

APPENDIX 2:

LITERATURE CITED COMPILED FROM ALL SECTIONS

Ecosystem Based Management Challenges for Alberta and Saskatchewan Forests

Α

- AFCSSC. 1997. Alberta forest conservation strategy a new perspective on sustaining Alberta's forests. Government of Alberta, Edmonton, AB, Canada.
- Agrawal, A., Chhatre, A., and Hardin, R. 2008. Changing Governance of the World's Forests. Science **320**(5882): 1460 LP-1462. https://doi.org/10.1126/science.1155369.
- Ajao, O., Marinova, M., Savadogo, O., and Paris, J. 2018. Hemicellulose based integrated forest biorefineries: Implementation strategies. Industrial Crops and Products **126**: 250–260. https://doi.org/10.1016/j.indcrop.2018.10.025.
- Alberta Environmental Protection. 1998. Interim Forest Management Planning Manual: Guidelines to Plan Development. Government of Alberta, Edmonton, AB.
- Alberta Pacific Forest Industries. 2015. Alberta-Pacific FMA Area 2015 Forest Management Plan: Chapter 1 Corporate Overview and Forest Management Approach.
- Alberta Pacific Forest Industries (Al-Pac). 1993. An operator's guide to stand structure. Boyle, AB, Canada.
- Alberta Water Council. 2013. Riparian Land Conservation and Management Report and Recommendations. Edmonton, AB, Canada.
- Alberta Wilderness Association (AWA). 2016. Alberta Wilderness Association position statement Alberta's forests. Alberta Wilderness Association. Calgary, AB, Canada.
- Allen, C.D., Breshears, D.D., and McDowell, N.G. 2015. On underestimation of global vulnerability to tree mortality and forest die-off from hotter drought in the Anthropocene. Ecosphere 6(8): art129. John Wiley & Sons, Ltd. https://doi.org/10.1890/ES15-00203.1.
- Allen, C.R., Fontaine, J.J., Pope, K.L., and Garmestani, A.S. 2011. Adaptive management for a turbulent future. Journal of Environmental Management **92**(5): 1339–1345. https://doi.org/10.1016/j.jenvman.2010.11.019.
- American Forest and Paper Association. 1994. Sustainable forestry principles and implementation guidelines. Washington D.C.
- Andison, D.W. 1998. Temporal patterns of age-class distributions on foothills landscapes in Alberta. Ecography **21**: 543–550. https://doi.org/10.1111/j.1600-0587.1998.tb00446.x.
- Andison, D.W. 2003a. Disturbance Events on Foothills and Mountain Landscapes of Alberta Part I. Alberta foothills disturbance ecology research series, report No, 5, Hinton, Alberta, Canada.

- Andison, D.W. 2003b. Tactical forest planning and landscape design. *In* Sustainable Management of the Boreal Forest. *Edited by* P.J. Burton, C. Messier, D.W. Smith, and W.L. Adamowicz. NRC Research Press, Ottawa, ON, Canada. pp. 433–480.
- Andison, D.W. 2006a. Finding Common Ground: Some Definitions. Natural Disturbance Program Integration Note Series, Issue #1, Hinton, Alberta, Canada.
- Andison, D.W. 2006b. Determining island remnant patterns and meso-scale fire patterns in Saskatchewan, Part 3: Event composition and spatial controls. Vancouver, British Columbia, Canada.
- Andison, D.W. 2006c. Large-Scale Natural Disturbance Demonstration Area. Hinton, Alberta, Canada.
- Andison, D.W. 2006d. Determining island remnant patterns and meso-scale fire patterns in Saskatchewan, Part 2: Island remnant patterns. Vancouver, British Columbia, Canada.
- Andison, D.W. 2012. The influence of wildfire boundary delineation on our understanding of burning patterns in the Alberta foothills1This article is one of a selection of papers from the 7th International Conference on Disturbance Dynamics in Boreal Forests. Canadian Journal of Forest Research **42**(7): 1253–1263. NRC Research Press. https://doi.org/10.1139/x2012-074.
- Andison, D.W. 2013. Wildfire patterns in western boreal Canada. Healthy Landscapes Research Report #8., Hinton, Alberta, Canada.
- Andison, D.W. 2019a. Pre-Industrial Fire Regimes of the Western Boreal Forest of Canada. fRI Research, Hinton, AB, Canada.
- Andison, D.W. 2019b. Modelling Historical Landscape Patterns on the Alberta-Pacific FMA.
- Andison, D.W. 2020a. EBM is a Journey. Healthy Landscapes Program, fRI Research, Hinton, AB, Canada.
- Andison, D.W. 2020b. Understanding Pre-Industrial Landscape Patterns on the Upper Peace Region of Alberta. Healthy Landscapes Program, Hinton, AB, Canada.
- Andison, D.W., Chubaty, A.M., and McIntire, E.J.B. 2021. Understanding historical landscape patterns in the Province of Alberta. fRI Research, Hinton, AB, Canada.
- Andison, D.W., Damme, L. Van, Hebert, D., Moore, T., Bonar, R., Boutin, S., and Donnelly, M. 2009a. The Healthy Landscape Approach to Land Management. A Foothills Research Institute, Natural Disturbance Program Project. Hinton, Alberta, Canada.
- Andison, D.W., and Kimmins, J.P. 1999. Scaling up to understand British Columbia's boreal mixedwoods. Environmental Reviews **7**(1): 19–30.
- Andison, D.W., Kremsater, L.L., Bélisle, A.C., Bergeron, Y., and MacLean, D. 2016. Towards a Natural Range of Variation (NRV) Strategy for the Canadian Boreal Forest Agreement Summary Report. Canadian Boreal Forest Agreement, Ottawa, ON, Canada.
- Andison, D.W., and McCleary, K. 2002. Disturbance in riparian zones on foothills and mountain landscapes of Alberta. Healthy Landscapes Program, Hinton, Alberta, Canada.
- Andison, D.W., and McCleary, K. 2014. Detecting regional differences in within-wildfire burn patterns in western boreal canada. Forestry Chronicle **90**(1): 59–69. https://doi.org/10.5558/tfc2014011.
- Andison, D.W., Parkins, J.R., Pyper, M.P., and Lebeouf, J. 2019. Understanding EBM Through Dialogue.



Healthy Landscapes Program, Hinton, AB, Canada.

- Andison, D.W., VanDamme, L., Hebert, D., Moore, T., Bonar, R., Boutin, S., and Donnelly, M. 2009b. The Healthy Landscape Approach to Land Management. A Foothills Research Institute, Natural Disturbance Program Project. fRI Research, Hinton, AB, Canada.
- Archibald, J.H., Klappenstein, G.D., and Corns, I.G.W. 1996. Field guide to ecosites of Southwestern Alberta. Special Report 5. Edmonton, AB, Canada.
- Arkle, R.S., and Pilliod, D.S. 2010. Prescribed fires as ecological surrogates for wildfires: A stream and riparian perspective. Forest Ecology and Management **259**(5): 893–903. https://doi.org/10.1016/j.foreco.2009.11.029.
- Arno, S.F., and Brown, J.K. 1991. Overcoming the paradox in managing wildland fire. Western Wildlands **17**: 40–46.
- Arno, S.F., Parsons, D.J., and Keane, R.E. 2000. Mixed-severity fire regimes in the northern Rocky Mountains: consequences of fire exclusion and options for the future. *In* Proceedings of the Wilderness Science in a Time of Change Conference. *Edited by* D.N. Cole, S.F. McCool, W.T. Borrie, and J. O'Loughlin. U.S. Department of Agriculture, Forest Service, Rocky Mountain research Station, Missoula, MT, USA. pp. 225–232.
- Arsenault, A., LeBlanc, R., Earle, E., Brooks, D., Clarke, B., Lavigne, D., and Royer, L. 2016. Unravelling the past to manage Newfoundland's forests for the future. The Forestry Chronicle **92**(04): 487–502. Canadian Institute of Forestry. https://doi.org/10.5558/tfc2016-085.
- ARTEC. 1991. Report of the Alberta round table on the environment and economy. Government of Alberta, Edmonton, AB, Canada.
- Asner, G.P. 2013. Geography of forest disturbance. Proceedings of the National Academy of Sciences **110**(10): 3711 LP-3712. https://doi.org/10.1073/pnas.1300396110.
- Aumann, C., Farr, D.R., and Boutin, S. 2007. Multiple use, overlapping tenures, and the challenge of sustainable forestry in Alberta. The Forestry Chronicle 83(5): 642–650. Canadian Institute of Forestry. https://doi.org/10.5558/tfc83642-5.

B

- Bacon, E.C., and Williams, M.D. 2021. Deconstructing the ivory tower: identifying challenges of university-industry ecosystem partnerships. Review of Managerial Science: s11846. https://doi.org/10.1007/s11846-020-00436-7.
- Baker, J.M., and Westman, C.N. 2018. Extracting knowledge: Social science, environmental impact assessment, and Indigenous consultation in the oil sands of Alberta, Canada. The Extractive Industries and Society 5(1): 144–153. https://doi.org/10.1016/j.exis.2017.12.008.
- Balint, P.J., Stewart, R.E., Desai, A., and Walters, L.C. 2011. Wicked environmental problems: managing uncertainty and conflict. Island Press, Washington D.C.
- Ballin, P., and Vyse, A. 2020. Old-growth Forests: A new future for old forests. A summary with commentary for BC Nature. BC Nature **54**: 6–10.

- Batavia, C., and Nelson, M.P. 2016. Conceptual Ambiguities and Practical Challenges of Ecological Forestry: A Critical Review. Journal of Forestry **114**(5): 572–581. https://doi.org/10.5849/jof.15-103.
- Baynham-Herd, Z., Redpath, S., Bunnefeld, N., Molony, T., and Keane, A. 2018. Conservation conflicts: Behavioural threats, frames, and intervention recommendations. Biological Conservation 222: 180–188. https://doi.org/10.1016/j.biocon.2018.04.012.
- Beach, L.R. 2021. Scenarios as narratives. Futures & Foresight Science 3: e58.
- Beanlands, G.E., and Duinker, P.N. 1983. An ecological framework for environmental impact assessment in Canada. Hull, QC, Canada.
- Beckingham, J.D., and Archibald, J.H. 1996. Field guide to ecosites of Northern Alberta. Special Report 5. Edmonton, AB, Canada.
- Beckingham, J.D., Corns, I.G.W., and Archibald, J.H. 1996a. Field Guide to Ecosites of West-central Alberta. Special Report 5. Edmonton, AB, Canada.
- Beckingham, J.D., Futoransky, V.A., and Corns, I.G.W. 1999. Ecological classification of Saskatchewan's mid-boreal ecoregions using resource maps and aerial photographs. Edmonton, AB, Canada.
- Beckingham, J.D., Nielsen, D.G., and Futoransky, V.A. 1996b. Field guide to ecosites of the mid-boreal ecoregions of Saskatchewan. Edmonton, AB, Canada.
- Beese, W.J., Deal, J., Dunsworth, B.G., Mitchell, S.J., and Philpott, T.J. 2019. Two decades of variable retention in British Columbia: a review of its implementation and effectiveness for biodiversity conservation. Ecological Processes **8**(1): 33. https://doi.org/10.1186/s13717-019-0181-9.
- Beese, W.J., Dunsworth, B.G., Zielke, K., and Bancroft, B. 2003. Maintaining attributes of old-growth forests in coastal B.C. through variable retention. The Forestry Chronicle **79**(3): 570–578. Canadian Institute of Forestry. https://doi.org/10.5558/tfc79570-3.
- Beland Lindahl, K., Sandström, C., and Sténs, A. 2017. Alternative pathways to sustainability? Comparing forest governance models. Forest Policy and Economics **77**: 69–78. https://doi.org/10.1016/j.forpol.2016.10.008.
- Beller, E.E., McClenachan, L., Zavaleta, E.S., and Larsen, L.G. 2020. Past forward: Recommendations from historical ecology for ecosystem management. Global Ecology and Conservation 21: e00836. https://doi.org/10.1016/j.gecco.2019.e00836.
- Bendix, J., and Cowell, C.M. 2010. Fire, floods and woody debris: Interactions between biotic and geomorphic processes. Geomorphology **116**(3): 297–304. https://doi.org/10.1016/j.geomorph.2009.09.043.
- Benítez-López, A., Alkemade, R., and Verweij, P.A. 2010. The impacts of roads and other infrastructure on mammal and bird populations: A meta-analysis. Biological Conservation **143**(6): 1307–1316. https://doi.org/10.1016/j.biocon.2010.02.009.
- Benson, M.H. 2012. Intelligent Tinkering: the Endangered Species Act and Resilience. Ecology and Society 17(4): 28. The Resilience Alliance. https://doi.org/10.5751/ES-05116-170428.
- Bentham, P. 2007. Audit of oil and gas mitigation measures employed within woodland caribou ranges. Golder Associates Ltd., Edmonton, AB, Calgary, AB, Canada and Montreal QC, CAnada.

- Bergeron, Y., Chen, H.Y.H., Kenkel, N.C., Leduc, A.L., and Macdonald, S.E. 2014. Boreal mixedwood stand dynamics: ecological processes underlying multiple pathways. The Forestry Chronicle **90**(02): 202– 213. Canadian Institute of Forestry. https://doi.org/10.5558/tfc2014-039.
- Bergeron, Y., Harvey, B., Leduc, A., and Gauthier, S. 1999. Forest management guidelines based on natural disturbance dynamics: Stand- and forest-level considerations. Forestry Chronicle 75(1): 49– 54. https://doi.org/10.5558/tfc75049-1.
- Bergeron, Y., Leduc, A., Harvey, B., and Gauthier, S. 2002. Natural fire regime: a guide for sustainable management of the Canadian boreal forest. Silva Fennica **36**(1): 81–95.
- Berkes, F. 2010. Devolution of environment and resources governance: trends and future. Environmental Conservation **37**(4): 489–500. Cambridge University Press. https://doi.org/10.1017/S037689291000072X.
- Berkes, F. 2018. Sacred Ecology: Traditional Ecological Knowledge and Resource Management. Routledge, New York, NY, USA.
- Berkes, F., Colding, J., and Folke, C. 2000. Rediscovery of traditional ecological knowledge as adaptive management. Ecological Applications **10**(5): 1251–1262. John Wiley & Sons, Ltd. https://doi.org/10.1890/1051-0761(2000)010[1251:ROTEKA]2.0.CO;2.
- Berkes, F., Colding, J., and Folke, C. 2008. Navigating Social-Ecological Systems: Building resilience for complexity and change. Cambridge University Press, Cambridge, UK.
- Berlinck, C.N., and Batista, E.K.L. 2020. Good fire, bad fire: It depends on who burns. Flora **268**: 151610. https://doi.org/10.1016/j.flora.2020.151610.
- Bird, S.C., and Hodges, K.E. 2017. Critical habitat designation for Canadian listed species: Slow, biased, and incomplete. Environmental Science and Policy **71**: 1–8. https://doi.org/10.1016/j.envsci.2017.01.007.
- Blackwell, B.A. 2021. What are the barriers and complexity to increasing the area treated by prescribed fire? Tree Frog News: online. Delta, BC, Canada.
- Bliss, J.C. 2000. Public Perceptions of Clearcutting. Journal of Forestry **98**: 4–9. https://doi.org/10.1093/jof/98.12.4.
- Bobrow, D.B. 2006. Policy design: Ubiquitous, necessary and difficult. *In* Handbook of Public Policy. *Edited by* B.G. Peters and J. Pierre. pp. 75–96. https://doi.org/10.4135/9781848608054.n5.
- Bonar, R. 2020. Ecosystem-based management for fish habitat. unpublished report, Vernon, BC, Canada.
- Bonar, R.L. 2000. Availability of pileated woodpecker cavities and use by other species. Journal of Wildlife Management **64**(1): 52–59.
- Bonar, R.L. 2001. Sustainable forest management practices on the Weldwood Forest Management Area at Hinton, Alberta. The Forestry Chronicle **77**(1): 69–73. https://doi.org/10.5558/tfc77069-1.
- Bond-Lamberty, B., Peckham, S.D., Ahl, D.E., and Gower, S.T. 2007. Fire as the dominant driver of central Canadian boreal forest carbon balance. Nature **450**(7166): 89–92. https://doi.org/10.1038/nature06272.

Bose, A.K., Harvey, B.D., Brais, S., Beaudet, M., and Leduc, A. 2014. Constraints to partial cutting in the

boreal forest of Canada in the context of natural disturbance-based management: a review. Forestry: An International Journal of Forest Research **87**(1): 11–28. https://doi.org/10.1093/forestry/cpt047.

Bott, R., Murphy, P.J., and Udell, R. 2003. Learning from the Forest. fRI Research, Hinton, AB, Canada.

- Botti, S.J. 1995. Funding fuels management in the National Park Service: costs and benefits. *In* The Biswell symposium: fire issues and solutions in urban interface and wildland ecosystems. *Edited by* R.E. Weise, David R.; Martin. Gen. Tech. Rep. PSW-GTR-158. Albany, CA: Pacific Southwest Research Station, Forest, Walnut Creek, California. pp. 57–62.
- Boulanger, Y., Arseneault, D., Boucher, Y., Gauthier, S., Cyr, D., Taylor, A.R., Price, D.T., and Dupuis, S. 2019. Climate change will affect the ability of forest management to reduce gaps between current and presettlement forest composition in southeastern Canada. Landscape Ecology **34**(1): 159–174. https://doi.org/10.1007/s10980-018-0761-6.
- Boulanger, Y., and Pascual Puigdevall, J. 2021. Boreal forests will be more severely affected by projected anthropogenic climate forcing than mixedwood and northern hardwood forests in eastern Canada. Landscape Ecology **36**(6): 1725–1740. https://doi.org/10.1007/s10980-021-01241-7.
- Bourgeois, W.W. 2008. Ecosystem-based management: Its application to forest management in British Columbia. Journal of Ecosystems and Management **9**(1): 1–11.
- Bourguignon, D. 2015. The precautionary principle: Definitions, applications and governance. European Parliamentary Research Service.
- Bowler, D.E., Mant, R., Orr, H., Hannah, D.M., and Pullin, A.S. 2012. What are the effects of wooded riparian zones on stream temperature? Environmental Evidence **1**(1): 3. https://doi.org/10.1186/2047-2382-1-3.
- Bowman, D.M.J.S., Kolden, C.A., Abatzoglou, J.T., Johnston, F.H., van der Werf, G.R., and Flannigan, M. 2020. Vegetation fires in the Anthropocene. Nature Reviews Earth & Environment **1**(10): 500–515. https://doi.org/10.1038/s43017-020-0085-3.
- Boyd, E., Nykvist, B., Borgström, S., and Stacewicz, I.A. 2015. Anticipatory governance for socialecological resilience. Ambio **44**(1): 149–161. https://doi.org/10.1007/s13280-014-0604-x.
- Boyd, R.G., and Hyde, W.F. 1989. Forestry sector intervention: the impacts of public regulation on social welfare. Iowa State University Press, Iowa City, Iowa, USA.
- Brassard, B.W., and Chen, H.Y.H. 2006. Stand structural dynamics of North American boreal forests. https://doi.org/10.1080/07352680500348857.
- Breslow, S.J., Allen, M., Holstein, D., Sojka, B., Barnea, R., Basurto, X., Carothers, C., Charnley, S., Coulthard, S., Dolšak, N., Donatuto, J., García-Quijano, C., Hicks, C.C., Levine, A., Mascia, M.B., Norman, K., Poe, M., Satterfield, T., St. Martin, K., and Levin, P.S. 2017. Evaluating indicators of human well-being for ecosystem-based management. Ecosystem Health and Sustainability 3(12): 1–18. Taylor & Francis. https://doi.org/10.1080/20964129.2017.1411767.
- Brice, M.-H., Vissault, S., Vieira, W., Gravel, D., Legendre, P., and Fortin, M.-J. 2020. Moderate disturbances accelerate forest transition dynamics under climate change in the temperate–boreal ecotone of eastern North America. Global Change Biology 26(8): 4418–4435. John Wiley & Sons, Ltd. https://doi.org/10.1111/gcb.15143.

- Brooks, T.M., Mittermeier, R.A., Mittermeier, C.G., Da Fonseca, G.A.B., Rylands, A.B., Konstant, W.R., Flick, P., Pilgrim, J., Oldfield, S., Magin, G., and Hilton-Taylor, C. 2002. Habitat Loss and Extinction in the Hotspots of Biodiversity. Conservation Biology **16**(4): 909–923. John Wiley & Sons, Ltd. https://doi.org/10.1046/j.1523-1739.2002.00530.x.
- Brownsey, K., and Rayner, J. 2009. Integrated land management in Alberta: From economic to environmental integration. Policy and Society **28**(2): 125–137. Routledge. https://doi.org/10.1016/j.polsoc.2009.05.002.
- Brundtland, G.H. 1987. Our common future: Report of the World Commission on Environment and Development. United Nations, New York, N.Y.
- Brunet, N.D., Hickey, G.M., and Humphries, M.M. 2016. Local participation and partnership development in Canada's Arctic research: challenges and opportunities in an age of empowerment and self-determination. Polar Record 52(3): 345–359. Cambridge University Press. https://doi.org/DOI: 10.1017/S003224741500090X.
- Budny, T. 2014. Integrated Environmental Policy in Alberta. University of Calgary. https://doi.org/10.11575/PRISM/26568.
- Bullock, R., Kirchhoff, D., Mauro, I., and Boerchers, M. 2018. Indigenous capacity for collaboration in Canada's energy, forestry and mining sectors: research metrics and trends. Environment, Development and Sustainability 20(2): 883–895. https://doi.org/10.1007/s10668-017-9917-9.
- Bunn, S.A., and Arthington, A.H. 2002. Basic Principles and Ecological Consequences of Altered Flow Regimes for Aquatic Biodiversity. Environmental Management **30**(4): 492–507. https://doi.org/10.1007/s00267-002-2737-0.
- Burda, C., Curran, D., Gale, F., and M'Gonigle, M. 1997. Forests in Trust: Reforming British Columbia's Forest Tenure System for Ecosystem and Community Health. *In* Report series R97-2. Eco-Research Chair of Environmental Law and Policy, Faculty of Law and Environmental Studies Programme, Victoria, BC, Canada.
- Burton, P.J., Messier, C., Adamowicz, W.L., and Kuuluvainen, T. 2006. Sustainable management of Canada's boreal forests: Progress and prospects. Écoscience **13**(2): 234–248. Taylor & Francis. https://doi.org/10.2980/i1195-6860-13-2-234.1.
- Burton, P.J., Messier, C., Weetman, G.F., Prepas, E.E., Adamowicz, W.L., and Tittler, R. 2003. The current state of boreal forestry and the drive for change. *In* Towards sustainable management of the boreal forest. National Research Council of Canada, Ottawa, ON, Canada. pp. 1–40.
- Buse, L.J., Wagner, R.G., and Perrin, B. 1995. Public attitudes towards forest herbicide use and the implications for public involvement. The Forestry Chronicle **71**(5): 596–600. Canadian Institute of Forestry. https://doi.org/10.5558/tfc71596-5.
- Butler, K.F., and Koontz, T.M. 2005. Theory into Practice: Implementing Ecosystem Management Objectives in the USDA Forest Service. Environmental Management **35**(2): 138–150. https://doi.org/10.1007/s00267-003-0312-y.

С

- Camaclang, A.E., Maron, M., Martin, T.G., and Possingham, H.P. 2015. Current practices in the identification of critical habitat for threatened species. Conservation Biology **29**(2): 482–492. John Wiley & Sons, Ltd. https://doi.org/10.1111/cobi.12428.
- Canada's Oil Sands Innovation Alliance. 2012. Canada's Oil Sands Innovation Alliance Charter. Edmonton, AB, Canada.
- Canadian Biodiversity Strategy. 1995. Canadian biodiversity strategy: Canada's response to the Convention on Biological Diversity. Environment Canada: Hull, QC, Canada.
- Canadian Boreal Forest Agreement. 2010. The Canadian Boreal Forest Agreement. CBFA, Edmonton, AB, Canada.
- Canadian Boreal Forest Agreement. 2015. Forestry requirements for natural range of variation (NRV) analysis and target setting. FPAC, Montreal, QC, Canada.
- Canadian Council of Forest Ministers. 1995. Defining sustainable forest management: A Canadian approach to criteria and indicators. Natural Resources Canada Canadian Forest Service, Ottawa, ON, Canada.
- Canadian Council of Forest Ministers. 2008. A Vision for Canada's Forests 2008 and Beyond. Natural Resources Canada, Ottawa, ON, Canada.
- Canadian Endangered Species Conservation Council. 1996. Accord for the protection of species at risk. Environment and Climate Change Canada, Ottawa, ON, Canada.
- Canadian Parks and Wilderness Society. 2016. A 2016 overview: another slow year for boreal woodland caribou conservation. Ottawa, ON, Canada.
- Canadian Parks and Wilderness Society. 2020. Parks and Protected Areas. Available from https://cpaws.org/our-work/parks-protected-areas/ [accessed 10 May 2020].
- Canadian Standards Association. 2002. Z809-02 Sustainable Forest Management: Requirements and Guidance. Mississauga, ON, Canada.
- Canadian Standards Association. 2016. CAN/CSA-Z809-16 Sustainable forest management. (Fourth Edition). CSA, Mississauga, ON, Canada.
- Canadian Wetland Inventory Technical Committee. 2016. Canadian Wetland Inventory (Data Model) Version 7.0. Ducks Unllimited Canada, Toronto, ON, Canada.
- Candel, J.J.L. 2021. The expediency of policy integration. Policy Studies **42**(4): 346–361. Routledge. https://doi.org/10.1080/01442872.2019.1634191.
- Carlson, M., Stelfox, B., Purves-Smith, N., Straker, J., Berryman, S., Barker, T., and Wilson, B. 2014. ALCES Online: Web-delivered Scenario Analysis to Inform Sustainable Land-use Decisions. *In* Bold Visions for Environmental Modelling. iEMSs, San Diego, CA, USA.
- Carter, S.K., Fleishman, E., Leinwand, I.I.F., Flather, C.H., Carr, N.B., Fogarty, F.A., Leu, M., Noon, B.R., Wohlfeil, M.E., and Wood, D.J.A. 2019. Quantifying Ecological Integrity of Terrestrial Systems to Inform Management of Multiple-Use Public Lands in the United States. Environmental



Management 64(1): 1–19. https://doi.org/10.1007/s00267-019-01163-w.

- Carter, S.K., Pilliod, D.S., Haby, T., Prentice, K.L., Aldridge, C.L., Anderson, P.J., Bowen, Z.H., Bradford, J.B., Cushman, S.A., DeVivo, J.C., Duniway, M.C., Hathaway, R.S., Nelson, L., Schultz, C.A., Schuster, R.M., Trammell, E.J., and Weltzin, J.F. 2020. Bridging the research-management gap: landscape science in practice on public lands in the western United States. Landscape Ecology **35**(3): 545–560. https://doi.org/10.1007/s10980-020-00970-5.
- Cashore, B., Auld, G., and Newsom, D. 2008. Governing through markets. Yale University Press, New Haven, CT, USA.
- CCFM. 1988. A national forest sector strategy for Canada. Government of Canada, Ottawa, ON, Canada.
- CCFM. 2019. Vulnerability Assessment of Forest Health Monitoring Policies and Practices under a Changing Climate: Adaptation, Implementation and Evaluation. Government of Canada, Ottawa, ON, Canada.
- Centre for Public Impact. 2020. Why do we need to reimagine government? Available from https://www.centreforpublicimpact.org/research-and-conversations/a-new-vision-for-government [accessed 20 September 2020].
- Chalfoun, A.D., Thompson III, F.R., and Ratnaswamy, M.J. 2002. Nest Predators and Fragmentation: a Review and Meta-Analysis. Conservation Biology **16**(2): 306–318. John Wiley & Sons, Ltd. https://doi.org/10.1046/j.1523-1739.2002.00308.x.
- Chambers, F.G. 1999. The Future of Grass-Roots Co-Management in Saskatchewan. Working Paper 1999-15, Edmonton, AB, Canada.
- Chambers, J.C., Allen, C.R., and Cushman, S.A. 2019. Operationalizing Ecological Resilience Concepts for Managing Species and Ecosystems at Risk. Frontiers in Ecology and Evolution **7**: 241. https://doi.org/10.3389/fevo.2019.00241.
- Chase, A. 2017. The fight over forests & the myths of nature: In a Dark Wood. *In* In a Dark Wood: A Critical History of the Fight over Forests. https://doi.org/10.4324/9780203788943.
- Chen, H.Y.H., Vasiliauskas, S., Kayahara, G.J., and Ilisson, T. 2009. Wildfire promotes broadleaves and species mixture in boreal forest. Forest Ecology and Management **257**(1): 343–350. https://doi.org/10.1016/j.foreco.2008.09.022.
- Chen, J., Franklin, J.F., and Spies, T.A. 1993. Contrasting microclimates among clearcut, edge, and interior of old-growth Douglas-fir forest. Agricultural and Forest Meteorology **63**(3): 219–237. https://doi.org/10.1016/0168-1923(93)90061-L.
- Chu, T., and MacKasey, P. 2019. Meadow Lake Provincial Park Ecosystem Based Management Plan. Government of Saskatchewan, Regina, SK, Canada.
- Churchman, C.W. 1967. Free for All. Management Science **14**(4): B-141-B-146. INFORMS. https://doi.org/10.1287/mnsc.14.4.B141.
- Cissel, J.H., Swanson, F.J., McKee, W.A., and Burditt, A.L. 1994. Using the past to plan the future in the Pacific Northwest. Journal of Forestry **92**(8): 30–31. https://doi.org/10.1093/jof/92.8.30.
- Citrin, J., and Stoker, L. 2018. Political Trust in a Cynical Age. Annual Review of Political Science **21**(1): 49–70. Annual Reviews. https://doi.org/10.1146/annurev-polisci-050316-092550.

- Clare, S., and Sass, G. 2012. Riparian lands in Alberta: Current state, conservation tools, and management approaches. Report 1163 prepared for Riparian Land Conservation and Management Team, Alberta Water Council, Edmonton, AB.
- Clarke, J.N., and McCool, D. 1996. Staking out the terrain: power and performance among natural resource agencies. SUNY Press, New York, NY, USA.
- Coast Information Team. 2004. The Scientific Basis of Ecosystem-Based Management. Victoria, BC, Canada.
- Coates, K.D., Hall, E.C., and Canham, C.D. 2018. Susceptibility of Trees to Windthrow Storm Damage in Partially Harvested Complex-Structured Multi-Species Forests. https://doi.org/10.3390/f9040199.
- Cole, D.N., and Yung, L. 2012. Beyond naturalness: rethinking park and wilderness stewardship in an era of rapid change. Island Press, Washington, D.C., USA.
- Comeau, P.G., Kabzems, R., McClarnon, J., and Heineman, J.L. 2005. Implications of selected approaches for regenerating and managing western boreal mixedwoods. The Forestry Chronicle **81**(4): 559–574. Canadian Institute of Forestry. https://doi.org/10.5558/tfc81559-4.
- Committee on the Status of Endangered Wildlife in Canada. 2018. COSEWIC guidelines for recognizing designatable units. Ottawa, ON, Canada.
- Conservation Measures Partnership. 2020. Open standards for the practice of conservation Version 4.0. ConservationMeasures.org.
- Coogan, S.C.P., Daniels, L.D., Boychuk, D., Burton, P.J., Flannigan, M.D., Gauthier, S., Kafka, V., Park, J.S., and Wotton, B.M. 2020. Fifty years of wildland fire science in Canada. Canadian Journal of Forest Research **51**(2): 283–302. NRC Research Press. https://doi.org/10.1139/cjfr-2020-0314.
- Cooke, B.J., and Carroll, A.L. 2017. Predicting the risk of mountain pine beetle spread to eastern pine forests: Considering uncertainty in uncertain times. Forest Ecology and Management **396**: 11–25. https://doi.org/10.1016/j.foreco.2017.04.008.
- Cooke, H.A., and Hannon, S.J. 2012. Nest-site selection by old boreal forest cavity excavators as a basis for structural retention guidelines in spatially-aggregated harvests. Forest Ecology and Management **269**: 37–51. https://doi.org/10.1016/j.foreco.2011.12.042.
- Cooney, R. 2004. The precautionary principle in biodiversity conservation and natural resource management: an issues paper for policy-makers, researchers and practitioners. *In* IUCN Polic. IUCN, Gland, Switzerlandand Cambridge, UK.
- Coop, J.D., Parks, S.A., Stevens-Rumann, C.S., Crausbay, S.D., Higuera, P.E., Hurteau, M.D., Tepley, A., Whitman, E., Assal, T., Collins, B.M., Davis, K.T., Dobrowski, S., Falk, D.A., Fornwalt, P.J., Fulé, P.Z., Harvey, B.J., Kane, V.R., Littlefield, C.E., Margolis, E.Q., North, M., Parisien, M.A., Prichard, S., and Rodman, K.C. 2020. Wildfire-Driven Forest Conversion in Western North American Landscapes. BioScience **70**(8): 659–673. https://doi.org/10.1093/biosci/biaa061.
- Coops, N.C., Tompaski, P., Nijland, W., Rickbeil, G.J.M., Nielsen, S.E., Bater, C.W., and Stadt, J.J. 2016. A forest structure habitat index based on airborne laser scanning data. Ecological Indicators **67**: 346–357. https://doi.org/10.1016/j.ecolind.2016.02.057.

Cortner, H.J. 1996. Institutional barriers and incentives for ecosystem management: a problem analysis.



US Department of Agriculture, Forest Service, Pacific Northwest Research Station.

- Cortner, H.J., and Moote, M.A. 1994. Trends and issues in land and water resources management: Setting the agenda for change. Environmental Management **18**(2): 167–173. https://doi.org/10.1007/BF02393759.
- Cortner, H.J., Wallace, M.G., Burke, S., and Moote, M.A. 1998. Institutions matter: the need to address the institutional challenges of ecosystem management. Landscape and Urban Planning **40**(1): 159–166. https://doi.org/10.1016/S0169-2046(97)00108-4.
- Côté, P., Tittler, R., Messier, C., Kneeshaw, D.D., Fall, A., and Fortin, M.-J. 2010. Comparing different forest zoning options for landscape-scale management of the boreal forest: Possible benefits of the TRIAD. Forest Ecology and Management **259**(3): 418–427. https://doi.org/10.1016/j.foreco.2009.10.038.
- Creed, I.F., Duinker, P.N., Serran, J.N., and Steenberg, J.W.N. 2019. Managing risks to Canada's boreal zone: transdisciplinary thinking in pursuit of sustainability1. Environmental Reviews **27**(3): 407–418. NRC Research Press. https://doi.org/10.1139/er-2018-0070.
- Creed, I.F., and Serran, J.N. 2019. The Boreal 2050 project: a road map towards sustainability of the boreal zone1. The Boreal 2050 project: a road map towards sustainability of the boreal zone **01**(01): i–iv. NRC Research Press. https://doi.org/10.1139/er-2018-0086@er-bor.issue01.
- Creighton, M.J.A., and Bennett, J.R. 2019. Taxonomic biases persist from listing to management for Canadian species at risk. Écoscience **26**(4): 315–321. Taylor & Francis. https://doi.org/10.1080/11956860.2019.1613752.
- Cronmiller, J.G., and Noble, B.F. 2018. The discontinuity of environmental effects monitoring in the Lower Athabasca region of Alberta, Canada: institutional challenges to long-term monitoring and cumulative effects management. Environmental Reviews **26**(2): 169–180. NRC Research Press. https://doi.org/10.1139/er-2017-0083.
- Cronon, W. 1996. The Trouble with Wilderness; Or, Getting Back to the Wrong Nature. Environmental History **1**(1): 7–28. https://doi.org/10.2307/3985059.
- CSA Group. 2016. Sustainable Forest Management: CAN/CSA-Z809-16 National Standard of Canada. *In* 2nd edition. Standards Council of Canada, Ottawa, ON, Ottawa, Ontario, Canada.
- Cumming, S.G. 2005. Effective fire suppression in boreal forests. Canadian Journal of Forest Research **35**(4): 772–786. NRC Research Press. https://doi.org/10.1139/x04-174.
- Cumming, S.G., and Armstrong, G.W. 2001. Divided land base and overlapping forest tenure in Alberta, Canada: A simulation study exploring costs of forest policy. The Forestry Chronicle **77**(3): 501–508. Canadian Institute of Forestry. https://doi.org/10.5558/tfc77501-3.
- Cumming, S.G., Schmiegelow, F.K.A., and Burton, P.J. 2000. Gap dynamics in boreal aspen stands: is the forest older than we think? Ecological Applications **10**(3): 744–759. John Wiley & Sons, Ltd. https://doi.org/10.1890/1051-0761(2000)010[0744:GDIBAS]2.0.CO;2.
- Curtin, C.G., and Parker, J.P. 2014. Foundations of Resilience Thinking. Conservation Biology **28**(4): 912–923. John Wiley & Sons, Ltd. https://doi.org/10.1111/cobi.12321.

Cushman, S.A., and McGarigal, K. 2019. Metrics and Models for Quantifying Ecological Resilience at

Landscape Scales. Frontiers in Ecology and Evolution **7**: 440. https://doi.org/10.3389/fevo.2019.00440.

D

- D'Amato, A.W., and Palik, B.J. 2021. Building on the last "new" thing: exploring the compatibility of ecological and adaptation silviculture. Canadian Journal of Forest Research **51**(2): 172–180. NRC Research Press. https://doi.org/10.1139/cjfr-2020-0306.
- Dabros, A., Pyper, M., and Castilla, G. 2018. Seismic lines in the boreal and arctic ecosystems of North America: environmental impacts, challenges, and opportunities. Environmental Reviews **26**(2): 214–229. NRC Research Press. https://doi.org/10.1139/er-2017-0080.
- Daishowa-Marubeni International Ltd. 2015. White area sustained yield units timber supply. Peace River, AB, Canada.
- Dale, V.H., Joyce, L.A., McNulty, S., and Neilson, R.P. 2000. The interplay between climate change, forests, and disturbances. Science of The Total Environment **262**(3): 201–204. https://doi.org/10.1016/S0048-9697(00)00522-2.
- Dalton, R.J. 2005. The Social Transformation of Trust in Government. International Review of Sociology **15**(1): 133–154. Routledge. https://doi.org/10.1080/03906700500038819.
- Dare, M. (Lain), Schirmer, J., and Vanclay, F. 2014. Community engagement and social licence to operate. Impact Assessment and Project Appraisal **32**(3): 188–197. Taylor & Francis. https://doi.org/10.1080/14615517.2014.927108.
- Dauvergne, P. 2017. Is the Power of Brand-Focused Activism Rising? The Case of Tropical Deforestation. The Journal of Environment & Development **26**(2): 135–155. SAGE Publications Inc. https://doi.org/10.1177/1070496517701249.
- Dawe, K.L., Bayne, E.M., and Boutin, S. 2014. Influence of climate and human land use on the distribution of white-tailed deer (Odocoileus virginianus) in the western boreal forest. Canadian Journal of Zoology **92**(4): 353–363. NRC Research Press. https://doi.org/10.1139/cjz-2013-0262.
- Day, D. V. 2000. Leadership development: A review in context. The Leadership Quarterly **11**(4): 581–613. https://doi.org/10.1016/S1048-9843(00)00061-8.
- DeFries, R., and Nagendra, H. 2017. Ecosystem management as a wicked problem. Science **356**(6335): 265 LP-270. https://doi.org/10.1126/science.aal1950.
- Delacámara, G., O'Higgins, T.G., Lago, M., and Langhans, S. 2020. Ecosystem-Based Management: Moving from Concept to Practice BT - Ecosystem-Based Management, Ecosystem Services and Aquatic Biodiversity : Theory, Tools and Applications. *Edited by* T.G. O'Higgins, M. Lago, and T.H. DeWitt. Springer International Publishing, Cham. pp. 39–60. https://doi.org/10.1007/978-3-030-45843-0_3.
- DeMars, C.A., Serrouya, R., Mumma, M.A., Gillingham, M.P., McNay, R.S., and Boutin, S. 2019. Moose, caribou, and fire: have we got it right yet? Canadian Journal of Zoology **97**(10): 866–879. NRC Research Press. https://doi.org/10.1139/cjz-2018-0319.

- Demulder, B., and Thorp, W. 2007. Integrated landscape management: Moving forward, 2003–2007. *In* Edmonton: Alberta Chamber of Resources. fRI Research, Hinton, AB, Canada.
- Diaz-Balteiro, L., and Romero, C. 2008. Making forestry decisions with multiple criteria: A review and an assessment. Forest Ecology and Management **255**(8): 3222–3241. https://doi.org/10.1016/j.foreco.2008.01.038.
- Díaz, S., Pascual, U., Stenseke, M., Martín-López, B., Watson, R.T., Molnár, Z., Hill, R., Chan, K.M.A., Baste, I.A., Brauman, K.A., Polasky, S., Church, A., Lonsdale, M., Larigauderie, A., Leadley, P.W., van Oudenhoven, A.P.E., van der Plaat, F., Schröter, M., Lavorel, S., Aumeeruddy-Thomas, Y., Bukvareva, E., Davies, K., Demissew, S., Erpul, G., Failler, P., Guerra, C.A., Hewitt, C.L., Keune, H., Lindley, S., and Shirayama, Y. 2018. Assessing nature's contributions to people. Science **359**(6373): 270 LP-272. https://doi.org/10.1126/science.aap8826.
- Dietz, T., Fitzgerald, A., and Shwom, R. 2005. Environmental values. Annual Review of Environment and Resources **30**(1): 335–372. Annual Reviews. https://doi.org/10.1146/annurev.energy.30.050504.144444.
- Dodds, D.G. 1994. Toward sustainable forestry in Canada. The Forestry Chronicle **70**(5): 538–542. Canadian Institute of Forestry. https://doi.org/10.5558/tfc70538-5.
- Dods, R.R. 2002. The death of Smokey Bear: The ecodisaster myth and forest management practices in prehistoric North America. World Archaeology **33**(3): 475–487. Routledge. https://doi.org/10.1080/00438240120107486.
- Dods, R.R. 2004. Knowing ways/ways of knowing: Reconciling science and tradition. World Archaeology **36**(4): 547–557. Routledge. https://doi.org/10.1080/0043824042000303719.
- Doelle, M., and Sinclair, A.J. 2019. The new IAA in Canada: From revolutionary thoughts to reality. Environmental Impact Assessment Review **79**: 106292. https://doi.org/10.1016/j.eiar.2019.106292.
- Doran, G.T. 1981. There's SMART way to write management's goals and objectives. Management review **70**(11): 35–36.
- Doyle, M. 2014. The evolution of Saskatchewan's forest inventory: yesterday, today and tomorrow. Prince Albert, SK, Canada.
- Duinker, P.N., and Greig, L.A. 2006. The Impotence of Cumulative Effects Assessment in Canada: Ailments and Ideas for Redeployment. Environmental Management **37**(2): 153–161. https://doi.org/10.1007/s00267-004-0240-5.
- Duinker, P.N., and Greig, L.A. 2007. Scenario analysis in environmental impact assessment: Improving explorations of the future. Environmental Impact Assessment Review **27**(3): 206–219. https://doi.org/10.1016/j.eiar.2006.11.001.
- Dzus, E., Grover, B., Dyer, S., Cheyne, D., Pope, D., and Schieck, J. 2009. Setting, implementing and monitoring targets as a basis for adaptive management: a Canadian forestry case study. Setting Conservation Targets for Managed Forest Landscapes: 352–392. Cambridge University Press Cambridge.



E

- Ecojustice. 2020. First Nations, environmental groups call on Alberta and Canada to implement immediate actions to protect boreal caribou. Ecojustice, Ottawa, ON, Canada.
- Ellis, E.C., Kaplan, J.O., Fuller, D.Q., Vavrus, S., Klein Goldewijk, K., and Verburg, P.H. 2013. Used planet: A global history. Proceedings of the National Academy of Sciences **110**(20): 7978 LP-7985. https://doi.org/10.1073/pnas.1217241110.
- Eng, M. 1998. Spatial patterns in forested landscapes: implications for biology and forestry. Conservation biology principles for forested landscapes. UBC Press, Vancouver: 42–72.
- Eric Denhoff. 2016. Setting Alberta on the Path to Caribou Recovery. Government of Alberta, Edmonton, AB, Canada.
- Everest, F.H. 1997. Evaluation of the use of scientific information in developing the 1997 forest plan for the Tongass National Forest. US Department of Agriculture, Forest Service, Pacific Northwest Research Station, Corvallis, OR, USA.

F

- Fabricius, C., and Cundill, G. 2014. Learning in Adaptive Management. Ecology and Society **19**(1). Resilience Alliance Inc.
- Fahrig, L. 2003. Effects of Habitat Fragmentation on Biodiversity. Annual Review of Ecology, Evolution, and Systematics 34(1): 487–515. Annual Reviews. https://doi.org/10.1146/annurev.ecolsys.34.011802.132419.
- Fahrig, L., Arroyo-Rodríguez, V., Bennett, J.R., Boucher-Lalonde, V., Cazetta, E., Currie, D.J., Eigenbrod, F., Ford, A.T., Harrison, S.P., Jaeger, J.A.G., Koper, N., Martin, A.E., Martin, J.-L., Metzger, J.P., Morrison, P., Rhodes, J.R., Saunders, D.A., Simberloff, D., Smith, A.C., Tischendorf, L., Vellend, M., and Watling, J.I. 2019. Is habitat fragmentation bad for biodiversity? Biological Conservation 230: 179–186. https://doi.org/10.1016/j.biocon.2018.12.026.

Farnden, C. 2010. Development of regeneration standards for sustainable forest management.

- Favaro, B., Claar, D.C., Fox, C.H., Freshwater, C., Holden, J.J., Roberts, A., and Derby, Uv.R. 2014. Trends in Extinction Risk for Imperiled Species in Canada. PLOS ONE **9**(11): e113118. Public Library of Science.
- Ferreira, C.C., Hossie, T.J., Jenkins, D.A., Wehtje, M., Austin, C.E., Boudreau, M.R., Chan, K., Clement, A., Hrynyk, M., Longhi, J., MacFarlane, S., Majchrzak, Y.N., Otis, J.-A., Peers, M.J.L., Rae, J., Seguin, J.L., Walker, S., Watt, C., and Murray, D.L. 2019. The Recovery Illusion: What Is Delaying the Rescue of Imperiled Species? BioScience 69(12): 1028–1034. https://doi.org/10.1093/biosci/biz113.
- Filicetti, A.T., Cody, M., and Nielsen, S.E. 2019. Caribou Conservation: Restoring Trees on Seismic Lines in Alberta, Canada. https://doi.org/10.3390/f10020185.
- Fischer, G., Lemke, A.C., Mastaglio, T., and Morch, A.I. 1991. The role of critiquing in cooperative problem solving. ACM Transactions on Information Systems (TOIS) **9**(2): 123–151. ACM New York,

NY, USA.

Fischhoff, B., and Fischhoff, I. 2001. Publics' opinions about biotechnologies. AgBioForum 4: 155–162.

- Fisher, J.T., Burton, A.C., Nolan, L., and Roy, L. 2020. Influences of landscape change and winter severity on invasive ungulate persistence in the Nearctic boreal forest. Scientific Reports **10**(1): 8742. https://doi.org/10.1038/s41598-020-65385-3.
- Fisheries and Oceans Canada. 2019a. Measures to protect fish and fish habitat. Ottawa, Ontario, Canada.
- Fisheries and Oceans Canada. 2019b. Fish and fish habitat protection policy statement. Ottawa, ON, Canada.
- Fisheries and Oceans Canada. 2019c. Standards and codes of practice. Ottawa, ON, Canada.
- Flannigan, M.D., Logan, K.A., Amiro, B.D., Skinner, W.R., and Stocks, B.J. 2005. Future Area Burned in Canada. Climatic Change **72**(1): 1–16. https://doi.org/10.1007/s10584-005-5935-y.
- Fletcher, R.J., Didham, R.K., Banks-Leite, C., Barlow, J., Ewers, R.M., Rosindell, J., Holt, R.D., Gonzalez, A., Pardini, R., Damschen, E.I., Melo, F.P.L., Ries, L., Prevedello, J.A., Tscharntke, T., Laurance, W.F., Lovejoy, T., and Haddad, N.M. 2018. Is habitat fragmentation good for biodiversity? Biological Conservation **226**: 9–15. https://doi.org/10.1016/j.biocon.2018.07.022.

Flood Recovery Task Force. 2013. Government of Alberta Flood Recovery Plan. Edmonton, AB, Canada.

- Florsheim, J.L., Mount, J.F., and Chin, A. 2008. Bank Erosion as a Desirable Attribute of Rivers. BioScience **58**(6): 519–529. https://doi.org/10.1641/B580608.
- Foley, J.A., Defries, R., Asner, G.P., Barford, C., Bonan, G., Carpenter, S.R., Chapin, F.S., Coe, M.T., Daily, G.C., Gibbs, H.K., Helkowski, J.H., Holloway, T., Howard, E.A., Kucharik, C.J., Monfreda, C., Patz, J.A., Prentice, I.C., Ramankutty, N., and Snyder, P.K. 2005. Global consequences of land use. Science (New York, N.Y.) **309**(5734): 570–574. University of Wisconsin, Madison, WI, USA. https://doi.org/10.1126/science.1111772.
- Foothills Stream Crossing Partnership. 2015. Stream Crossing Partnership: An Overview. fRI Research, Hinton, AB.
- Forcorp Solutions Inc. 2012. Regional Forest Landscape Assessment: Upper Athabasca Region. Edmonton, AB, Canada.
- Forest Stewardship Council. 2004. National Boreal Standard. Toronto, ON, Canada.
- Forest Stewardship Council. 2018. The FSC National Forest Stewardship Standard of Canada. FSC-STD-CAN-01-2018 V 1-0 EN, Toronto, ON, Canada.
- Forestry Corp. 2006. NEPTUNE user guide. fRI Research, Hinton. AB, Edmonton, AB, Canada.
- Franklin, C.M.A., Macdonald, S.E., and Nielsen, S.E. 2019. Can retention harvests help conserve wildlife? Evidence for vertebrates in the boreal forest. Ecosphere **10**(3): e02632. https://doi.org/10.1002/ecs2.2632.
- Franklin, J.F. 1990. Biological legacies: a critical management concept from Mount St. Helens. *In* Trans. North American Wildlands Natural Resource Conference. pp. 216–219.

- Franklin, J.F. 1992. The contribution of old growth to the new forestry. Forestry Program, Faculty of Agriculture & Forestry, University of Alberta, Edmonton, AB, Canada.
- Franklin, J.F., Spies, T.A., Pelt, R. Van, Carey, A.B., Thornburgh, D.A., Berg, D.R., Lindenmayer, D.B., Harmon, M.E., Keeton, W.S., Shaw, D.C., Bible, K., and Chen, J. 2002. Disturbances and structural development of natural forest ecosystems with silvicultural implications, using Douglas-fir forests as an example. Forest Ecology and Management **155**(1): 399–423. https://doi.org/10.1016/S0378-1127(01)00575-8.
- Fraser, E.D.G., Dougill, A.J., Mabee, W.E., Reed, M., and McAlpine, P. 2006. Bottom up and top down: Analysis of participatory processes for sustainability indicator identification as a pathway to community empowerment and sustainable environmental management. Journal of Environmental Management **78**(2): 114–127. https://doi.org/10.1016/j.jenvman.2005.04.009.
- Freeman, J., Kobziar, L., Rose, E.W., and Cropper, W. 2017. A critique of the historical-fire-regime concept in conservation. Conservation Biology **31**(5): 976–985. John Wiley & Sons, Ltd. https://doi.org/10.1111/cobi.12942.
- Fridman, J., and Walheim, M. 2000. Amount, structure, and dynamics of dead wood on managed forestland in Sweden. Forest Ecology and Management **131**(1): 23–36. https://doi.org/10.1016/S0378-1127(99)00208-X.
- Fuerth, L.S. 2009. Foresight and anticipatory governance. Foresight **11**(4): 14–32. Emerald Group Publishing Limited. https://doi.org/10.1108/14636680910982412.
- Fulford, R.S., Heymans, S.J.J., and Wu, W. 2020. Mathematical Modeling for Ecosystem-Based Management (EBM) and Ecosystem Goods and Services (EGS) Assessment. *In* Ecosystem-Based Management, Ecosystem Services and Aquatic Biodiversity. Springer, Cham. pp. 275–289.
- Fuller, W.A. 2001. The Alberta forest conservation strategy revisited. Wildlands Advocate 9(3): 7.
- Fulmer, C.A., and Gelfand, M.J. 2012. At What Level (and in Whom) We Trust: Trust Across Multiple Organizational Levels. Journal of Management 38(4): 1167–1230. SAGE Publications Inc. https://doi.org/10.1177/0149206312439327.
- Fuss, G.E., Steenberg, J.W.N., Weber, M.L., Peggy Smith, M.A., and Creed, I.F. 2019. Governance as a driver of change in the Canadian boreal zone1. https://doi.org/10.1139/er-2018-0057.

G

- Garmestani, A.S., and Benson, M.H. 2013. A Framework for Resilience-based Governance of Social-Ecological Systems. Ecology and Society **18**(1). Resilience Alliance Inc. https://doi.org/10.5751/ES-05180-180109.
- Gehman, J., Lefsrud, L.M., and Fast, S. 2017. Social license to operate: Legitimacy by another name? Canadian Public Administration **60**(2): 293–317. John Wiley & Sons, Ltd. https://doi.org/10.1111/capa.12218.
- Gifford, R. 2011. The dragons of inaction: Psychological barriers that limit climate change mitigation and adaptation. American Psychological Association, Gifford, Robert: Department of Psychology, University of Victoria, Victoria, BC, Canada, V8S 2H1, rgifford@uvic.ca.



https://doi.org/10.1037/a0023566.

- Gilani, H.R., Innes, J.L., and Kent, H. 2018. Developing Human Well-being Domains, Metrics and Indicators in an Ecosystem-Based Management Context in Haida Gwaii, British Columbia, Canada. Society & Natural Resources **31**(12): 1321–1337. Routledge. https://doi.org/10.1080/08941920.2018.1481548.
- Godschalk, D.R. 2004. Land Use Planning Challenges: Coping with Conflicts in Visions of Sustainable Development and Livable Communities. Journal of the American Planning Association **70**(1): 5–13. Routledge. https://doi.org/10.1080/01944360408976334.
- Gorley, A., and Merkel, G. 2020. A New Future for Old Forests: A strategic review of how British Columbia manages for old forests within its ancient ecosystems. Government of British Columbia, Victoria, BC, Canada.

GoA

Government of Alberta. 1971. Regeneration Survey Manual. Edmonton, AB, Canada.

Government of Alberta. 1985. Alberta phase 3 forest inventory: an overview. Edmonton, AB, Canada.

- Government of Alberta. 1989. Buck for wildlife the program. Edmonton, AB, Canada.
- Government of Alberta. 1992. Regeneration Survey Manual. Edmonton, AB, Canada.
- Government of Alberta. 1994. Alberta timber harvest planning and operating ground rules 1994. Government of Alberta, Edmonton, AB, Canada.
- Government of Alberta. 1998a. The Alberta forest legacy: implementation framework for sustainable forest management. Alberta Environmental Protection, Edmonton, AB, Canada.

Government of Alberta. 1998b. Alberta Forest Management Planning Standard. Edmonton, AB, Canada.

- Government of Alberta. 2000a. Wildlife Act. Government of Alberta, Edmonton, AB, Canada.
- Government of Alberta. 2000b. Environmental Protection and Enhancement Act. Government of Alberta, Edmonton, AB, Canada.
- Government of Alberta. 2001. Wildfire management in Alberta. Edmonton, AB, Canada.
- Government of Alberta. 2005. Alberta Vegetation Inventory Interpretation Standards. Edmonton, AB, Canada.
- Government of Alberta. 2006. Alberta Forest Management Planning Standard. Public Lands and Forests Division of the Forest Management Branch, Edmonton, AB, Edmonton, AB, Canada.
- Government of Alberta. 2007. Fire salvage planning and operations. Government of Alberta, Edmonton, AB, Canada.
- Government of Alberta. 2008. Land-use Framework. Government of Alberta, Edmonton, AB, Canada.
- Government of Alberta. 2009a. Sustainable forest management current facts and statistics. Government of Alberta, Edmonton, AB, Canada.

Government of Alberta. 2009b. Alberta Land Stewardship Act. Government of Alberta, Edmonton, AB,

Canada.

- Government of Alberta. 2009c. Plan for Parks 2009 2019. Government of Alberta, Edmonton, AB, Canada.
- Government of Alberta. 2010. Describing the Integrated Land Management Approach. Government of Alberta, Edmonton, AB, Canada.
- Government of Alberta. 2011. Cypress Hills Provincial Park Management Plan. Government of Alberta, Edmonton, AB, Canada.
- Government of Alberta. 2015a. Alberta's environmental assessment process. Government of Alberta, Edmonton, AB, Canada.
- Government of Alberta. 2015b. Alberta Wetland Classification System. Government of Alberta, Edmonton, AB, Canada.
- Government of Alberta. 2016a. Alberta Grizzly Bear Recovery Plan. Government of Alberta, Edmonton, AB, Canada.
- Government of Alberta. 2016b. Alberta timber harvest planning and operating ground rules framework for renewal. Government of Alberta, Edmonton, AB, Canada.
- Government of Alberta. 2017a. Forest Management Planning Standard Interpretive Bulletin: Stewardship Reporting Requirements. Alberta Agriculture and Forestry, Edmonton, AB.
- Government of Alberta. 2017b. South Saskatchewan Regional Plan 2014–2024 Amended February 2017. Government of Alberta, Edmonton, AB, Canada.
- Government of Alberta. 2017c. Draft provincial woodland caribou range plan. Government of Alberta, Edmonton, AB, Canada.
- Government of Alberta. 2017d. Hydrologic unit code watersheds of Alberta. Government of Alberta, Edmonton, AB, Canada.
- Government of Alberta. 2018a. Reforestation standard of Alberta. Government of Alberta, Edmonton, AB, Canada.
- Government of Alberta. 2018b. Methods for Refining Federal Classification of Woodland Caribou Biophysical Critical Habitat for Alberta. Edmonton, AB, Canada.
- Government of Alberta. 2018c. Castle Management Plan. Castle Provincial Park and Castle Wildland Provincial Park. Government of Alberta, Edmonton, AB, Canada.
- Government of Alberta. 2018d. Alberta parks management planning process. Government of Alberta, Edmonton, AB, Canada.
- Government of Alberta. 2020a. Alberta native trout recovery program. Government of Alberta, Edmonton, AB, Canada.
- Government of Alberta. 2020b. Alberta's Crown Land Vision. Government of Alberta, Edmonton, AB, Canada.
- Government of Alberta. 2020c. Watershed Planning and Advisory Councils. Available from https://www.alberta.ca/watershed-planning-and-advisory-councils.aspx [accessed 24 September

2021].

Government of Alberta, and Government of Canada. 2020. Draft Conservation Agreement for Woodland Caribou (Canada-Alberta) Overview. Government of Canada, Ottawa, Canada.

GoC

Government of Canada. 1985. Fisheries Act. Department of Fisheries and Oceans, Ottawa, ON, Canada.

- Government of Canada. 1994. Migratory Birds Convention Act. Environment Canada, Ottawa, ON, Canada.
- Government of Canada. 1995. Canadian Biodiversity Strategy: Canada's Response to the Convention on Biological Diversity. Minister of Supply and Services Canada, Ottawa, ON, Canada.
- Government of Canada. 1998. Parks Canada Agency Act. Government of Canada, Ottawa, ON, Canada.
- Government of Canada. 2000a. Canada National Parks Act. Environment Canada, Ottawa, ON, Canada.
- Government of Canada. 2000b. Unimpaired for Future Generations? Protecting Ecological Integrity with Canada's National Parks. Government of Canada, Ottawa, ON, Canada.
- Government of Canada. 2002. Species at Risk Act. Government of Canada, Ottawa, ON, Canada.
- Government of Canada. 2003. Standard drainage area classification. Government of Canada, Ottawa, ON, Canada.
- Government of Canada. 2005. Monitoring and Reporting Ecological Integrity in Canada's National Parks Volume I: Guiding Principles. Government of Canada, Ottawa, ON, Canada.
- Government of Canada. 2008a. Scientific review for the identification of critical habitat for woodland caribou (Rangifer tarandus caribou), boreal population, in Canada. Government of Canada, Ottawa, ON, Canada.
- Government of Canada. 2008b. Principles and guidelines for ecological restoration in Canada's Protected Natural Areas. Government of Canada, Ottawa, ON, Canada.
- Government of Canada. 2008c. Prince Albert National Park Management Plan. Government of Canada, Ottawa, ON, Canada.
- Government of Canada. 2010a. The Cabinet Directive on the Environmental Assessment of Policy, Plan and Program Proposals. Government of Canada, Ottawa, ON, Canada.
- Government of Canada. 2010b. Banff National Park Management Plan. Parks Canada, Ottawa, ON, Canada.
- Government of Canada. 2010c. Waterton Lakes National Park Management Plan. Parks Canada Agency, Ottawa, ON, Canada.
- Government of Canada. 2011a. Scientific assessment to support the identification of critical habitat for woodland caribou (Rangifer tarandus caribou), boreal population, in Canada: 2011 update. Government of Canada, Ottawa, ON, Canada.

Government of Canada. 2011b. Consolidated Guidelines for Ecological Integrity Monitoring in Canada's



National Parks. Government of Canada, Ottawa, ON, Canada.

- Government of Canada. 2012a. Recovery Strategy for the Woodland Caribou (Rangifer tarandus caribou), Boreal population, in Canada. Government of Canada, Ottawa, ON, Canada.
- Government of Canada. 2012b. Recovery Strategy for the Woodland Caribou (Rangifer tarandus caribou), Boreal Population, in Canada. Government of Canada, Ottawa, Canada.
- Government of Canada. 2013. Fall Report of the Commissioner of the Environment and Sustainable Development. Chapter 6. Recovery planning for species at risk. Government of Canada, Ottawa, ON, Canada.
- Government of Canada. 2014. Recovery Strategy for the Woodland Caribou (Rangifer tarandus caribou) Southern Mountain Population in Canada. Government of Canada, Ottawa, ON, Canada.
- Government of Canada. 2015a. Guidelines for the Identification of Critical Habitat for Aquatic Species at Risk. Government of Canada, Ottawa, ON, Canada.
- Government of Canada. 2015b. Canada's biodiversity outcomes framework. Government of Canada, Ottawa, ON, Canada.
- Government of Canada. 2015c. Canada's biodiversity outcomes framework and 2020 goals & targets. Ottawa, ON, Canada.
- Government of Canada. 2015d. 2020 Biodiversity Goals and Targets for Canada. Available from https://biodivcanada.chm-cbd.net/2020-biodiversity-goals-and-targets-canada?lang=En&n=9B5793F6-1 [accessed 21 September 2021].
- Government of Canada. 2016a. Approach to the Identification of Critical Habitat under the Species at Risk Act when Habitat Loss and Degradation is Not Believed to be a Significant Threat to the Survival or Recovery of the Species. [Proposed]. Government of Canada, Ottawa, ON, Canada.
- Government of Canada. 2016b. Critical habitat identification toolbox: Species at Risk Act guidance. Government of Canada, Ottawa, ON, Canada.
- Government of Canada. 2016c. Range Plan Guidance for Woodland Caribou, Boreal Population. Government of Canada, Ottawa, ON, Canada.
- Government of Canada. 2016d. Policy on Protecting Critical Habitat with Conservation Agreements under Section 11 of the Species at Risk Act [Proposed]. Government of Canada, Ottawa, ON, Canada.
- Government of Canada. 2016e. State of Canada's Natural and Cultural Heritage Places. Government of Canada, Ottawa, ON, Canada.
- Government of Canada. 2017. Report on the progress of recovery strategy implementation for the woodland caribou (Rangifer tarandus caribou), boreal population in Canada for the period 2012–2017. Species at Risk Act Recovery Strategy Series, Ottawa, ON, Canada.
- Government of Canada. 2018a. Pan-Canadian approach to transforming species at risk conservation in Canada. Government of Canada, Ottawa, ON, Canada.
- Government of Canada. 2018b. Sixth national report for the Convention on Biodiversity. Government of Canada, Ottawa, ON, Canada.

- Government of Canada. 2018c. Action Plan for the Woodland Caribou (Rangifer tarandus caribou), Boreal Population, in Canada: Federal actions. Government of Canada, Ottawa, ON, Canada.
- Government of Canada. 2018d. Parks Canada Guiding Principles and Operational Policies. Government of Canada, Ottawa, ON, Canada.
- Government of Canada. 2018e. Prince Albert National Park Management Plan. Government of Canada, Prince Albert, SK, Canada.
- Government of Canada. 2019a. Recovery Strategy and Action Plan for the Alberta Populations of Westslope Cutthroat Trout (Oncorhynchus clarkii lewisi) in Canada 2019 [Proposed]. Government of Canada, Ottawa, ON, Canada.
- Government of Canada. 2019b. Amended Recovery Strategy for the Woodland Caribou (Rangifer tarandus caribou), Boreal population, in Canada 2019. Government of Canada, Ottawa, ON, Canada.
- Government of Canada. 2019c. Impact Assessment Act. Government of Canada, Ottawa, ON, Canada.
- Government of Canada. 2019d. Fisheries Act (Amended). Department of Fisheries and Oceans, Ottawa, ON, Canada.
- Government of Canada. 2020a. 2020 Biodiversity Goals and Targets for Canada. Government of Canada, Ottawa, ON, Canada.
- Government of Canada. 2020b. Bull Trout (Salvelinus confluentus), Saskatchewan-Nelson Rivers: recovery strategy, 2020 (proposed). Government of Canada, Ottawa, ON, Canada.
- Government of Canada. 2020c. Information for identification of candidate critical habitat of bull trout, Salvelinus confluentus (Saskatchewan-Nelson Rivers populations). Can. Sci. Advis. Sec. Proceed. Ser. 2020/041, Government of Canada, Ottawa, ON, Canada.
- Government of Canada. 2020d. Recovery Strategy for the Rainbow Trout (Oncorhynchus mykiss) in Canada (Athabasca River populations). Government of Canada, Ottawa, ON, Canada.
- Government of Canada. 2020e. Critical Habitat of the Bull Trout (Salvelinus confluentus) Saskatchewan-Nelson Rivers Populations Order. Department of Fisheries and Oceans, Ottawa, ON, Canada.
- Government of Canada. 2021. 2 billion trees commitment. Government of Canada, Ottawa, ON, Canada.
- Government of Canada, Government of British Columbia, Salteau First Nations, and West Moberly First Nations. 2020. Intergovernmental partnership agreement for the conservation of the central group of the southern mountain caribou. Government of Canada, Ottawa, ON, Canada.
- Government of Canada, and Government of Canada. 2019. Agreement for the conservation of the woodland caribou, boreal population ("woodland caribou") in Saskatchewan. Government of Canada, Ottawa, ON, Canada.

GoS

Government of Saskatchewan. 1995. Saskatchewan long-term integrated forest resource management plan. Government of Saskatchewan, Regina, SK, Canada.

Government of Saskatchewan. 1996. The Forest Resources Management Act. Government of

Saskatchewan, Regina, SK, Canada.

Government of Saskatchewan. 1998. The Wildlife Act. Saskatchewan Environment, Regina, SK, Canada.

- Government of Saskatchewan. 1999a. An ecosystem-based planning framework, process and source book for preparing ecoregional plans. Government of Saskatchewan, Regina, SK, Canada.
- Government of Saskatchewan. 1999b. The Forest Resources Management Regulations. Ministry of Environment, Regina, SK, Canada.
- Government of Saskatchewan. 2000a. Conserving Saskatchewan's natural environment. Framework for a Saskatchewan Biodiversity Action Plan. Government of Saskatchewan, Regina, SK, Canada.
- Government of Saskatchewan. 2000b. The Environmental Protection Act. Government of Saskatchewan, Regina, SK, Canada.
- Government of Saskatchewan. 2003. Fire and Forest Insect and Disease Management Policy Framework Document. Government of Saskatchewan, Regina, SK, Canada.
- Government of Saskatchewan. 2004. Saskatchewan Forest Vegetation Inventory: Forest Planning Manual. Government of Saskatchewan, Regina, SK, Canada.
- Government of Saskatchewan. 2007. Forest Management Planning Document Forest Planning Manual. Government of Saskatchewan, Regina, SK, Canada.
- Government of Saskatchewan. 2010. The Weed Control Act. Government of Saskatchewan, Regina, SK, Canada.
- Government of Saskatchewan. 2012a. Forest Operating Plan Standard. Government of Saskatchewan, Regina, SK, Canada.
- Government of Saskatchewan. 2012b. Forest regeneration assessment standard. Government of Saskatchewan, Regina, SK, Canada.
- Government of Saskatchewan. 2013. Conservation Strategy for Boreal Woodland Caribou (Rangifer tarandus caribou) in Saskatchewan. Government of Saskatchewan, Regina, SK, Canada.
- Government of Saskatchewan. 2014. Saskatchewan Environmental Code. Chapter D.1.5 Forest Management Planning. Government of Saskatchewan, Regina, SK, Canada.
- Government of Saskatchewan. 2017a. Forest Management Planning Standard: Saskatchewan Environmental Code. Forest Planning, Policy and Protection Branch, Saskatoon, SK, Regina, SK, Canada.
- Government of Saskatchewan. 2017b. Saskatchewan Environmental Code: Forest Management Planning Standard. Government of Saskatchewan, Regina, SK, Canada.
- Government of Saskatchewan. 2018. Meadow Lake Provincial Park Forest Conservation Management Plan. Forsite Forest Management Specialists, Regina, SK, Canada.
- Government of Saskatchewan. 2019a. State of the Environment 2019: A Focus on Forests. Government of Saskatchewan, Regina, SK, Canada.
- Government of Saskatchewan. 2019b. Draft range plan for woodland caribou in Saskatchewan boreal plain ecozone SK2 west caribou administration unit. Government of Saskatchewan, Regina, SK,

Canada.

- Government of Saskatchewan. 2019c. Notification letter adoption of forest operations standard. Government of Saskatchewan, Prince Albert, SK, Canada.
- Government of Saskatchewan. 2020a. Ecosystem management. Government of Saskatchewan, Regina, SK, Canada.
- Government of Saskatchewan. 2020b. Forest operation standard. Government of Saskatchewan, Regina, SK, Canada.
- Government of Saskatchewan, and Government of Canada. 2020. Woodland Caribou (Boreal population) in Saskatchewan: draft conservation agreement. Government of Canada, Regina, SK, Canada.
- Granström, A. 2001. Fire Management for Biodiversity in the European Boreal Forest. Scandinavian Journal of Forest Research **16**(sup003): 62–69. Taylor & Francis. https://doi.org/10.1080/028275801300090627.
- Green, D.M. 2005. Designatable Units for Status Assessment of Endangered Species. Conservation Biology **19**(6): 1813–1820. John Wiley & Sons, Ltd. https://doi.org/10.1111/j.1523-1739.2005.00284.x.
- Greenlink Forestry. 2013. Spatial Classification of Riparian Areas Across Hinton Wood Products Forest Management Area. Hinton, AB, Canada.
- Greig, L.A., Pawley, K., and Duinker, P.N. 2004. Alternative scenarios of future development: An aid to cumulative effects assessment. ESSA Technologies Ltd, Gatineau, QC, Canada.
- Grenon, F., Jette, J.P., and Leblanc, M. 2011. Reference manual for ecosystem-based forest management in Quebec. Module 1: Foundation and implementation approach. Government of Quebec, Quebec City, QC, Canada.
- de Groot, W.J., Flannigan, M.D., and Cantin, A.S. 2013. Climate change impacts on future boreal fire regimes. Forest Ecology and Management **294**: 35–44. https://doi.org/10.1016/j.foreco.2012.09.027.
- Grumbine, R.E. 1994. What is ecosystem management. Conservation Biology 8(1): 27–38.
- Grumbine, R.E. 1997. Reflections on "What is Ecosystem Management?" Conservation Biology **11**(1): 41–47. John Wiley & Sons, Ltd. https://doi.org/10.1046/j.1523-1739.1997.95479.x.
- Guedo, D.C. 2007. The effects of fire and salvage logging on early post-fire succession in mixedwood boreal forest communities of Saskatchewan. University of Saskatchewan, Saskatoon, SK, Canada.
- Gunderson, L., and Light, S.S. 2006. Adaptive management and adaptive governance in the everglades ecosystem. Policy Sciences **39**(4): 323–334. https://doi.org/10.1007/s11077-006-9027-2.
- Gunningham, N., and Sinclair, D. 1999. Smart Regulation: Designing Environment Policy. Clarendon Press, Oxford, UK.
- Gustafsson, L., Baker, S.C., Bauhus, J., Beese, W.J., Brodie, A., Kouki, J., Lindenmayer, D.B., Lõhmus, A., Pastur, G.M., Messier, C., Neyland, M., Palik, B.J., Sverdrup-Thygeson, A., Volney, W.J.A., Wayne, A., and Franklin, J.F. 2012. Retention Forestry to Maintain Multifunctional Forests: A World



Perspective. BioScience 62(7): 633-645. https://doi.org/10.1525/bio.2012.62.7.6.

- Gustafsson, L., Bauhus, J., Asbeck, T., Augustynczik, A.L.D., Basile, M., Frey, J., Gutzat, F., Hanewinkel, M., Helbach, J., Jonker, M., Knuff, A., Messier, C., Penner, J., Pyttel, P., Reif, A., Storch, F., Winiger, N., Winkel, G., Yousefpour, R., and Storch, I. 2020. Retention as an integrated biodiversity conservation approach for continuous-cover forestry in Europe. Ambio 49(1): 85–97. https://doi.org/10.1007/s13280-019-01190-1.
- Gutzat, F., and Dormann, C.F. 2018. Decaying trees improve nesting opportunities for cavity-nesting birds in temperate and boreal forests: A meta-analysis and implications for retention forestry. Ecology and Evolution **8**(16): 8616–8626. https://doi.org/10.1002/ece3.4245.

Η

- Hajjar, R., McGuigan, E., Moshofsky, M., and Kozak, R.A. 2014. Opinions on strategies for forest adaptation to future climate conditions in western Canada: surveys of the general public and leaders of forest-dependent communities. Canadian Journal of Forest Research 44(12): 1525–1533. NRC Research Press. https://doi.org/10.1139/cjfr-2014-0142.
- Haley, D., and Nelson, H. 2007. Has the time come to rethink Canada's Crown forest tenure systems? The Forestry Chronicle **83**(5): 630–641. Canadian Institute of Forestry. https://doi.org/10.5558/tfc83630-5.
- Hanan, N.P., and Anchang, J.Y. 2020. Satellites could soon map every tree on Earth. Nature **587**(7832): 42–43. https://doi.org/10.1038/d41586-020-02830-3.
- Harmon, M.E., Franklin, J.F., Swanson, F.J., Sollins, P., Gregory, S. V, Lattin, J.D., Anderson, N.H., Cline, S.P., Aumen, N.G., Sedell, J.R., Lienkaemper, G.W., Cromack Jr., K., and Cummins, K.W. 1986.
 Ecology of coarse woody debris in temperate ecosystems. Advances in Ecological Research 15: 133–302. https://doi.org/10.1016/S0065-2504(08)60121-X.
- Harshaw, H.W., Sheppard, S., and Jeakins, P. 2009. Public attitudes toward sustainable forest management: Opinions from forest-dependent communities in British Columbia. Journal of Ecosystems and Managementt **10**(2): 81–103.
- Harshaw, H.W., and Tindall, D.B. 2005. Social Structure, Identities, and Values: A Network Approach to Understanding People's Relationships to Forests. Journal of Leisure Research **37**(4): 426–449. Routledge. https://doi.org/10.1080/00222216.2005.11950061.
- Hawkins, C., and Balliet, N. 2008. Managing northern mixedwood stands to sustainably maximize productivity and minimize costs. University of Northern British Columbia, Prince George, BC, Canada.
- Hedley, R.W., McLeod, L.J.T., Yip, D.A., Farr, D., Knaga, P., Drake, K.L., and Bayne, E. 2020. Modeling the occurrence of the Yellow Rail (Coturnicops noveboracensis) in the context of ongoing resource development in the oil sands region of Alberta. Avian Conservation and Ecology 15(1). The Resilience Alliance. https://doi.org/10.5751/ACE-01538-150110.
- Heinrichs, J.A., Bender, D.J., Gummer, D.L., and Schumaker, N.H. 2010. Assessing critical habitat: Evaluating the relative contribution of habitats to population persistence. Biological Conservation 143(9): 2229–2237. https://doi.org/10.1016/j.biocon.2010.06.009.

- Hemphill, T.A. 2020. "The innovation governance dilemma: Alternatives to the precautionary principle." Technology in Society **63**: 101381. https://doi.org/10.1016/j.techsoc.2020.101381.
- Hinton Wood Products. 2013. An ecosystem-based riparian management strategy. Hinton, AB, Canada.
- Hinton Wood Products. 2017. 2014 Detailed Forest Mangement Plan Hinton Wood Products. Hinton, Alberta, Canada.
- Hobbs, R.J., Higgs, E., and Harris, J.A. 2009. Novel ecosystems: implications for conservation and restoration. Trends in Ecology & Evolution 24(11): 599–605. https://doi.org/10.1016/j.tree.2009.05.012.
- Hoberg, G. 2019. How the Battles over Oil Sands Pipelines have Transformed Climate Politics. *In* Annual Meeting of the American Political Science Association. Washington and London.
- Hobson, K.A., and Bayne, E. 2000. Breeding Bird Communities in Boreal Forest of Western Canada: Consequences of "Unmixing" the Mixedwoods. The Condor **102**(4): 759–769. https://doi.org/10.1093/condor/102.4.759.
- Hogg, E.H. (Ted), Brandt, J.P., and Michaelian, M. 2008. Impacts of a regional drought on the productivity, dieback, and biomass of western Canadian aspen forests. Canadian Journal of Forest Research 38(6): 1373–1384. NRC Research Press. https://doi.org/10.1139/X08-001.
- Hogl, K., Kleinschmit, D., and Rayner, J. 2016. Achieving policy integration across fragmented policy domains: Forests, agriculture, climate and energy. Environment and Planning C: Government and Policy 34(3): 399–414. SAGE Publications Ltd STM. https://doi.org/10.1177/0263774X16644815.
- Holling, C.S. 1973. Resilience and Stability of Ecological Systems. Annual Review of Ecology and Systematics **4**(1): 1–23. Annual Reviews. https://doi.org/10.1146/annurev.es.04.110173.000245.
- Holling, C.S. 1978. Adaptive environmental assessment and management. John Wiley & Sons, Hoboken, NJ, US.
- Holling, C.S., and Meffe, G.K. 1996. Command and Control and the Pathology of Natural Resource Management. Conservation Biology 10(2): 328–337. John Wiley & Sons, Ltd. https://doi.org/10.1046/j.1523-1739.1996.10020328.x.
- Horgan, J. 2019. letter from Premier John Horgan to the British Columbia forest industry. Victoria, BC, Canada.
- Howlett, M. 2019. Designing public policies: Principles and instruments. Taylor & Francis / Routledge, London, U.K. https://doi.org/10.4324/9781315232003.
- Humphrey, J.W., Sippola, A.L., Lempérière, G., Dodelin, B., Alexander, K.N.A., and Butler, J.E. 2005.
 Deadwood as an indicator of biodiversity in European forests: from theory to operational guidance.
 In Monitoring and indicators of forest biodiversity in Europe–from ideas to operationality. *Edited by* M. Marchetti. European Forest Institute, Joensuu, Finland. pp. 193–206.
- Hunter, M.L. 1991. Coping with ignorance: the coarse filter strategy for maintaining biodiversity. *In* Balancing on the Brink of Extinction. *Edited by* K. Kohm. Island Press, Washington D.C. pp. 266–281.
- Hunter, M.L. 1993. Natural fire regimes as spatial models for managing boreal forests. Biological Conservation **65**: 115–120. https://doi.org/10.1016/0006-3207(93)90440-C.

Hunter, M.L. 2005. A mesofilter conservation strategy to complement fine and coarse filters. Conservation Biology **19**(4): 1025–1029. https://doi.org/10.1111/j.1523-1739.2005.00172.x.

- Ibáñez, I., Acharya, K., Juno, E., Karounos, C., Lee, B.R., McCollum, C., Schaffer-Morrison, S., and Tourville, J. 2019. Forest resilience under global environmental change: Do we have the information we need? A systematic review. PLOS ONE 14(9): e0222207. Public Library of Science. https://doi.org/10.1371/journal.pone.0222207.
- Indigenous Circle of Experts. 2018. We rise together : achieving pathway to Canada target 1 through the creation of Indigenous protected and conserved areas in the spirit and practice of reconciliation. Government of Canada, Gatineau, QC, Canada.
- International Organization for Standardization. 2015. SO 14001: 2015 Environmental management systems -- Requirements with guidance for use. ISO, Geneva, Switzerland.

J

- Jabbal, S., Atwood, B., and Gonzalez, D. 2020, July 14. Against the current: Both sides of the Springbank dam argument. Calgary Journal: online. Calgary, AB, Canada.
- Jackson, J.A., and Jackson, B.J.S. 2004. Ecological Relationships Between Fungi and Woodpecker Cavity Sites. The Condor **106**(1): 37–49. https://doi.org/10.1093/condor/106.1.37.
- Janisch, J.E., and Harmon, M.E. 2002. Successional changes in live and dead wood carbon stores: implications for net ecosystem productivity. Tree Physiology **22**(2–3): 77–89. https://doi.org/10.1093/treephys/22.2-3.77.
- Joa, B., Winkel, G., and Primmer, E. 2018. The unknown known A review of local ecological knowledge in relation to forest biodiversity conservation. Land Use Policy **79**: 520–530. https://doi.org/10.1016/j.landusepol.2018.09.001.
- Jochim, A.E., and May, P.J. 2010. Beyond Subsystems: Policy Regimes and Governance. Policy Studies Journal **38**(2): 303–327. John Wiley & Sons, Ltd. https://doi.org/10.1111/j.1541-0072.2010.00363.x.
- Johnson, C.A., Sutherland, G.D., Neave, E., Leblond, M., Kirby, P., Superbie, C., and McLoughlin, P.D. 2020. Science to inform policy: Linking population dynamics to habitat for a threatened species in Canada. Journal of Applied Ecology 57(7): 1314–1327. John Wiley & Sons, Ltd. https://doi.org/10.1111/1365-2664.13637.
- Johnston, J. 2006. Cross–border approaches to protected areas, heritage conservation, and tourism: a Parks Canada perspective. *In* Transboundary Protected Areas, Research and Planning: Parks and Protected Areas Research in Ontario. Proceedings of the Parks Research Forum of Ontario. Ottawa, ON, Canada. pp. 75–90.
- Johnston, L.M. 2016. Interface maps for wildfire in Canada. Western Partnership for Wildland Fire Science and Natural Resources Canada, Edmonton, AB, Canada.

- Johnston, L.M., and Flannigan, M.D. 2018. Mapping Canadian wildland fire interface areas. International Journal of Wildland Fire **27**(1): 1–14. https://doi.org/10.1071/WF16221.
- Johnstone, W.D. 1981. 25-year results. Northern Forest Research Centre, Canadian Forestry Service, Environment Canada.
- Jones, M.W., Smith, A., Betts, R., Canadell, J.G., Prentice, I.C., and Le Quéré, C. 2020. Climate change increases risk of wildfires. ScienceBrief Reviews **116**: 117.
- Jyväsjärvi, J., Koivunen, I., and Muotka, T. 2020. Does the buffer width matter: Testing the effectiveness of forest certificates in the protection of headwater stream ecosystems. Forest Ecology and Management **478**: 118532. https://doi.org/10.1016/j.foreco.2020.118532.

Κ

- Kalynka, K. 2020. Tracking Change in the Canadian National Parks: From One Crisis to Another. University of Victoria, Victoria, BC, Canada.
- Kardynal, K.J., Hobson, K.A., Van Wilgenburg, S.L., and Morissette, J.L. 2009. Moving riparian management guidelines towards a natural disturbance model: An example using boreal riparian and shoreline forest bird communities. Forest Ecology and Management **257**(1): 54–65. https://doi.org/10.1016/j.foreco.2008.08.029.
- Kayahara, G.J., and Armstrong, C.L. 2015. Understanding First Nations rights and perspectives on the use of herbicides in forestry: A case study from northeastern Ontario. The Forestry Chronicle 91(02): 126–140. Canadian Institute of Forestry. https://doi.org/10.5558/tfc2015-024.
- Keane, R.E. 2008. Biophysical controls on surface fuel litterfall and decomposition in the northern Rocky Mountains, USA. Canadian Journal of Forest Research 38(6): 1431–1445. NRC Research Press. https://doi.org/10.1139/X08-003.
- Keane, R.E., Hessburg, P.F., Landres, P.B., and Swanson, F.J. 2009. The use of historical range and variability (HRV) in landscape management. Forest Ecology and Management **258**(7): 1025–1037. https://doi.org/10.1016/j.foreco.2009.05.035.
- Keane, R.E., Ryan, K.C., Veblen, T.T., Allen, C.D., Logan, J., and Hawkes, B.C. 2002. Cascading Effects of Fire Exclusion in Rocky Mountain Ecosystems: A Litertaure Review. *In* RMRS GTR-9. USGS Forest Service.
- Keeling, P.M. 2008. Does the idea of wilderness need a defence? Environmental Values **17**(4): 505–519. https://doi.org/10.3197/096327108X368511.
- Keenan, R.J. 2015. Climate change impacts and adaptation in forest management: a review. Annals of Forest Science **72**(2): 145–167. https://doi.org/10.1007/s13595-014-0446-5.
- Kelly, L.T., Giljohann, K.M., Duane, A., Aquilué, N., Archibald, S., Batllori, E., Bennett, A.F., Buckland, S.T., Canelles, Q., Clarke, M.F., Fortin, M.-J., Hermoso, V., Herrando, S., Keane, R.E., Lake, F.K., McCarthy, M.A., Morán-Ordóñez, A., Parr, C.L., Pausas, J.G., Penman, T.D., Regos, A., Rumpff, L., Santos, J.L., Smith, A.L., Syphard, A.D., Tingley, M.W., and Brotons, L. 2020. Fire and biodiversity in the Anthropocene. Science **370**(6519): eabb0355. https://doi.org/10.1126/science.abb0355.



- Kennett, S.A. 1999. Towards a New Paradigm for Cumulative Effects Management. https://doi.org/10.11575/PRISM/34325.
- Kennett, S.A., and Schneider, R.R. 2008. Making It Real: Implementing Alberta's Land-Use Framework. CPAWS, Edmonton and Drayton Valley, AB, Canada.
- Kent, B., Bare, B.B., Field, R.C., and Bradley, G.A. 1991. Natural Resource Land Management Planning Using Large-Scale Linear Programs: The USDA Forest Service Experience with FORPLAN. Operations Research **39**(1): 13–27. INFORMS. https://doi.org/10.1287/opre.39.1.13.
- Klenk, N.L., Bull, G.Q., and MacLellan, J.I. 2009. The "emulation of natural disturbance" (END) management approach in Canadian forestry: A critical evaluation. The Forestry Chronicle 85(3): 440–445. https://doi.org/10.5558/tfc85440-3.
- Knafo, A., Roccas, S., and Sagiv, L. 2011. The Value of Values in Cross-Cultural Research: A Special Issue in Honor of Shalom Schwartz. Journal of Cross-Cultural Psychology 42(2): 178–185. SAGE Publications Inc. https://doi.org/10.1177/0022022110396863.
- Kneeshaw, D.D., Sturtevant, B.R., DeGrandpé, L., Doblas-Miranda, E., James, P.M.A., Tardif, D., and Burton, P.J. 2021. The Vision of Managing for Pest-Resistant Landscapes: Realistic or Utopic? Current Forestry Reports 7(2): 97–113. https://doi.org/10.1007/s40725-021-00140-z.
- Knopf, F.L., Johnson, R.R., Rich, T., Samson, F.B., and Szaro, R.C. 1988. Conservation of riparian ecosystems in the United States. The Wilson Bulletin **100**(2): 272–284.
- Kolden, C.A. 2019. We're Not Doing Enough Prescribed Fire in the Western United States to Mitigate Wildfire Risk. Fire **2**(2): 30. https://doi.org/10.3390/fire2020030.
- KPMG. 2012. Lesser Slave Lake Regional Urban Interface Wildfire Lessons Learned Final Report. Edmonton, AB, Canada.
- KPMG. 2017. Lessons learned and recommendations from the 2016 Horse River Wildfire. Edmonton, AB, Canada.
- Kremsater, L., and Bunnell, F.L. 1999. Edge effects: theory, evidence and implications to management of western North American forests. *In* Forest Fragmentation: Wildlife and Management Implications. *Edited by* Rochelle J.A., L.A. Lehmann, and J. Wisniewski. Brill Academic Publishers. pp. 117–153.
- Kreutzweiser, D.P., Sibley, P.K., Richardson, J.S., and Gordon, A.M. 2012. Introduction and a theoretical basis for using disturbance by forest management activities to sustain aquatic ecosystems.
 Freshwater Science **31**(1): 224–231. The University of Chicago Press. https://doi.org/10.1899/11-114.1.
- Kreye, M.M., Rimsaite, R., and Adams, D.C. 2019. Public Attitudes about Private Forest Management and Government Involvement in the Southeastern United States. Forests **10**(9): 776. https://doi.org/10.3390/f10090776.
- Kurz, W.A., Stinson, G., Rampley, G.J., Dymond, C.C., and Neilson, E.T. 2008. Risk of natural disturbances makes future contribution of Canada's forests to the global carbon cycle highly uncertain.
 Proceedings of the National Academy of Sciences **105**(5): 1551 LP-1555. https://doi.org/10.1073/pnas.0708133105.

Kuuluvainen, T., Tahvonen, O., and Aakala, T. 2012. Even-Aged and Uneven-Aged Forest Management in

Boreal Fennoscandia: A Review. AMBIO **41**(7): 720–737. https://doi.org/10.1007/s13280-012-0289-y.

- Lagasio, V., and Cucari, N. 2019. Corporate governance and environmental social governance disclosure: A meta-analytical review. Corporate Social Responsibility and Environmental Management **26**(4): 701–711. John Wiley & Sons, Ltd. https://doi.org/10.1002/csr.1716.
- Lake, F.K., and Christianson, A.C. 2019. Indigenous Fire Stewardship. *In* Encyclopedia of Wildfire and Wildland-Urban Interface (WUI) Fires. *Edited by* S.L. Manzello. Springer International Publishing, Switzerland. pp. 1–9. https://doi.org/10.1007/978-3-319-51727-8_225-1.
- Land Use Planning Hub. 2018. The boom and bust of regional planning. Available from https://landusehub.ca/the-boom-and-bust-of-regional-planning/ [accessed 2 September 2020].
- Landres, P.B., Morgan, P., and Swanson, F.J. 1999. Overview of natural variability concepts in managing ecological systems. Ecological Applications **9**(4): 1179–1188.
- Lassauce, A., Paillet, Y., Jactel, H., and Bouget, C. 2011. Deadwood as a surrogate for forest biodiversity: Meta-analysis of correlations between deadwood volume and species richness of saproxylic organisms. Ecological Indicators **11**(5): 1027–1039. https://doi.org/10.1016/j.ecolind.2011.02.004.
- Law, B.E., Hudiburg, T.W., Berner, L.T., Kent, J.J., Buotte, P.C., and Harmon, M.E. 2018. Land use strategies to mitigate climate change in carbon dense temperate forests. Proceedings of the National Academy of Sciences **115**(14): 3663 LP-3668. https://doi.org/10.1073/pnas.1720064115.
- Leach, M., Scoones, I., and Stirling, A. 2010. Dynamic sustainabilities: technology, environment, social justice. Taylor and Francis, Oxfordshire, U.K.
- Ledesma, J.L.J., Futter, M.N., Blackburn, M., Lidman, F., Grabs, T., Sponseller, R.A., Laudon, H., Bishop, K.H., and Köhler, S.J. 2018. Towards an Improved Conceptualization of Riparian Zones in Boreal Forest Headwaters. Ecosystems **21**(2): 297–315. https://doi.org/10.1007/s10021-017-0149-5.
- Lee, K.N. 1993. Compass and gyroscope: Integrating science and politics for the environment. Island Press, Washington, D.C., USA.
- Lee, P., and Smith, C. 2003. Riparian forest management: paradigms for ecological management and practices in Alberta. Edmonton, AB, Canada.
- Lemieux Lefebvre, S., Landry-Cuerrier, M., and Humphries, M.M. 2018. Identifying the critical habitat of Canadian vertebrate species at risk. Canadian Journal of Zoology **96**(4): 297–304. NRC Research Press. https://doi.org/10.1139/cjz-2016-0304.
- Lemos, M.C., and Agrawal, A. 2006. Environmental Governance. Annual Review of Environment and Resources **31**(1): 297–325. Annual Reviews. https://doi.org/10.1146/annurev.energy.31.042605.135621.
- De Leo, G.A., and Levin, S. 1997. The multifaceted aspects of ecosystem integrity. Conservation Ecology [online] 1(1:3): 1–24.
- Levin, S.A. 1992. The problem of pattern and scale in ecology. Ecology **73**(6): 1943–1967.

- Lewis, H.T. 1978. Traditional Uses of Fire by Indians in Northern Alberta. Current Anthropology **19**(2): 401–402. https://doi.org/10.1086/202098.
- Lidberg, W., Nilsson, M., and Ågren, A. 2020. Using machine learning to generate high-resolution wet area maps for planning forest management: A study in a boreal forest landscape. Ambio 49(2): 475–486. https://doi.org/10.1007/s13280-019-01196-9.
- Lieffers, V.J., Armstrong, G.W., Stadt, K.J., and Marenholtz, E.H. 2008. Forest regeneration standards: are they limiting management options for Alberta's boreal mixedwoods? The Forestry Chronicle 84(1): 76–82. https://doi.org/10.5558/tfc84076-1.
- Lieffers, V.J., Pinno, B.D., Beverly, J.L., Thomas, B.R., and Nock, C. 2020. Reforestation policy has constrained options for managing risks on public forests. Canadian Journal of Forest Research 50(9): 855–861. https://doi.org/10.1139/cjfr-2019-0422.
- Lieffers, V.J., Stewart, J.D., Macmillan, R.B., Macpherson, D., and Branter, K. 1996. Semi-natural and intensive silvicultural systems for the boreal mixedwood forest. The Forestry Chronicle 72(3): 286– 292. https://doi.org/10.5558/tfc72286-3.
- Lindenmayer, D.B., Foster, D.R., Franklin, J.F., Hunter, M.L., Noss, R.F., Schmiegelow, F.A., and Perry, D. 2004. Salvage Harvesting Policies After Natural Disturbance. Science **303**(5662): 1303 LP-1303. https://doi.org/10.1126/science.1093438.
- Lindenmayer, D.B., and Franklin, J.F. 2002. Conserving forest biodiversity: a comprehensive multiscaled approach. Island Press, Washington.
- Lindenmayer, D.B., Franklin, J.F., Lõhmus, A., Baker, S.C., Bauhus, J., Beese, W., Brodie, A., Kiehl, B., Kouki, J., Pastur, G.M., Messier, C., Neyland, M., Palik, B.J., Sverdrup-Thygeson, A., Volney, J., Wayne, A., and Gustafsson, L. 2012. A major shift to the retention approach for forestry can help resolve some global forest sustainability issues. Conservation Letters 5(6): 421–431. John Wiley & Sons, Ltd. https://doi.org/10.1111/j.1755-263X.2012.00257.x.
- Lindner, M., Maroschek, M., Netherer, S., Kremer, A., Barbati, A., Garcia-Gonzalo, J., Seidl, R., Delzon, S., Corona, P., Kolström, M., Lexer, M.J., and Marchetti, M. 2010. Climate change impacts, adaptive capacity, and vulnerability of European forest ecosystems. Forest Ecology and Management **259**(4): 698–709. https://doi.org/10.1016/j.foreco.2009.09.023.
- Long, J.N. 2009. Emulating natural disturbance regimes as a basis for forest management: A North American view. Forest Ecology and Management **257**(9): 1868–1873. https://doi.org/10.1016/j.foreco.2008.12.019.
- Luckert, M.K. 1993. Property rights for changing forest values: a study of mixed-wood management in Canada. Canadian Journal of Forest Research **23**(4): 688–699. NRC Research Press. https://doi.org/10.1139/x93-090.
- Luckert, M.K., Haley, D., and Hoberg, G. 2011. Policies for sustainably managing Canada's forests: tenure, stumpage fees, and forest practices. *In* UBC Press. https://doi.org/10.5860/choice.49-5667.
- Luckert, M.K., and Williamson, T. 2005. Should sustained yield be part of sustainable forest management? Canadian Journal of Forest Research **35**(2): 356–364. NRC Research Press. https://doi.org/10.1139/x04-172.

Lukasiewicz, A., Pittock, J., and Finlayson, M. 2016. Institutional challenges of adopting ecosystem-based



adaptation to climate change. Regional Environmental Change **16**(2): 487–499. https://doi.org/10.1007/s10113-015-0765-6.

- Lukey, J.R., Crawford, S.S., and Gillis, D. 2010. Effect of Information Availability on Assessment and Designation of Species at Risk. Conservation Biology **24**(5): 1398–1406. John Wiley & Sons, Ltd. https://doi.org/10.1111/j.1523-1739.2010.01555.x.
- Lynch-Wood, G., and Williamson, D. 2007. The Social Licence as a Form of Regulation for Small and Medium Enterprises. Journal of Law and Society **34**(3): 321–341. John Wiley & Sons, Ltd. https://doi.org/10.1111/j.1467-6478.2007.00395.x.

Μ

- MacKeracher, T., Diedrich, A., Gurney, G.G., and Marshall, N. 2018. Who trusts whom in the Great Barrier Reef? Exploring trust and communication in natural resource management. Environmental Science & Policy **88**: 24–31. https://doi.org/10.1016/j.envsci.2018.06.010.
- Maclean's Editor. 2021, April. If you thought the cutting of B.C.'s ancient forests was winding down, you'd be wrong. Macleans Magazine. Toronto, ON, Canada.
- MacMillan, R.A., and Pettapiece, W.W. 2000. Alberta Landforms: Quantitative morphometric descriptions and classification of typical Alberta landforms. Government of Canada, Swift Current, SK, Canada.
- MacPhail, F., and Bowles, P. 2021. Toward a Typology of Fossil Fuel Flashpoints. *In* Regime of Obstruction: How Corporate Power Blocks Energy Democracy. *Edited by* F. MacPhail and P. Bowles. Athabasca University Press, Athabasca, AB, Canada.
- Mansuy, N., Burton, P.J., Stanturf, J., Beatty, C., Mooney, C., Besseau, P., Degenhardt, D., MacAfee, K., and Lapointe, R. 2020. Scaling up forest landscape restoration in Canada in an era of cumulative effects and climate change. Forest Policy and Economics **116**: 102177. https://doi.org/10.1016/j.forpol.2020.102177.
- Mårald, E., Sandström, C., Nordin, A., Rist, L., Sténs, A., Beland Lindahl, K., Carlsson-Kanyama, A., Johansson, J., Keskitalo, E.C.H., Laudon, H., Lidskog, R., Lämås, T., Lundmark, T., Nilsson, U., Nordström, E.-M., Roberge, J.-M., and Sonesson, J. 2017. Forest governance and management across time : Developing a new forest social contract. *In* The earthscan forest library. Routledge, School of Humanities, Education and Social Sciences, Örebro University.
- Marchi, N., Pirotti, F., and Lingua, E. 2018. Airborne and Terrestrial Laser Scanning Data for the Assessment of Standing and Lying Deadwood: Current Situation and New Perspectives. https://doi.org/10.3390/rs10091356.
- Marczak, L.B., Sakamaki, T., Turvey, S.L., Deguise, I., Wood, S.L.R., and Richardson, J.S. 2010. Are forested buffers an effective conservation strategy for riparian fauna? An assessment using metaanalysis. Ecological Applications **20**(1): 126–134. John Wiley & Sons, Ltd. https://doi.org/10.1890/08-2064.1.
- Margerum, R.D. 2011. Beyond consensus: Improving collaborative planning and management. *In* Beyond Consensus: Improving Collaborative Planning and Management. MIT Press, Cambridge, MA, USA. https://doi.org/10.1080/1523908x.2012.707403.

- Marshak, A.R., Link, J.S., Shuford, R., Monaco, M.E., Johannesen, E., Bianchi, G., Anderson, M.R., Olsen, E., Smith, D.C., Schmidt, J.O., and Dickey-Collas, M. 2017. International perceptions of an integrated, multi-sectoral, ecosystem approach to management. ICES Journal of Marine Science 74(1): 414–420. https://doi.org/10.1093/icesjms/fsw214.
- Martell, D.L. 2001. Forest fire management. *In* Forest fires behavior and ecological effects. *Edited by* E.A. Johnson and K. Miyanishi. Academic Press, Cambridge, MA, USA. pp. 527–583.
- Martin, T.G., Kehoe, L., Mantyka-Pringle, C., Chades, I., Wilson, S., Bloom, R.G., Davis, S.K., Fisher, R., Keith, J., Mehl, K., Diaz, B.P., Wayland, M.E., Wellicome, T.I., Zimmer, K.P., and Smith, P.A. 2018.
 Prioritizing recovery funding to maximize conservation of endangered species. Conservation Letters **11**(6): e12604. John Wiley & Sons, Ltd. https://doi.org/10.1111/conl.12604.
- Mathews, G., and Izquierdo, C. 2008. Pursuits of happiness: Well-being in anthropological perspective. *In* Pursuits of Happiness: Well-Being in Anthropological Perspective. Berghahn, New York, NY, USA.
- Mayer, B. 2012. Canadian Institute of Forestry Looking Back, Looking Forward Alberta's forest history, and the Forest History Association of Alberta. Presentation to Canadian Institute of Forestry, Edmonton, AB, Canada.
- Mayer, M., Aparicio Estalella, C., Windels, S.K., and Rosell, F.N. 2020. Landscape structure and population density affect intraspecific aggression in beavers. Ecology and Evolution **10**: 13883–13894. John Wiley & Sons, Ltd. https://doi.org/10.1002/ece3.6980.
- McCarthy, J. 2001. Gap dynamics of forest trees: a review with particular attention to boreal forests. Environmental Reviews **9**: 1–59. https://doi.org/10.1139/a00-012.
- McCleary, R. 2005. Structure and Function of Small Foothills Streams and Riparian Areas Following Fire. Hinton, Alberta, Canada.
- McCleary, R., Haslett, S., and Christie, K. 2012. Field Manual for Erosion-Based Channel Classification. Hinton, Alberta, Canada.
- McDougall, F.W. 1990. Sustained Yield in Alberta. The Forestry Chronicle **February**: 14–19. https://doi.org/10.5558/tfc66014-1.
- McGarigal, K., Mallek, M., Estes, B., Tierney, M., Walsh, T., Thane, T., Safford, H., and Cushman, S.A. 2018. Modeling historical range of variability and alternative management scenarios in the upper yuba river watershed, tahoe national forest, California. *In* USDA Forest Service General Technical Report RMRS-GTR. https://doi.org/10.2737/RMRS-GTR-385.
- McGregor, D. 2008. Linking traditional ecological knowledge and Western science: aboriginal perspectives from the 2000 State of the Lakes Ecosystem Conference. The Canadian Journal of Native Studies **28**(1): 139–158.
- McLaughlan, M.S., Wright, R.A., and Jiricka, R.D. 2010. Field guide to the ecosites of Saskatchewan's provincial forests. Government of Saskatchewan, Prince Albert, SK, Canada.
- McLoughlin, P.D., Superbie, C., Stewart, K., Tomchuk, P.A., Neufeld, B., Barks, D., Perry, T., Greuel, R., Regan, C., Truchon-Savard, A., Hart, S., Henkelman, J., and Johnstone, J.F. 2019. Population and habitat ecology of boreal caribou and their predators in the Saskatchewan Boreal Shield. Saskatoon, SK, Canada.

- McRae, D.J., Duchesne, L.C., Freedman, B., Lynham, T.J., and Woodley, S. 2001. Comparisons between wildfire and forest harvesting and their implications in forest management. Environmental Reviews **9**: 223–260.
- McWethy, D.B., Schoennagel, T., Higuera, P.E., Krawchuk, M., Harvey, B.J., Metcalf, E.C., Schultz, C., Miller, C., Metcalf, A.L., Buma, B., Virapongse, A., Kulig, J.C., Stedman, R.C., Ratajczak, Z., Nelson, C.R., and Kolden, C. 2019. Rethinking resilience to wildfire. Nature Sustainability **2**(9): 797–804. https://doi.org/10.1038/s41893-019-0353-8.
- MEA. 2003. Millennium Ecosystem Assessment: Ecosystems and Human Well-Being A Framework for Assessment. *In* Millennium Ecosystem Assessment. CIFOR, Washington, D.C., USA.
- Mencken, H.L. 1920. Prejudices: Second Series. Alfred A. Knopf, New York, NY, US.
- Millar, C.I. 2014. Historic Variability: Informing Restoration Strategies, Not Prescribing Targets. Journal of Sustainable Forestry 33(sup1): S28–S42. Taylor & Francis. https://doi.org/10.1080/10549811.2014.887474.
- Miller, L., and Nadeau, S. 2020. Perceptions of public land governance from two Canadian provinces: How is the social agenda being met through sustainable forest management? Land Use Policy **91**: 102485. https://doi.org/10.1016/j.landusepol.2016.10.041.
- Miller, L.F., and Nadeau, S. 2017. Participatory processes for public lands. Ecology and Society **22**(2). Resilience Alliance Inc.
- Mistik Management Ltd. 1997. 1997 20-Year Forest Management Plan. Meadow Lake, SK, Canada.
- Mladenoff, D.J., and Baker, W.L. 1999. Spatial modeling of forest landscape change. Cambridge University Press.
- MNP LLP. 2016. Review of Alberta Agriculture and Forestry's wildfire management program and the 2016 fire season. Volume 1: Summary report. Edmonton, AB, Canada.
- MNP LLP. 2017. A review of the 2016 Horse River Wildfire. Alberta Agriculture and Forestry preparedness and response. Edmonton, AB, Canada.
- Moffatt, S. 2021. Protecting forests, planting trees and fighting climate change separating fact from fiction. Available from https://www.greenpeace.org/canada/en/story/46897/protecting-forests-planting-trees-and-fighting-climate-change-separating-fact-from-fiction/ [accessed 17 April 2021].
- Mooers, A.O., Doak, D.F., Scott Findlay, C., Green, D.M., Grouios, C., Manne, L.L., Rashvand, A., Rudd, M.A., and Whitton, J. 2010. Science, Policy, and Species at Risk in Canada. BioScience **60**(10): 843– 849. https://doi.org/10.1525/bio.2010.60.10.11.
- Moomaw, W.R., Masino, S.A., and 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. https://doi.org/10.3389/ffgc.2019.00027.
- Moore, J.R., Mitchell, S.J., Maguire, D.A., and Quine, C.P. 2003. Wind damage in alternative silvicultural systems: Review and synthesis of previous studies. *In* Proceedings of the International Conference 'Wind Effects on Trees.' 16–18 September 2003, Karlsruhe, Germany. pp. 191–198.
- Moore, T., and Tink, G. 2008. Technical considerations in the design of core habitat patches in forest management: A case study using the Patchworks spatial model. The Forestry Chronicle **84**(5): 731–



740. Canadian Institute of Forestry. https://doi.org/10.5558/tfc84731-5.

- Morissette, J.L., and Donnelly, M. 2010. Riparian areas challenges and opportunities for conservation and sustainable forest management. University of Alberta, Edmonton, AB, Canada.
- Moritz, M.A., Batllori, E., Bradstock, R.A., Gill, A.M., Handmer, J., Hessburg, P.F., Leonard, J., McCaffrey, S., Odion, D.C., Schoennagel, T., and Syphard, A.D. 2014. Learning to coexist with wildfire. Nature **515**(7525): 58–66. https://doi.org/10.1038/nature13946.
- Morse, N.B., Pellissier, P.A., Cianciola, E.N., Brereton, R.L., Sullivan, M.M., Shonka, N.K., Wheeler, T.B., and McDowell, W.H. 2014. Novel ecosystems in the Anthropocene. Ecology and Society **19**(2). Resilience Alliance Inc.
- Morton, T. 2020, September 23. The great divide between Edmonton and Ottawa. The National Post. Toronto, ON, Canada.
- Mozelewski, T.G., and Scheller, R.M. 2021. Forecasting for intended consequences. Conservation Science and Practice **3**(4): e370. John Wiley & Sons, Ltd. https://doi.org/10.1111/csp2.370.
- Muhly, T.B., Johnson, C.A., Hebblewhite, M., Neilson, E.W., Fortin, D., Fryxell, J.M., Latham, A.D.M., Latham, M.C., McLoughlin, P.D., Merrill, E., Paquet, P.C., Patterson, B.R., Schmiegelow, F., Scurrah, F., and Musiani, M. 2019. Functional response of wolves to human development across boreal North America. Ecology and Evolution 9(18): 10801–10815. https://doi.org/10.1002/ece3.5600.
- Mulder, B.S., and Palmer, C.J. 1994. Chapter 1: Introduction to effectiveness monitoring. *In* General Technical Report. *Edited By*R. Everett, P. Hessburg, M.E. Jensen, and B.T. Bormann. USDA, Forest Service, Corvallis, OR, USA.
- Murcia, C., Aronson, J., Kattan, G.H., Moreno-Mateos, D., Dixon, K., and Simberloff, D. 2014. A critique of the 'novel ecosystem' concept. Trends in Ecology & Evolution 29(10): 548–553. https://doi.org/10.1016/j.tree.2014.07.006.
- Murphy, P.J. 1985a. Methods for evaluating the effects of forest fire management in Alberta. University of British Columbia, Vancouver, BC, Canada.
- Murphy, P.J. 1985b. History of forest and prairie fire control policy in Alberta. *Edited By*F.A.O of the United Nations. Alberta Energy and Natural Resources, Forest Service, Edmonton, AB, Canada.
- Murphy, P.J., and Luckert, M.K. 2002. The evolution of Forest Management Agreements on the Weldwood Hinton forest. Foothills Model Forest, Hinton, AB, Canada.
- Murphy, P.J., Tymstra, C., and Massie, M. 2015. The Great Fire of 1919. Forest History Today: 22–30.
- Murray, C., and Marmorek, D. 2003. Adaptive management and ecological restoration. *In* Ecological restoration of southwestern ponderosa pine forests Vol. 2. *Edited by* P. Friederici and Ecological Restoration Institute. Island Press, Washington, D.C., USA. pp. 417–428.
- Mussells, C., and Stephenson, R.L. 2020. A comparison of sustainability objectives: how well does the Canadian Fisheries Research Network framework compare with fisheries, forestry, and aquaculture certification schemes? Ecology and Society 25(1). The Resilience Alliance. https://doi.org/10.5751/ES-11368-250117.

Ν

- Naiman, R.J. 2002. Dead wood dynamics in stream ecosystems. USDA Forest Service Gen. Tech. Rep. **PSW-GTR-18**: 23–48.
- Naiman, R.J., Décamps, H., and Pollock, M.M. 1993. The role of riparian corridors in maintaining regional biodiversity. Ecological Applications **3**(2): 209–212.
- Nalau, J., Becken, S., and Mackey, B. 2018. Ecosystem-based Adaptation: A review of the constraints. Environmental Science & Policy **89**: 357–364. https://doi.org/10.1016/j.envsci.2018.08.014.
- Nappi, A., Drapeau, P., and Savard, J.-P.L. 2004. Salvage logging after wildfire in the boreal forest: Is it becoming a hot issue for wildlife? The Forestry Chronicle **80**(1): 67–74. Canadian Institute of Forestry. https://doi.org/10.5558/tfc80067-1.
- National Forestry Database. 2019. Alberta and Saskatchewan 2018 harvest and AAC statistics. National Forestry Database, Ottawa, ON, Canada.
- National Round Table on the Environment and the Economy. 1995. Annual review. Government of Canada, Ottawa, ON, Canada.
- National Wetlands Working Group. 1997. The Canadian Wetland Classification System. *In* Second Edi. *Edited By*B.G. Warner and C.D.A. Rubec. Wetlands Research Centre, Waterloo, ON, Canada.
- Navarro, K.M., Schweizer, D., Balmes, J.R., and Cisneros, R. 2018. A Review of Community Smoke Exposure from Wildfire Compared to Prescribed Fire in the United States. https://doi.org/10.3390/atmos9050185.
- Naylor, B.J., Mackereth, R.W., Kreutzweiser, D.P., and Sibley, P.K. 2012. Merging END concepts with protection of fish habitat and water quality in new direction for riparian forests in Ontario: a case study of science guiding policy and practice. Freshwater Science **31**(1): 248–257. The University of Chicago Press. https://doi.org/10.1899/11-035.1.
- Nenko, A., Parkins, J.R., and Reed, M.G. 2018. Indigenous experiences with public advisory committees in Canadian forest management. Canadian Journal of Forest Research 49(4): 331–338. NRC Research Press. https://doi.org/10.1139/cjfr-2018-0235.
- Neufeld, B.T., Superbie, C., Greuel, R.J., Perry, T., Tomchuk, P.A., Fortin, D., and McLoughlin, P.D. 2021. Disturbance-Mediated Apparent Competition Decouples in a Northern Boreal Caribou Range. The Journal of Wildlife Management 85: 254–270. John Wiley & Sons, Ltd. https://doi.org/10.1002/jwmg.21982.
- Newaz, M.S., Mackereth, R.W., Mallik, A.U., and McCormick, D. 2020. How much boreal lake shoreline is burned by wildfire? Implications for emulating natural disturbance in riparian forest management. Forest Ecology and Management **473**: 118283. https://doi.org/10.1016/j.foreco.2020.118283.
- Newing, H.S. 2010. Conducting research in conservation: a social science perspective. Routledge, London and New York.
- Newman, E.A. 2019. Disturbance Ecology in the Anthropocene. Frontiers in Ecology and Evolution **7**: 147. https://doi.org/10.3389/fevo.2019.00147.
- Nie, M.A., and Schultz, C.A. 2012. Decision-Making Triggers in Adaptive Management. Conservation



Biology **26**(6): 1137–1144. John Wiley & Sons, Ltd. https://doi.org/10.1111/j.1523-1739.2012.01915.x.

- Nielsen, S.E., McDermid, G., Stenhouse, G.B., and Boyce, M.S. 2010. Dynamic wildlife habitat models: Seasonal foods and mortality risk predict occupancy-abundance and habitat selection in grizzly bears. Biological Conservation **143**(7): 1623–1634. https://doi.org/10.1016/j.biocon.2010.04.007.
- Nilsson, S. 2015. Transition of the Canadian Forest Sector BT The Future Use of Nordic Forests: A Global Perspective. *Edited by* E. Westholm, K. Beland Lindahl, and F. Kraxner. Springer International Publishing, Cham. pp. 125–144. https://doi.org/10.1007/978-3-319-14218-0_9.
- Nitschke, C.R. 2005. Does forest harvesting emulate fire disturbance? A comparison of effects on selected attributes in coniferous-dominated headwater systems. Forest Ecology and Management **214**(1): 305–319. https://doi.org/10.1016/j.foreco.2005.04.015.
- Nixon, S., Page, D., Pinkus, S., Podolsky, L., and Russell, S. 2012. Failure to protect: grading Canada's species at risk laws. Ecojustice Canada, Vancouver, BC, Canada [online]: Available from ecojustice. ca/wp-content/uploads/2014/08/Failure-to-protect_Grading-Canadas-Species-at-Risk-Laws. pdf.
- Noble, B., Gibson, R., White, L., Blakley, J., Croal, P., Nwanekezie, K., and Doelle, M. 2019. Effectiveness of strategic environmental assessment in Canada under directive-based and informal practice. Impact Assessment and Project Appraisal **37**(3–4): 344–355. Taylor & Francis. https://doi.org/10.1080/14615517.2019.1565708.
- Noble, B., and Nwanekezie, K. 2017. Conceptualizing strategic environmental assessment: Principles, approaches and research directions. Environmental Impact Assessment Review **62**: 165–173. https://doi.org/10.1016/j.eiar.2016.03.005.
- Nocentini, S., Buttoud, G., Ciancio, O., and Corona, P. 2017. Managing forests in a changing world: the need for a systemic approach. A review. Forest Systems **26**(1): eR01. https://doi.org/10.5424/fs/2017261-09443.
- Norton, B.G. 1991. Ecological health and sustainable resource management. *In* Ecological economics: the science and management of sustainability. *Edited by* R. Constanza. Columbia University Press, New York, NY, US. pp. 102–177.
- Noss, R.F. 1987. From plant communities to landscapes in conservation inventories: A look at the nature conservancy (USA). Biological Conservation **41**(1): 11–37. https://doi.org/10.1016/0006-3207(87)90045-0.
- Noss, R.F., Franklin, J.F., Baker, W.L., Schoennagel, T., and Moyle, P.B. 2006. Managing fire-prone forests in the western United States. Frontiers in Ecology and the Environment **4**(9): 481–487. John Wiley & Sons, Ltd. https://doi.org/10.1890/1540-9295(2006)4[481:MFFITW]2.0.CO;2.

0

O'Hara, K.L. 2002. The historical development of uneven-aged silviculture in North America. Forestry: An International Journal of Forest Research **75**(4): 339–346. https://doi.org/10.1093/forestry/75.4.339.

Odion, D.C., Hanson, C.T., Arsenault, A., Baker, W.L., DellaSala, D.A., Hutto, R.L., Klenner, W., Moritz,

M.A., Sherriff, R.L., Veblen, T.T., and Williams, M.A. 2014. Examining Historical and Current Mixed-Severity Fire Regimes in Ponderosa Pine and Mixed-Conifer Forests of Western North America. PLOS ONE **9**(2): e87852. Public Library of Science.

- Odsen, S.G., Pyper, M.P., Leboeuf, J., and Andison, D.W. 2019. Creating a roadmap for EBM in Alberta and beyond. fRI Research, Hinton, AB, Canada.
- Odum, W.E. 1982. Environmental Degradation and the Tyranny of Small Decisions. BioScience **32**(9): 728–729. https://doi.org/10.2307/1308718.
- OECD. 2007. Instrument Mixes Addressing Non--Point Sources of Water Pollution. *In* Instrument Mixes for Environmental Policy. OECD Publishing, Paris, France. https://doi.org/10.1787/9789264018419-4-en.

Orphan Well Association. 2019. Annual report 2019. Edmonton, AB, Canada.

Ostrom, E. 2003. Toward a behavioral theory linking trust, reciprocity, and reputation. *In* Trust and reciprocity: Interdisciplinary lessons from experimental research. Russell Sage Foundation, New York, NY, USA. pp. 19–79.

Ρ

- Padbury, G.A., and Acton, D.F. 1994. Ecoregions of Saskatchewan. Government of Canada, Ottawa, ON, Canada.
- Palik, B.J., and D'Amato, A.W. 2017. Ecological Forestry: Much More Than Retention Harvesting. Journal of Forestry **115**(1): 51–53. https://doi.org/10.5849/jof.16-057.
- Palik, B.J., D'Amato, A.W., Franklin, J.F., and Johnson, K.N. 2020. Ecological silviculture: foundations and applications. Waveland Press, Long Grove, IL, USA.
- Papillon, M., and Rodon, T. 2017. Proponent-Indigenous agreements and the implementation of the right to free, prior, and informed consent in Canada. Environmental Impact Assessment Review **62**: 216–224. https://doi.org/10.1016/j.eiar.2016.06.009.
- Parkins, J.R. 2010. The Problem With Trust: Insights from Advisory Committees in the Forest Sector of Alberta. Society & Natural Resources **23**(9): 822–836. Routledge. https://doi.org/10.1080/08941920802545792.
- Parkins, J.R. 2011. Deliberative Democracy, Institution Building, and the Pragmatics of Cumulative Effects Assessment. Ecology and Society **16**(3). Resilience Alliance Inc. https://doi.org/10.5751/ES-04236-160320.
- Parkins, J.R., Nadeau, S., Hunt, L.M., Sinclair, J., Reed, M.G., and Wallace, S. 2006. Public participation in forest management. Information Report NOR-X-409E, Edmonton, AB, Canada.
- Parks Canada. 2000. Ecological Integrity in National Parks Policy: Evolution of the Concept. Parks Canada Agency, Ottawa, ON, Canada.
- Parrish, J.D., Braun, D.P., and Unnasch, R.S. 2003. Are We Conserving What We Say We Are? Measuring Ecological Integrity within Protected Areas. BioScience **53**(9): 851–860. https://doi.org/10.1641/0006-3568(2003)053[0851:AWCWWS]2.0.CO;2.

- Pasetto, D., Arenas-Castro, S., Bustamante, J., Casagrandi, R., Chrysoulakis, N., Cord, A.F., Dittrich, A., Domingo-Marimon, C., El Serafy, G., Karnieli, A., Kordelas, G.A., Manakos, I., Mari, L., Monteiro, A., Palazzi, E., Poursanidis, D., Rinaldo, A., Terzago, S., Ziemba, A., and Ziv, G. 2018. Integration of satellite remote sensing data in ecosystem modelling at local scales: Practices and trends. Methods in Ecology and Evolution **9**(8): 1810–1821. John Wiley & Sons, Ltd. https://doi.org/10.1111/2041-210X.13018.
- Passelac-Ross, M.M. 2011. Public participation in Alberta's land-use planning process. Canadian Institute of Resources Law. Resources **112**: 1–7.
- Pavlovic, R., Chen, J., Anderson, K.R., Moran, M.D., Beaulieu, P.-A., Davignon, D., and Cousineau, S. 2016. The FireWork air quality forecast system with near-real-time biomass burning emissions: Recent developments and evaluation of performance for the 2015 North American wildfire season. Journal of the Air & Waste Management Association 66(9): 819–841. Taylor & Francis. https://doi.org/10.1080/10962247.2016.1158214.
- Pearson, H. 2019. Years of fire suppression contributing to increasing Alberta wildfires: expert. Global News Canada: accessed 1 Oct 2021. Toronto, ON, Canada.
- Perera, A.H., Buse, L.J., Weber, M.G., and Crow, T.R. 2008. Emulating Natural Forest Landscape Disturbances. *Edited by* A.H. Perera, L.J. Buse, and M.G. Weber. Columbia University Press, New York Chichester, West Sussex. pp. 265–274. https://doi.org/doi:10.7312/pere12916-025.
- Perry, J. 2021. Reviewed Work: Agendas, Alternatives, and Public Policies. Journal of Policy Analysis and Management 4(4): 621. [Wiley, Association for Public Policy Analysis and Management]. https://doi.org/10.2307/3323801.
- Peterson, G.D., Cumming, G.S., and Carpenter, S.R. 2003. Scenario Planning: a Tool for Conservation in an Uncertain World. Conservation Biology **17**(2): 358–366. John Wiley & Sons, Ltd. https://doi.org/10.1046/j.1523-1739.2003.01491.x.
- Pettit, N.E., and Naiman, R.J. 2007. Fire in the Riparian Zone: Characteristics and Ecological Consequences. Ecosystems **10**(5): 673–687. https://doi.org/10.1007/s10021-007-9048-5.
- Pfister, R. 1993. The need and potential for an ecosystem approach to management in forests of the Inland Northwest. *In* Defining Sustainable Forestry. *Edited by* G.H. Aplet, N. Johnson, J.T. Olson, and V.A. Sample. Island Press, Washington D.C.
- Phelan, R., Kareiva, P., Marvier, M., Robbins, P., and Weber, M. 2021. Why intended consequences? Conservation Science and Practice 3(4): e408. John Wiley & Sons, Ltd. https://doi.org/10.1111/csp2.408.
- Pickell, P.D., Andison, D.W., and Coops, N.C. 2013. Characterizations of anthropogenic disturbance patterns in the mixedwood boreal forest of Alberta, Canada. Forest Ecology and Management. https://doi.org/10.1016/j.foreco.2013.04.031.
- Pickell, P.D., Andison, D.W., Coops, N.C., Gergel, S.E., and Marshall, P.L. 2015. The spatial patterns of anthropogenic disturbance in the western Canadian boreal forest following oil and gas development. Canadian Journal of Forest Research 45(6): 732–743. NRC Research Press. https://doi.org/10.1139/cjfr-2014-0546.
- Piégay, H., and Gurnell, A.M. 1997. Large woody debris and river geomorphological pattern: examples from S.E. France and S. England. Geomorphology **19**(1): 99–116. https://doi.org/10.1016/S0169-

555X(96)00045-1.

- Pigeon, K.E., Anderson, M., MacNearney, D., Cranston, J., Stenhouse, G., and Finnegan, L. 2016. Toward the Restoration of Caribou Habitat: Understanding Factors Associated with Human Motorized Use of Legacy Seismic Lines. Environmental Management 58(5): 821–832. https://doi.org/10.1007/s00267-016-0763-6.
- Pinno, B.D., Errington, R.C., and Thompson, D.K. 2013. Young jack pine and high severity fire combine to create potentially expansive areas of understocked forest. Forest Ecology and Management **310**: 517–522. https://doi.org/10.1016/j.foreco.2013.08.055.
- Poff, N.L., Allan, J.D., Bain, M.B., Karr, J.R., Prestegaard, K.L., Richter, B.D., Sparks, R.E., and Stromberg, J.C. 1997. The Natural Flow Regime. BioScience 47(11): 769–784. [American Institute of Biological Sciences, Oxford University Press]. https://doi.org/10.2307/1313099.
- Poiani, K.A., Richter, B.D., Anderson, M.G., and Richter, H.E. 2000. Biodiversity Conservation at Multiple Scales: Functional Sites, Landscapes, and Networks. BioScience **50**(2): 133–146. https://doi.org/10.1641/0006-3568(2000)050[0133:BCAMSF]2.3.CO;2.
- Pope, K.L., Allen, C.R., and Angeler, D.G. 2014. Fishing for Resilience. Transactions of the American Fisheries Society **143**(2): 467–478. Taylor & Francis. https://doi.org/10.1080/00028487.2014.880735.
- Porter, J.W., Price, R.A., McCrossan, R.G., Kent, P., Bott, M.H.P., McKenzie, D.P., and Williams, C.A. 1982. The Western Canada sedimentary basin. Philosophical Transactions of the Royal Society of London. Series A, Mathematical and Physical Sciences **305**(1489): 169–192. Royal Society. https://doi.org/10.1098/rsta.1982.0032.
- Powell, S.R., Daniels, L.D., and Jones, T.A. 2009. Temporal dynamics of large woody debris in small streams of the Alberta foothills, Canada. Canadian Journal of Forest Research **39**(6): 1159–1170. NRC Research Press. https://doi.org/10.1139/X09-035.
- Price, D.T., Alfaro, R.I., Brown, K.J., Flannigan, M.D., Fleming, R.A., Hogg, E.H., Girardin, M.P., Lakusta, T., Johnston, M., McKenney, D.W., Pedlar, J.H., Stratton, T., Sturrock, R.N., Thompson, I.D., Trofymow, J.A., and Venier, L.A. 2013. Anticipating the consequences of climate change for Canada's boreal forest ecosystems. Environmental Reviews **21**(4): 322–365. NRC Research Press. https://doi.org/10.1139/er-2013-0042.
- Price, K., and Daust, D. 2009. Making monitoring manageable: a framework to guide learning. Canadian Journal of Forest Research **39**(10): 1881–1892. NRC Research Press. https://doi.org/10.1139/X09-101.
- Price, K., Roburn, A., and MacKinnon, A. 2009. Ecosystem-based management in the Great Bear Rainforest. Forest Ecology and Management **258**(4): 495–503. https://doi.org/10.1016/j.foreco.2008.10.010.
- Prichard, D., Barrett, H., Cagney, J., Clark, R., Fogg, J., Gebhardt, K., Hansen, P., Mitchell, B., and Tippy, D.
 1993. Riparian Area Management: Process for Assessing Proper Functioning Condition. TR 1737-9, Boulder, CO, USA.
- Puettmann, K.J., Wilson, S.M., Baker, S.C., Donoso, P.J., Drössler, L., Amente, G., Harvey, B.D., Knoke, T., Lu, Y., Nocentini, S., Putz, F.E., Yoshida, T., and Bauhus, J. 2015. Silvicultural alternatives to conventional even-aged forest management - what limits global adoption? Forest Ecosystems 2(1):



- 8. https://doi.org/10.1186/s40663-015-0031-x.
- Pukkala, T. 2016. Which type of forest management provides most ecosystem services? Forest Ecosystems **3**(1): 9. https://doi.org/10.1186/s40663-016-0068-5.
- Pyne, S.J. 2007. Awful splendour: a fire history of Canada. UBC Press (University of British Columbia), Vancouver.

Q

- Quinn-Davidson, L.N., and Varner, J.M. 2012. Impediments to prescribed fire across agency, landscape and manager: an example from northern California. International Journal of Wildland Fire **21**(3): 210–218.
- Quiring, B. 2004. Saskatchewan Politicians: Lives Past and Present. *Edited By*B. Mlazger. University of Regina. Canadian Plains Research Center, Regina, SK, Canada.

R

- Radeloff, V.C., Pidgeon, A.M., and Hostert, P. 1999. Habitat and population modelling of roe deer using an interactive geographic information system. Ecological Modelling **114**(2): 287–304. https://doi.org/10.1016/S0304-3800(98)00164-1.
- Raffensperger, C., and Tickner, J.A. 1999. Protecting public health & the environment: Implementing the Precautionary Principle. *Edited By*FAO of the United Nations. Island Press, Gland, Switzerlandand.
- Rametsteiner, E., and Simula, M. 2003. Forest certification—an instrument to promote sustainable forest management? Journal of Environmental Management 67(1): 87–98. https://doi.org/10.1016/S0301-4797(02)00191-3.
- Ramirez, R. 2021, March 5. The world's largest intact forest is in danger. Here's how to save it. Huffington Post: Online.
- Rasmussen, C., and Stavne, R. 2016. Restoring Natural Habitat for Wildlife. Alberta Conservation Association, Edmonton, AB, Canada.
- Raymond, C. V, Wen, L., Cooke, S.J., and Bennett, J.R. 2018. National attention to endangered wildlife is not affected by global endangerment: A case study of Canada's species at risk program. Environmental Science & Policy 84: 74–79. https://doi.org/10.1016/j.envsci.2018.03.001.
- Rayner, J., and Howlett, M. 2009. Implementing Integrated Land Management in Western Canada: Policy Reform and the Resilience of Clientelism. Journal of Natural Resources Policy Research 1(4): 321–334. Routledge. https://doi.org/10.1080/19390450903137565.
- Rayner, J., McNutt, K., and Wellstead, A. 2013. Dispersed Capacity and Weak Coordination: The Challenge of Climate Change Adaptation in Canada's Forest Policy Sector. Review of Policy Research **30**(1): 66–90. John Wiley & Sons, Ltd. https://doi.org/10.1111/ropr.12003.
- Rayner, J., and Needham, F. 2009. Saskatchewan: Change without direction. Policy and Society **28**(2): 139–150. Routledge. https://doi.org/10.1016/j.polsoc.2009.05.003.

- van Rensen, C.K., Nielsen, S.E., White, B., Vinge, T., and Lieffers, V.J. 2015. Natural regeneration of forest vegetation on legacy seismic lines in boreal habitats in Alberta's oil sands region. Biological Conservation **184**: 127–135. https://doi.org/10.1016/j.biocon.2015.01.020.
- Ribe, R.G. 2005. Aesthetic perceptions of green-tree retention harvests in vista views: The interaction of cut level, retention pattern and harvest shape. Landscape and Urban Planning 73(4): 277–293. https://doi.org/10.1016/j.landurbplan.2004.07.003.
- Richards, K.R., and Stokes, C. 2004. A Review of Forest Carbon Sequestration Cost Studies: A Dozen Years of Research. Climatic Change **63**(1): 1–48. https://doi.org/10.1023/B:CLIM.0000018503.10080.89.
- Richardson, J.S., Naiman, R.J., and Bisson, P.A. 2012. How did fixed-width buffers become standard practice for protecting freshwaters and their riparian areas from forest harvest practices?
 Freshwater Science **31**(1): 232–238. The University of Chicago Press. https://doi.org/10.1899/11-031.1.
- Ring, I., and Schröter-Schlaack, C. 2011. Instrument Mixes for Biodiversity Policies. *In* Issue No. Helmholtz Centre for Environmental Research, Leipzig, Germany.
- Robertson, K., Loza-Balbuena, I., and Ford-Robertson, J. 2004. Monitoring and economic factors affecting the economic viability of afforestation for carbon sequestration projects. Environmental Science & Policy **7**(6): 465–475. https://doi.org/10.1016/j.envsci.2004.07.003.
- Robinson, D., Pfister, R., Shultis, J., and Safford, E. 1997. New Directions in Resource Recreation Management: A Response to the Educational Challenge. SCHOLE: A Journal of Leisure Studies and Recreation Education **12**(1): 1–11. Routledge. https://doi.org/10.1080/1937156X.1997.11949406.
- Robinson, D., Robson, M., and Rollins, R. 2001. Towards increased citizen influence in Canadian Forest Management. Environments **29**: 21–41.
- Robitaille, P.A., Shahi, C., Smith, M.A., and Luckai, N. 2017. Growing together: A principle-based approach to building collaborative Indigenous partnerships in Canada's forest sector. The Forestry Chronicle **93**(01): 44–57. Canadian Institute of Forestry. https://doi.org/10.5558/tfc2017-010.
- Rodhouse, T., and Vanclay, F. 2016. Is free, prior and informed consent a form of corporate social responsibility? Journal of Cleaner Production **131**: 785–794. https://doi.org/10.1016/j.jclepro.2016.04.075.
- Rogers, M. 2008. A progress report on the regional land use planning process and the representative areas network program in Saskatchewan. Government of Saskatchewan, Regina, SK, Canada.
- Rosenfeld, J.S., and Hatfield, T. 2006. Information needs for assessing critical habitat of freshwater fish. Canadian Journal of Fisheries and Aquatic Sciences **63**(3): 683–698. NRC Research Press. https://doi.org/10.1139/f05-242.
- Rosenvald, R., and Lõhmus, A. 2008. For what, when, and where is green-tree retention better than clear-cutting? A review of the biodiversity aspects. Forest Ecology and Management **255**(1): 1–15. https://doi.org/10.1016/j.foreco.2007.09.016.
- Ross, M. 1997. A History of Forest Legislation in Canada 1867-1996. University of Calgary. https://doi.org/10.11575/PRISM/34269.
- Rowe, J.S., and Scotter, G.W. 1973. Fire in the boreal forest. Quaternary Research 3(3): 444–464.

https://doi.org/10.1016/0033-5894(73)90008-2.

Ryan, K.C., Knapp, E.E., and Varner, J.M. 2013. Prescribed fire in North American forests and woodlands: history, current practice, and challenges. Frontiers in Ecology and the Environment **11**(s1): e15– e24. John Wiley & Sons, Ltd. https://doi.org/10.1890/120329.

S

- Sakâw Askiy Management Inc. 2018. 2018 2038 Forest Management Plan Volume II. Prince Albert, SK, Canada.
- Sandström, J., Bernes, C., Junninen, K., Lõhmus, A., Macdonald, E., Müller, J., and Jonsson, B.G. 2019. Impacts of dead wood manipulation on the biodiversity of temperate and boreal forests. A systematic review. Journal of Applied Ecology **56**(7): 1770–1781. John Wiley & Sons, Ltd. https://doi.org/10.1111/1365-2664.13395.
- Sankey, S. 2018. Blueprint for wildland fire science in Canada (2019-2029). Government of Canada, Edmonton, AB, Canada.
- Saskatchewan's 2009 State of the Environment Report and State of Saskatchewan's Provincial Forests. 2009. Government of Saskatchewan, Regina, SK, Canada.
- Saskatchewan Round Table on Environment and Economy. 2002. Conservation Strategy for Sustainable Development in Saskatchewan. Government of Saskatchewan, Regina, SK, Canada.
- Schall, P., Gossner, M.M., Heinrichs, S., Fischer, M., Boch, S., Prati, D., Jung, K., Baumgartner, V., Blaser, S., Böhm, S., Buscot, F., Daniel, R., Goldmann, K., Kaiser, K., Kahl, T., Lange, M., Müller, J., Overmann, J., Renner, S.C., Schulze, E.-D., Sikorski, J., Tschapka, M., Türke, M., Weisser, W.W., Wemheuer, B., Wubet, T., and Ammer, C. 2018. The impact of even-aged and uneven-aged forest management on regional biodiversity of multiple taxa in European beech forests. Journal of Applied Ecology 55(1): 267–278. John Wiley & Sons, Ltd. https://doi.org/10.1111/1365-2664.12950.
- Scharlemann, J.P.W., Tanner, E.V.J., Hiederer, R., and Kapos, V. 2014. Global soil carbon: understanding and managing the largest terrestrial carbon pool. Carbon Management **5**(1): 81–91. Taylor & Francis. https://doi.org/10.4155/cmt.13.77.
- Schmiegelow, F.K.A., Machtans, C.S., and Hannon, S.J. 1997. Are boreal birds resilient to forest fragmentation? An experimental study of short-term community responses. Ecology **78**(6): 1914– 1932. John Wiley & Sons, Ltd. https://doi.org/10.1890/0012-9658(1997)078[1914:ABBRTF]2.0.CO;2.
- Schneider, R.R., Stelfox, J.B., Boutin, S., and Wasel, S. 2003. Managing the Cumulative Impacts of Land Uses in the Western Canadian Sedimentary Basin. Conservation Ecology **7**(1): 8.
- Schoemaker, P.J.H. 1995. Scenario Planning: A Tool for Strategic Thinking. The Journal of Product Innovation Management **12**(4): 355–356.
- Schoennagel, T., Balch, J.K., Brenkert-Smith, H., Dennison, P.E., Harvey, B.J., Krawchuk, M.A., Mietkiewicz, N., Morgan, P., Moritz, M.A., Rasker, R., Turner, M.G., and Whitlock, C. 2017. Adapt to more wildfire in western North American forests as climate changes. Proceedings of the National



Academy of Sciences **114**(18): 4582 LP-4590. https://doi.org/10.1073/pnas.1617464114.

- Scholte, P. 2009. At the Interface of Legislation and Wildlife Management: A Decade of Experience with Consensual Protected Area Management Planning in Cameroon. Journal of International Wildlife Law & Policy **12**(1–2): 1–32. Routledge. https://doi.org/10.1080/13880290902938062.
- Schultz, C.A., McCaffrey, S.M., and Huber-Stearns, H.R. 2019. Policy barriers and opportunities for prescribed fire application in the western United States. International Journal of Wildland Fire 28(11): 874–884. https://doi.org/10.1071/WF19040.
- Schweizer, D., Cisneros, R., Traina, S., Ghezzehei, T.A., and Shaw, G. 2017. Using National Ambient Air Quality Standards for fine particulate matter to assess regional wildland fire smoke and air quality management. Journal of Environmental Management **201**: 345–356. https://doi.org/10.1016/j.jenvman.2017.07.004.
- Seaber, P.R., Kapinos, F.P., and Knapp, G.L. 1987. Hydrologic unit maps. United States Geological Survey Water Supply Paper 2294, Denver, CO, USA.
- Seastedt, T.R., Hobbs, R.J., and Suding, K.N. 2008. Management of novel ecosystems: are novel approaches required? Frontiers in Ecology and the Environment **6**(10): 547–553. John Wiley & Sons, Ltd. https://doi.org/10.1890/070046.
- Seidl, R., Fernandes, P.M., Fonseca, T.F., Gillet, F., Jönsson, A.M., Merganičová, K., Netherer, S., Arpaci, A., Bontemps, J.-D., Bugmann, H., González-Olabarria, J.R., Lasch, P., Meredieu, C., Moreira, F., Schelhaas, M.-J., and Mohren, F. 2011. Modelling natural disturbances in forest ecosystems: a review. Ecological Modelling 222(4): 903–924. https://doi.org/10.1016/j.ecolmodel.2010.09.040.
- Seidl, R., Honkaniemi, J., Aakala, T., Aleinikov, A., Angelstam, P., Bouchard, M., Boulanger, Y., Burton, P.J., De Grandpré, L., Gauthier, S., Hansen, W.D., Jepsen, J.U., Jõgiste, K., Kneeshaw, D.D., Kuuluvainen, T., Lisitsyna, O., Makoto, K., Mori, A.S., Pureswaran, D.S., Shorohova, E., Shubnitsina, E., Taylor, A.R., Vladimirova, N., Vodde, F., and Senf, C. 2020. Globally consistent climate sensitivity of natural disturbances across boreal and temperate forest ecosystems. Ecography 43(7): 967–978. John Wiley & Sons, Ltd. https://doi.org/10.1111/ecog.04995.
- Seidl, R., Spies, T.A., Peterson, D.L., Stephens, S.L., and Hicke, J.A. 2016. REVIEW: Searching for resilience: addressing the impacts of changing disturbance regimes on forest ecosystem services. Journal of Applied Ecology 53(1): 120–129. John Wiley & Sons, Ltd. https://doi.org/10.1111/1365-2664.12511.
- Seppelt, R., Dormann, C.F., Eppink, F. V, Lautenbach, S., and Schmidt, S. 2011. A quantitative review of ecosystem service studies: approaches, shortcomings and the road ahead. Journal of Applied Ecology 48(3): 630–636. John Wiley & Sons, Ltd. https://doi.org/10.1111/j.1365-2664.2010.01952.x.
- Sessions, J., and Bettinger, P. 2001. Hierarchical planning: pathway to the future. *In* Proceedings of the First International Precision Forestry Symposium, University of Washington Institute for Forest Resources, Seattle, Washington, USA. Proceedings of the First International Precision Forestry Symposium, University of Washington Institute for Forest Resources, Seattle, Washington, USA. pp. 185–190.
- Seymour, R.S., and Hunter, M.L. 1992. New forestry in eastern spruce-fir forests: principles and applications to Maine. Maine Agricultural Experiment Station, Orono. MN, USA.

- Seymour, R.S., and Hunter, M.L. 1999. Principles of ecological forestry. *In* Maintaining biodiversity in forest ecosystems. Cambridge University Press, Cambridge, UK. pp. 22–61.
- Sheppard, S.R.J., and Meitner, M. 2005. Using multi-criteria analysis and visualisation for sustainable forest management planning with stakeholder groups. Forest Ecology and Management 207(1): 171–187. https://doi.org/10.1016/j.foreco.2004.10.032.
- Sibley, P.K., Kreutzweiser, D.P., Naylor, B.J., Richardson, J.S., and Gordon, A.M. 2012. Emulation of natural disturbance (END) for riparian forest management: synthesis and recommendations. Freshwater Science **31**(1): 258–264. https://doi.org/10.1899/11-094.1.
- Silvacom Ltd. 2017. Regional Access Management Planning (RAMP) project report. Edmonton, AB, Canada.
- Šimunović, N., Hesser, F., and Stern, T. 2018. Frame Analysis of ENGO Conceptualization of Sustainable Forest Management: Environmental Justice and Neoliberalism at the Core of Sustainability. Sustainability 10(9): 3165. https://doi.org/10.3390/su10093165.
- Skaburskis, A. 2008. The Origin of "Wicked Problems." Planning Theory & Practice **9**(2): 277–280. Routledge. https://doi.org/10.1080/14649350802041654.
- Slaper, T.F., and Hall, T.J. 2011. The triple bottom line: What is it and how does it work. Indiana business review **86**(1): 4–8.
- Sleep, D.J.H., and Loehle, C. 2010. Validation of a Demographic Model for Woodland Caribou. The Journal of Wildlife Management 74(7): 1508–1512. John Wiley & Sons, Ltd. https://doi.org/10.1111/j.1937-2817.2010.tb01278.x.
- Slocombe, D.S. 1993a. Implementing ecosystem-based management. BioScience **43**(9): 612–622. https://doi.org/10.2307/1312148.
- Slocombe, D.S. 1993b. Implementing Ecosystem-Based Management. BioScience **43**(9): 612–622. https://doi.org/10.2307/1312148.
- Slocombe, D.S. 1993c. Implementing ecosystem-based management. BioScience 43(9): 612–622.
- Slocombe, D.S. 1998a. Lessons from experience with ecosystem-based management. Landscape and Urban Planning **40**(1): 31–39. https://doi.org/10.1016/S0169-2046(97)00096-0.
- Slocombe, D.S. 1998b. Defining Goals and Criteria for Ecosystem-Based Management. Environmental Management **22**(4): 483–493. https://doi.org/10.1007/s002679900121.
- Smith, D.M. 1962. The practice of silviculture. John Wiley and Sons, Hoboken, NJ, USA.
- Smith, J.W., Leahy, J.E., Anderson, D.H., and Davenport, M.A. 2013. Community/Agency Trust and Public Involvement in Resource Planning. Society & Natural Resources 26(4): 452–471. Routledge. https://doi.org/10.1080/08941920.2012.678465.
- Smith, M., Sterritt, A., and Armstrong, P. 2007. From conflict to collaboration: the story of the Great Bear Rainforest. *In* Forest Ethics. Coastal First Nations, and Moresby Consulting Ltd, Vancouver, BC.
- Smith, T.B., Bruford, M.W., and Wayne, R.K. 1996. The preservation of process: The missing element of conservation programs, chapter 9. *In* Ecosystem Management: Selected Readings. *Edited by* F.L. Knopf and F.B. Samson. Springer, New York. pp. 71–75.

- Snetsinger, J. 2010. Chief forester's guidance on coarse woody debris management. Government of British Columbia, Victoria, BC, Canada.
- Soil Classification Working Group. 1998. The Canadian System of Soil Classification. *In* 3rd Editio. *Edited By*R.H. Haynes. NRC Research Press, Ottawa, ON, Canada.
- Sorensen, T., McLoughlin, P.D., Hervieux, D., Dzus, E., Nolan, J., Wynes, B.O.B., and Boutin, S. 2008. Determining Sustainable Levels of Cumulative Effects for Boreal Caribou. The Journal of Wildlife Management 72(4): 900–905. John Wiley & Sons, Ltd. https://doi.org/10.2193/2007-079.
- Sougavinski, S., and Doyon, F. 2002. Variable Retention: Research Findings, Trial Implementation and Operational Issues. Edmonton, AB, Canada.
- Spahlinger, M. 2018. Environmental Assessment Improvements in Canada: a Comparative Analysis of Global Environmental Assessment Systems. University of Calgary.
- Spence, B.C., Lolimicky, G.A., Hughes, R.M., and Novitzki, R.P. 1996. An ecosystem approach to salmonid conservation. Durham, North Carolina, USA.
- Spence, J.R., Volney, W.J.A., Weber, M.G., Lieffers, V.J., Luchkow, S.A., and Vinge, T.W. 1999. The Alberta EMEND project: recipe and cooks' argument. Sustainable Forest Management Network, University of Alberta, Edmonton, AB, Canada.
- Stadt, J. 2009. Review of Riparian Management Policy in Alberta's Forests. Government of Alberta, Edmonton, AB, Canada.
- Stanturf, J.A. 2015. Future landscapes: opportunities and challenges. New Forests **46**(5): 615–644. https://doi.org/10.1007/s11056-015-9500-x.
- Sterling, E.J., Betley, E., Sigouin, A., Gomez, A., Toomey, A., Cullman, G., Malone, C., Pekor, A., Arengo, F., Blair, M., Filardi, C., Landrigan, K., and Porzecanski, A.L. 2017. Assessing the evidence for stakeholder engagement in biodiversity conservation. Biological Conservation 209: 159–171. https://doi.org/10.1016/j.biocon.2017.02.008.
- Sterling, G., Goodbrand, A., and Spencer, S.A. 2016. Tri-Creeks Experimental Watershed. The Forestry Chronicle **92**(01): 53–56. Canadian Institute of Forestry. https://doi.org/10.5558/tfc2016-016.
- Stern, M.J., and Coleman, K.J. 2015. The Multidimensionality of Trust: Applications in Collaborative Natural Resource Management. Society & Natural Resources 28(2): 117–132. Routledge. https://doi.org/10.1080/08941920.2014.945062.
- Stewart, F.E.C., Nowak, J.J., Micheletti, T., McIntire, E.J.B., Schmiegelow, F.K.A., and Cumming, S.G. 2020.
 Boreal Caribou Can Coexist with Natural but Not Industrial Disturbances. The Journal of Wildlife
 Management 84: 1435–1444. John Wiley & Sons, Ltd. https://doi.org/10.1002/jwmg.21937.
- Stirling, A. 2007. Risk, precaution and science: towards a more constructive policy debate. EMBO reports **8**(4): 309–315. John Wiley & Sons, Ltd. https://doi.org/10.1038/sj.embor.7400953.
- Storch, I., Penner, J., Asbeck, T., Basile, M., Bauhus, J., Braunisch, V., Dormann, C.F., Frey, J., Gärtner, S., Hanewinkel, M., Koch, B., Klein, A.-M., Kuss, T., Pregernig, M., Pyttel, P., Reif, A., Scherer-Lorenzen, M., Segelbacher, G., Schraml, U., Staab, M., Winkel, G., and Yousefpour, R. 2020. Evaluating the effectiveness of retention forestry to enhance biodiversity in production forests of Central Europe using an interdisciplinary, multi-scale approach. Ecology and Evolution 10(3): 1489–1509. John



Wiley & Sons, Ltd. https://doi.org/10.1002/ece3.6003.

- Store, R., and Jokimäki, J. 2003. A GIS-based multi-scale approach to habitat suitability modeling. Ecological Modelling **169**(1): 1–15. https://doi.org/10.1016/S0304-3800(03)00203-5.
- Stutter, M., Kronvang, B., Ó hUallacháin, D., and Rozemeijer, J. 2019. Current Insights into the Effectiveness of Riparian Management, Attainment of Multiple Benefits, and Potential Technical Enhancements. Journal of Environmental Quality 48(2): 236–247. John Wiley & Sons, Ltd. https://doi.org/10.2134/jeq2019.01.0020.
- Summers, M. 2014. FRIAA: A Forestry Overture. The Forestry Chronicle **90**(4): 410–414. NRC Research Press.
- Sunstein, C.R. 2002. The paralyzing principle: does the precautionary principle point us in any helpful direction? Regulation **25**: 32–37.
- Sustainable Forestry Initiative. 2015. SFI 2015-2019 extended through December 2021 forest management standard. SFI, Ottawa, ON, Canada.
- Sutherland, C.R. 2020. Pyrogeography in Context: Encountering Wildland Fire in Canadian National Parks. York University.
- Swanson, F.J. 1994. Natural Variability-Implications for Ecosystem Management. In Ecosystem Management : Principles and Applications. Edited by M.E. Jensen and P.S. Bourgeron. Eastside Forest Ecosystem Health Assessment. USDA Forest Service Pacific Northwest Research Station, Corvallis, OR. pp. 80–94.
- Swanson, M.E., Franklin, J.F., Beschta, R.L., Crisafulli, C.M., DellaSala, D.A., Hutto, R.L., Lindenmayer, D.B., and Swanson, F.J. 2011. The forgotten stage of forest succession: early-successional ecosystems on forest sites. Frontiers in Ecology and the Environment 9(2): 117–125. John Wiley & Sons, Ltd. https://doi.org/10.1890/090157.
- Sweeney, B.W., and Newbold, J.D. 2014. Streamside Forest Buffer Width Needed to Protect Stream Water Quality, Habitat, and Organisms: A Literature Review. JAWRA Journal of the American Water Resources Association 50(3): 560–584. John Wiley & Sons, Ltd. https://doi.org/10.1111/jawr.12203.

Т

- Taylor, S.W., and Carroll, A.L. 2003. Disturbance, forest age, and mountain pine beetle outbreak dynamics in BC: A historical perspective. *In* Mountain Pine Beetle symposium: challenges and solutions. pp. 41–51.
- Termeer, C.J.A.M., and Dewulf, A. 2019. A small wins framework to overcome the evaluation paradox of governing wicked problems. Policy and Society **38**(2): 298–314. Routledge. https://doi.org/10.1080/14494035.2018.1497933.
- The Subsidiary Body on Scientific Technical and Technical Advice. 2000. Recommendation V/10 Ecosystem approach: further conceptual elaboration. Recommendations adopted by the SBSTTA fifth meeting. Convention on Biological Diversity, Montreal, QC.

- Thielmann, T., and Tollefson, C. 2009. Tears from an onion: Layering, exhaustion and conversion in British Columbia land use planning policy. Policy and Society **28**(2): 111–124. Routledge. https://doi.org/10.1016/j.polsoc.2009.05.006.
- Thompson, I.D., Mackey, B., McNulty, S., and Mosseler, A. 2009. Forest resilience, biodiversity, and climate change. *In* Secretariat of the Convention on Biological Diversity, Montreal. Technical Series no. 43. 1-67. Montreal, QC. pp. 1–67.
- Thompson, M. 2009. The organizational champion: How to develop passionate change agents at every level. McGraw-Hill, New York, N.Y.
- Thompson, S., Vehkaoja, M., Pellikka, J., and Nummi, P. 2021. Ecosystem services provided by beavers Castor spp. Mammal Review **51**(1): 25–39. Wiley Online Library. https://doi.org/10.1111/mam.12220.
- Thorp, W. 2008. Berland Smoky Access Plan. Foothills Research Institute, Hinton, AB.
- Thorp, W., and FMLF. 2019. Little Smoky Regional Access Management Plan. fRI Research, Hinton, AB.
- Thorp, W., Hyshka, K., and Bambrick, C. 2021. Review of Alberta's Integrated Land Management Policies, Practices and Legislation. fRI Research, Hinton, AB, Canada.
- Thorpe, H.C., and Thomas, S.C. 2007. Partial harvesting in the Canadian boreal: Success will depend on stand dynamic responses. The Forestry Chronicle **83**(3): 319–325. Canadian Institute of Forestry. https://doi.org/10.5558/tfc83319-3.
- Tierney, G.L., Faber-Langendoen, D., Mitchell, B.R., Shriver, W.G., and Gibbs, J.P. 2009. Monitoring and evaluating the ecological integrity of forest ecosystems. Frontiers in Ecology and the Environment 7(6): 308–316. John Wiley & Sons, Ltd. https://doi.org/10.1890/070176.
- Tinbergen, J. 1952. On the theory of economic policy. *In* Books (Jan Tinbergen). North-Holland Publishing Company, Amsterdam, the Netherlands.
- Tiwari, T., Lundström, J., Kuglerová, L., Laudon, H., Öhman, K., and Ågren, A.M. 2016. Cost of riparian buffer zones: A comparison of hydrologically adapted site-specific riparian buffers with traditional fixed widths. Water Resources Research **52**(2): 1056–1069. John Wiley & Sons, Ltd. https://doi.org/10.1002/2015WR018014.
- Tolkkinen, M.J., Heino, J., Ahonen, S.H.K., Lehosmaa, K., and Mykrä, H. 2020. Streams and riparian forests depend on each other: A review with a special focus on microbes. Forest Ecology and Management **462**: 117962. https://doi.org/10.1016/j.foreco.2020.117962.
- Tripp, D.B., Nordin, L., Tschaplinski, P.J., Hogan, D.L., and Bird, S. 2020. Protocol for Evaluating the Condition of Streams and Riparian Managment Areas (riparian Management Routine Effectiveness Evaluation). Government of British Columbia, Victoria, BC, Canada.
- Turner, M.G. 1989. Landscape ecology: The effect of pattern on process. Annual Review in Ecological Systems **20**: 171–197.
- Turner, M.G. 2010. Disturbance and landscape dynamics in a changing world. Ecology **91**(10): 2833–2849. John Wiley & Sons, Ltd. https://doi.org/10.1890/10-0097.1.
- Turner, M.G., Romme, W.H., Gardner, R.H., and Hargrove, W.W. 1997. Effects of fire size and pattern on early succession in Yellowstone National Park. Ecological Monographs **67**(4): 411–433. John Wiley



& Sons, Ltd. https://doi.org/10.1890/0012-9615(1997)067[0411:EOFSAP]2.0.CO;2.

- Turner, M.G., Tinker, D.B., Romme, W.H., Kashian, D.M., and Litton, C.M. 2004. Landscape Patterns of Sapling Density, Leaf Area, and Aboveground Net Primary Production in Postfire Lodgepole Pine Forests, Yellowstone National Park (USA). Ecosystems 7(7): 751. https://doi.org/10.1007/s10021-004-0011-4.
- Tymstra, C., Stocks, B.J., Cai, X., and Flannigan, M.D. 2020. Wildfire management in Canada: Review, challenges and opportunities. Progress in Disaster Science **5**: 100045. https://doi.org/10.1016/j.pdisas.2019.100045.

U

- Unesco/Commission Mondiale de l'Ethique des Connaissances Scientifiques et des Technologies. 2005. The precautionary principle: World Commission on the Ethics of Scientific Knowledge and Technology (COMEST). UNESCO, Paris, France.
- United Nations General Assembly. 2007. United Nations Declaration on the Rights of Indigenous Peoples. Supplement No. 53 (A/61/53), part one, chap. II, sect. A., New York, NY, US.
- Urban, D.L., O'Neill, R. V, and Shugart, H.H.J.R. 1987. Landscape ecology. The study of landscape is emerging as a new discipline in the field of ecology. Bioscience **37**(2): 119–127. American Institute of Biological Sciences, Washington, DC.

V

- VanDamme, L., Plante, L., Burkhardt, R., and Saunders, K. 2014. Status Report on Ecosystem-based Management (EBM): Policy Barriers and Opportunities for EBM in Canada. Canadian Boreal Forest Agreement, KBM Resources Group, Thunder Bay, ON, KBM Resources Group, Thunder Bay, ON.
- Venier, L.A., Thompson, I.D., Fleming, R., Malcolm, J., Aubin, I., Trofymow, J.A., Langor, D., Sturrock, R., Patry, C., Outerbridge, R.O., Holmes, S.B., Haeussler, S., De Grandpré, L., Chen, H.Y.H., Bayne, E., Arsenault, A., and Brandt, J.P. 2014. Effects of natural resource development on the terrestrial biodiversity of Canadian boreal forests1. Environmental Reviews 22(4): 457–490. https://doi.org/10.1139/er-2013-0075.
- Versteeg, H. 2006. Conserving wildlife species and recovering species at risk in Canada: . Discussion document prepared for the Minister's round table under the species at risk act. Ottawa, ON, Canada.
- Vertinsky, I., and Luckert, M.K. 2010. Design of Forest Tenure Institutions-The Challenges of Governing Forests. University of Alberta, Edmonton, AB, Canada.
- Vogel, D., Reuber, A., and Vogel, R. 2020. Developing a short scale to assess public leadership. Public Administration **98**(4): 958–973. John Wiley & Sons, Ltd. https://doi.org/10.1111/padm.12665.
- Van Wagner, C.E., and Methven, I.R. 1980. Fire in the management of Canada's National Parks: philosophy and strategy. Parks Canada. National Park Occassional Paper 1, Ottawa, ON, Canada.

W

- Walker, H.M., Reed, M.G., and Fletcher, A.J. 2020. Wildfire in the news media: An intersectional critical frame analysis. Geoforum **114**: 128–137. https://doi.org/10.1016/j.geoforum.2020.06.008.
- Wallace, L., Lucieer, A., Watson, C., and Turner, D. 2012. Development of a UAV-LiDAR System with Application to Forest Inventory. https://doi.org/10.3390/rs4061519.
- Walters, C. 1997. Challenges in adaptive management of riparian and coastal ecosystems. Conservation Ecology [online] 1(2): 1–22.
- Walters, C.J. 1986. Adaptive management of renewable resources. MacMillan Press, New York, N.Y.
- Walters, C.J., and Holling, C.S. 1990. Large-Scale Management Experiments and Learning by Doing. Ecology **71**(6): 2060–2068. John Wiley & Sons, Ltd. https://doi.org/10.2307/1938620.
- Walters, K.R. 1993. Design and development of a generalized forest management modeling system: Woodstock. *In* International Symposium on Systems Analysis and Management Decisions in Forestry. Remsoft Inc., Valdiva, Chile.
- Warnock, J.W. 2001. Saskatchewan's neo-colonial forestry policy. Available from https://policyoptions.irpp.org/magazines/political-dissent/saskatchewans-neo-colonial-forestrypolicy/ [accessed 6 July 2021].
- Waylen, K.A., Blackstock, K.L., and Holstead, K.L. 2015. How does legacy create sticking points for environmental management? Insights from challenges to implementation of the ecosystem approach. Ecology and Society **20**(2). Resilience Alliance Inc. https://doi.org/10.5751/ES-07594-200221.
- Waylen, K.A., Hastings, E.J., Banks, E.A., Holstead, K.L., Irvine, R.J., and Blackstock, K.L. 2014. The Need to Disentangle Key Concepts from Ecosystem-Approach Jargon. Conservation Biology 28(5): 1215–1224. John Wiley & Sons, Ltd. https://doi.org/10.1111/cobi.12331.
- Weber, E.P., and Khademian, A.M. 2008. Wicked Problems, Knowledge Challenges, and Collaborative Capacity Builders in Network Settings. Public Administration Review **68**(2): 334–349. John Wiley & Sons, Ltd. https://doi.org/10.1111/j.1540-6210.2007.00866.x.
- Weber, M.G., and Taylor, S.W. 1992. The use of prescribed fire in the management of Canada's forested lands. The Forestry Chronicle **68**(3): 324–334. Canadian Institute of Forestry. https://doi.org/10.5558/tfc68324-3.
- Webster, D.G. 2009. Adaptive governance: the dynamics of Atlantic Fisheries Management. *Edited By*F A O of the United Nations. MIT Press, Cambridge, MA (USA).
- Weintraub, A., and Cholaky, A. 1991. A Hierarchical Approach to Forest Planning. Forest Science **37**(2): 439–460. https://doi.org/10.1093/forestscience/37.2.439.
- Weir, J.M.H., Chapman, K.J., and Johnson, E.A. 1995. Wildland fire management and the fire regime in the Southern Canadian Rockies. United Nations.
- Weir, J.M.H., Johnson, E.A., and Miyanishi, K. 2000. Fire frequency and the spatial age mosaic of the mixed-wood boreal forest in western Canada. Ecological Applications **10**(4): 1162–1177. https://doi.org/10.1890/1051-0761(2000)010[1162:FFATSA]2.0.CO;2.

- Weir, J.R., Kreuter, U.P., Wonkka, C.L., Twidwell, D., Stroman, D.A., Russell, M., and Taylor, C.A. 2019.
 Liability and Prescribed Fire: Perception and Reality. Rangeland Ecology & Management 72(3): 533–538. https://doi.org/10.1016/j.rama.2018.11.010.
- Weldwood of Canada Ltd. 2000. 1999 Forest management plan volume 1 management strategy 1999 2008. Hinton, AB, Canada.
- Welsch, D.J. 1991. Riparian forest buffers: function and design for protection and enhancement of water resources. *Edited By*F.A.O. of the UN. U.S. Dept. of Agriculture, Forest Service, Northeastern Area, State and Private Forestry, Forest Resources Management.
- West Fraser Mills Ltd. 2014. Hinton Wood Products: Natural Disturbance Strategy for the 2014 DFMP. Hinton, Alberta, Canada.
- Westgate, M.J., Likens, G.E., and Lindenmayer, D.B. 2013. Adaptive management of biological systems: A review. Biological Conservation **158**: 128–139. https://doi.org/10.1016/j.biocon.2012.08.016.
- Westwood, A.R., Barker, N.K., Grant, S., Amos, A.L., Camfield, A.F., Cooper, K.L., Dénes, F. V, Jean-Gagnon, F., McBlane, L., Schmiegelow, F.K.A., Simpson, J.I., Slattery, S.M., Sleep, D.J.H., Sliwa, S., Wells, J. V, and Whitaker, D.M. 2020. Toward actionable, coproduced research on boreal birds focused on building respectful partnerships. Avian Conservation and Ecology 15(1): 26. The Resilience Alliance. https://doi.org/10.5751/ACE-01589-150126.
- Westwood, A.R., Otto, S.P., Mooers, A., Darimont, C., Hodges, K.E., Johnson, C., Starzomski, B.M., Burton, C., Chan, K.M.A., Festa-Bianchet, M., Fluker, S., Gulati, S., Jacob, A.L., Kraus, D., Martin, T.G., Palen, W.J., Reynolds, J.D., and Whitton, J. 2019. Protecting biodiversity in British Columbia: Recommendations for developing species at risk legislation. Facets 4(1): 136–160. Canadian Science Publishing. https://doi.org/10.1139/facets-2018-0042.
- Weyerhaeuser Canada. 1997. Ecologically based forest management: the conservation of biodiversity in Weyerhaeuser Canada forest management areas in Alberta. Edmonton, AB, Canada.
- White, J.C., Coops, N.C., Wulder, M.A., Vastaranta, M., Hilker, T., and Tompalski, P. 2016. Remote Sensing Technologies for Enhancing Forest Inventories: A Review. Canadian Journal of Remote Sensing 42(5): 619–641. Taylor & Francis. https://doi.org/10.1080/07038992.2016.1207484.
- Williams, B.K. 2011. Adaptive management of natural resources—framework and issues. Journal of Environmental Management **92**(5): 1346–1353. https://doi.org/10.1016/j.jenvman.2010.10.041.
- Wilson, J. 1998. Talk and log: wilderness politics in British Columbia. UBC Press, Vancouver, BC.
- Wilson, J., and Graham, J. 2005. Relationships Between First Nations and the Forest Industry: The Legal and Policy Context. Institute on Governance.
- Wolfe, J.D., Shook, K.R., Spence, C., and Whitfield, C.J. 2018. Watershed classification for the Canadian Prairie. Hydrology and Earth System Sciences **1**: 1–44. https://doi.org/10.5194/hess-2018-625.
- Wong, C.M., and Iverson, K. 2004. Range of natural variability: Applying the concept to forest management in central British Columbia. Journal of Ecosystems and Managementt **4**(1): S1.
- Woodley, S. 1993. Monitoring and measuring ecosystem integrity in Canadian National Parks. *In* Ecological Integrity and the Management of Ecosystems, 1st edition. *Edited by* S. Woodley, J. Kay, and G. Francis. CRC Press, Boca Raton, FL. pp. 155–176.

- Woodley, S. 2010. Ecological Integrity and Canada's National Parks. The George Wright Forum **27**(2): 151–160. George Wright Society.
- Woodley, S.J. 1995. Fire in protected areas. Parks Canada, Alberta and Pacific-Yukon Regions. Research Links **3**(2): 9–10.
- World Wildlife Fund. 2017. Living planet report Canada a national look at wildlife loss. Toronto, ON, Canada.
- Wotton, B.M., Nock, C.A., and Flannigan, M.D. 2010. Forest fire occurrence and climate change in Canada. International Journal of Wildland Fire **19**(3): 253–271. https://doi.org/10.1071/WF09002.
- Wyatt, S. 2008. First Nations, forest lands, and "aboriginal forestry" in Canada: from exclusion to comanagement and beyond. Canadian Journal of Forest Research **38**(2): 171–180. NRC Research Press. https://doi.org/10.1139/X07-214.
- Wyatt, S., Fortier, J.-F., Natcher, D.C., Smith, M.A., and Hébert, M. 2013. Collaboration between Aboriginal peoples and the Canadian forest sector: A typology of arrangements for establishing control and determining benefits of forestlands. Journal of Environmental Management **115**: 21– 31. https://doi.org/10.1016/j.jenvman.2012.10.038.

Y

- Yaffee, S.L. 1996. Ecosystem Management in Practice: The Importance of Human Institutions. Ecological Applications **6**(3): 724–727. John Wiley & Sons, Ltd. https://doi.org/10.2307/2269472.
- Yamamoto, S.-I. 1992. The gap theory in forest dynamics. The botanical magazine (Shokubutsu-gaku-zasshi) **105**(2): 375–383. https://doi.org/10.1007/BF02489426.
- Yoder, J., Engle, D., and Fuhlendorf, S. 2004. Liability, incentives, and prescribed fire for ecosystem management. Frontiers in Ecology and the Environment **2**(7): 361–366. John Wiley & Sons, Ltd. https://doi.org/10.1890/1540-9295(2004)002[0361:LIAPFF]2.0.CO;2.
- Youdelis, M. 2016. "They could take you out for coffee and call it consultation!": The colonial antipolitics of Indigenous consultation in Jasper National Park. Environment and Planning A: Economy and Space **48**(7): 1374–1392. SAGE Publications Ltd. https://doi.org/10.1177/0308518X16640530.
- Youdelis, M. 2018. Austerity Politics and the Post-Politicisation of Conservation Governance in Canada. Conservation and Society **16**: 257. https://doi.org/10.4103/cs.cs_16_149.
- Youdelis, M., Nakoochee, R., O'Neil, C., Lunstrum, E., and Roth, R. 2020. "Wilderness" revisited: Is Canadian park management moving beyond the "wilderness" ethic? The Canadian Geographer / Le Géographe canadien **64**(2): 232–249. John Wiley & Sons, Ltd. https://doi.org/10.1111/cag.12600.
- Young, J.C., Searle, K., Butler, A., Simmons, P., Watt, A.D., and Jordan, A. 2016. The role of trust in the resolution of conservation conflicts. Biological Conservation **195**: 196–202. https://doi.org/10.1016/j.biocon.2015.12.030.



Ζ

- Zahara, A. 2020. Breathing Fire into Landscapes that Burn: Wildfire Management in a Time of Alterlife. Engaging Science, Technology, and Society **6**: 555–585. https://doi.org/10.17351/ests2020.429.
- Zietsma, C., and Lawrence, T.B. 2010. Institutional Work in the Transformation of an Organizational Field: The Interplay of Boundary Work and Practice Work. Administrative Science Quarterly **55**(2): 189–221. SAGE Publications Inc. https://doi.org/10.2189/asqu.2010.55.2.189.
- Zurba, M., Diduck, A.P., and Sinclair, A.J. 2016. First Nations and industry collaboration for forest governance in northwestern Ontario, Canada. Forest Policy and Economics 69: 1–10. https://doi.org/10.1016/j.forpol.2016.04.003.