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Project Prioritisation Protocol

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Project Prioritisation Protocol

1. Why prioritise management actions?
2. What is the Project Prioritisation Protocol?
3. Who is using it?

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Why prioritise management actions?

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Recovery plans

- Excellent for bringing together stake holders, engaging community groups and collating information
- Expensive and time consuming – therefore, we don't have plans for every species.
- Lack a consistent managment objective for all species
- There isn't any way of comparing costs and benefits of the management projects
- Actions are not specific often we're left without a clear strategy for the species recovery
- Not enough actions that will result in recovery - a common recommendation is more research/surveys and nothing else

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Project Prioritisation Protocol

- Similar to recovery planning process but:
  - clarifies the agency's objective for managing species
  - facilitates collation of vital information for costs and benefits of actions
  - very specific actions (location/intensity)
  - the planning process is much faster and cheaper
- Allows us to rank projects by their cost-effectiveness
- Informs us about the most cost-effective actions to do and where
- Can calculate what the cost of managing all threatened species
- Can calculate how many species we can recovery for a given budget
- We can be clear about what we can not afford to do

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What is the Project Prioritisation Protocol?

(1) Define objectives
(2) State constraints
(3) List biodiversity assets
(4) Weight assets
(5) List management projects
(6) Calculate the costs of each project
(7) Predict the benefit to assets
(8) Estimate likelihood of success
(9) Rank projects

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Project Prioritisation Protocol

Project	Cost *C*	Benefit *B*	Success *S*	Weight *W*	

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(1) Define objectives

Clear, measurable and achievable objective:

"To secure (over a period of 50 years) the greatest number of threatened species of value with the Threatened Species Budget."

Secure = a viable population that is stable and will allow future recovery

Value = biological, economic and/or social values (see Step 4)

Threatened Species budget = see Step 2

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(2) State constraints

National TS Budget* = NZ$33 million/year

* Budget that is earmarked for conservation of biodiversity. Does not include the budgets for Iconic Species (e.g. Kiwis), Ecosystems, Recreation, or Community Outreach Programmes

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(3) List biodiversity assets

Species listed as the following on New Zealand's threatened species list:

- nationally critical (NC)
- nationally endangered (NE)
- nationally vulnerable (NV)
- serious decline (SD)

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(3) List biodiversity assets

Project					
North Island brown kiwi					
Robust grasshopper					
Long-tailed bat					
Maud Island frog					
Canterbury mudfish					

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(4) Weight assets

$$\text{Weight} = \sqrt{\frac{1}{f \times g \times s}}$$

f = the number of families in the order
g = the number of genera in the family
s = the number of species in the genus

Species	*f*	*g*	*s*	*W*
North Island brown kiwi	4	1	5	**0.224**
Robust grasshopper	48	1402	3	**0.002**
Long-tailed bat	17	35	15	**0.011**
Maud Island frog	33	1	4	**0.087**
Canterbury mudfish	12	7	5	**0.049**

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(4) Weight assets

Project				Weight *W*	
North Island brown kiwi				0.224	
Robust grasshopper				0.002	
Long-tailed bat				0.011	
Maud Island frog				0.087	
Canterbury mudfish				0.049	

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(5) List management projects

North Island brown kiwi project

Project management	
Service support	
Infrastructure	
Outcome monitoring	
Predator control	
Dog control	
Community relations	

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(6) Calculate the management costs

North Island brown kiwi project

Project management	$3 064 260
Service support	$612 852
Infrastructure	$1 172 520
Outcome monitoring	$391 182
Predator control	$3 911 821
Dog control	$766 065
Community relations	$3 096 858
Total over 50 years	$12,897,720

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(6) Calculate the management costs

Project	Cost *C*			Weight *W*	
North Island brown kiwi	$12,897,720			0.224	
Robust grasshopper	$8,412,335			0.002	
Long-tailed bat	$10,116,626			0.011	
Maud Island frog	$2,076,132			0.087	
Canterbury mudfish	$1,400,653			0.049	

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(7) Predict the benefit to assets

$$\textbf{Benefit} = P_a - P_0$$

P_a = the probability of security with the management project
P_0 = the probability of security without management

Species	P_a	P_0	B
North Island brown kiwi	0.95	0.00	0.95
Robust grasshopper	0.95	0.05	0.90
Long-tailed bat	0.95	0.00	0.95
Maud Island frog	0.95	0.25	0.70
Canterbury mudfish	0.95	0.00	0.95

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(7) Predict the benefit to assets

Project	Cost *C*	Benefit *B*		Weight *W*	
North Island brown kiwi	$12,897,720	0.95		0.224	
Robust grasshopper	$8,412,335	0.90		0.002	
Long-tailed bat	$10,116,626	0.95		0.011	
Maud Island frog	$2,076,132	0.70		0.087	
Canterbury mudfish	$1,400,653	0.95		0.049	

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(8) Estimate likelihood of success

Species	S
North Island brown kiwi	1
Robust grasshopper	0.05
Long-tailed bat	0.21
Maud Island frog	1
Canterbury mudfish	0.16

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(8) Estimate likelihood of success

Project	Cost C	Benefit B	Success S	Weight W	
North Island brown kiwi	$12,897,720	0.95	1.00	0.224	
Robust grasshopper	$8,412,335	0.90	0.05	0.002	
Long-tailed bat	$10,116,626	0.95	0.21	0.011	
Maud Island frog	$2,076,132	0.70	1.00	0.087	
Canterbury mudfish	$1,400,653	0.95	0.16	0.049	

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(9) Rank projects

$$\text{Project Efficiency} = \frac{W \times B \times S}{C}$$

B = Benefits of the project
S = Probability of success of project
C = Project costs
W = Species value

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(9) Rank projects

Project	Cost C	Benefit B	Success S	Weight W	$PE = \frac{W \times B \times S}{C} \times 10^{-12}$
North Island brown kiwi	$12,897,720	0.95	1.00	0.224	16470
Robust grasshopper	$8,412,335	0.90	0.05	0.002	13
Long-tailed bat	$10,116,626	0.95	0.21	0.011	204
Maud Island frog	$2,076,132	0.70	1.00	0.087	29346
Canterbury mudfish	$1,400,653	0.95	0.16	0.049	5361

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(9) Rank projects

	Project	Cost C	Benefit B	Success S	Weight W	$PE = \frac{W \times B \times S}{C} \times 10^{-12}$
2	North Island brown kiwi	$12,897,720	0.95	1.00	0.224	16470
5	Robust grasshopper	$8,412,335	0.90	0.05	0.002	13
4	Long-tailed bat	$10,116,626	0.95	0.21	0.011	204
1	Maud Island frog	$2,076,132	0.70	1.00	0.087	29346
3	Canterbury mudfish	$1,400,653	0.95	0.16	0.049	5361

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Rank	Project	C	B	S	W	PE*1e12
1	Wood rose	$1,231,194	0.70	1.00	0.236	134009
2	Maud Island frog	$2,076,132	0.70	1.00	0.087	29346
3	Shrubby tororaro	$1,217,047	0.40	0.90	0.091	27003
4	Hamilton's frog	$2,182,636	0.60	1.00	0.087	23927
5	North Island brown kiwi	$12,897,720	0.95	1.00	0.224	16470
6	Climbing everlasting daisy	$604,269	0.35	1.00	0.023	13592
7	Hochsetter's frog	$577,966	0.10	0.90	0.087	13554
8	New Zealand shore plover	$1,394,502	0.40	0.76	0.043	9381
9	Oreomyrrhis sp. nov	$1,167,133	0.70	0.90	0.015	7916
10	Pittosporum patulum	$5,264,883	0.95	1.00	0.044	7913
11	Pachycladon exilis	$1,418,753	0.95	0.48	0.024	7842
12	Archey's frog	$7,950,247	0.70	0.90	0.087	6897
13	Canterbury mudfish	$1,400,653	0.95	0.16	0.049	5361
14	Carmichaelia hollowayi	$1,213,650	0.70	0.68	0.006	2306
15	Poa spania	$1,367,361	0.70	0.90	0.005	2089
16	Chatham Island oystercatcher	$2,932,430	0.95	0.42	0.012	1698
17	Kaki	$13,924,215	0.95	0.95	0.019	1247
18	Cardamine cf. bilobata	$1,395,080	0.95	0.20	0.008	1033
19	Black robin	$2,502,151	0.40	0.41	0.012	804
20	Pygmy button daisy	$480,693	0.60	0.04	0.008	436
21	Cook Strait giant weta	$1,280,897	0.40	1.00	0.001	363
22	Big-nose galaxias	$3,176,555	0.95	0.06	0.019	338
23	Carabid beetle	$1,955,562	0.70	0.21	0.003	206
24	Long-tailed bat	$10,116,626	0.95	0.21	0.011	204
25	Lowland long jaw galaxid	$2,805,222	0.95	0.03	0.019	177
26	Orange-fronted parakeet	$23,403,819	0.95	0.10	0.041	164
27	Mohua	$9,386,714	0.40	0.38	0.007	116
28	Grand skink	$11,738,055	0.95	0.48	0.003	105
29	Otago Skink	$11,738,055	0.95	0.48	0.003	105
30	Short horned grasshopper	$5,997,109	0.90	0.14	0.001	31
31	Chevron skink	$12,855,468	0.70	0.14	0.003	22
32	Robust grasshopper	$8,412,335	0.90	0.05	0.002	13

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Conservation Biology

Contributed Paper

Optimal Allocation of Resources among Threatened Species: a Project Prioritization Protocol

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Abstract: *Conservation funds are grossly inadequate to address the plight of threatened species. Government and conservation organizations faced with the task of conserving threatened species desperately need simple strategies for allocating limited resources. The academic literature dedicated to systematic priority setting usually recommends ranking species on several criteria, including level of endangerment and metrics of species value such as evolutionary distinctiveness, ecological importance, and social significance. These approaches ignore 2 crucial factors: the cost of management and the likelihood that the management will succeed. These oversights will result in misallocation of scarce conservation resources and possibly unnecessary losses. We devised a project prioritization protocol (PPP) to optimize resource allocation among New Zealand's threatened-species projects, where costs, benefits (including species values), and the likelihood of management success were considered simultaneously. We compared the number of species managed and the expected*

Joseph, L. N., R. F. Maloney, and H. P. Possingham (2009) Optimal allocation of resources among threatened species: a project prioritization protocol. *Conservation Biology* 23:328-338.

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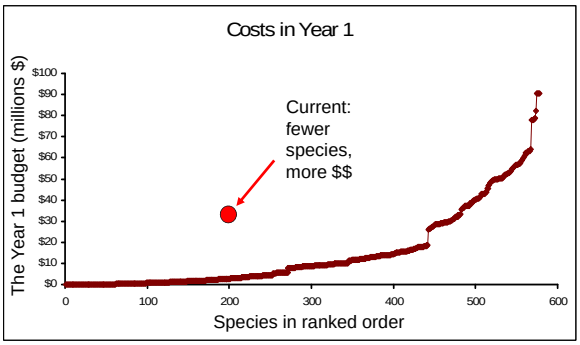

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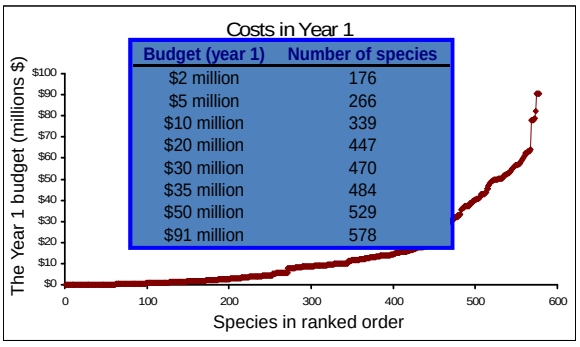

Budget (year 1)	Number of species
$2 million	176
$5 million	266
$10 million	339
$20 million	447
$30 million	470
$35 million	484
$50 million	529
$91 million	578

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Who is using it?

- New Zealand – Species
- New Zealand – Ecosystems
- Tasmania – state and NRMs
- NSW - DECCW
- Australia - DEWHA
- WWF Macropods

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New Zealand threatened species

- Designed and ranked management projects for 700 of New Zealand's most threatened species
- Two objectives: "security" and "persistence"
- Will guide spending of NZ$33 million/year
- Resulted in a plan to effectively manage >300 more species

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New Zealand threatened species

Joseph, LN, R Maloney & HP Possingham (2009) Optimal allocation of resources among threatened species: a project prioritization protocol. ***Conservation Biology***, 23:328-338

Joseph, LN, R Maloney, S O'Connor, P Cromarty, P Jansen, T Stephens & HP Possingham (2008) Improving resource allocation methods for threatened species: the case for a new national approach in New Zealand. ***Pacific Conservation Biology***, 14:154-158

Maloney, RF, LN Joseph, DG Newman, SM O'Conner & HP Possingham (2009) Development of a new approach to threatened species management in New Zealand. In JM Baxter and CA Galbraith (eds). ***Species management: Challenges and solutions for the 21st century.*** TSO Scotland, Edinburgh

New Zealand threatened species

Nowak, R. 2009. 'Flawed' Red List putting species at risk. ***New Scientist***, 11 March 2009:8-9.

AEDA. 2009. Dial PPP for robust allocation: A transparent and correct method for choosing management priorities for threatened species. ***Decision Point***, 29: 8-10.

New Zealand Ecosystems

- In the process of designing and ranking management projects for all of New Zealand's ecosystems

Tasmanian threatened species

- The 3 Tasmania NRMs contracted the state government to prioritise management actions for threatened species
- In collaboration with DoC and **AEDA**, they used the Project Prioritisation Protocol
- We are working with them to publish the results and learnings

NSW threatened species

- Using the Project Prioritisation Protocol for NSW's *Priority Action Statements* = PAS2

J Szabo, S Briggs, R Lonie, L Bell, I Hunter, RF Maloney, LN Joseph and HP Possingham (2009) The feasibility of applying a cost-effective approach for assigning priorities for threatened species recovery with a case study from New South Wales, Australia. *Pacific Conservation Biology*

Joseph, LN, JEM Watson, HP Possingham (2009) The NSW Priority Action Statement and opportunities for maximising return on investment for conservation. Environmental Management and Restoration 10(S1): S143-S144

WWF - Macropods

- Prioritising management actions for all the macropods of Australia, PNG and Indonesia

Joseph, LN, HP Possingham (2009) Prioritising projects for the management of threatened macropods of Australia. WWF – Australia

Australia - DEWHA

- Working with Peter Latch to evaluate planning systems for identifying and prioritising management actions
- Reviewing the effectiveness of Recovery Plans
- Examining the potential to retrofit Recovery Plans to use in the Project Prioritisation Protocol
- Review of EBPC Act (2009): 5.72-5.76 – recommends PPP framework for prioritising recovery management

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Other projects on the horizon...

- Using the Project Prioritisation Protocol to prioritise management of:
  - Private reserves (Australian Wildlife Conservancy)
  - Single species management (Bridled Nailtail Wallaby)

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