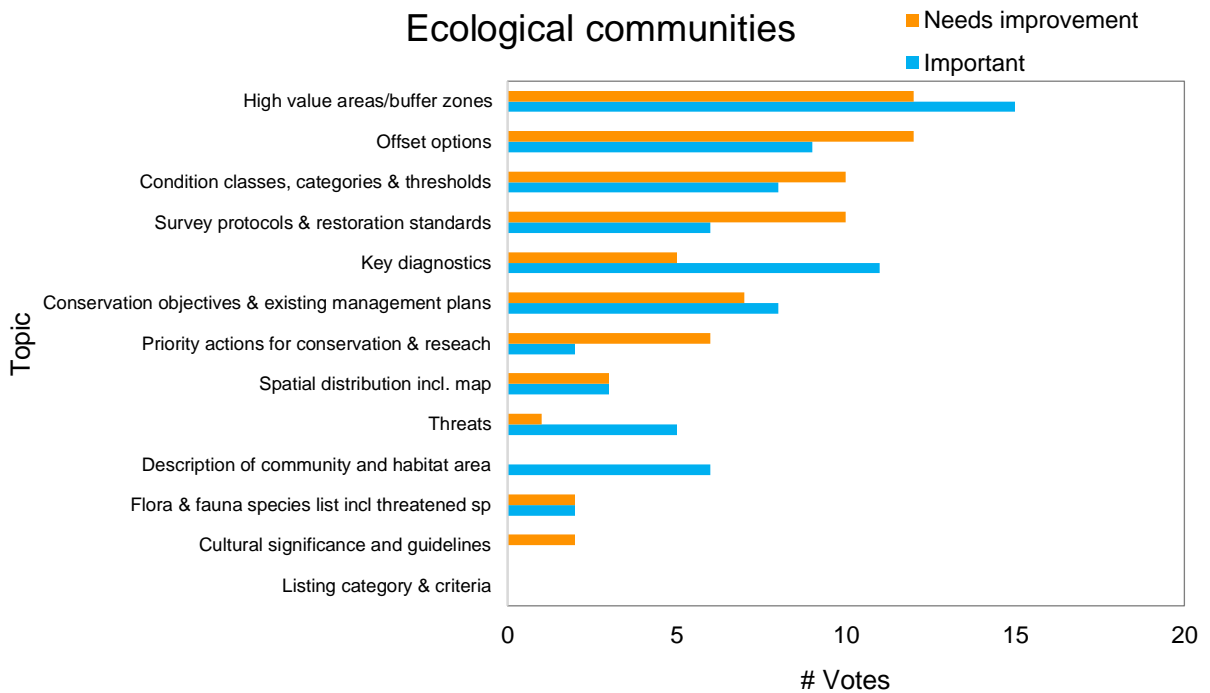


Figure 4-2. The number of votes received from the Environmental Approvals Division officers who participated in the introductory workshop for the importance and need of improvement of various topics covered by Conservation Advices for threatened ecological communities.

Box 4-1. Aspects of Conservation Advices for species, ecological communities or both that were deemed important and in need of improvement at the introductory workshop, grouped by topic in the DCCEEW Conservation Advice template. This selection was used as the basis for comment during the 4 participatory workshops.

1. Descriptors: description of species or ecological community and habitat area, key diagnostics, condition classes, categories and thresholds
2. Locations: important populations and/or high-value areas including buffer zones, no impact areas, habitat critical
3. Conservation objective, management priorities and plans
4. Survey and monitoring protocols
5. Referral standards and guidelines
6. Mitigation: offset options, no-offset areas, rehabilitation options, restoration standards and duration, research priorities
7. Climate change impacts (range shifts, adaptive goals, feasible mitigation options)
8. Use of precautionary principle
9. Revision times or prompts for Conservation Advices
10. Any other matters

4.2 Suggestions for improving the process of developing and revising Conservation Advices

(See Appendix 2 for full details.)

Although relevant EAD officers are routinely invited to comment on conservation planning documents, the participants considered that the process needed to be improved to better accommodate the other demands on their time. They suggested that relevant EAD officers be explicitly involved in:

- the annual review of the templates for Conservation Advices for species and ecological communities
- identifying exemplars for various sections of a Conservation Advices that could be used by PSECB staff as models when drafting Conservation Advices
- developing and reviewing the Conservation Advices of entities likely to be of regulatory interest or with a regulatory history
- identifying problem entities so they can be earmarked for specific research on key matters of relevance to them (e.g. robust survey methodologies, criteria for important populations of wide range species).

The EPBC Act is silent on a revision schedule for Conservation Advices. Participants suggested that they be updated at least every 5 years; every 2 years for entities that of frequent regulatory interest, especially Critically Endangered entities, and that conservation plans of such species be flagged to ensure updating if important new information becomes available, for example:

- when industry and development pressures change (e.g. renewable energy infrastructure)
- when there are changes in the regulatory context
- after natural disasters
- when other threats emerge (e.g. invasive species)
- when relevant expert advice received
- when assessment officers advise on need for revision when there are ongoing issues for them.

PSECB staff noted that revisions come at significant cost in time and resources, and they need to be balanced against other priorities.

4.3 Suggestions for improving the content of Conservation Advices

(See Appendix 3 for details.)

Appendix 3 comprises 84 suggestions grouped into 19 'potential advice improvement' topics. Most items applied to both species and ecological communities; 12 were for species only; 3 for ecological communities only. Most items fitted under the headings in the September 2022 PSECB Conservation Advice template including: habitat, habitat critical to the survival, important populations, threats, climate change and severe weather impacts, primary conservation objective, conservation and management priorities, survey and monitoring priorities, information and research priorities.

Suggestions under these headings mostly refer to the need for clarity, comprehensive details and the rationale for the information in the Conservation Advice. Participants stressed the need to minimise opportunities for misinterpretation of Conservation Advices by endeavouring to pre-empt loopholes and including what **should** and **should not** be done by proponents and managers to address threats to species.

Several participants emphasised the need to address the inevitable uncertainty in the information in a constructive manner. They stressed the need to be clear about what aspects of the information are uncertain, while minimising uncertainty as much as possible (they considered that including information such as 'likely to include' is not helpful), specifying what can be done to reduce this uncertainty (including what proponents might do). One participant suggested that it would be useful to rank the certainty of various components of the information using an agreed scale.

The EPBC Act (s391 (1)) requires the Minister to use the precautionary principle in their final decision to the extent he or she can do so consistently with the other provisions of the EPBC Act, when scientific uncertainty is associated with threats of serious or irreversible environmental damage. Given this requirement, workshop participants were hesitant to recommend the use of the term 'precautionary principle' in a Conservation Advice but recommended that information could be qualified by using the term 'precautionary approach'.

A recommended example of a precautionary approach was including 'may occur' in range map of each entity, so that proponents would need to consider that the entity of interest may occur there.

Conservation Advices prepared at the time of listing a threatened entity include the relevant Listing Advice as an appendix. When this is not the case (e.g. 1,171 species assessed under the previous Australian *Endangered Species Protection Act 1992* and not reassessed under the EPBC Act), participants stressed the need to ensure the reason for listing is well described in the Conservation Advice as assessment officers need to understand why an entity is at risk. Unfortunately, the available data are often only sufficient for a threatened entity to be assessed under a subset of the categories for which they are *likely* eligible. Thus, the criteria used in the assessment may not always be reflective of the overall extinction risks. The current practice of identifying criteria in a listing assessment for which there are 'insufficient data to determine eligibility' is important.

Approvals decisions for 'wide-range species' were considered particularly challenging, and participants suggested that clear guidelines would be useful for identifying the habitat critical for the survival of wide-range species, especially species with different critical habitats at different stages of their life cycle, times of year or different parts of their range. Participants did not define what they meant by wide-range species. The median for all species listed as threatened under the EPBC Act falls well within an accepted definition for small-range species (< 1,000 km²; Watson et al. 2011). We assumed that wide range meant a range > 10,000 km²; medium range 1,000–10,000 km² and small range < 1,000 km². Although small range size is a strong predictor of vulnerability to extinction (Staudé et al. 2020), there were 277 species listed as threatened with ranges > 10,000 km², including 174 listed as Vulnerable; 82 listed as Endangered and 21 as Critically Endangered (SPRAT 11/5/22).

The participants considered the major improvement needed for ecological communities was to make the description of what the ecological community is/is not as clear as possible for both consultants and non-specialists and to link to descriptions of corresponding state-listed communities if relevant.

The participants called for Conservation Advices to provide enough information on mitigation and adaptation (including adaptive management) options and their likelihood of success to enable assessment officers to discuss these options with proponents to pre-empt the conversation 'going straight to offsets'. They requested clear advice about suitable and unsuitable (avoidance) offset areas, and direct and indirect offsets in the context of climate change, especially if a species is unlikely to recolonise isolated or disturbed sites.

Participants asked that the number of documents that they needed to consult be minimised as much as possible and checked to ensure that their information is consistent. They explained that inclusion of referral standards and guidelines in the Conservation Advice with definitions of what constitutes a 'significant impact' and 'serious and irreversible harm' for the listed entity assisted them with the referral process. Wide-range species are particularly difficult and thresholds to trigger referral in the context of surrounding resources/habitat area are very useful.

Several participants stated that they find Conservation Advices, particularly those for ecological communities, hard to navigate and stressed the need to include a table of

contents and a standardised outline format. Relevant articles in professional journals need to be referenced and hyperlinked if possible. A glossary or a link to one would be helpful. One participant suggested that an entity-specific factsheet for proponents summarising the key information relevant to them would be a constructive innovation. The intent of this suggestion could also be realised by including a dot-point summary at the front of each conservation planning instrument.

4.4 Response from the Protected Species and Ecological Communities Branch

As summarised in Appendix 2 and Appendix 3, the PSECB provided one of the 10 suggestions in Appendix 2 and 31 of the 68 suggestions in Appendix 3 (that had not already been adopted) to the Threatened Species Scientific Committee at the committee's 93rd meeting in September 2023. They requested the committee's agreement to their inclusion in the 2023 version of the 'Conservation Advice template' and associated 'Guidance for populating the Conservation Advice template' used by DCCEE. The committee agreed to all 31 suggestions. PSECB advised that the remaining 37 suggestions in Appendix 3 would be considered in the revision of supporting documents to be conducted as part of the anticipated legislative reforms, noting that not all the EAD suggestions may be appropriate for inclusion in a statutory planning instrument.

5. Discussion

The participants made a total of 94 suggestions for improvements to the practice of developing the format and content of Conservation Advices and to the format of the contents of these instruments (see Appendix 2 and Appendix 3 for details). Sixteen of their format and content suggestions reflect practice at the time of the workshops and another 32 (one in Appendix 2 and 31 in Appendix 3) were approved for implementation in future Conservation Advices in September 2023.

PSECB indicated their intent to reconsider the remaining suggestions in Appendix 2 and Appendix 3 in the context of the relevant subsidiary documents associated with the proposed new environmental laws, noting that some of the EAD's suggestions may be more appropriate for inclusion in guidance notes that the conservation planning instrument *per se*. We are optimistic that at least some of these suggestions will be reflected in a new conservation planning instrument foreshadowed in the Nature Positive Plan (DCCEEW 2022a), and in the proposed standards for MNES.

The participants also made suggestions that likely need more consideration including (i) the development of systems to enable them to play more active and meaningful roles in the development and revision of statutory conservation planning instruments (Appendix 2) and (ii) the matters discussed below.

5.1 Dealing with data deficiency and uncertainty

Participants requested a standard operating procedure for addressing uncertainty in conservation planning documents, including a scale for ranking the uncertainty of various components of information.

This matter has also been of concern to other jurisdictions. In the context of discussing regulatory decisions under the *USA Endangered Species Act*, Doremus (2004) points out the scientific information relevant to decisions under that Act is likely to remain 'thin' for the foreseeable future. This situation is even more challenging in Australia, where the information deficit is much greater than in the USA.

Unlike the USA, Australia is a mega-diverse country with extraordinary levels of endemism. For example, Australia has an estimated 18,714 species of endemic plants, more than twice as many as the USA (8,830). Only 39% of Australia's known endemic plants have had their conservation status assessed compared with 87% in the USA (Gallagher et al. 2023), indicating much greater data deficiency, even though the absolute numbers of assessed plants are not very different (7,682 USA; 7,298 Australia). In addition, as in the USA (Malcolm and Li 2018), much of the Australian information is out of date. Only 19% of Australia's listed threatened species (13% of threatened plants) had a listing date effective in the previous 10 years in May 2022 (SPRAT 11/05/22). Thus, it is inevitable that EAD will have to prepare many assessment reports based on 'uncertain' information for the foreseeable future, especially in the face of climate change, which will affect the distribution and abundance of many threatened entities in unknown ways (Beyer and Manica 2020) and as discussed below. There is currently no statutory requirement for a revision schedule for

Conservation Advices. EAD officers suggested that a process be adopted that enables them to have a say in prioritising updates. Such a reform should be much easier to achieve if the proposed Nature Positive reforms (DCCEEW 2022a) are implemented.

The Significant Impact Guidelines (Department of the Environment 2013a) ask a proponent to consider the degree of confidence with which the impacts of the action are known and understood. MacIntosh et al. (2019) reports that it is common for proponents to be required to provide an assessment of the uncertainty associated with their impact analysis. For example, the assessment guidelines prepared by the Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development require modelling 'to show the range and likelihood of possible outcomes, based on sensitivity and uncertainty analysis' (IESC, 2018). Nonetheless, MacIntosh et al. (2019) reported that proponents often fail to quantify the relevant uncertainties and called for consideration regarding a mandatory requirement for all assessments to include quantitative or qualitative evaluations of the confidence levels associated with each material data point in each impact analysis.

Such a requirement would benefit from a process for dealing with uncertainty in the information provided in Conservation Advices. All the EAD officers' suggestions regarding uncertainty (see Appendix 3, #2.1–2.4) were incorporated into the 'Conservation Advice template' and 'Guidance for populating the Conservation Advice template' documents in September 2023. However, these changes are less than required by the overarching suggestion of the EAD officers to develop a standard operating procedure for addressing uncertainty and precaution in conservation planning documents e.g. 'develop and introduce a scale for ranking the uncertainty of various components of information' (Appendix 2, #3), and much less than the recommendation of Doremus (2004).

Doremus (2004) calls on the relevant US agencies to openly acknowledge the limits of existing data and, if the missing information cannot be reasonably obtained, to include a statement explaining how such deficiency would be relevant to evaluation of a project's environmental impacts. She suggests that decision-makers be required to 'acknowledge incomplete data and explain any extrapolations, gap-filling steps, assumptions and choices about dealing with uncertainty and analyse how remaining uncertainties could be reduced, including estimates of the time and expense required to carry out gap-filling studies and the value for future generations those studies would be expected to generate'. Rumpff et al. (2023) tell a cautionary tale about how conservation decisions were made in the face of data deficiencies and uncertainty after the 2019–20 megafires in Australia. They note that that 'uncertainty can be overwhelming but need not be crippling' and stressed that specifying uncertainty can help identify the need for and help to target monitoring and research to prioritise the addressing of 'critical' knowledge gaps, which, if resolved, will result in more effective management, because such gaps are 'critical' to decision making (Runge et al. 2011).

We suggest that consideration be given to (i) introducing a mandatory requirement for all Listing Assessments to include quantitative or qualitative evaluations of the certainty associated with each material data point as recommended by MacIntosh et al. (2019) and (ii) developing methods to describe uncertainty in conservation planning documents, noting the danger of conflating confidence in a decision with certainty in the data. For example, if estimates of the population size of a threatened species are known to be biased but have

shown a decline of 80%, the actual population size might not be known with certainty. But if exactly the same methods have been used throughout the time series of population estimates, we can have confidence in the trend, because that uncertainty in the population size is not 'critical' to our assessment of the trend as long as the bias is constant.

With regards to uncertainty in data, plausible intervals are currently provided for the key assessment parameters in Listing Assessments, e.g. number of mature individuals, population trend, generation time extent of occurrence, area of occupancy, number of subpopulations, number of locations (see SPRAT). The range of a species or ecological community is provided as 'likely to occur' or 'may occur' in SPRAT. However, there is limited guidance for describing or reducing uncertainty in key components of Conservation Advices, apart from the suggestions that have been incorporated into the 2023 version of the Conservation Advice template and the associated Guidance for populating the Conservation Advice template document from Appendix 3.

There are also relevant Australian precedents for dealing with confidence in assessments. The *Australia state of the environment 2021* report (Cresswell et al. 2021) ranks the confidence of its assessments using the following 5-point grading scale based on that used in in the *Australia state of the environment 2016* report (Jackson et al. 2017):

Adequate:	Adequate high-quality evidence and high level of consensus
Somewhat adequate:	Adequate high-quality evidence or high level of consensus
Limited:	Limited evidence or limited consensus
Very limited:	Limited evidence and limited consensus
Low:	Evidence and consensus too low to make an assessment

The *Australia state of the environment* grading scale for confidence is used when considering the risks to the listed entity associated with each biodiversity threat in Conservation Advices.

There are also regulatory reasons for specifying the level of scientific uncertainty associated with key matters in conservation planning documents. Under the EPBC Act (s391), the precautionary principle applies when both the following are true: (i) a threat of serious or irreversible environmental damage and (ii) scientific uncertainty as to the environmental damage. Thus, uncertainty about relevant matters such as the nature and extent of a species' habitat can lead to the application of the precautionary principle when the action under consideration includes a threat of serious or irreversible environmental damage.

We suggest that further work be done to develop a protocol regarding how relevant environmental decision-science techniques (e.g. Runge et al. 2011; Hemming et al. 2022) might be used to provide quantitative or qualitative evaluations of the certainty associated with each of the data points relevant to the approval of actions, with priority given to conservation-planning documents for entities of known or anticipated regulatory interest (see also Appendix 2, #8). In addition, consideration should be given to including a section in such documents summarising the assumptions and approaches used to deal with uncertainty, plus advice as to how the remaining 'critical' uncertainties could be reduced. This approach would be a positive and transparent communication tool.

5.2 Cumulative impacts and wide range species

The EAD officers suggested that a system be developed for predicting cumulative impacts on a listed threatened entity (Appendix 2, #4). Although the EPBC Act does not explicitly mention cumulative impacts, Federal Court rulings have interpreted the Act in such a way that the Minister for the Environment must include cumulative impacts when considering the significance of a proposed action (Franks et al. 2010). The independent reviews of the EPBC Act by Hawke (2010) and Samuel (2020) both identified the need for cumulative impacts to be a matter for reform, primarily because the EPBC Act focuses on the assessment of individual projects in isolation. While an individual project may not have a significant impact on MNES, numerous projects collectively may have a significant cumulative impact. The Wentworth Group of Concerned Scientists (2023) provides a conceptual model for differentiating between project-based and cumulative impacts. The Nature Positive Plan (DCCEEW 2022a) proposes regional plans to address cumulative impacts, a proposal that accords with Samuel Review recommendation 25b (Samuel 2020).

As Willstead et al. (2023) point out, scale is critical to addressing cumulative impacts. The impacts of an action may extend well beyond the geographic location of a proposed project and may have the potential to exacerbate other impacts on a listed threatened species or ecological community as acknowledged in the Significant Impact Guidelines (Department of the Environment 2013a). Even though regional planning has considerable potential to address cumulative impacts, it will not provide the whole solution. For example, the ranges of a high proportion of listed threatened species and ecological communities extend beyond the spatial scale of individual bioregions and subregions (Table 5-1) or even 2 or 3 bioregions, indicating that regional planning will not comprehensively address cumulative impacts on all threatened entities. At the upper limit of wide range entities are species such as the Vulnerable grey falcon [*Falco hypoleucos*] with a 3,951,290 km² range that occurs in arid and semi-arid Australia, including the Murray-Darling basin, Eyre basin, central Australia and Western Australia and the Vulnerable Subtropical and Temperate Coastal Saltmarsh threatened ecological community that spans 29 NRM regions (SPRAT).

Table 5-1. The range sizes (likely to occur) of EPBC Act-listed species and ecological communities relative to the extent of Interim Biogeographic Regionalisation for Australia (IBRA) bioregions and sub-regions, and natural resource management (NRM) regions.

# regions overlapped	# species			# ecological communities		
	1	2–3	>3	1	2–3	>3
89 IBRA bioregions	735	673	336	36	24	34
419 IBRA subregions	442	628	674	19	18	57
54 NRM regions	877	581	286	34	26	34

Our EAD participants also suggested 'developing guidelines for triggering referral and defining important populations and habitat critical for survival for wide-range species, especially species with different habitats critical to survival at various stages in their life cycle

or at various times of year' (Appendix 2, #5) and made specific suggestions for improvements to deal with wide range species (see Appendix 3; #14.6, 18.2, 19.4). They also asked for assistance with identifying important populations. For an action to be considered significant (and thus be of regulatory interest), it must adversely affect an 'important population' of a Vulnerable species (Department of the Environment 2013a). Simmonds et al. (2020) discuss this problem in more depth.

The effective management of cumulative impacts, particularly on wide-range species, will require accessible up-to-date information for each listed species and ecological community on how it has been and is being impacted throughout its range to enable informed decisions to be made in the assessments and approvals process. Macintosh et al. (2019) pointed out that at the time of writing their report, the document management systems of EAD were inadequate for this purpose. It is clear from their suggestions that the EAD officers we consulted find assessing potential impacts of a proposed action on wide-range species particularly challenging. The improvements to data management proposed in the Nature Positive Plan (DCCEE 2022a) have the potential to remedy this situation.

5.3 Restoration

The EAD officers requested advice on restoration (Appendix 3, #19.1–19.4), including information on restoration standards and the time required to achieve ecological benefits and to provide relevant exemplars. Recent Conservation Advices refer to the Society for Ecological Restoration's National Standards for the practice of ecological restoration in Australia (Standards Reference Group SERA 2021) but are silent on the timescales required to achieve recovery outcomes. The situation could perhaps be improved through the methodologies to be developed for the Nature Repair Market proposed in the Nature Positive Plan (DCCEE 2022a). To be relevant to conservation planning, the approved methodologies would need to include, as a minimum, guidelines on (i) the approximate, estimated timescales required to reach the various points on a recovery trajectory for different terrestrial or aquatic ecosystems based on the starting condition of the ecosystem, the life history strategies and generation times of the dominant species, the resumption of key ecosystem functions (e.g. nutrient cycling, pollination services) and the productivity and/or fire history of the environment in the absence of threats, (ii) the monitoring required to evaluate progressive restoration outcomes, (iii) how this information would be incorporated into an adaptive management cycles and (iv) the requirements for compliance and enforcement. Links to the information relevant to a particular MNES could then be explicitly included in the relevant conservation planning instrument.

5.4 Climate change

A report commissioned by the Australian Conservation Foundation and prepared by the Australian National University's GreenLaw project argued that there is a significant 'climate gap' in the management of Australia's threatened species (Reynolds et al. 2021). Their analysis concluded that when climate change was mentioned in relevant statutory planning documents, the information 'tended to be brief and generalised' and the recommended actions to mitigate the threat limited. For example, the Endangered spectacled flying-fox

(*Pteropus conspicillatus*) is known to be highly susceptible to extreme hot days, but the 2019 Conservation Advice merely provides brief mention of this matter in the threats table.

The EAD officers who attended our workshops confirmed this problem (see Appendix 3 #3.5, 12.1–12.5) and identified their need for information on:

- likely range shifts attributable to climate change
- parts of the range of protected species and ecological communities likely to be lost due to climate change
- populations and habitats likely to be particularly important for species and ecological communities in the face of climate change
- future core habitats and likely climate refugia
- possible climate mitigation and adaptation measures
- survey efforts, research and modelling required to determine climate change impacts on species/ecological communities
- advice on how to consider effects of relevant extreme weather events such as prolonged droughts, fire, floods on key diagnostics for ecological communities.

The NESP Climate Systems Hub and Resilient Landscapes Hub are working with DCCEEW to plan workshops to address this need in February 2024. The proposed workshops will involve relevant officers from DCCEEW, scientists from the Climate Systems, Resilient Landscapes, and Marine and Coastal hubs and external experts. The objective of the workshops will be to design a potential NESP project to develop methodological frameworks to support the preparation of conservation planning documents so that they explain how the direct impacts of all dimensions of climate change and extreme weather events and their interactions with other threats affect protected species and ecological communities, including options for avoidance, mitigation and adaptation. This proposed project would be subject to the usual NESP approval processes and is not confirmed.

5.5 Survey and monitoring priorities

Appendix 3 Section 15 #15.1–15.8 summarises the EAD officers' suggestions regarding survey and monitoring priorities; 2 of these suggestions have already been adopted. Nonetheless, the EAD officers requested more specific advice on this topic in conservation planning documents. This need is likely to increase if the reforms proposed by the National Positive Plan (DCCEEW 2022A) to streamline the regulatory processes for EIA are adopted.

The SPRAT database refers to survey guidelines for major groups of threatened animals (e.g. bats [DEWHA 2010a]; birds [DEWHA 2010b]; frogs [DEWHA 2010c]; fish [DSEWPC 2011a]; mammals [DSEWPC 2011b], reptiles [DSEWPC 2011c]). In addition, there are draft survey guidelines for orchids (Department of Environment 2013b) but for no other plants. Generic guidelines for biological survey and mapped data were developed in 2018 (Commonwealth of Australia 2018) as well as specific guidance (e.g. referral guidelines, significant impact guidelines) for 22 listed threatened species (21 animals and one plant) and

their habitats of frequent regulatory interest (e.g. koala; Youngentob et al. 2021). However, many of these guidelines are dated and do not include recent innovations in survey techniques (such as drones, camera traps and eDNA). Some states and territories have also developed survey guidelines. The Ecological Monitoring System Australia (EMSA) has been developed by TERN in collaboration with the Australian Government DCCEEW to support the **National Landcare Program** by standardising ecological protocols for natural resource management monitoring. Version 1 of the 'Ecological Field Monitoring Protocols Manual' was released on 21 July 2023 <https://www.tern.org.au/emsa-protocols-manual>

We consider that it would be desirable for DCCEEW to review the suite of survey guidelines for species and ecological communities of regulatory interest to the Commonwealth, update as necessary and provide clear advice to the authors of conservation planning documents and proponents.

6. Conclusions and additional suggestions

The EAD officers suggested wide ranging changes to developing Conservation Advices and to the format of the contents of these instruments; about half of these changes have already been adopted or approved for adoption. Others are scheduled for reconsideration in the context of the development of the subsidiary documents for the proposed new environmental laws. The proposed adoption of a digitised conservation planning instrument with strong regulatory standing that can be readily updated with contemporary data and information provides an opportunity to reconsider the balance between information in the conservation planning instruments for threatened species and ecological communities and generic guidelines.

We suggest that DCCEEW should also consider:

- whether there should be additional information (e.g. actions to be avoided) provided in the conservation plans of species and ecological communities of established or anticipated regulatory interest or whether such information should be required in all statutory conservation planning documents
- an explicitly labelled section containing advice to regulators should be included in conservation planning documents to provide a summary of the information regulators need and where to find further details.

7. Glossary

DCCEEW.....	Department of Climate Change, Energy, the Environment and Water
EAD	Environmental Approvals Division
EIA.....	environmental impact assessment
EPBC Act.....	Australian <i>Environment Protection and Biodiversity Conservation Act 1999</i>
MNES	Matters of National Environmental Significance
NESP.....	National Environmental Science Program
PSECB	Protected Species and Ecological Communities Branch
SPRAT.....	Species Profile and Threats Database

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9. Appendix 1. Participant information sheet

PROJECT TITLE: Improving the outcomes for listed species and ecological communities that are frequently considered by the Commonwealth Government approval process.

You are invited to take part in a project that aims to improve the conservation outcomes for listed species and ecological communities that are frequently considered in projects that require approval from the Commonwealth government under the EPBC Act by asking your advice about the strengths and weaknesses of statutory Conservation Advices from your professional perspective.

The research outcomes will be designed to help you with your assessments through improvements in the statutory documents that you have to consult as part of the assessment process.

The research project is being conducted by the NESP [Resilient Landscapes Hub](#), which is funded by the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW).

The project has been co-designed with DCCEEW, including staff from the Environmental Approvals Division and has recently been approved by the JCU Human Ethics Committee and has been allocated Ethics Approval Number H8872.

The **voluntary** involvement of assessment officers in the project has been endorsed by Karina Edwards (EAD).

If you agree to be involved in the project, you will be invited to attend two online workshops with other EAD assessment officers: an introductory workshop lasting no more than one hour on November 11 and a participatory workshop lasting no-more than 90 minutes (several time slots are available on November 16 and 18).

Senior EAD officers will not be present at the workshops and will not be advised of the names of attendees. Comments will not be attributed to any participant. Despite these precautions it may be possible that your identity will become known to other participants.

The workshops will be facilitated by [Dr Josie Carwardine](#) from CSIRO.

The consolidated results of the workshops will be provided by email to all officers of EAD and the Protected Species and Communities Branch, all of whom will also be invited to attend a webinar where the results will be discussed.

Please contact me by email if you have any queries about the study.

<p>Principal Investigator: Professor Helene Marsh College: Science and Engineering James Cook University, Townsville Phone: 0747816901 Email: helene.marsh@jcu.edu.au</p>	<p>If you have any concerns regarding the ethical conduct of the study, please contact: Human Ethics, Research Office James Cook University, Townsville, Qld, 4811 Phone: (07) 4781 5011 (ethics@jcu.edu.au)</p>
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10. Appendix 2. Suggestions for improving the process for developing and approving Conservation Advices

The suggestion in **bold** was adopted in the revisions to the Conservation Advice template and Guidance Document in September 2023.

Overarching suggestion

Establish systems to enable EAD officers to play more active and meaningful roles in the **development** and **revision** of statutory conservation planning instruments.

Actions that might be considered include:

1. Enabling EAD staff to have the time to have meaningful input into conservation plans as they are developed, especially plans for entities with a record of triggering the EPBC Act or the potential to do so.
2. Enabling EAD staff to identify problem entities so that they can be earmarked for specific action on key matters of relevance to them.
3. Working with EAD staff to develop a Standard Operating Procedure for addressing uncertainty and precaution in conservation planning documents e.g. develop and introduce a scale for ranking the uncertainty of various components of information.
4. Developing a system for predicting cumulative impacts on a listed threatened entity.
5. Developing guidelines for triggering referral and defining 'important populations' and 'habitat critical for survival' for wide-range species, especially species with different critical habitats at various stages in their life cycle or at various times of year.
6. Working with EAD staff to identify exemplars for various sections of statutory conservation planning instruments for PSECB staff to use when drafting them.
7. Developing a revision schedule for statutory conservation planning document that enables a needs basis as well as a time basis, e.g. a system to enable EAD staff to have a say in prioritising updates.
8. Considering whether there should be additional information (e.g. actions to be avoided) provided in the conservation plans of species and ecological communities that frequently trigger the EPBC Act or have the potential to do so or whether such information should be required in all statutory conservation planning documents.

9. Preparing an entity-specific fact sheet summarizing the key information in each conservation planning document relevant to proponents.²
10. **Check that the various documents relevant to conservation planning (Conservation Advices, Recovery Plans, Threat Abatement Plans, Key Threatening Processes etc) for each entity are aligned so that the information is consistent.**³

² This could be done by providing a dot point summary at the front of each conservation planning instrument.

³ The Nature Positive Plan (DCCEEW 2022a) proposes that contemporary data and information will be incorporated in protection and recovery responses as new threats emerge and science evolves.

11. Appendix 3. Suggestions for improving the content of Conservation Advices

Suggestions in *italics* had been adopted by PSECB prior to this research. Suggestions in **bold** were adopted in the revisions to the Conservation Advice template and Guidance Document in September 2023.

1. **Format**

- 1.1. Use standard formats for Conservation Advices for both species and ECs to make document navigation easier for assessment officers.⁴
- 1.2. **Provide a table of contents for each Conservation Advice.**⁵
- 1.3. **Provide a glossary of definitions of key terms, especially terms which have a different meaning in other contexts such as ‘location’, or a link to such a list.**⁶
- 1.4. Use consistent headings in each Conservation Advice to facilitate navigation by EAD officers.
- 1.5. **Ensure that all information is clear, referenced and hyperlinked to relevant literature including relevant papers and reports. Include a reference list that is up to date at the time the Conservation Advice is created noting the need for such lists to be updated.**
- 1.6. **Minimise misinterpretation by endeavouring to pre-empt misunderstandings⁷ – sometimes changing one word matters.**

2. **Dealing with uncertainty**

- 2.1. **Be clear about what information is uncertain and the degree and nature of the uncertainty using an agreed scale.**⁸

⁴ EAD officers considered that many current Conservation Advices, especially those for ecological communities, were very difficult to navigate.

⁵ This is already done for Conservation Advices for ecological communities.

⁶ For habitat critical to survival and important populations, PSECB added a link to the Significant Impact Guidelines (DCCEEW 2013a), noting that these terms will likely change with the reform work. The following key terms are defined in IUCN Guidelines, which are linked in the template: *AOO*, *EOO*, *Location*, *Mature individuals*, *Severely fragmented*, *Extreme fluctuations*, *Subspecies*. The revised Conservation Advice template also has incorporated definitions such as: *Categories for likelihood* and *Categories for consequences*.

⁷ Given that the author of a Conservation Advice presumably writes such that they *think* they are being as clear and unambiguous as possible, this concern is further reason to institute formal checking by EAD staff.

⁸ The *Australia state of the environment 2021* report (Cresswell et al. 2021) ranks the confidence of its information and conclusions using the following 5-point scale:

Adequate:	Adequate high-quality evidence and high level of consensus
Somewhat adequate:	Adequate high-quality evidence or high level of consensus
Limited:	Limited evidence or limited consensus
Very limited:	Limited evidence and limited consensus
Low:	Evidence and consensus too low to make an assessment

- 2.2. **Minimise uncertainty as much as possible while being transparent about the inadequacies in information.**
 - 2.3. *Identify specific uncertainties as knowledge gaps that need to be addressed. Specify what can be done to reduce this uncertainty (including what proponents, scientists, government agencies and citizen science groups might do).*
 - 2.4. **Where possible, outline an approach that could be used in the interim to minimise known impacts to the species and assist with the application of precautionary principle/approach (see Section 4 below) along the lines illustrated in this following example: evidence suggests that noise impacts on species X will result in avoidance and abandonment behaviour of breeding/denning habitat; one study (not a big sample size) has shown that a 500 m buffer surrounding the breeding/denning habitat reduced the likelihood of abandonment. Apply a 500 m buffer until further research refines buffer width.**
3. **Precautionary Approach**
 - 3.1. Couch advice in the context of a 'precautionary approach' that takes account of the uncertainty specified in the Conservation Advice.
 - 3.2. Avoid explicitly mentioning the precautionary principle, noting the requirements for Ministerial decisions stipulated in the EPBC Act s391⁹ and the interim Standard Operating Procedure (SOP) (DCCEEW 2022b) developed to provide support to EAD officers in how to apply the precautionary principle in Parts 7–9 of the EPBC Act.
 4. **Conservation status**
 - 4.1. Ensure that the reason for listing is described in all Conservation Advices including Conservation Advices without appended listing assessments so that EAD officers understand why an entity is at risk and can reduce the risk of cumulative impacts.¹⁰
 5. **Information on populations of species**
 - 5.1. **Identify whether a large-range species comprises a single meta-population, or multiple distinct/isolated sub-populations and explain the reasons for this determination.**
 - 5.2. **Include information about each sub-population, if available.**
 - 5.3. **Provide information on the relative/absolute size of all populations/sub-populations, if possible.**

⁹ EPBC Act s391(2) states that 'The precautionary principle is that lack of full scientific certainty should not be used as a reason for postponing a measure to prevent degradation of the environment where there are threats of serious or irreversible environmental damage' and that 'The Minister must take account of the precautionary principle in making a decision listed in the table in subsection (3), to the extent he or she can do so consistently with the other provisions of this Act' (S391(1)).

¹⁰ This is required in EPBC Act s266B (1).

- 5.4. Explain why particular populations of a species are important (identifying important populations is currently essential for Vulnerable species but good to include for all species).
- 5.5. **Explain why certain populations are necessary for long-term survival of a species and how they should be protected.**
- 5.6. *Provide information on corresponding state/territory-listed species/sub-species if relevant.*¹¹

6. **Information on Ecological Communities**

- 6.1. *Describe what the ecological community is /is not, as clearly as possible in language accessible to both consultants and non-specialists.*
- 6.2. *Provide clear diagnostics and thresholds for each ecological community including condition classes and categories.*
- 6.3. *Provide information on corresponding state/territory-listed ecological communities*

7. **Cultural and community significance**

- 7.1. *Ensure that information on cultural, community and social significance (both tangible and intangible values) of entity is as comprehensive and specific as possible.*

8. **Habitat – general**

- 8.1. **Make descriptions of habitat as clear, informative and definite as possible, especially for critically endangered entities.**
- 8.2. **Describe what high value habitat¹² looks like.**
- 8.3. *Include 'may occur' in range map of each entity, so that proponents need to consider that the entity may be there.*
- 8.4. *Overlay distribution maps with habitat maps where possible.*
- 8.5. Describe possible range shifts due to climate change and the predicted timeframe for such shifts as the necessary information becomes available.

9. **Habitat- species**

- 9.1. **Identify knowledge gaps regarding habitat use, particularly for cryptic species**
- 9.2. If habitat varies spatially, provide regionally specific advice, reflecting the relevant regions in accompanying maps.

¹¹ Modern Conservation Advices include a link to listings in other jurisdictions. This requirement should become increasingly less relevant under the Common Assessment Method (CAM).

¹² The *Nature Positive Plan* (DCCEEW 2022a) stipulates that conservation planning documents will identify and prioritise important habitats for threatened species and ecological communities.

- 9.3. Ensure habitat diagnostics do not rely on species presence, if possible, especially in the case of cryptic species.
- 9.4. **Provide clear, specific information on what is needed to support a species during breeding (identify breeding sites on range map if relevant), foraging, dispersal and migration (as relevant) and the times of year when these activities are likely to occur.**¹³
- 9.5. Explain how sub-populations are connected, identifying important connectivity features (e.g. paddock trees for birds) and barriers to connectivity (e.g. roads, waterways).
- 9.6. Provide information on the risks of fragmentation and loss of connectivity including home range and site fidelity information and dispersal habitat. e.g. if a species breeds/dens at a site but only uses the site for 2–3 years and then disperses x km to develop a new breeding/denning site.

10. **Habitat critical to survival**¹⁴

- 10.1. Explain the rationale and criteria for Habitat Critical to Survival.¹⁵
- 10.2. **Be as definite as possible about habitat critical to survival, noting the need to be clear about uncertainty.**
- 10.3. *Include details of habitat critical to survival where appropriate e.g. hollow requirements for relevant species.*
- 10.4. **Link habitat critical information to landscape features (e.g. water courses) if possible and relevant information on life cycle e.g. Biologically Important Areas on the blue whale migration.**

11. **Threats**

- 11.1. *Explain the species/ecological community's sensitivities to threats and associated uncertainty.*
- 11.2. *Include information on the appropriate responses to specific threats to inform conservation actions.*
- 11.3. Be as specific and quantitative as possible about what constitutes appropriate avoidance buffer zones for specific threats and likely edge effects. Relate this information to the entity's habitat requirements where possible.¹⁶

¹³ In September 2023, PSECB advised that mapping of breeding sites not included in the Conservation Advice template at this stage due to concerns about sensitivity of those sites and adverse outcomes of human disturbance, etc. Also constrained by geospatial capacity.

¹⁴ The *Nature Positive Plan* (DCCEEW 2022a) stipulates that 'critical habitat' for threatened species must be included in Areas of High Environmental Value in Regional Plans.

¹⁵ This reform should be addressed by the proposed new approach to critical habitat.

¹⁶ Policy guidelines for buffer zones for certain generic types of species would be useful.

- 11.4. Describe the extent/severity of actual and potential threats¹⁷ across a species/sub-population/EC's range.
- 11.5. Ensure that emerging threats e.g. renewable energy sites are considered.

12. Climate change¹⁸

- 12.1. Provide advice on how climate change should be considered in assessments.
- 12.2. **Identify if entity is particularly susceptible to climate change and explain how/ why.**
- 12.3. As the information becomes available, provide clear information in the context of explicit timeframes (? next 10 years) of: (1) likely range shifts attributable to climate change; (2) parts of range likely to be lost due to climate change; (3) populations and habitats likely to be particularly important for species/EC in the face of climate change; (4) future core habitats and likely climate refugia, and (5) possible climate mitigation and adaptation measures
- 12.4. Identify survey efforts, research and modelling required to determine climate change impacts on species/ECs.
- 12.5. **Provide advice on how to consider effects of relevant extreme weather events such as prolonged droughts, fire, floods on key diagnostics for ecological communities.**

13. Conservation objective

- 13.1. **Ensure that the conservation objective(s) is/are clear, targeted, realistic (from a biological perspective) and time bound, with a specified baseline and consistent with the remainder of the document.**¹⁹
- 13.2. **Link conservation objective to the uncertainties and need to fill key knowledge gaps for the species.**
- 13.3. Specify and prioritize what should and should not be done to achieve the objective and specify areas to protect and key avoidance measures e.g. the size of the population should be maintained therefore minimise the risk of killing individuals or remove nesting habitat, using unambiguous language; state the obvious; include thresholds if appropriate.

¹⁷ The *Nature Positive Plan* (DCCEEW 2022a) stipulates that conservation planning documents will identify and prioritise threats for threatened species and ecological communities.

¹⁸ The *Nature Positive Plan* (DCCEEW 2022a) stipulates that regional and conservation planning will be required to take account of climate change. EAD officers considered that climate change was inadequately dealt with in most current Conservation Advices.

¹⁹ This is often but not always done now. The recent work on conservation objectives by the Threatened Species Scientific Committee should improve them.

14. **Conservation and management priorities**²⁰

- 14.1. **Ensure that all stakeholders understand what it is important to do and not do.**
- 14.2. **Link to relevant national, regional and local management plans and priorities including relevant plans of First Nations groups.**
- 14.3. Include details of relevant cultural management regimes.
- 14.4. Where possible outline an adaptive management approach to manage some of the uncertainties that could be iteratively addressed through an implementation of a regional or site management plan.
- 14.5. **Provide advice on actions to be avoided (e.g. removal of known breeding hollows would be an irreversible loss), known responses to impacts, and knowledge gaps to be considered.**
- 14.6. **Provide advice on how connectivity can be achieved for entities with wide ranges.**
- 14.7. Define appropriate fire regime(s), if relevant.

15. **Survey and monitoring priorities**²¹

- 15.1. Include clear up-to-date survey guidelines (timing, methods, effort) for each entity if possible or link to relevant survey guidelines if they are likely to be updated more readily.
- 15.2. Provide details of monitoring protocols, aligning with relevant state monitoring protocols, if appropriate.
- 15.3. Provide clear guidance on what needs to be looked for in surveys e.g. individuals or signs of species, especially cryptic species, minimising information open to interpretation.
- 15.4. Advise how to structure surveys to determine site quality (which needs to be clearly defined).
- 15.5. **Provide clear advice on survey timing, if important.**
- 15.6. Be clear about the minimum survey effort required (e.g. to achieve a robust baseline), especially for cryptic species or species with a complex life cycle.
- 15.7. Specify outdated survey methods so they can be avoided.

²⁰ The *Nature Positive Plan* (DCCEEW 2022a) proposes that conservation planning documents will identify and prioritize actions for threatened species and ecological communities. The Plan stipulates that when a proponent is unable to find or secure 'like for like' offsets, they will be able to make a conservation payment which will be used to deliver biodiversity outcomes for relevant bioregions according to an evidence-based investment strategy. The Plan also commits to 'conservation planning that targets resources to areas where they will have the greatest impact'.

²¹ The *Nature Positive Plan* (DCCEEW 2022a) proposes that proponents will be required to provide survey data to the data division of the environment department to be known as Environment Information Australia.

- 15.8. **Ensure Conservation Advices for NSW endemics (for which survey guidelines are held separately) provide details of where guidelines are held and how to access them.**

16. **Information and research priorities**

- 16.1. *Provide clear advice on relevant national, regional and local research priorities and gaps to guide investment (when appropriate).*²²
- 16.2. *Explicitly link clearly-defined research priorities to conservation outcomes.*

17. **Referral standards and guidelines**

- 17.1. Include referral guidelines in Conservation Advice if possible, noting the risks associated with defining these in statutory documents, if the documents are not updated regularly.²³
- 17.2. Define what constitutes a 'significant impact' and 'serious and irreversible harm' for entity after consultation with EAD officers, especially for species that have a record of triggering the EPBC Act or are predicted to do so.
- 17.3. Define thresholds to trigger referral in the context of surrounding resources/habitat areas (especially for wide range species).
- 17.4. Define thresholds for projects that will violate MNES standards.

18. **Offsets**

- 18.1. Provide enough information on avoidance, mitigation and adaptation (including adaptive management) options and their likelihood of success to enable EAD officers to discuss them with proponents.²⁴
- 18.2. **Ensure that the Conservation Advice is as specific as possible about what is important for the survival of a species from a local, regional and range- wide perspective to enable any offsets to be as effective as possible e.g. focussed on an important habitat element or located in areas where it is important to preserve habitat.**
- 18.3. Provide clear advice about suitable and unsuitable offset areas in the context of climate change, especially if a species is unlikely to recolonise isolated or disturbed sites.
- 18.4. Specify when viable offsets are not available if possible.

²² The *Nature Positive Plan* (DCCEEW 2022a) stipulates that when a proponent is unable to find or secure 'like-for-like' offsets, they will be able to make a conservation payment which will be used to deliver biodiversity outcomes for relevant bioregions according to an evidence-based investment strategy. The Plan also commits to 'conservation planning that targets resources to areas where they will have the greatest impact'.

²³ This reform should occur with the proposed new digital, modular approach.

²⁴ The environmental offset standard proposed by Nature Positive will mandate the requirement for avoidance and mitigation to be considered before offsets.

- 18.5. Provide thresholds and tipping points for a viable population e.g. needs at least x hectares of suitable habitat.
- 18.6. Provide information on how existing populations disperse so that EAD officers can understand the potential for dispersal into an offset area.

19. **Restoration**²⁵

- 19.1. Develop specific restoration and habitat improvement standards for entities that frequently trigger the EPBC Act.
- 19.2. Discuss the feasibility of restoration/recovery for species or ecological community, linking to what is known to be important for the species, either in terms of threats to be mitigated (fragmentation maybe) or values to be protected (hollow bearing trees)
- 19.3. *Provide advice on restoration standards and duration (time until ecological benefit achievable) and to provide relevant examples of work that has been done/trialled.*
- 19.4. **If translocation is an option, provide relevant advice. Explain how connectivity is achieved across entities with wide ranges e.g. the species is not known to move through habitat corridors less than 100 m wide.**

²⁵ Restoration would be a key activity for projects that established under the proposed Nature Repair Market.