

Science for saving species

Magazine of the Threatened
Species Recovery Hub

May 2016
Issue 1

Safe havens can
buy crucial time

Lighting a
candle in
the dark

Putting a value on
threatened species



National Environmental Science Programme

From the Director



About 20 years ago I was having a meeting with the then Environment Minister Senator Robert Hill as Chair of the inaugural and now defunct Biological Diversity Advisory Committee and he asked me: "Why do we have so many threatened species recovery plans but none of them have recovered? Should we be writing plans or saving species?"

Our hub will not do research for research's sake – a common problem with threatened species and ecosystem research – our research should make a difference to decisions and outcomes.

As with most complex issues – Senator Hill was both right and wrong – either way he was right to be frustrated. The recovery planning process has failed to recover species and it is expensive. That said, it has almost certainly stopped many threatened species from declining further.

Since that conversation there have been several tragic losses with respect to Australia's threatened species – the case of the Christmas Island pipistrelle and the Bramble Cay melomys (a small rodent that used to occupy a tiny sand island up in the Torres Strait), species that look like they have gone extinct because of late or inadequate action.

Today's government is determined to halt the loss of species, and hopefully hasten some recovery. Some components of that commitment are:

- the creation of a Threatened Species Strategy,
- the establishment of the position of Threatened Species Commissioner (Gregory Andrews) to focus attention on threatened species policy, and
- funding a Threatened Species Recovery Hub in the National Environmental Science Programme. We were lucky enough to win the competitive process for that hub and this is the first issue of our Hub magazine, *Science for saving species*. But who are 'we' and what do we plan to do?

The Threatened Species Recovery Hub is a consortium of 11 directly funded entities (10 universities and the Australian Wildlife Conservancy) plus 27 partner organisations and hundreds of friends and colleagues. Our eight person leadership team brings together experts from around the country and across the spectrum of threatened species science (albeit with a slight bias towards vertebrates). Our friends are you, indeed everyone who cares about and helps to save our threatened species.

Because we are a research hub we can only take on-ground action through a close working relationship with on-ground management agencies: state governments, federal government, regional bodies, local councils, non-government organisations, recovery teams, landowners, etc.

The trick to prioritising research that will make a difference 'on the ground' is assessing the likely value of the information being generated by any particular piece of research in terms of uncovering new management or policy options, and choosing between those options. Our Hub will not do research for research's sake – a common problem with threatened species and ecosystem research – our research should make a difference to decisions and outcomes. Not all research is useful in the short or medium term for threatened species recovery. We have very little time.

The Hub's first full research plan has just been ratified and all projects are now underway, each guided by a team that includes government staff. These projects fall under six major themes. In this first issue of *Science for saving species*, we showcase the breadth of TSR Hub research by introducing each of the six major themes of project activity. Many projects are nested within these themes, and we look forward to sharing updates of their progress in future editions.

This is an exciting time, but we have little time to rest on the laurels of all our previous major wins in policy and management. More than ever before there is a need for truly applied research to deliver innovative solutions that will secure and recover Australia's threatened fauna and flora. And we need those solutions quickly. Given the fact that Australia has almost 1800 species listed as threatened, this is a daunting task but what task could be more important than helping to secure Australia's natural wealth?

Professor Hugh Possingham
Director, TSR Hub

Inside this issue

From the Director	2	Making more of monitoring	8-9
Connecting fire management and threatened species conservation	3	Safe havens can buy crucial time	10-11
Taking the threat out of threatened species	4	Prioritising policy to reduce pressure	12-13
Saving woodland and alpine habitats	4-5	Lighting a candle in the dark	13
No surprises, no regrets: research to inform on-ground priorities	6-7	Social support vital to save threatened species	14
		Putting a value on threatened species	15
		Science for success	16



**The Threatened Species
Commissioner Gregory Andrews
with the threatened numbat from
Western Australia.**

Science for success

Science, action and partnership – these are the three principles that underpin the fight against extinction outlined in Australia’s Threatened Species Strategy. For me, the National Environmental Science Programme’s Threatened Species Recovery Hub is key to delivering the science needed for success.

In approving the \$30 million Hub, Environment Minister Greg Hunt emphasised that science provides the evidence base needed to plan and direct activities to save our threatened species. The Hub is supporting world-class science from some of Australia’s most prominent and established scientists. And it is also investing in the future by nurturing Australia’s next generation of science leaders.

Conservation scientists can be innovation leaders. We all have a responsibility to be positive and creative in our work to bring species back from the brink. More of the same will not create the change needed to halt avoidable extinctions. And to give in to pessimism is to give up on the animals and plants that define us as a nation.

Around the country, people are telling me about their projects and how on-ground action is saving our threatened animals and plants.

On Christmas Island, Parks Australia has used a \$500,000 grant to lay 16,000 Eradicat baits to protect the island’s biodiversity.

On Norfolk Island, rat control has seen a 200 per cent increase in Norfolk Island green parrot chicks.

In the Wheatbelt Natural Resource Management region, community groups have removed feral predators, and

black-flanked rock-wallaby numbers are increasing.

In Kosciuszko National Park, detector dogs are protecting endangered mountain pygmy possums and finding new populations of Koonoom (also known as the smoky mouse).

As your research progresses, I invite you to share stories about your discoveries, work in the field, social science initiatives, successes and engagement with the community. Email me and I can help you showcase this great work through my regular reports and social media channels.

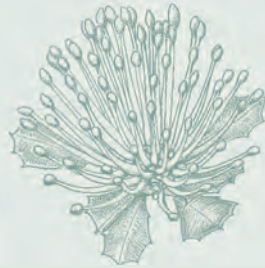
Achieving the ambitious goals in Australia’s Threatened Species Strategy requires national effort. We all have a role to play. As well as working with you on the Hub’s Steering Committee, I especially look forward to hearing and celebrating the Hub’s contributions as you tackle threats and recover species through robust science, on-ground action and increased social engagement. I am confident that together we can win Australia’s fight against extinction.

Gregory Andrews
Threatened Species Commissioner

**To give in to pessimism is
to give up on the animals
and plants that define us
as a nation.**



ThreatenedSpeciesCommissioner@environment.gov.au



Taking the threat out of threatened species

Threats loom large in the environment of identified threatened species and specifically targeting them is one way to achieving on-ground conservation outcomes.

“It’s clear that identifying the threats that are most pervasive for a particular suite of threatened species, or the emerging threats most likely to threaten species with extinction, is crucial to conservation,” says Dr Sarah Legge, leader of the TSR Hub’s Theme 1 – Taking the threat out of threatened species.

Dr Legge says ameliorating a threat can often help multiple species in the same area.

“That said, the response of a particular species to the removal of a specific threat can be deceptively complex – in many cases, because co-occurring threats may be interacting.”

That is why threat management is best done in an adaptive management framework that links on-ground action with research, monitoring and response.

A great example of this is that the control of foxes via widespread baiting in the southwest of WA was initially successful, and resulted in the recovery of in several mammal species that were threatened by fox predation. However, over time, the reduction in foxes opened up competitive space for feral cats, which increased in numbers and then caused precipitous declines in species like woylies and numbats.

“That is why threat management is best done in an adaptive management framework that links on-ground action with research, monitoring and response.”

The research that makes up this theme will develop general principles for the reduction of key threats based on targeted research at carefully chosen sites around the country.

“This theme will focus strategically on key threats operating across large landscapes and affecting multiple threatened species. It cannot address all threats to all threatened species.

“For example, key areas of interest will include reducing the impacts of feral predators, and improving fire management – both are threats operating at continental scales. In addition, one of the projects in this theme will focus on recovery of threatened habitats and ecological communities, which usually contain a relatively high number of threatened species”.

For further information:
sarahmarialegge@gmail.com



Saving wo

Threatened and endangered species need the right vegetation and resources throughout their lifecycle to survive, and when you’re dealing with habitats you’re rarely just conserving one species – it’s often whole communities under threat.

Led by Associate Professor Peter Vesk, the TSR Hub’s Project 1.2 is protecting more than individual species. It is working to conserve habitats that house entire communities of threatened species, focussing on three critical habitats - box gum grassy woodlands, the buloke woodlands, alpine sphagnum bogs and associated fens.

“A lot of the large trees in the grassy box woodlands of South-East Australia have been cleared for agricultural development and will take hundreds of years to be restored to their historic state, prior to European settlement.

“Professor David Lindenmayer’s (Australian National University) group of researchers will focus on key structures like large old trees, which provide lots of flowers and large branches which fall off to create hollows that many threatened bird species depend on for breeding.

“As part of the aim of restoring general habitat quality, we’ll assess the effectiveness of 150 purpose-built nesting boxes for



Woodland and alpine habitats

IMAGE: XAVIER LAMBRECHT
FLICKRCCBYNCZ

hollow-dependent bird species such as the Brown Treecreeper, the Squirrel Glider and Brush-tailed Phascogale.”

Another way to improve habitats for threatened woodland birds, including white-browed treecreepers, swift parrots and jacky winters, may be to manage the thriving and disruptive noisy miner population.

“European settlement has changed the Australian landscape in a way that favours noisy miners – which hang around in very large family groups and are quite aggressive in pushing other birds out of their territory. While they’re native, they’re now contributing to the decline of other woodland birds.”

“There have been calls for culling programs, but we first need to know whether that would make a difference, before embarking on such controversial management actions.”

Further research will also take place into how to best improve habitat quality for reptiles in the Box Gum Grassy woodlands, led by Damien Michael from ANU.

“While much attention has gone into planting shrubs and trees for birds and arboreal mammals, reptiles just don’t use them, so we’ll work to better understand the value and use of features such as rocky outcrops and boulders,” says Associate Professor Vesk.

The group is also trying to work out how its detailed understanding of woodland restoration in one part of the country might be applied to other areas.

“While there might be Blakely’s red gum in NSW where there’s grey box or river red gum in Victoria, there will still be woodland spacing between them, with grassy areas scattered between occasional scrubs.”

“If we can generalise learnings across these woodlands we’ll be able to apply them to other places, making the best use of the limited research and management resources.”

The second major focus for Project 1.2 is the pine-buloke woodlands of Northwest Victoria – home to the buloke or casuarina and Murray pine.

“These trees are preferred food sources for the threatened red-tailed black-cockatoo, which uses its strong beak to get the seeds out of its large woody fruits.

“While a lot of these trees have been cleared from the woodland for agriculture and cropping, there are some mature trees remaining in the Wyperfeld National Park and we’re working with Parks Victoria to investigate why there aren’t younger trees growing to replace them.

“A major factor seems to be livestock, feral rabbits and kangaroos grazing the seedlings – as well as climate conditions.

Kangaroos have a boom and bust cycle, building up to high population densities and eating all the vegetation but then dying in large numbers when drought hits. Important vegetation like casuarinas, cypress pines and rosewood just don’t have time to recover.

“We have two students starting at the University of Melbourne to better understand the grazing pressures in the region, and the best ways to give seedlings a chance of growing up to become mature trees.

“One of the students will be investigating whether there’s a good remote sensing tool to estimate the availability of foliage for kangaroos and thus predict the potential pressures they may apply to seedlings.”

The third key component to the project will be prioritising the many threats to habitats in the alpine bogs and fens – led by Dr Joslin Moore from Monash University.

“These areas are home to many threatened plant and animal species which are facing a number of threats listed in the Australian Government Department of Environment’s recent Recovery Plan that include weeds, feral deer and brumbies.”

For further information:
pvesk@unimelb.edu.au



No surprises, no regrets: informing on-ground priorities

World-wide, biodiversity decline is a chronic, insidious and worsening problem. Species are declining; some are becoming extinct; habitats are being degraded and destroyed; and ecological processes are faltering.

And Professor John Woinarski, leader of TSR Hub Theme 2 says those concerned about such degradation and loss face many difficult choices.

“One choice often posited is between devoting resources to the most acute problems (typically species about to become extinct) or instead using those resources strategically and more cost-effectively to try to maintain species and ecological systems before they reach such crisis points,” Professor Woinarski says.

Just as our health system has, and must have, components relating to the accident and emergency ward, routine check-ups, preventative medicine, research, control of factors causing ill-health, and community-wide health programs, so too with environmental management.

“The analogy often used is that the former represents the ambulance at the bottom of the cliff, and the latter a barrier to stop species before they get to the stage of tumbling.

“But this is a misconception of the problem. Just as our health system has, and must have, components relating to the accident and emergency ward, routine check-

ups, preventative medicine, research, control of factors causing ill-health, and community-wide health programs, so too with environmental management.”

He says it is entirely appropriate that some attention is devoted to those species and ecological communities that are most imperilled.

“Indeed, our national environmental legislation focuses substantially on the need to care for such species. We live in a wonderful land: Australia has an extraordinarily distinctive suite of plant and animal species. However, we have had a poor record in looking after these species: more Australian mammal species have become extinct than for any other country, and our rate of loss of plant and amphibian species is also exceptionally high.”

Much of the loss of Australian species happened in an earlier age, when our community cared less, Professor Woinarski says.

But the rate of extinction of Australian species is undiminished, and will continue unabated unless the most highly imperilled species are identified and the threats affecting them are managed effectively. This is the context for the set of projects in Theme 2 of the TSR Hub. It is also the basis for the Australian Government’s listing of 20 priority bird and mammal species for particular conservation attention.

This Hub theme is largely about seeking to avoid unwanted surprises and regrets due to inaction or insufficient knowledge. “Some recent extinctions in Australia have been predictable, but occurred nonetheless because management responses were not taken, were misdirected or were enacted too slowly or ineffectively. Others have occurred because the severe risk of extinction was not recognised.”

Projects conducted under Theme 2, aim to determine which plant and animal species are most likely to become extinct in the next 10-20 years. The projects will then identify and prioritise the critical management responses required to avert the extinction and to secure or recover the species. Most of these projects will be undertaken by researchers at Charles Darwin University, University of Queensland and Australian National University.

One project will focus on Australia’s fauna. It has initially considered birds and mammals, and will move to other groups including reptiles.

A similar project is under way to identify Australia’s most imperilled plants, establishing a ‘red-hot’ list of plant species threatened with extinction in the immediate future and identifying priority actions for recovery.

With over 1200 plants formally listed as threatened, the project led by Dr Rod Fensham from the University of



IMAGE: NATALIE TAPSON FLICKRCCBYNASA2

Queensland, faces a significant challenge identifying those at imminent risk.

"Some of these most imperilled plant and animal species are currently and appropriately listed as Critically Endangered on Australia's threatened species list. Other species are listed as Critically Endangered in state jurisdictions but have not yet been evaluated at a national level. Still others may be at imminent risk of extinction, but there are often insufficient data to evaluate them," Professor Woinarski says.

Recent cases demonstrate how some species go from apparently secure to extinct remarkably quickly.

"And, leading up to those extinctions, the rapid decline may be almost unpredictable. The fact is that every case is different, so management must be flexible depending on the circumstances".

Specific management challenges are being tackled in the two remaining projects within this theme.

In Tasmania, the hollow-nesting swift and orange-bellied parrots and forty-spotted pardalotes have suffered a significant decline over the past decade. For the swift

parrot in particular, this is largely as a result of introduced sugar gliders eating eggs, young and females while they are nesting. This project will seek to identify populations at risk of extinction via predation, and test and establish techniques to reduce the risk.

The fourth project in this theme recognises that two of Australia's very recent extinctions of vertebrates have occurred on Christmas Island, and that trends for many other species suggest that they face similar prospects there. This project will focus initially on Christmas Island's endemic and critically endangered flying fox and reptiles.

"As in most cases involving the conservation of highly imperilled species, we need to be clearer about which factors are causing decline. We also need to work with managers to control more effectively those factors," says Professor Woinarski.

The King's Lomatia (*Lomatia tasmanica*) is a critically Endangered species. There are only 500 plants in the wild, on the southwestern tip of Tasmania. It doesn't produce fruits or seed and reproduces vegetatively meaning there is not way to increase the genetic diversity of the remaining population.

For further information:
John.Woinarski@cdu.edu.au



Making more of monitoring

IMAGE: GERALD KUCHLING; DEPARTMENT OF PARKS AND WILDLIFE

When it comes to saving threatened species, monitoring is usually the poor cousin in the story. Most people will acknowledge that good monitoring is important to our efforts to save threatened species but, when all is said and done, our track record in monitoring is appalling. Often it's not done at all or, when it is, it's not done well or we don't act on what the monitoring is telling us.

Professor David Lindenmayer hopes that the Threatened Species Recovery Hub's Theme 3 will change this. Theme 3, led by Professor Lindenmayer, is all about doing better with monitoring and management. It will bring together what we've learnt from past efforts (good and bad), and combine this with a series of carefully planned on-the-ground case studies that will enable us to develop a framework of general principles that will bring monitoring front and centre in our efforts to save threatened species.

"Monitoring also gets a bad rap for being 'a bit technical' and a tad boring," says Professor Lindenmayer.

"We hope to change that, too. Theme 3 will see the field testing of cutting-edge technology such as camera-mounted drones. We'll test the effectiveness of this (and other emerging technologies) and come up with guidelines on how it can be applied to make a real difference in monitoring and managing threatened species."

The research in this theme involves a multi-pronged approach.

The first project (3.1) seeks to trial, develop and evaluate a set of metrics (indices) that inform us about how threatened-species are trending. Australian governments have many strategies and have invested considerable resources in recovering threatened species. However, there is no coherent and transparent reporting on changes in Australian biodiversity generally, or threatened species in particular.

Led by Hugh Possingham, Project 3.1 will develop biodiversity indices that will allow for integrated reporting at national, state and regional levels. These indices will enable comparison across different environments and taxonomic groups while also comparing responses to different types of threat. Most importantly, these indices will report crisply on responses to management interventions, something that is essential if we are to learn from our efforts to save threatened species.

Project 3.2, co led by Professor Lindenmayer with Dr Sarah Legge, seeks to identify the most ecologically-effective and cost-effective ways of monitoring.

"We'll be staging a couple of workshops to kick this project off," says Professor Lindenmayer.

"These will involve bringing together experts to put on the table what we know about monitoring that works (as well as what doesn't).

"Monitoring of critically endangered species that doesn't include triggers for action, for example, has demonstrably failed us in the past with the Christmas Island pipistrelle now being extinct as a result. The important thing is we learn from such experiences."

The 'lessons' arising from this consultation will inform frameworks for monitoring that will further be developed in a series of targeted case studies in a variety of locations. This will include some exciting re-introductions of threatened animals in

Booderee National Park on the NSW south coast (reintroduced animals will include eastern quolls, long-nosed potoroos and southern brown bandicoots); monitoring of bilbies on Indigenous Protected Areas; monitoring of threat management for malleefowl populations in Victoria and South Australia; and monitoring programs for other critically endangered animals such as the Leadbeater's possum in Victoria, and swift parrots in Tasmania.

"Part of this work will involve rolling out some cutting-edge technologies."

"For example, we'll be using aerial drones with cameras to test their utility on monitoring bilbies in arid lands while developing techniques to collect and analyse environmental DNA (eDNA) to survey growling grass frogs (and other threatened species) in Melbourne's urban fringe. eDNA is trace genetic material that animals shed into their environment (skin or faeces for example) which can be picked up by researchers without them needing to find or sample from the species directly. This can be enormously valuable because, by their very nature, threatened species can often be very challenging to find."

Adaptive management is critical to our ability to improve our efforts to save threatened species. Project 3.3 is all about making more of adaptive management with our monitoring activities. This project also begins by bringing together the lessons from the past.

"We know that while much has been published about the importance of adaptive management and how it might theoretically be applied, there aren't many cases in the published literature on what's been achieved in the field," notes Professor Lindenmayer.

"However, we know there are case studies on adaptive management that never made it into the 'published' literature but ended up being buried on dusty shelves in state agencies. So, part of the challenge here is to bring these unpublished studies to the table so we can learn from them," says Professor Lindenmayer.

"Adaptively managing threatened species has its own set of special challenges. We can't waltz in and remove half the population in a controlled experiment in an effort to throw light on what's the best form of management. Populations of threatened species are often so low that every individual is too precious. Care is needed.

"So, we will bring all these lessons together, build a framework and then trial and refine that framework in the management of Leadbeater's possum (a threatened species targeted for emergency intervention) and malleefowl."

Monitoring of critically endangered species that doesn't include triggers for action, for example, has demonstrably failed us in the past

Professor Lindenmayer is confident that the Hub's research will make monitoring matter.

"This research has the potential to lift the practice of monitoring to new heights, demonstrate its true power and, in so doing, become the cornerstone of effective threatened-species conservation," he says.

For further information:
David.Lindenmayer@anu.edu.au



IMAGE: SHARON GILLIAM INNES

Monitoring how we manage threats to malleefowl populations in Victoria and South Australia will prove crucial to their conservation.

Safe havens can buy crucial time

Refugia are places in which plants and animals can persist in times of stress. Natural refugia have played a key role in the evolution and persistence of species over geological time. Human-made and managed refugia can buy time while we find better or more permanent solutions for conserving threatened species.

The concept is not new says Associate Professor Brendan Wintle, leader of Theme 4: Reintroductions and refugia.

“People have been talking about it for a long time; it’s a key ecological concept,” he says.

“However, by characterising refugia for the purpose of practical, on-ground conservation actions, we are taking a different view.”

This is the reality that underpins the approach to re-introductions and refugia programs for threatened species in Australia.

“We may be able to help particularly vulnerable species through a population bottleneck, or buy them some time until a more permanent solution to their problems can be found,” says Associate Professor Wintle.

The Growling Grass Frog (*Litoria raniformis*) is one of Victoria’s most endangered frogs.



IMAGE: GEOFF HEARD

“For example, predator-proof conservation areas are critical for keeping many species in existence while we find ways of managing the threat of cats and foxes in the wider landscape.”

Degradation and decline of habitat, predation from and competition with feral species all contribute to the problems faced by Australia’s most vulnerable plants and animals. Theme 4 will focus on either finding the places where they can be safe from harm, or creating new safe havens.

“In response to these challenges, we can move animals behind fences, or shift them to other, safer parts of their range. We might reintroduce them to locations where we know they were once found, or somewhere completely new where we expect they will thrive,” says Professor Wintle.

“In the case of plants, we can introduce new genetic material to a population to increase the diversity of genes available, enhancing their capacity to survive. We can also transplant plants to new locations in response to shifting climates.”

Theme 4 includes a number of projects designed to tackle the most difficult challenges faced by conservation managers.

“One project will develop a national level strategy for creating refuges on islands and within fenced areas on the mainland. This is a priority for critical weight range mammals [mammals between 35g and 5500g] unlikely to survive relentless predation by feral cats and foxes.

“A number of organisations, including the Australian Wildlife Conservancy, have produced examples to show protective fencing can work quite well. However, there has never been a national fencing strategy.”

The lack of formal strategy has led to a bias in the location of fencing projects, which tend to focus on drier, cheaper areas of land that are more economical to fence.

“We need to secure a diverse range of environments, representative of a broad cross-section of Australian wildlife and environments, keeping in mind the practical reality of what we are doing, what we would like to achieve and the costs involved.”

Another project included within this theme will further highlight the important role that islands play in conservation and wildlife management. Islands are a valuable resource because they often contain endemic taxa [species that cannot be found elsewhere], and because threats can be mitigated in ways that aren’t possible on the mainland.

“In some instances, we can totally eradicate feral species to enable islands to serve as refuges in the same way that our fenced areas do. One obvious benefit is that we don’t need to spend resources on building and maintaining fences, though other costs, including quarantine can be significant”



IMAGE: DILETTANTIQUITY, FLICKRCC BY 2.0

Australia has 8,222 islands within its maritime borders that account for 32,163 square kilometres of land, an area roughly equivalent to half the size of Tasmania. However, not all of this land is suitable for threatened species.

“It’s not always going to be possible to create long-term, sustainable populations, but we can try to help threatened species stay in the game.”

In comparison the Australian mainland accounts for 7,659,861 square kilometres, and the search for natural refuges will form the basis of other Theme 4 projects.

“There may be natural features on the mainland that create refuges for threatened species. Hub researchers are also investigating different climates, temperatures, water balances and fire regimes that can either provide protection to native species or inhibit feral cats from movement and hunting.

“In some places drought or fire appear to be less damaging to native animal populations for some reason, but we don’t always clearly understand why this is the case and where these places are.

“We hope to identify high-value areas for threatened species, where we can give the native species a hand with the greatest cost-effectiveness.”

Theme 4 will ultimately link with the other five Hub themes and reveal where policy makers and managers should be focussing their efforts. Theme 4 researchers will work in close collaboration with the researchers and findings of Theme 1 (which aims to reduce the impact of introduced predators on threatened mammals), by highlighting the areas where they will get the biggest return on feral animal management programs.

“There are still a lot of gaps, in both our knowledge and our conservation strategies. I would say in most cases, we still don’t really know where they [refugia] are, how to best manage them or completely understand why they are refugia in the first place.”

“We also have a huge opportunity to connect with Theme 6, which will explore opportunities for engaging communities in threatened species and management issues, as fenced areas and island refuges are great engagement tools, where the public can see first-hand what we are working on and how amazing our environments are when all the native species are present.”

The numbat has been successfully re-established in NSW, protected from feral predators by the fences that surround AWC’s Scotia sanctuary.



For further information:
b.wintle@unimelb.edu.au



Prioritising policy to reduce pressure

IMAGE: KYM RAMADGE

When it comes down to it, saving threatened species is all about good policy. You can have the best science in the world but without effective policy it won't make a difference to protecting our endangered flora and fauna.

Much of the science being done by the TSR Hub is about generating information on the identification, monitoring, protection and recovery of threatened species. Government uses this information to help form policy that aims to reduce the pressure on our endangered species. Theme 5 in the TSR Hub (Enhancing threatened species policy) is a little different from the other themes in that

By exploring these innovative new options it might be that we could reduce costs to business while improving the effectiveness of offsets.

its focus is on the conservation policy itself – could its various elements (eg, identification, monitoring, protection and recovery) be better coordinated? Could we modify policy to make it more effective?

Associate Professor Martine Maron, leader of Theme 5, believes we can make policy much more effective.

“We’re aiming to link in directly with existing (and developing) government policy to provide the technical expertise and new approaches to continually improve conservation outcomes,” she says.

“Our specific focus in Theme 5 is on policies around environmental offsetting and threatened species listing.”

The listing of threatened species is the process by which governments ‘officially’ acknowledge that a species is ‘in trouble’ and in need of added legislative protection. This added protection usually involves bringing together experts to help better understand what threatens the species and what can be done about the threat (or, as often is the case, multiple threats). This step can involve the creation of a recovery plan, which outlines what needs to be done by whom to help the species.

“Listing also means that when a development proposal comes forward that might impact on a threatened species (eg, to develop some land that might contain valuable habitat for the species in question), the government needs to consider the impact of this development on the threatened species.”

“The developer is then asked what associated steps would be undertaken to reduce any negative impact on the listed species.”

Listing threatened species is a crucial step in the process of developing approaches for their recovery. However, listing relies on knowing which species are at risk. For many species, we simply don’t know enough about them to estimate this risk. Project work under this theme will help develop approaches for determining the likely conservation status of species we know little about.

“Research in this area will also improve policy approaches for both listing and de-listing of threatened species and communities.”

“De-listing, by the way, is a good thing as it suggests the chances of the species in question persisting well into the future have significantly improved.

“We will also be looking at what’s required to keep the threatened species list up to date. An out-of-date list is more than

Baluk Willam Nature Conservation Reserve in Victoria, sanctuary for over a third of Victoria's orchid species.

merely undesirable, it gets in the way of efforts to prioritise the limited resources available for conservation. It means resources might go to species that don't need them at the expense of other species that do."

Other research being undertaken in Theme 5 will focus on how we can ensure that unavoidable impacts on threatened species – such as might result from the development of essential infrastructure – doesn't have an overall negative impact on the conservation of that species.

"The idea is to use biodiversity offsets to compensate for impacts."

"A biodiversity offset involves creating a benefit for a threatened species that counterbalances the negative impact of a development.

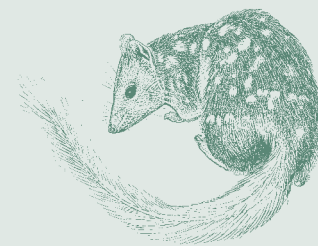
"This project will draw together information about the most cost-effective ways to benefit threatened species. We will attempt to identify how we can improve the current approaches to offsets for nationally threatened species."

A common approach with many offsets is to acquire and protect land to make up for the impacts from development elsewhere. But, by exploring innovative new offsetting options, it might be possible, for example, to find that measurably better outcomes for a threatened species can be achieved through funding a predator-control program instead.

"By exploring these innovative new options it might be that we could reduce costs to business while improving the effectiveness of offsets."

"This could lead to increased government and community confidence that offsets genuinely achieve an 'improve-or-maintain' outcome for threatened species and habitats. And that's an outcome we could all be proud of."

For further information:
m.maron@uq.edu.au



Lighting a candle in the dark

By John Woinarski

Any enterprise works best when it is supported by adequate information. Knowledge is a key for good conservation management and policy. But, notwithstanding a history of much impressive environmental research in Australia, little is known about most Australian plants and animals. For most species, there is scant evidence about population size and trends, the factors that threaten them or how we can best manage them.

It is highly likely that many poorly-known species in Australia are actually highly imperilled, and are in danger of disappearing before we even recognise that they are in trouble. Many of these species have not yet even been recognised and graced with a scientific name.

A particular problem in this regard is that a substantial amount of evidence is required in order to list species as threatened, so the plight of poorly known species is not formally recognised and they receive little or no targeted protection.

This shortcoming also means that the current list of 'officially-recognised' threatened species is likely to be a marked under-estimate of the number of species that really are threatened.

Project 5.2 (Improving policy and management considerations for data-poor species) seeks to give some attention and solace to the majority of Australian species that are poorly known. To bring them into the conservation management fold, we will:

- (i) attempt to develop elicitation techniques that can reliably extract more meaning from the limited information available on them;
- (ii) assess the value of management to a range of potential conservation categorisations (such as the use of 'data-deficient' status, or the extent to which their conservation can be enveloped by other approaches such as the use of ecological communities);
- (iii) use modelling derived from related but better-known species to fill knowledge gaps about data-deficient species (and to inform the management of these species).

Improving the lot of the many data-poor species is an enormous challenge. We will approach the challenge initially with a focus on a few major groups, including the rich Australian reptile fauna.

For further information:
John.Woinarski@cdu.edu.au

This beetle, like many Australian species, is undescribed and little is known about it.



IMAGE BY MELINDA MOIR



IMAGE: PURPLE COPPER BUTTERFLY, BY MICHELLE BAKER.

Social support vital to save threatened species

The early 20th century fashion for egret plumes in ladies' hats collapsed when members of the Royal Australasian Ornithologists Union published photographs of starving egret chicks. Suddenly, social support swung behind the egrets. Shooting them was banned and their numbers started to recover.

It's a story that Professor Stephen Garnett from Charles Darwin University is fond of telling because it demonstrates how potent social values can be when it comes to protecting nature and saving threatened species. Professor Garnett leads the TSR Hub's Theme 6: 'Using social and economic opportunities for threatened species recovery' and is firmly of the belief that social support is an important basis for effective threatened species conservation.

We aim to secure increased public support for investments in threatened species by providing approaches and tools that will give people greater confidence that these investments provide value for money.

"Social support can be critical in saving threatened species," he says.

"Such support has increased enormously in the last hundred years. Today more than 80% of Australians do not want to see species go extinct.

"Understanding the nature of this social support and how the wider public can best contribute to conservation is fundamental to any holistic research program on threatened species."

Theme 6 within the TSR Hub is attempting to cultivate this understanding by developing five projects that will consider different aspects of social science.

"We aim to secure increased public support for investments in threatened species by providing approaches and tools that will give people greater confidence that these investments provide value for money," explains Professor Garnett.

"One element of that is quantifying the importance to the public of protecting different types of threatened species and ecological communities. Ideally this importance would be expressed in dollar-equivalent terms to allow comparisons with program costs and with different types of benefits."

Towards this end, Project 6.1 is reviewing what's been done so far with non-market valuation studies of threatened species.

Project 6.2 explores collaborations with, and participation of, Indigenous people in threatened species research and management.

"The values that Indigenous people hold for 'country' are core to the conservation of threatened species," says Professor Garnett.

"Nearly half the protected-area estate in Australia is voluntarily conserved as Indigenous Protected Areas (IPAs) and many other parts of Australia are under various forms of Indigenous management.

"The extent to which Indigenous people wish to be engaged in threatened species conservation, the opportunities this involvement can provide for employment and getting people back on country, and the other benefits that might arise from these arrangements are a few of the issues being explored in project 6.2. This project is being led by CSIRO's Cathy Robinson."

Social values across the wider society will also be explored. Project 6.3 (led by Sarah Bekessy and Georgia Garrard at RMIT University) will be examining how to translate the community's affection and concern for threatened species into effective conservation action at a local level. What can people do to help? Which sorts of threatened species are best suited to public involvement? Can we make the unloved loved through strategic messaging?

"Many campaigns have run over the years trying to improve public engagement and involvement."

"In Project 6.2 we will be attempting to analyse the effectiveness of such programs while also exploring new approaches, especially through new communications strategies."

A key part of securing ongoing social involvement with threatened species is a reassurance that the work is worthwhile. So many stories about threatened species are gloomy when in fact Australia has had some remarkable successes.

Telling the stories of those successes and understanding how they came about, especially how they differed from failures, is key to another project being led by Professor Garnett.

"One major aim will be to come up with a set of guidelines on how to run a successful recovery team," says Professor Garnett.

"Who should be on a recovery team? How should they run? How should the performance of a recovery team be monitored?"



Putting a value on threatened species

IMAGE: DAVID SALT

“This project is partly about learning, but also about simply letting more people know of the brilliant work that has been conducted over recent decades. Without this effort, many species would no longer exist.”

The final project under this theme is under development. It looks at how the community can be involved and help with the science and conservation of threatened species.

“There are many examples of citizen-science projects in which volunteers are making major contributions to our understanding of threatened-species conservation,” says Professor Garnett.

“We are working to identify opportunities to broaden and deepen this community engagement.”

Today, most Australians care for much more than plumed egrets. Through government and non-government organisations, the Australian people invest considerable resources in the science and management of threatened species. Professor Garnett thinks this support is available because there is a widely shared belief that society has a responsibility to retain all species for future generations to enjoy.

“Understanding the social aspects of threatened species conservation is thus essential if long term success is to be achieved.”

For further information:
stephen.garnett@cdu.edu.au

How much is a threatened species worth? It's a tricky question on many levels. For some it's a challenging technical problem: How do you measure the value of a species that doesn't come with a price tag? For others it's more of a moral dilemma. Is it right to even try to put a dollar value on a threatened species?

Ram Pandit and colleagues have attempted to throw a bit of light on this sensitive issue by reviewing the scientific literature on non-market valuation of threatened species (Project 6.1).

“The values associated with threatened species are difficult to estimate,” says Ram Pandit. “The price of most things like bread and butter can be determined because they are bought and sold in markets. But that doesn't happen with Leadbeater's possums or orange-bellied parrots. There is no market for threatened species with the result that we cannot observe the prices that people are willing to pay.”

However, economists have developed a variety of techniques for determining the values of things not traded on markets (non-market valuations). These include finding out how much people are willing to pay to travel to see a threatened species or asking people how much they might be prepared to pay to save a threatened species.

“Many people are sensitive about economists putting a dollar value on a species. They feel it discounts the many other values of a species that can't be priced, like the species 'right to exist', sometimes referred to as intrinsic values.

“But our review of the literature on non-market valuation revealed many interesting things about conserving threatened species. For example, there is strong evidence that the broader

community does support and is willing to pay for the protection and recovery of threatened species. In many cases, the estimated non-market values far exceed the expenditure that would be required to protect or recover the species.”

The researchers also found that non-market valuations in other parts of the world have played critical roles in campaigns to save threatened species including the conservation of wolves in Minnesota.

“We identified many cases where non-market valuations have had a notable impact on the management or funding of threatened species. “However, the overall use of these techniques is low. Our review revealed there is great potential for larger benefits if the use of non-market valuations were more.

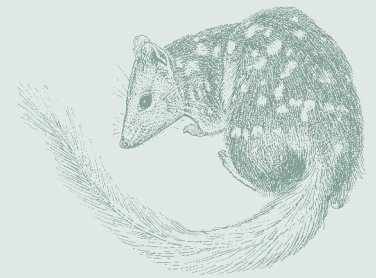
For further information:
ram.pandit@uwa.edu.au

Reference

Pandit, R., Subroy, V., Garnett, S.T., Zander, K.K. and Pannell, D. 2015. A review of non-market valuation studies of threatened species and ecological communities. Report to the National Environmental Science Programme, Department of the Environment, Canberra. December 2015.



Brett Murphy taking measurements in the tropical savanna.



Connecting fire management and species conservation

TSR Hub
Researcher
Profile

Fire is a basic part of life – and death – in northern Australia. And changes in the frequency, timing and intensity of bushfires is shifting the balance of life in such a way that a diverse assortment of small native mammals – bandicoots, tree-rats, possums – are sliding towards extinction.

“Work in Kakadu National Park has shown that between 1996 and 2009 mammal populations crashed,” says Dr Brett Murphy from the TSR Hub at Charles Darwin University. “During that time site-level species richness and abundance decreased by 65% and 75% respectively.”

Dr Murphy’s research broadly focuses on how fire has shaped and maintains the biota of Australia’s tropical savanna landscapes, and how contemporary fire regimes can best be managed for biodiversity conservation, especially in relation to declining small mammals and fire-sensitive vegetation communities.

“There’s strong evidence suggesting the decline is connected to changes in fire regime, with frequent, intense fires most likely facilitating predation by feral cats. Our challenge is to understand the nature of this connection and determine how we can manage both fire and feral predators to reverse the declines.”

Dr Murphy is involved with two NESP TSR Hub Projects. The first focusses on analysing existing datasets relating to the distribution and abundance of feral predators, small mammals and their interactions (Project 1.1: Developing evidence-based management tools and protocols to reduce impacts of introduced predators on threatened mammals).

“As part of Project 1.1, I’ll also be helping to evaluate the effectiveness of a cat-baiting programme in the Pilbara. Our hope with this work is to enhance populations of the endangered northern quoll.”

The second TSR Hub project he’ll be contributing to relates to emergency care – identifying and prioritising action to save fauna species at acute risk of extinction (Project 2.1). This project aims to identify Australia’s most imperilled bird and mammal species, in most urgent need of conservation action. The approach will involve a range of complementary techniques, including population modelling and expert elicitation.

Dr Murphy’s passion for ecology in Australia’s tropical savannas grew from his childhood in northwestern Australia’s big and (relatively) intact landscapes. He loves being in the remote parts of northern and central Australia where you can gaze to a distant horizon without seeing any impact of industrialised society.

Our hope with this work is to enhance populations of the endangered northern quoll.

Prior to his involvement with the TSR Hub, Dr Murphy’s career involved some time working in the Western Australian mining industry (as an ecological consultant and then environmental officer). But the intellectual challenge of a research career beckoned, and he returned to postgraduate studies followed by several postdoctoral roles investigating the drivers of large-scale patterns of tropical vegetation and fire regimes.

For further information:
Brett.P.Murphy@cdu.edu.au

The Threatened Species Recovery Hub is supported through funding Australian Government’s National Environmental Science Programme.



www.nespthreatenedspecies.edu.au/

COVER IMAGE: THERE ARE FIVE SUBSPECIES OF THE RED-TAILED BLACK-COCKATOO (*CALYPTORHYNCHUS BANKSI*). TWO ARE THREATENED, INCLUDING THE FOREST RED-TAILED BLACK-COCKATOO, LISTED AS VULNERABLE. IMAGE: KEITH LIGHTBODY WWW.ZARDEC.NET.AU/KEITH/PHOTOS.HTM

Science
for saving species

A bi-monthly publication for the Threatened Species Recovery Hub

TSR Hub Communications:

Susan McNair

Editor:

David Salt

Art direction & design:

Kym Ramadge | krd

Illustrations:

Michelle Baker

PRINTED ON MAINE RECYCLED SILK,
FSC CERTIFIED, 40% FSC VIRGIN FIBRE,
60% POST CONSUMER WASTE.

