

# PRIMARY TEMPERATE FORESTS

## HARBOR UNIQUE BIODIVERSITY AND ECOSYSTEM SERVICES, INCLUDING CLIMATE REGULATION

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The statements made in the primary temperate forest infographic were drawn from the following publications.

### Carbon

- Ajani, J. I., Keith, H., Blakers, M., Mackey, B. G., & King, H. P. (2013). Comprehensive carbon stock and flow accounting: A national framework to support climate change mitigation policy. *Ecological Economics*, 89(5), 61-72.
- Brown, S., Schroeder, P., & Birdsey, R. (1997). Aboveground biomass distribution of US eastern hardwood forests and the use of large trees as an indicator of forest development. *Forest Ecology and Management*, 96(1-2), 37-47.
- Dean, C., Roxburgh, S., & Mackey, B. (2003). Growth modelling of Eucalyptus regnans for carbon accounting at the landscape scale. In *Modelling forest systems. Workshop on the interface between reality, modelling and the parameter estimation processes*, Sesimbra, Portugal, 2-5 June 2002 (pp. 27-39). CABI, Sesimbra, Portugal.
- Harmon, M. E. (2019). Have product substitution carbon benefits been overestimated? A sensitivity analysis of key assumptions. *Environmental Research Letters*, 14(6), 065008.
- Keith, H., Lindenmayer, D. B., MacKey, B. G., Blair, D., Carter, L., McBurney, L., ... Konishi-Nagano, T. (2014b). Accounting for biomass carbon stock change due to wildfire in temperate forest landscapes in Australia. *PLoS ONE*, 9(9), e107126.
- Keith, H., Lindenmayer, D., MacKey, B., Blair, D., Carter, L., McBurney, L., ... Konishi-Nagano, T. (2014a). Managing temperate forests for carbon storage: Impacts of logging versus forest protection on carbon stocks. *Ecosphere*, 5(6), 75.
- Keith, H., Mackey, B. G., & Lindenmayer, D. B. (2009). Re-evaluation of forest biomass carbon stocks and lessons from the world's most carbon-dense forests. *Proceedings of the National Academy of Sciences of the United States of America*, 106(28), 11635-11640.
- Mackey, B. (2014). Counting trees, carbon and climate change. *The Royal Statistical Society*, 11(1), 19-23.
- Mackey, B., DellaSala, D. A., Kormos, C., Lindenmayer, D., Kumpel, N., Zimmerman, B., ... Watson, J. E. M. (2015). Policy Options for the World's Primary Forests in Multilateral Environmental Agreements. *Conservation Letters*, 8(2), 139-147.
- Mackey, B., Prentice, I. C., Steffen, W., House, J. I., Lindenmayer, D., Keith, H., & Berry, S. (2013). Untangling the confusion around land carbon science and climate change mitigation policy. *Nature Climate Change*, 3(6), 552-557.
- Moomaw, W. R., Masino, S. A., & Faison, E. K. (2019). Intact Forests in the United States: Proforestation Mitigates Climate Change and Serves the Greatest Good. *Frontiers in Forests and Global Change*, 2, 27.
- Ough, K. (2001). Regeneration of wet forest flora a decade after clear-felling or wildfire - Is there a difference? *Australian Journal of Botany*, 49(5), 645-664.
- Roxburgh, S. H., Wood, S. W., Mackey, B. G., Woldendorp, G., & Gibbons, P. (2006). Assessing the carbon sequestration potential of managed forests: A case study from temperate Australia. *Journal of Applied Ecology*, 43(6), 1149-1159.
- Stephenson, N. L., Das, A. J., Condit, R., Russo, S. E., Baker, P. J., Beckman, N. G., ... Zavala, M. A. (2014). Rate of tree carbon accumulation increases continuously with tree size. *Nature*, 507(7490), 90-93.
- Watson, J. E. M., Evans, T., Venter, O., Williams, B., Tulloch, A., Stewart, C., ... Lindenmayer, D. (2018). The exceptional value of intact forest ecosystems. *Nature Ecology and Evolution*, 2(4), 599-610.

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## Carbon Numbers

- Intergovernmental Panel on Climate Change (IPCC) (2006). Agriculture, forestry and other land use: Forest land. In: IPCC Guidelines for National Greenhouse Gas Inventories. IGES, Kanagawa, Japan (83 pp.).
- Keith, H., Mackey, B. G., & Lindenmayer, D. B. (2009). Re-evaluation of forest biomass carbon stocks and lessons from the world's most carbon-dense forests. *Proceedings of the National Academy of Sciences of the United States of America*, 106(28), 11635-11640.
- Morales-Hidalgo, D., Oswalt, S. N., & Somanathan, E. (2015). Status and trends in global primary forest, protected areas, and areas designated for conservation of biodiversity from the Global Forest Resources Assessment 2015. *Forest Ecology and Management*, 352, 68-77.
- Pan, Y., Birdsey, R. A., Fang, J., Houghton, R., Kauppi, P. E., Kurz, W. A., ... & Ciais, P. (2011). A large and persistent carbon sink in the world's forests. *Science*, 333(6045), 988-993.
- Post, W. M., Pastor, J., Zinke, P. J., & Stangenberger, A. G. (1985). Global patterns of soil nitrogen storage. *Nature*, 317(6038), 613-616.

## Big, Old Trees

- Bradley, C. M., Hanson, C. T., & DellaSala, D. A. (2016). Does increased forest protection correspond to higher fire severity in frequent-fire forests of the western United States? *Ecosphere*, 7(10), e01492.
- DellaSala, D. A. (2019). Fire-mediated biological legacies in dry forested ecosystems of the Pacific Northwest, USA. In *Disturbance Ecology and Biological Diversity* (pp. 65-86). CRC Press, Boca Raton, FL.
- Ellison, D., Morris, C. E., Locatelli, B., Sheil, D., Cohen, J., Murdiyarso, D., ... Sullivan, C. A. (2017). Trees, forests and water: Cool insights for a hot world. *Global Environmental Change*, 43, 51-61.
- Harmon, M. E., Franklin, J. F., Swanson, F. J., Sollins, P., Gregory, S. V., Lattin, J. D., ... Cummins, K. W. (2004). Ecology of coarse woody debris in temperate ecosystems. *Advances in Ecological Research*, 15, 133-302.
- Lesmeister, D. B., Sovern, S. G., Davis, R. J., Bell, D. M., Gregory, M. J., & Vogeler, J. C. (2019). Mixed-severity wildfire and habitat of an old-forest obligate. *Ecosphere*, 10(4), e02696.
- Lindenmayer, D. B., Laurance, W. F., & Franklin, J. F. (2012). Global decline in large old trees. *Science*, 338(6112), 1305-1306.
- Mackey, B., DellaSala, D. A., Kormos, C., Lindenmayer, D., Kumpel, N., Zimmerman, B., ... Watson, J. E. M. (2015). Policy Options for the World's Primary Forests in Multilateral Environmental Agreements. *Conservation Letters*, 8(2), 139-147.
- McIntosh, D. (2020). Australian National Register of Big Trees. <<https://www.nationalregisterofbigtrees.com.au>> (accessed February 5, 2020)
- Sillett, S. C., Van Pelt, R., Koch, G. W., Ambrose, A. R., Carroll, A. L., Antoine, M. E., & Mifsud, B. M. (2010). Increasing wood production through old age in tall trees. *Forest Ecology and Management*, 259(5), 976-994.
- Szalay, J. (2017). Giant Sequoias and Redwoods: The Largest and Tallest Trees. <<https://www.livescience.com/39461-sequoias-redwood-trees.html>> (accessed January 14, 2020)
- Thompson, J. R., Spies, T. A., & Ganio, L. M. (2007). Reburn severity in managed and unmanaged vegetation in a large wildfire. *Proceedings of the National Academy of Sciences of the United States of America*, 104(25), 10743-10748.
- Tng, D. Y. P., Williamson, G. J., Jordan, G. J., & Bowman, D. M. J. S. (2012). Giant eucalypts - globally unique fire-adapted rain-forest trees? *New Phytologist*, 196(4), 1001-1014.
- Watson, J. E. M., Evans, T., Venter, O., Williams, B., Tulloch, A., Stewart, C., ... Lindenmayer, D. (2018). The exceptional value of intact forest ecosystems. *Nature Ecology and Evolution*, 2(4), 599-610.

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## Biodiversity

- Brandt, P., Abson, D. J., DellaSala, D. A., Feller, R., & von Wehrden, H. (2014). Multifunctionality and biodiversity: Ecosystem services in temperate rainforests of the Pacific Northwest, USA. *Biological Conservation*, 169, 362–371.
- Cederholm, C. J., Kunze, M. D., Murota, T., & Sibatani, A. (1999). Pacific Salmon Carcasses: Essential Contributions of Nutrients and Energy for Aquatic and Terrestrial Ecosystems. *Fisheries*, 24(10), 6–15.
- Claridge, A. W. (2002). Ecological role of hypogeous ectomycorrhizal fungi in Australian forests and woodlands. *Plant and Soil*, 244(1–2), 291–305.
- Clout, M. N., & Gaze, P. D. (1984). Effects of Plantation Forestry on Birds in New Zealand. *The Journal of Applied Ecology*, 21(3), 795.
- DellaSala, D. A. (2011). *Temperate and boreal rainforests of the world: ecology and conservation*. Island Press, Washington, DC (336 pp.).
- DellaSala, D. A., Bond, M. L., Hanson, C. T., Hutto, R. L., & Odion, D. C. (2014). Complex early seral forests of the Sierra Nevada: what are they and how can they be managed for ecological integrity? *Natural Areas Journal*, 34(3), 310–324.
- DellaSala, D. A., & Hanson, C. T. (2015). *The Ecological Importance of Mixed-Severity Fires: Nature's Phoenix*. Elsevier, Boston (409 pp.).
- Keith, H., Vardon, M., Stein, J. A., Stein, J. L., & Lindenmayer, D. (2017). Ecosystem accounts define explicit and spatial trade-offs for managing natural resources. *Nature Ecology and Evolution*, 1(11), 1683–1692.
- Peh, K. S. H., Corlett, R. T., & Bergeron, Y. (2015). *Routledge Handbook of Forest Ecology*. Routledge, London, United Kingdom (652 pp.).
- Silander, J. A. Jr. (2001). Temperate Forests: plant species biodiversity and conservation. In *Encyclopedia of Biodiversity*, 5, 607–626.
- Spies, T. A. (2004). Ecological concepts and diversity of old-growth forests. *Journal of Forestry*, 102(3), 14–21.
- Swanson, M. E., Franklin, J. F., Beschta, R. L., Crisafulli, C. M., DellaSala, D. A., Hutto, R. L., Lindenmayer, D. B., & Swanson, F. J. (2011). The forgotten stage of forest succession: early-successional ecosystems on forested sites. *Frontiers in Ecology and Environment*, 9(2), 117–125.
- Watson, J. E. M., Evans, T., Venter, O., Williams, B., Tulloch, A., Stewart, C., ... Lindenmayer, D. (2018). The exceptional value of intact forest ecosystems. *Nature Ecology and Evolution*, 2(4), 599–610.
- Wiensczyk, a. M., Gamiet, S., Durall, D. M., Jones, M. D., & Simard, S. W. (2002). Ectomycorrhizae and forestry in British Columbia: A summary of current research and conservation strategies. *British Columbia Journal of Ecosystems and Management*, 2(1), 1–20.
- Wilcox, B. A., & Murphy, D. D. (1985). Conservation strategy: the effects of fragmentation on extinction. *American Naturalist*, 125, 879–887.
- Willson, M. F., Gende, S. M., & Marston, B. H. (1998). Fishes and the Forest: Expanding perspectives on fish-wildlife interactions. *BioScience*, 48(6), 455–462.
- Zurita, G. A., Rey, N., Varela, D. M., Villagra, M., & Bellocq, M. I. (2006). Conversion of the Atlantic Forest into native and exotic tree plantations: Effects on bird communities from the local and regional perspectives. *Forest Ecology and Management*, 235(1–3), 164–173.