

Systematic, transparent and repeatable species prioritisation

The recently released Statistics New Zealand report on Sustainable Development includes biodiversity amongst its measures. The selected biodiversity indicators are used to chart progress, or lack of it, compared to earlier assessments. Statistics New Zealand's summary of results is... "*The distribution of seven native 'indicator' species has declined over the three decades to 2007. Most of this decline is attributed to predation and competition from introduced pests and habitat loss. Between 2002 and 2005, the threat status worsened rather than improved for a greater number of native species. However, native land cover changed very little between 1997 and 2002.*"

That brief comment provides some insight into the nature and scale of the challenges New Zealand faces in managing its biodiversity. New Zealand has a very large number of threatened and endangered species. About 2800 of New Zealand's estimated 90,000 indigenous species are listed as threatened and a further 3000 are listed as data deficient (Hitchmough 2007). Large numbers of introduced animal (including 32 mammal species) and 16,000 plants species predate on or compete with indigenous species. Land use conversion still occurs and resulted in 175 km² loss of indigenous habitat between 1996-2002 (OECD 2007).

Government (national, regional and local), a range of Not for Profits and businesses, and hundreds of individuals apply effort to combat the threats, halt the decline and restore the dawn chorus, midday katydid chirrup and sighing forests. The resources available to tackle the challenges of managing biodiversity are limited. The efforts applied, have to date proved insufficient to reverse the trend of biodiversity loss. Given the scale of the challenge how can society best allocate the limited resources available to manage biodiversity? This sounds like and indeed is a classic economic problem – there are not enough resources available to tackle all problems simultaneously. We have to make hard choices and determine priorities.

The value to humans, threats, home range areas, effectiveness, cost, speed of response to biodiversity projects, vary between species and projects. Kiwis are iconic, known world wide, long lived, slow population growth rate species and have many vertebrate predators. Maud Island Frog occurred only on one island and are vulnerable to disease, pollution and predation. *Pittosporum patulum* is found only in the eastern South Island in sub-alpine scrub and in canopy gaps of mountain beech forest above 800 metres. It faces threats from possums, deer, goats and rats. *Dactylanthus* or woodrose, is a flowering parasitic plant which grows on the roots of trees on the forest floor. It faces threats from browsing, habitat depletion, collection, reduced pollination.

There are plenty of options on how biodiversity management resources might be allocated. Six strategies that could be considered are: most at risk threatened species first; most iconic threatened species first; most popular species first; most genetically important threatened species first; low cost threatened species first; equal expenditures on all threatened species; most cost-effective projects first. The choices we make inevitably require tradeoffs or forgoing some actions and possible outcomes.

Researchers in a few countries have explored the likely outcomes from pursuing prioritisation strategies somewhat like those listed above (Metrick & Weitzman 1996; Joseph et al., 2009; Doerksen et al., 1998). After some years of seemingly opaque approaches to prioritisation of biodiversity projects, New Zealand is now at the forefront of efforts applying systematic, transparent and repeatable methods to prioritisation. Liana Joseph, Richard Maloney and Hugh Possingham (2009) report

how they have developed a Project Prioritization Protocol (PPP), and with input from 105 experts, investigated the impacts of varying approaches to prioritisation of more than 2000 species. Project management parameters (costs, benefit and probability of success) and species parameters (taxonomic distinctiveness and threat status) were used to characterise over 2000 species projects. Five priority setting methods (weighted efficiency; unweighted efficiency; cost, distinctiveness; threat status) were used to investigate tradeoffs between projects.

Their paper reports (Table 2) the ranks for species projects depending on choice of weighting method. *Dactylanthus* for example ranks: 1, 2, 7, 1, 27; North Island Brown Kiwi ranks: 5, 19, 30, 2, 28. The concluding words of Joseph et al., (2009: 10) are notable for their economic content and their importance for conservation. “*We demonstrated that to select management actions that maximize conservation outcomes, it is insufficient to prioritize species based solely on threat status or species value. Correspondingly, return on investment of conservation dollars is substantially improved by incorporating management costs, benefit, and likelihood of management success. Consequently, the number of species managed and the expected overall benefit to threatened species is increased remarkably.*”

The PPP approach is certainly a major advance in prioritisation methods. PPP could be modified to include other characteristics of species such as ecosystem importance (Perry 2006). The introduction of PPP may provide a means in future to determine how best to integrate State and NFP species conservation efforts. Systematic, transparent, repeatable systems are to be hailed for their ability to lead to most effective use of species conservation dollars.

References

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