



Threatened
Species
Recovery
Hub

National Environmental Science Programme



Cactus Dryandra (*Banksia anatona*). Image: Australian Network for Plant Conservation

Appendix 7

The additional benefits of implementing threat abatement strategies aimed at recovering threatened species

This document is an appendix from: April E. Reside, Michelle Ward, C.J. Yong, James E.M. Watson, Andrew Rogers, Ruben Venegas Li and Josie Carwardine. (2021) A knowledge synthesis to inform a national approach to fighting extinction - Final Report. NESP Threatened Species Recovery Hub Project 7.7 report, Brisbane.

November 2021

Introduction

Managing the threats to Australia's threatened species could generate significant additional benefits for biodiversity, the environment more generally, and society. While biodiversity conservation has real and perceived conflicts with other societal priorities and resource use, conservation management can also create ecosystem services and socio-economic benefits for people. Previous analyses on this topic have focused on co-locating biodiversity conservation actions with ecosystem services (e.g. Chan et al.,); quantifying the monetary value of biodiversity and ecosystems (Costanza et al.), and a smaller number have estimated the economic value of biodiversity conservation programs (Austin et al. 2016) or carrying out threat management activities: for example, the management of invasive species to recovery threatened species over Australia's Lake Eyre Basin has been estimated to avert agricultural losses of up to \$226 million/year (Rees et al. 2020).

We build on this previous body of work to estimate and discuss a preliminary set of 'additional benefits' of implementing threat management strategies targeted at Australia wide threatened species recovery. Where applicable, we apply our mechanistic cost models to quantify the additional benefits of threat management at a greater level of detail across a broader scale than has been previously possible. A fully comprehensive analysis of the additional benefits of reducing threats to threatened species across Australia is outside the scope of this analysis. Rather, we showcase a snapshot of four types these benefits, which can be created through:

- 1) Restoring the integrity and extent of threatened species habitat in ways that creates additional environmental benefits as well as improving the outlook for threatened species
- 2) Reducing threats that impact upon the economic outcomes of other sectors, such as agriculture and tourism industries
- 3) Creating jobs and livelihoods
- 4) Increasing opportunities for First Nations Traditional Custodians to lead in decision making and management for cultural species and places

Table 1. Restored areas would improve over 80,000 km² of habitat. These areas would capture more than 10.8 million tonnes of CO₂ over time as well as significantly contribute to the area retention targets for selected bioregions.

Co-Benefit	Method	Assumptions	Benefit	Units	References
Above ground carbon	Restoration of cleared areas x maximum potential above ground biomass	Maximum above ground biomass calculation	8,631,128	t DM	(Roxburgh et al. 2017)
Below ground carbon		below ground carbon is 26% of above ground carbon	2,246,115	t DM	(Mokany et al. 2006)
Total carbon			10,885,019	tonnes CO ₂	
Total value of CO ₂		price per tonne of Carbon is AUD 16.55 (last quarter of 2020)	180,147,076	AUD	(ACCU 2021)
Restored area	Area restored that falls outside of current protected area network (CAPAD)		79,960.00	km ²	(CAPAD 2018)
	Habitat added to regional ecosystems outside of protected areas		77,337.24	km ²	(IBRA7 2021)
	Habitat added to Ecological Communities of National Environmental Significance		29,659.00	km ²	(ECNES 2021)
	Habitat added to Bio-regions under-represented in the current protected area network		61,944.00	km ²	(Australian Government 2020)

Table 2. Management of invasive species could save the Australian economy more than \$9.9 billion dollars per year in avoided costs of control, avoided production loss, and avoided health care costs associated with disease transmission.

Management Strategy	Benefit	Method	Assumptions	Species	Benefit	Units	references
Invasive predator	Avoided production loss, reduced cost of control, reduced disease transmission	Overlap in management area and target species current distribution	Species costs/impacts are consistent across their range	dogs	98,676,476	AUD	(McLeod 2016)
				foxes	30,904,963	AUD	(McLeod 2016)
				cats	5,995,545,541	AUD	(Legge et al. 2020)
Invasive herbivore	Avoided production loss, reduced cost of control	Overlap in management area and target species current distribution	impacts are consistent across their range	pigs	10,111,024	AUD	(McLeod 2016)
				rabbits	20,829,511	AUD	(McLeod 2016)
				goats	6,798,062	AUD	(McLeod 2016)
Invasive bird	Avoided production loss, reduced cost of control	Overlap in management area and target species current distribution	impacts are consistent across target species range	starlings	16,732,576	AUD	(McLeod 2016)
Weeds	Avoided production loss, reduced cost of control	overlap in weed control and agricultural areas	impacts are consistent across agricultural areas		3,720,468,604	AUD	(Sinden et al. 2003)
	Total benefit				9,900,066,760	AUD	

Table 3: Jobs created by implementing the Threat Abatement Strategies outlined.

THREAT ABATEMENT STRATEGY	TOTAL AREA MANAGED	SPATIAL COST/KM2	NUMBER OF FTES ACROSS AUSTRALIA
AQUATIC CONNECTIVITY	2,993	227,370	6,218
DISEASE INCLUDING PHYTOPHTHORA	936,058	9,885	84,356
FIRE	7,308,481	323	21,512
GRAZING	3,643,760	596	19,806
INVASIVE FISH	1,072,484	12,258	119,872
INVASIVE GRAZERS	5,295,790	241	11,636
INVASIVE PREDATORS	7,591,786	234	16,219
INVASIVE PROBLEMATIC BIRDS	1,216,263	498	5,523
INVASIVE RABBITS	5,727,081	1,045	54,542
MAP AND PROTECT	2,745,020	24	615
NATIVE HERBIVORES	3,322,385	748	22,672
RESTRICT ACCESS	456,043	265	1,114
HABITAT RESTORATION	79,960	55,593	40,541
INVASIVE WEED MANAGEMENT	4,414,089	13,658	549,650
		Total FTE	954,275

Note 1 - We calculated total labour cost = Total area managed*Labour cost/km2 + Non-spatial cost

Note 2 - We assume the cheaper action labour cost/km2 when there is potential of double counting actions (i.e. ground and aerial activities)

Note 3 - We assume the most common vegetation type when there are multiple vegetation types.

Note 4 - FTE = Total labour cost/Experienced annual salary. We assume that the annual FTE salary is \$110k p.a. (\$84k with 30% of on-costs)

Note 5 - We have only included TAS that have a spatial element. We have excluded Biosecurity and Policy/ Education

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Further information:

<http://www.nespthreatenedspecies.edu.au>

This project is supported through funding from the
Australian Government's National Environmental Science Program.



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