

## REINETTE BIGGS: PUBLICATIONS

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### PEER-REVIEWED JOURNAL ARTICLES

1. Biggs, D., M.L. Schoon, **R. Biggs**, V. Dakos, and R.J. Scholes. In press. One crisis after another: Are we entering an era of concatenated global shocks? *Ecology and Society*.
2. Pereira H. M., P. W. Leadley, V. Proenca, R. Alkemade, J. P. W. Scharlemann, J. F. Fernandez-Manjarres, M. B. Araujo, P. Balvanera, **R. Biggs**, W. W. L. Cheung, L. Chini, H. D. Cooper, E. L. Gilman, S. Guenette, G. C. Hurtt, H. P. Huntington, G. M. Mace, T. Oberdorff, C. Revenga, P. Rodrigues, R. J. Scholes, U. R. Sumaila, and M. Walpole. 2010. Scenarios for Global Biodiversity in the 21st Century. *Science* 330:1496-1501. DOI: 10.1126/science.1196624.
3. **Biggs, R.**, F.R. Westley and S.R. Carpenter. 2010. Navigating the back loop: Fostering social innovation and transformation in ecosystem management. *Ecology and Society* 15(2): 9.
4. **Biggs, R.**, M.W. Diebel, D. Gilroy, A.M. Kamarainen, M.S. Kornis, N.D. Preston, J.E. Schmitz, C.K. Uejio, M.C. Van De Bogert, B.C. Weidel, P.C. West, D.P.M. Zaks and S.R. Carpenter. 2010. Preparing for the future: Teaching scenario planning at the graduate level. *Frontiers in Ecology and the Environment* 8(5): 267-273. doi:10.1890/080075
5. Chapin, F.S., III, S.R. Carpenter, G.P. Kofinas, C. Folke, N. Abel, W.C. Clark, P. Olsson, D.M. Stafford Smith, B.H. Walker, O.R. Young, F. Berkes, **R. Biggs**, J.M. Grove, R.L. Naylor, E. Pinkerton, W. Steffen and F.J. Swanson. 2010. Ecosystem Stewardship: Sustainability Strategies for a Rapidly Changing Planet. *Trends in Ecology and Evolution* 25(4): 241-249.
6. Walker, B.H., L. Pearson, M. Harris, K.G. Mäler, L. Chuan-Zhong, **R. Biggs** and T. Baynes. Incorporating resilience in the assessment of Inclusive Wealth: An example from South East Australia. 2010. *Environmental and Resource Economics* 45: 183-202.
7. **Biggs, R.**, S.R. Carpenter and W.A. Brock. 2009. Turning back from the brink: Detecting an impending regime shift in time to avert it. *Proceedings of the National Academy of Sciences* 106(3): 826-831.
8. **Biggs, R.**, S.R. Carpenter and W.A. Brock. 2009. Spurious certainty: How ignoring measurement error and environmental heterogeneity may contribute to environmental controversies. *BioScience* 59(1): 65-76.
9. Kamarainen, A.M., F. Rowland, **R. Biggs**, and S.R. Carpenter. 2008. Zooplankton and the Total Phosphorous-Chlorophyll a relationship: A hierarchical Bayesian analysis. *Canadian Journal of Fisheries and Aquatic Sciences* 65: 2644-2655.
10. **Biggs, R.**, H. Simons, M. Bakkenes, R.J. Scholes, B. Eickhout, D. van Vuuren and J.R.M. Alkemade. 2008. Scenarios of biodiversity loss in southern Africa in the 21<sup>st</sup> Century. *Global Environmental Change* 18: 296-309.
11. Hui, D., **R. Biggs**, R.J. Scholes, and R.B. Jackson. 2008. Measuring uncertainty in estimates of biodiversity loss: The example of biodiversity intactness variance. *Biological Conservation* 141: 1091-1094.
12. **Biggs, R.**, C. Raudsepp-Hearne, C. Atkinson-Palombo, E. Bohensky, E. Boyd, G. Cundill, H. Fox, S. Ingram, K. Kok, S. Spehar, M. Tengö, D. Timmer, M. Zurek. 2007. Linking futures across scales: a dialog on multi-scale scenarios. *Ecology and Society* 12(1):17.
13. Kok, K., **R. Biggs** and M. Zurek. 2007. Methods for developing participatory scenarios at multiple scales: Insights from southern Africa and Europe. *Ecology and Society* 12(1):8.
14. Carpenter, S.R., B.J. Benson, **R. Biggs**, J.W. Chipman, J.A. Foley, S.A. Golding, R.B. Hammer, P.C. Hanson, P.T.J. Johnson, A.M. Kamarainen, T.K. Kratz, R.C. Lathrop, K.D.

- McMahon, B. Provencher, J.A. Rusak, C.T. Solomon, E.H. Stanley, M.G. Turner, M.J. Vander Zanden, C.-H. Wu and H. Yuan. 2007. Understanding regional change: Comparison of two lake districts. *BioScience* 57(4): 323-335.
15. **Biggs, R.**, B. Reyers and R.J. Scholes. 2006. A biodiversity intactness score for South Africa. *South African Journal of Science* 102(7/8): 277-283.
  16. Scholes, R.J. and **R. Biggs**. 2005. A biodiversity intactness index. *Nature* 434: 45-49.
  17. Van Jaarsveld, A.S., **R. Biggs**, R.J. Scholes, E. Bohensky, B. Reyers, T. Lynam, C. Msuvuto and C. Fabricius. 2005. Measuring conditions and trends in ecosystem services at multiple scales: The Southern African Assessment (SAfMA) experience. *Philosophical Transactions of the Royal Society of London, Series B, Biological Sciences* 360: 425-441.
  18. **Biggs, R.**, H.C. Biggs, T.T. Dunne, N. Govender and A.L.F. Potgieter. 2003. Experimental burn plot trial in the Kruger National Park: history, experimental design and suggestions for data analysis. *Koedoe* 46(1): 1-15.
  19. **Biggs, R.** and R.J. Scholes. 2002. Land-cover changes in South Africa 1911-1993. *South African Journal of Science* 98(9/10): 420-424.
  20. Jacobs, O.S. and **R. Biggs**. 2002. The impact of the African elephant on Marula (*Sclerocarya birrea* subsp. *caffra*) trees in the Kruger National Park. *South African Journal of Wildlife Research* 32(1): 13-22.
  21. Jacobs, O.S. and **R. Biggs**. 2002. The status and population structure of the Marula (*Sclerocarya birrea* subsp. *caffra*) in the Kruger National Park. *South African Journal of Wildlife Research* 32(1): 1-12.
  22. Jacobs, O.S. and **R. Biggs**. 2001. The effect of different fire treatments on the population structure and density of the Marula, *Sclerocarya birrea* (A.Rich.) subsp. *caffra* (Sond.) *kokwaro* (Kokwaro & Gillet 1980) in the Kruger National Park. *African Journal of Range and Forage Science* 18(1): 13-23.
  23. Enslin, B.W., A.L.F. Potgieter, H.C. Biggs and **R. Biggs**. 2000. Long term effects of fire frequency and season on the woody vegetation dynamics of the *Sclerocarya birrea*/*Acacia nigrescens* savanna of the Kruger National Park. *Koedoe* 43(1): 27-37.

#### PEER-REVIEWED BOOK CHAPTERS

1. **Biggs, R.**, T. Blenckner, C. Folke, L. Gordon, A. Norström, M. Nyström and G. Peterson. In press. Regime Shifts. In: *Sourcebook in Theoretical Ecology*. A. Hastings and L. Gross (eds). University of California Press.
2. Scholes, R.J., **R. Biggs**, C. Palm and A. Duraiappah. 2010. Assessing state and trends in ecosystem services and human well-being. Chapter 4 in: *Ecosystems and Human Well-being: A manual for assessment practitioners*. N. Ash, H. Blanco, C. Brown, K. Garcia, T. Henrichs, N. Lucas, C. Raudsepp-Hearne, R.D. Simpson, R.J. Scholes, T. Tomich, B. Vira, and M. Zurek (eds). Island Press, Washington DC. ISBN: 9781597267106.
3. Carpenter, S.R. and **R. Biggs**. 2009. Freshwaters: Managing across scales in space and time. Chapter 9 (p197-220) in: *Principles of ecosystem stewardship: Resilience-based natural resource management in a changing world*. F.S. Chapin, III, G.P. Kofinas and C. Folke (eds). Springer, New York. ISBN: 978-0-387-73032-5.
4. Chapin III F.S., G.P. Kofinas, C. Folke, S.R. Carpenter, P. Olsson, N. Abel, **R. Biggs**, R.L. Naylor, E. Pinkerton, D.M. Stafford-Smith, W.L. Steffen, B.H. Walker, and O.R. Young. 2009. Resilience-based stewardship: Strategies for navigating sustainable pathways in a changing world. Chapter 15 (p319-337) in: *Principles of ecosystem stewardship: Resilience-based natural resource management in a changing world*. F.S. Chapin, III, G.P. Kofinas and C. Folke (eds). Springer, New York. ISBN: 978-0-387-73032-5.

5. Zurek, M., **R. Biggs**, C. Raudsepp-Hearne, E.M. Bennett, K. Kok and S.J. Velarde. 2008. Looking into the future of ecosystem services and human well-being. Chapter 4 (p45-56) in: *Ecosystem Services: A Guide for Decision Makers*. J. Ranganathan, C. Raudsepp-Hearne, N. Lucas, F. Irwin, M. Zurek, K. Bennett, N. Ash, P. West. World Resources Institute, Washington DC, USA. ISBN: 978-1-56973-669-2. [http://pdf.wri.org/ecosystem\\_services\\_guide\\_for\\_decisionmakers.pdf](http://pdf.wri.org/ecosystem_services_guide_for_decisionmakers.pdf)
6. **Biggs, R.** and R.J. Scholes. 2007. Assessing the loss of natural capital: A biodiversity intactness index. Chapter 6 (p44-54) in: *Restoring Natural Capital: Science, Business, and Practice*. J. Aronson, S.J. Milton and J.N. Blignaut (eds). The Science and Practice of Ecological Restoration Series. Island Press, Washington DC, USA. ISBN: 1-59726-076-2.
7. Scholes, R.J., **R. Biggs**, E.J. Brown Gaddis and K.D. Holl. 2007. Overcoming obstacles at a global scale to restore natural capital. Chapter 30 (p265-274) in: *Restoring Natural Capital: Science, Business, and Practice*. J. Aronson, S.J. Milton and J.N. Blignaut (eds). The Science and Practice of Ecological Restoration Series. Island Press, Washington DC, USA. ISBN: 1-59726-076-2.
8. **Biggs, R.**, R.J. Scholes, B.J.E. ten Brink and D. Vačkář. 2007. Biodiversity Indicators. Chapter 16 (p249-270) in: *Sustainability indicators: A scientific assessment*. T. Hák B. Moldan, and A.L. Dahl (eds). SCOPE Report 67, Island Press, Washington DC, USA. ISBN: 1-59726-131-9.
9. Karlsson, S., A.L. Dahl, **R. Biggs**, B.J.E. ten Brink, E. Gutierrez-Espeleta, M.N.H. Hasan, G. Laumann, B. Moldan, A. Singh, J. Spangenberg, D. Stanners. 2007. Meeting conceptual challenges. Chapter 2 (p27-48) in: *Sustainability indicators: A scientific assessment*. T. Hák B. Moldan, and A.L. Dahl (eds). SCOPE Report 67, Island Press, Washington DC, USA. ISBN: 1-59726-131-9.
10. Scholes, R.J., W. Küper and **R. Biggs**. 2006. Biodiversity. Chapter 7 (p226-261) in: *Africa Environmental Outlook 2: Our environment, our wealth*. United Nations Environment Programme, Nairobi, Kenya. ISBN: 92-807-2691-9. [http://www.unep.org/dewa/africa/aeo2\\_launch/index.asp](http://www.unep.org/dewa/africa/aeo2_launch/index.asp)
11. Zermoglio, M.F., A.S. van Jaarsveld, W.V. Reid, J. Romm, **R. Biggs**, Y. Tianxiang, L. Vicente. 2005. The multiscale approach. Chapter 4 (p61-84) in: *Ecosystems and human well-being: Multiscale assessments*. D. Capistrano, C.K. Samper, M.J. Lee, C. Raudsepp-Hearne (eds). Report of the Sub-Global Assessments Working Group of the Millennium Ecosystem Assessment, Island Press, Washington DC, USA. ISBN: 1-55963-186-4. <http://www.maweb.org/en/Products.aspx>
12. Lebel, L, P. Thongbai, K. Kok, J.B.R. Agard, E.M. Bennett, **R. Biggs**, M. Ferreira, C. Filer, Y. Gokhale, W. Mala, C. Rumsey, S.J. Velarde, M. Zurek, H. Blanco, T. Lynam, Y. Tianxiang. 2005. Sub-global scenarios. Chapter 10 (p229-260) in: *Ecosystems and human well-being: Multiscale assessments*. D. Capistrano, C.K. Samper, M.J. Lee, C. Raudsepp-Hearne (eds). Report of the Sub-Global Assessments Working Group of the Millennium Ecosystem Assessment, Island Press, Washington DC, USA. ISBN: 1-55963-186-4. <http://www.maweb.org/en/Products.aspx>
13. **Biggs, R.** and R.J. Scholes. 2005. South Africa. p542-549 in: *Our Earth's Changing Land: An Encyclopedia of Land-Use and Land-Cover Change*. H. Geist (ed). Greenwood Publishing Group, Westport, USA. ISBN: 0-313-32704-1.
14. **Biggs, R.** and R.J. Scholes. 2005. Southern Africa. p560-566 in: *Our Earth's Changing Land: An Encyclopedia of Land-Use and Land-Cover Change*. H. Geist (ed.). Greenwood Publishing Group, Westport, USA. ISBN: 0-313-32704-1.
15. Capistrano, D., L. Lebel, C. Samper, R.J. Scholes, T.J. Wilbanks, **R. Biggs**, M.J. Lee and G. Petschel-Held. 2003. Dealing with Scale. Chapter 5 (p107-126) in: *Ecosystems and Human Well-being: A Framework for Assessment*. Report of the Conceptual Framework Working

Group of the Millennium Ecosystem Assessment. Island Press, Washington DC, USA. ISBN: 1-55963-403-0. <http://www.maweb.org/en/Products.aspx>

## REPORTS

1. Elmqvist, T., S. Polasky, F. Alpizar, H. Berg, T. Bergendorff, **R. Biggs**, G. Cumming, O. Eriksson, A. Hejnowicz, A. Kinzig, C. Kremen, A. Larigauderie, S. Naeem, C. Perrings, S. Purushothaman, B. Reyers, M. Schultz. 2010. Ecosystem Service Indicators: A social-ecological systems approach for generating relevant indicators for the CBD 2020 targets. Report to UNEP and the CBD. DIVERSITAS bioSUSTAINABILITY Program, Stockholm, Sweden.
2. Leadley, P., H.M. Pereira, R. Alkemade, J.F. Fernandez-Manjarrés, V. Proença, J.P.W. Scharlemann, M.J. Walpole, et al. 2010. Biodiversity Scenarios: Projections of 21st century change in biodiversity and associated ecosystem services. 132 pp. Convention on Biological Diversity, Montreal, Canada. ISBN 92-9225-219-4. [Contributing author] <http://www.cbd.int/doc/publications/cbd-ts-50-en.pdf>
3. Bakkes, J., L. Aalbers, T. Aalbers, **R. Biggs**, H. Eerens, B. Eickhout, K. Geurs, A. Hanemaaijer, H. Hoff, N. Hoogervorst, M. Kok, H. Nijland, T. Manders, K. Overmars, J. Notenboom, F. van Oort, A. Petersen, G. Peterson, J. Ros, B. van Ruijven, L. van Schaik, M. Thissen, D. van Vuuren, H. Westhoek. 2009. Getting in the Right Lane for 2050. 106pp. Netherlands Environmental Assessment Agency (PBL), Bilthoven, The Netherlands. ISBN: 978-90-6960-235-6. <http://www.rivm.nl/bibliotheek/rapporten/500150001.pdf>
4. **Biggs, R.**, E. Bohensky, P.V. Desanker, C. Fabricius, T. Lynam, A.A. Misselhorn, C. Musvoto, M. Mutale, B. Reyers, R.J. Scholes, S. Shikongo, A.S. van Jaarsveld. 2004. *Nature supporting people: The Southern African Millennium Ecosystem Assessment. Integrated Report*. 68pp. Council for Scientific and Industrial Research, Pretoria, South Africa. ISBN: 0-7988-5528-2. <http://www.maweb.org/en/Products.Subglobal.aspx>
5. Scholes, R.J. and **R. Biggs** (eds). 2004. *Ecosystem Services in Southern Africa: A regional assessment*. 84pp. Council for Scientific and Industrial Research, Pretoria, South Africa. ISBN: 0-7988-5527-4. <http://www.maweb.org/en/Products.Subglobal.aspx>

## LAY PUBLICATIONS

1. Carpenter S. R., **R. Biggs**, M. Diebel, J. Fox, D. Gilroy, A. Kamarainen, M. Kornis, N. Preston, J. Schmitz, C. Uejio, M. Van de Bogert, B. Weidel, P. West, and D. Zaks 2007. Scenarios for the future of Lake Wingra. Report prepared for Friends of Lake Wingra by Zoology 955 graduate students, Spring 2007. Center for Limnology, University of Wisconsin, Madison, WI, USA.
2. **Southern African Millennium Ecosystem Assessment (SAfMA)**. 2004. *Nature supporting People: The Southern African Millennium Ecosystem Assessment. Summary for Decision-Makers*. 8pp. Council for Scientific and Industrial Research, Pretoria, South Africa. <http://www.maweb.org/en/Products.Subglobal.aspx>
3. **Southern African Millennium Ecosystem Assessment (SAfMA)**. 2002. *Nature serving People: A pilot assessment of Southern African Ecosystems*. Brochure released at the World Summit on Sustainable Development (WSSD), August 2002. 16pp. Council for Scientific and Industrial Research, Pretoria, South Africa. <http://www.maweb.org/en/Products.Subglobal.aspx>