Decision science for landscape scale conservation

Conservation science is booming and as it matures many of its components are becoming more quantitative. In this talk I will discuss how we have been using decision theory tools to solve problems in conservation – like what actions to take where, prioritizing actions for threatened species and zoning multi-use landscapes with Marxan (http://www.uq.edu.au/marxan/).

Ultimately, deciding what actions to do when and where is the key conservation problem – and the challenge is determining their costs, expected benefits (which can be hard to quantify) and likelihood of success. We will discuss these issues.

Recent relevant papers:

Bode M., Wilson K.A., Brooks T.M., Turner W.R., Mittermeier R.A., McBride M.F., Underwood E.C. & Possingham H.P. 2008. Cost-effective global conservation spending is robust to taxonomic group. ***Proceedings of the National Academy of Sciences of the United States of America***, 105, 6498-6501

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Klaassen M., Bauer S., Madsen J. & Possingham H. 2008. Optimal management of a goose flyway: migrant management at minimum cost. ***Journal of Applied Ecology***, 45, 1446-1452.

Klein C., Wilson K., Watts M., Stein J., Berry S., Carwardine J., Smith M.S., Mackey B. & Possingham H. (2009). Incorporating ecological and evolutionary processes into continental-scale conservation planning. ***Ecological Applications***, 19, 206-217

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McDonald-Madden E., Gordon A., Wintle B.A., Walker S., Grantham H., Carvalho S., Bottrill M., Joseph L., Ponce R., Stewart R. & Possingham H.P. 2009. "True" Conservation Progress. ***Science***, 323, 43-44

Fuller, R. A., E. McDonald-Madden, K. A. Wilson, J. Carwardine, H. S. Grantham, J. E. M. Watson, C. J. Klein, D. C. Green, and H. P. Possingham. 2010. Replacing underperforming protected areas achieves better conservation outcomes. ***Nature*** 466:365-367.

McDonald-Madden, E., P. W. J. Baxter, R. A. Fuller, T. G. Martin, E. T. Game, J. Montambault, and H. P. Possingham. 2011. Should we implement monitoring or research for conservation? ***Trends in Ecology & Evolution*** 26:108-109.

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Aside from his day job, Hugh has a variety of broader public roles advising policy makers and managers sitting on 16 committees and boards outside the University including: The Wentworth Group of Concerned Scientists (founding member), Queensland Smart State Council, Chief Editor of Conservation Letters (an international scientific journal, Council of the Australian Academy of Science, and ENGO scientific advisory committee. He and Dr Barry Traill wrote "The Brigalow Declaration", used by Premier Beattie to stop land clearing in Queensland thereby securing at least 1 billion tonnes of CO_2.

The Possingham lab developed the most widely used conservation planning software in the world. Marxan www.ecology.uq.edu.au/marxan.htm was used to underpin the rezoning of the Great Barrier Reef and is currently used in over 100 countries by over 2500 users – from the UK to Brazil.

Hugh has coauthored over 300 refereed publications covered by the Web of Science (21 in Science, Nature or PNAS) and has 7500 Web of Science citations. He currently directs two research centres, each of c$15 million, and he has supervised (or is supervising) 51 PhD students and 32 postdoctoral fellows.