



**SAVING OUR SPECIES**

# **Threatened ecological communities strategy**



## Photography

Cover photo: Themeda grassland on seacliffs and coastal headlands in the NSW North Coast, S Ruming.

Page IV & 1: Themeda grassland at Coffs Coast Regional Park, S Ruming.

Page 2: Coastal saltmarsh, S Ruming.

Page 3: Black swans, S Ruming.

Page 4: Littoral Rainforest in the New South Wales North Coast, J Turbill.

Page 6: Genowlan Point (*Allocasuarina nana*) Heathland, OEH.

Page 7: Robertson Rainforest in the Sydney Basin, J Lemmon/OEH.

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Page 9: O'Hares Creek Shale Forest, J Lemmon.

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Page 11: Freshwater wetlands on coastal floodplains, M Murphy.

Page 12: Littoral Rainforest in the New South Wales North Coast, J Turbill.

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**Currently over 100 threatened ecological communities are recognised in NSW.**



# Introduction

An ecological community is a naturally occurring collection of native plants, animals and other organisms occupying a particular area. Ecological communities are threatened when they become at risk of extinction. Currently over 100 threatened ecological communities are recognised in NSW.

This document outlines how NSW Government's *Saving our Species* (SoS) program creates conservation strategies for ensuring the survival of threatened ecological communities.

## ***Saving our Species*** **conservation program**

The SoS program is the NSW Government's management plan for securing threatened species, populations and ecological communities.

The aim of the program is to develop targeted conservation projects for managing threatened species, populations and ecological communities using the best available information.

An aspiration of the program is that its principles of cost-effectiveness, scientific rigour and transparency will guide investment by (government and non-government) stakeholders across NSW.

All conservation projects developed under SoS are unified by the overarching objective of the program, 'To maximise the number of threatened species that are secure in the wild in NSW for 100 years'.

Healthy ecological communities have complex and mutually beneficial interrelationships and interactions that ensure their survival and resilience. They contribute to important environmental services like water and air purification, water and nutrient cycling, and protection against soil erosion and salinisation. Maintaining ecological function – the processes and interactions that take place within an ecological community – is vital for conserving ecological communities. Survival of ecological communities will be threatened if they are significantly reduced in size, distribution and ecological function.

# Background



The International Union for Conservation of Nature (IUCN) Red List of Ecosystems criteria assesses extinction risk to ecosystems. The Red List is closely aligned with the provisions for listing threatened ecological communities under the new *Biodiversity Conservation Act 2016* (BC Act), which is based on the state and change of geographic distribution, ecological function, and environmental degradation of a community. These provisions underpin SoS program objectives and guide the management of threatened ecological communities. The provisions of the BC Act also provide a framework for evaluating threat impacts and management outcomes when it comes to threatened ecological communities.

In the BC Act threatened ecological communities are defined by the NSW Threatened Species Scientific Committee based on:

- characteristic native biota: biological features that define the identity of a community
- environmental features such as geology, terrain or typical climate.
- occurrence in a particular geographic location.

The extinction risk of communities is assessed by the committee against criteria relating to the state and change of geographic distribution and reduction in ecological function.

The BC Act lists over 100 threatened ecological communities. All except four are primarily made up of plant species. A threatened ecological community is listed as either vulnerable, endangered or critically endangered.

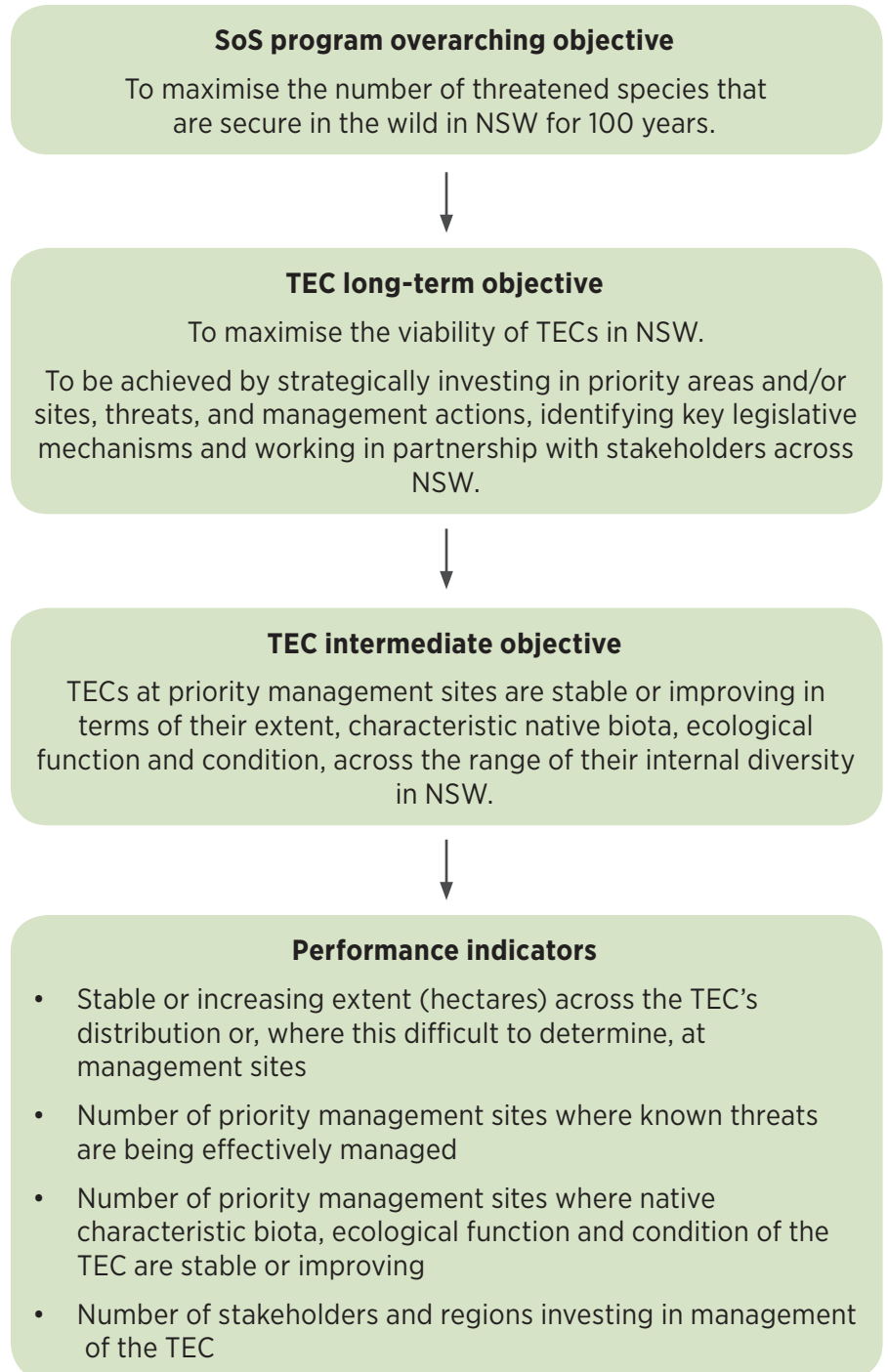
The *Biodiversity Conservation Act* requires the Chief Executive of the Office of Environment and Heritage (OEH) to ensure that a strategy is developed for each threatened ecological community within two years of being listed. The content of each strategy will vary according to specific management requirements of the ecological community. A strategy may comprise detailed, spatially explicit conservation projects that outline the critical management priorities required for all priority ecological communities.

Currently, the development of SoS conservation projects is the primary tool that guides the management of threatened ecological communities in NSW. These projects have been developed using existing approved NSW recovery plans where available. Examples include the Cumberland Plain Woodland which covers multiple threatened ecological communities, the Lord Howe Island multi-species recovery plan which includes one threatened ecological community and the Eastern Suburbs banksia scrub, and Commonwealth recovery plans such as the White Box-Yellow Box-Blakely's Red Gum Woodland.

# Objective



The objective for the management of threatened ecological communities under the SoS program is to maximise the number of communities that are secure in the wild in NSW for 100 years. Detailed long-term and intermediate objectives map how on-ground management actions help contribute to the overarching program objective (Figure 1).



**Figure 1** How the management objectives for threatened ecological communities (TEC) work with the *Saving our Species* objective

# Approach



Conservation projects developed for threatened ecological communities under the SoS program must fulfil the provisions of the new BC Act (Part 4, Division 6, 4.36) from July 2017.

Each project must:

- maximise the long-term security of threatened species and threatened ecological communities in nature
- minimise the impacts of key threatening processes on biodiversity and ecological integrity.

Managing threatened ecological communities will focus on three interacting components – biological features (native biota), ecological function and environmental (abiotic) characteristics in a particular place. The importance of the community’s ecological function and the nature of its interactions with biological and environmental components are variable within and across the distribution of threatened ecological communities.

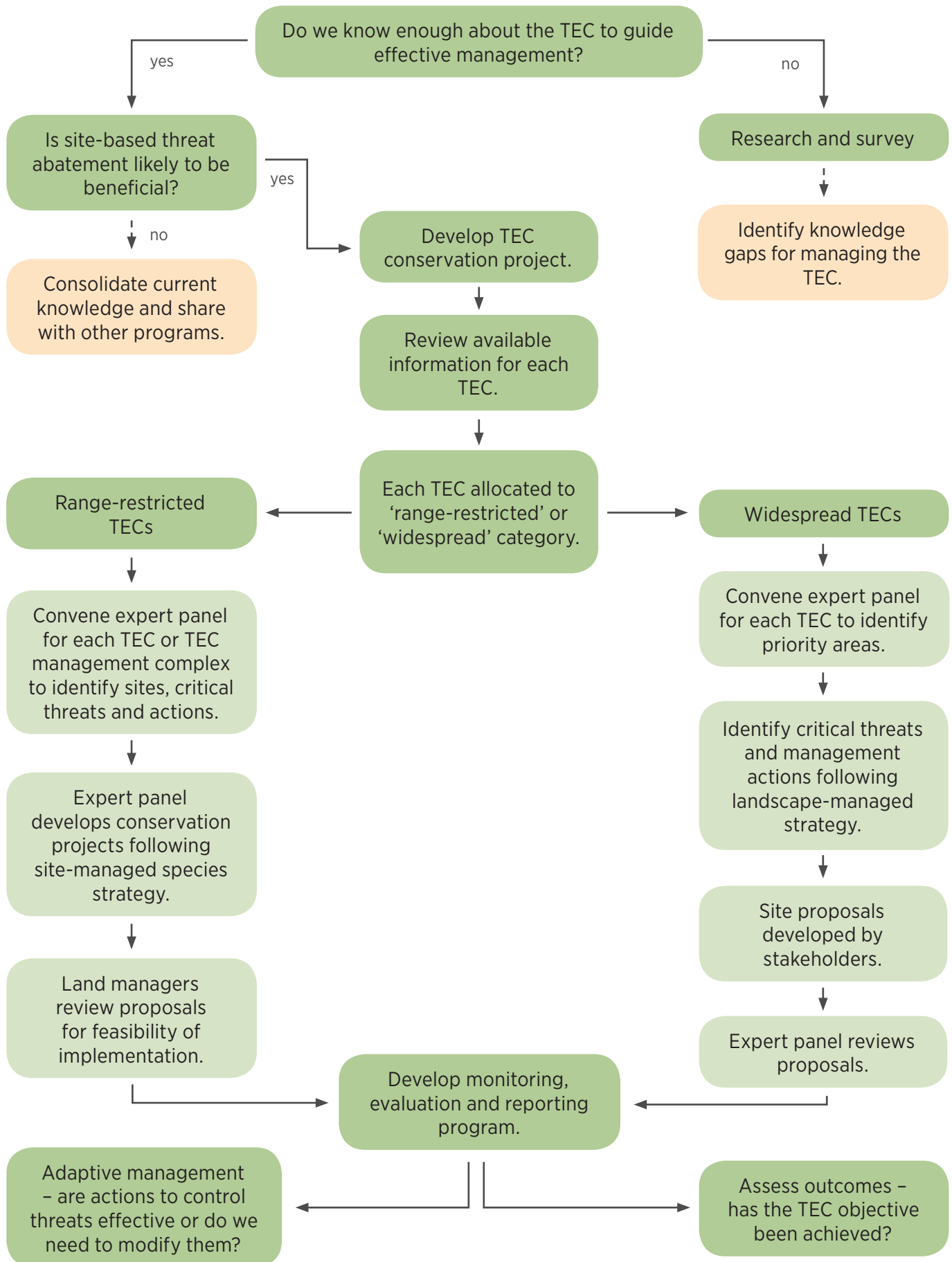
Fundamentally, the approach to threatened ecological communities under SoS will continue to align with a key principle of the program – to identify if and where investment in on-ground management will have the greatest outcomes for the long-term security of these ecological communities.

This strategy aims to guide stakeholder investment in broad-scale reserve planning, restoration, revegetation, increasing habitat connectivity, private land stewardship and land management, as well as more targeted on-ground activities.

The SoS approach to TEC conservation is only part of what is required to properly secure threatened ecological communities in NSW. A range of other policies and programs delivered by the NSW Government and external partners, such as regulation of native vegetation clearance, will also significantly contribute to TEC conservation.



# Developing projects



**Figure 2** Threatened ecological community (TEC) project development process



## Initial review

The first step in the project development process is to review what is known about the threatened ecological community. If there isn't enough knowledge or data relating to distribution, threats, biological or environmental components or environmental function of a particular threatened community to inform the development of an effective project, research and survey to fill these gaps is the first priority for investment.

The second step is to evaluate if certain threatened ecological communities might benefit from the SoS program. For instance, if the regulation of native vegetation clearance is more critical to the long-term viability of the community rather than on-ground management such as threat abatement or active intervention, those threatened ecological communities will not be prioritised for active site-based management under the SoS program.

The steps above are evaluated by a TEC advisory group with broad ecological knowledge and/or management experience of NSW's ecological communities. The group is chaired and the process coordinated by OEH.

## Allocation to 'range-restricted' or 'widespread' category

As threatened ecological communities vary by extent, area of occupancy and fragmentation, classifying them into management categories will facilitate the development of strategies and their management. Therefore, the third step in the project development process is the allocation of each threatened ecological community to either a 'range-restricted' or 'widespread' category, based on its distribution in NSW. Allocation to these categories is not fixed and may change as more information becomes available.

### Range-restricted threatened ecological communities

Range-restricted threatened ecological communities are to be approached the same way as site-managed species. With this approach, management of key threats at discrete sites can secure the threatened ecological community in the long term. Ecological communities that fall into this category are likely to be those that are reliably defined at a local scale and have established investment sites, community engagement and support, and enough experts to direct actions.

Maps may already exist of threatened ecological communities that fall into the range-restricted category and be adequate to inform site management and monitoring requirements. If not, it must be possible to ascertain the distribution and site locations at this scale.



## Widespread threatened ecological communities

Widespread threatened ecological communities:

- generally occur across a range of Interim Biogeographic Regionalisation for Australia (IBRA) subregions
- are not currently mapped at a detailed scale
- will likely require further research to properly identify key management sites that can help to secure the ecological community in the long term.

They will likely need to rely on a multi-faceted approach involving regulatory processes (including on-ground work), community engagement and private land conservation. The development of conservation projects for these threatened ecological communities will closely align with the landscape-managed species approach.

Detailed mapping of widespread TECs, though ideal, would need heavy investment and is unlikely to be possible across the full distribution of all TECs. Also, following the approach for landscape-managed species, mapping may not be necessary to proceed with developing conservation strategies for widespread TECs.

## Appointing an expert panel for the conservation project

Once a threatened ecological community has been categorised, the next step is to bring together a panel comprising experts relevant to that particular ecological community.

The panel may include experts on the ecology or management of the particular threatened ecological community, relevant land managers, and other experts from OEH and external organisations such as botanic gardens, local government, the Aboriginal community, state agencies and universities.

In developing conservation projects, the panel looks at data from sources such as the NSW Scientific Committee determination, the NSW BioNet (including the NSW Wildlife Atlas), peer-reviewed literature, approved or draft recovery plans, commissioned survey reports, existing SoS actions, Biodiversity Priorities for Widespread Weeds and regional pest and weed management strategies.

Information on the location and management needs of management sites for a particular threatened ecological community could be collated from existing OEH programs, investment or known regional priority sites, and the convened panel of experts. For example Biodiversity Priorities for Widespread Weeds has prioritised almost 1700 management sites (cross tenure). This list can be used as an initial starting point by expert panels for ecological communities at risk from weed invasion. When assessing possible management sites, the panel will also consider land owners' or managers' willingness to be involved in the conservation project.

The above process creates conservation projects that differ slightly based on whether they fall into the range-restricted or widespread category.



## Range-restricted conservation projects

Range-restricted TEC conservation projects should have:

- an indicative map or an indication of the known distribution of a particular threatened ecological community using best available data and knowledge, and identifying limitations of mapping where applicable
- a selection of mapped SoS key management sites
- an understanding of critical threats that need to be managed at those priority management sites
- a description of management actions required to address critical threats, and an estimate of how much they will cost to implement.

The selection of key management sites is guided by:

- the objective of maximising the viability of the threatened ecological community in NSW
- the balancing of the benefit: for example, by considering its contribution to statewide viability
- likelihood of success, considering factors such as land tenure, access and feasibility of management
- cost: based on the extent and severity of threats and condition.

## Widespread conservation projects

Widespread TEC conservation projects should have:

- an indicative map or indication of the known distribution of a particular threatened ecological community using best available data and knowledge, and identifying limitations of mapping where applicable
- identified SoS priority management areas: these can be broadly defined, with stakeholders who are involved in the implementation identifying specific management sites
- an action toolbox: a list of critical threats and broadly defined, proposed management actions to address threats at the appropriate scale.

A key consideration when identifying priority areas should be maximising the adaptive capacity of each threatened ecological community by capturing locations that represent its internal diversity in NSW, including climatic, topographic, soil, geological and hydrological variation. This may be achieved by ensuring that each biogeographic region where the threatened ecological community is known to occur is represented in the project.

Another important consideration is ensuring alignment between priority areas identified through the SoS process and areas identified as high-value TEC remnants through other NSW government programs and policies including the *Biodiversity Conservation Investment Strategy*.

Based on the scale of identified priority areas for widespread TECs, there will be a large number of potential locations for targeting site-based management (i.e. at the property scale or similar). Stakeholders who have the capacity to deliver outcomes on the ground will drive the identification of these sites.

As a quality assurance step, OEH will arrange for an expert group to review a selection of proposals for site-based management of widespread threatened ecological communities against the following criteria, aligning with similar criteria for landscape-managed species:

- there is a demonstrated presence of the threatened ecological community
- it occurs within an identified priority area
- the conservation project objectives align with those outlined in this strategy
- the project targets threats that are critically affecting the threatened ecological community's long-term viability
- there is a reasonable likelihood of success or, if there is significant risk of failure, that's offset by high benefit (if successful) or low implementation costs
- the project involves managers who have the capacity, expertise and influence required to meet objectives
- the project has clearly defined targets relating to project objectives and a rigorous method for evaluating outcomes against those targets consistent with the SoS monitoring, evaluation and reporting (MER) framework.



# Key considerations



## Identifying how threatened ecological communities are distributed

Defining a particular threatened ecological community and its spatial boundaries is not always a simple task. The threatened ecological communities in NSW are all vegetation communities except for one shorebird community, one snail and slug community, a lichen community and a fungal community. Mapping is limited by scale, the time of survey as communities can change over time, and it can be difficult to define the boundaries of a community. Many vegetation communities are mapped at the local or regional scale but surveys done before the determination of many threatened ecological communities or equivalents do not explicitly include reference to threatened ecological communities.

Links between the parts of an ecological community can change over time and by location. The make-up of a community at one location may be firmly set while at another it may be highly variable, although still retaining the same core defining species.

Indicative distribution maps produced for SoS planning and management should not be used for any other purpose. If there is enough expert knowledge to identify priority sites (range-restricted) or priority areas (widespread), that knowledge is fit for purpose, and no additional mapping is needed. SoS investment in mapping should only occur where the TEC expert panel finds that there is not enough information available to develop a conservation project without such mapping.

## Maximising adaptive capacity under climate change

Any approach to managing threatened ecological communities needs to address ecological function in the context of climate change. Climate change may cause changes to the composition of the ecological community, to seasonal events such as flowering or animal migration, plant-animal interactions, carbon balance, food webs, and natural disturbance regimes. These changes may also then facilitate invasion by non-native species and the extinction of key animals and plants which may result in the reduction of an ecological community's functional diversity.

Also, potential impacts on genetic diversity can prevent the species from adapting to different environmental conditions, such as being unable to adjust to higher temperatures. Conservation strategies that restore and conserve genetic diversity at the local and regional scale may help safeguard ecological processes under future climate conditions. If information on population genetics is not available, variation in different environmental metrics (e.g. rainfall, soil type and altitude) can be used to understand potential impacts.



## Prioritising investment

Limited resources prevent us from undertaking all the management required to secure all threatened ecological communities throughout their entire distribution. Therefore, it is necessary to prioritise investment, and it is also required under legislation. A key principle of SoS is to ensure that the limited resources available for threatened species are invested where they are most likely to deliver the greatest outcomes, which calls for an objective and transparent method of prioritisation.

Investment in SoS priority management sites for threatened ecological communities is prioritised using the following qualitative measures to compare competing sites:

- the project's likelihood of success based on feasibility of management, costs, the land holder's or manager's willingness to be involved, and the number and magnitude of threats
- alignment with existing NSW government programs and policies (for example, *Biodiversity Conservation Investment Strategy*)
- the amount of data available as a baseline against which to measure outcomes or to demonstrate the likelihood of success
- the proportion of the threatened ecological community's distribution in NSW if the ecological community extends beyond NSW, or the site's strategic importance to the long-term viability of the ecological community in NSW, taking into account TEC's capacity to adapt under climate change
- the predicted amount of multiple benefits to species or other biodiversity assets such as habitats and protected sites, and the operational efficiencies of managing co-occurring TECs as one: for example, the TECs present on the estuarine floodplains (coastal saltmarsh, swamp-oak floodplain forest and swamp sclerophyll forest) could be considered as a TEC management complex
- the extent of broader community support, partnerships, or the capacity to leverage significant additional investment
- the sustainability and longevity of management benefits (if the threatened ecological community is in a national park or on private land protected by an in-perpetuity agreement, the benefits are more secure in the long term)
- the capacity of the site to add to and spread knowledge that can be applied to other populations, species or habitats in NSW
- the project's cost-effectiveness.

The prioritisation of investment in particular sites will be informed by a broad, strategic analysis of overlapping priorities across the program, where individual actions with multiple benefits can deliver the most efficient outcomes.



## Contribution of existing policies and programs

As mentioned earlier, SoS may not add any value to protecting some threatened ecological communities. These may be ecological communities that are largely dependent on regulation and the most effective tool for their protection is environmental legislation such as NSW *Environmental Planning and Assessment Act 1979* and other biodiversity legislation.

Private land conservation aims to increase biodiversity and habitat protected on private land tenure and can currently be achieved through a variety of mechanisms including voluntary conservation agreements and the establishment of sites to offset impacts from development. These mechanisms can protect land that is protecting priority threatened species. The data that is used to inform private land conservation priorities will also form part of the dataset that is used to inform the SoS approach to threatened ecological communities. The SoS program will complement these efforts and identify where future conservation actions will most benefit threatened species.

## Monitoring, evaluation and reporting

Evaluating statewide outcomes for threatened ecological communities is challenging due to their often broad and patchy distribution, and because biological and environmental characteristics vary within and between communities. Therefore, it is generally not cost-effective to attempt to monitor and evaluate status or management outcomes for TECs everywhere they occur. Instead, monitoring should be strategic and cost-effective, and targeted to where it is likely to return the most useful data for the least investment.

In practice, this means that the monitoring should mostly focus on assessing the effectiveness of management in achieving the stated objective for threatened ecological communities at priority management sites. Each conservation strategy will have its own specific monitoring, evaluation and reporting program with questions based on inherent characteristics and processes and the level of impact from critical threats. These specific questions could be aligned with the performance indicators of the overall objective and the IUCN Red List for Ecosystems criteria. Such broad groups may include:

- extent of the threatened ecological community
- floristic composition and structure: height and thickness of stems, trunks and so on
- threat reduction
- native biological diversity and abundance



- environmental components
- ecological functionality
- research and information gaps
- stakeholder engagement.

MER for each threatened ecological community is initially driven by findings of the expert panel and further refined by the project coordinator. When applied at the site scale, all MER activities should align with the the SoS monitoring, evaluation and reporting guidelines for conservation projects, and be designed to address progress against intermediate and long-term objectives.

MER of floristic components in particular will point to better adaptive management possibilities if aligned with other conservation and data collection programs such as the Biodiversity Assessment Method and Vegetation Information System (VIS) Classification.

It may not be possible to monitor threat impacts for widespread threatened ecological communities at a landscape scale due to the resources and cost involved. However, monitoring designed to identify threat dynamics and inform more effective management can be cost-effective. This may be true with threats that impact many threatened ecological communities and where there is currently significant uncertainty – for instance, climate change – about how to manage them.

Threatened ecological communities sit within a framework of the SoS conservation program that includes site-managed species, landscape-managed species and key threatening processes. As conservation projects may overlap as they respond to common threats, it would be efficient for TEC management and monitoring to work alongside other SoS management streams where possible at the statewide scale.

In the threatened species framework, monitoring, evaluation and reporting of threatened ecological communities are based on the assumption that investment and knowledge can lead to effective threat abatement, which helps protect the ecological community from further decline. If all management sites are measured to be responding positively to management, then the project is considered to be on track to secure the ecological community in the wild in NSW.

# References

*Biodiversity Conservation Investment Strategy* (in preparation), <https://www.landmanagement.nsw.gov.au/private-land-conservation/>

NSW Department of Primary Industries, *Biodiversity Priorities for Widespread Weeds*, State of NSW, 2011: <http://www.dpi.nsw.gov.au/biosecurity/weeds/strategy/handbook/cmas>

Office of Environment and Heritage, *Saving our Species Monitoring, Evaluation and Reporting*, 2016: <http://www.environment.nsw.gov.au/resources/threatenedspecies/SavingOurSpecies/saving-our-species-monitoring-evaluation-guide-160100.pdf>