【お詫びと訂正】
2024年10月刊行『グローバル変動生物学』第1刷につきまして，内容に一部誤りがございました．ここに深くお詫びし，訂正させていただきます．正誤表は下記の弊社ウェブサイトの本書書籍ページよりご覧ください．
https://www.asakura.co.jp/detail.php?book_code=18064

文　　献

1章

Alexander, Bynum, Johnson, King, Mustonen, Neofotis, Oettlé, et al. 2011. “Linking Indigenous and Scientific Knowledge of Climate Change.” *BioScience* 61 (6): 477–84. doi.org/10.1525/bio.2011.61.6.10.

Arnqvist & Wooster. 1995. “Meta-Analysis: Synthesizing Research Findings in Ecology and Evolution.” *Trends in Ecology & Evolution*. 10 (6): 236–40. doi.org/10.1016/S0169-5347(00)89073-4.

Arrhenius. 1897. “On the Influence of Carbonic Acid in the Air upon the Temperature of the Earth.” *Publications of the Astronomical Society of the Pacific* 9 (54): 14–24. doi.org/10.1086/121158.

Berkes. 2009. “Indigenous Ways of Knowing and the Study of Environmental Change.” *Journal of the Royal Society of New Zealand*. 39 (4): 151–56. doi.org/10.1080/03014220909510568.

Brulle & Pellow. 2006. “Environmental Justice: Human Health and Environmental Inequalities.” *Annual Review of Public Health* 27 (1): 103–24. doi.org/10.1146/annurev.publhealth.27.021405.102124.

Byrne, Rothstein, Poorten, Erens, Settles, & Rosenblum. 2017. “Unlocking the Story in the Swab: A New Genotyping Assay for the Amphibian Chytrid Fungus *Batrachochytrium Dendrobatidis*.” *Molecular Ecology Resources* 17 (6): 1283–92. doi.org/10.1111/1755-0998.12675

Callendar. 1938. “The Artificial Production of Carbon Dioxide and Its Influence on Temperature.” *Quarterly Journal of the Meteorological Society* 64 (275): 223–40.

Carson. 1962. *Silent Spring*. Boston: Houghton Mifflin.

Chen. 2020. “Researchers around the World Prepare to #ShutDownSTEM and ‘Strike For Black Lives’.” *Science News*. doi:10.1126/science.abd2504. www.sciencemag.org/news/2020/06/researchers-around-world-prepare-shutdownstem-and-strike-black-lives

Costanza, D’Arge, De Groot, Farber, Grasso, Hannon, Limburg, et al. 1997. “The Value of the World’s Ecosystem Services and Natural Capital.” *Nature* 387 (6630): 253–60. doi.org/10.1038/387253a0.

Costanza, de Groot, Sutton, van der Ploeg, Anderson, Kubiszewski, Farber, & Turner. 2014. “Changes in the Global Value of Ecosystem Services.” *Global Environmental Change* 26 (1): 152–58. doi.org/10.1016/j.gloenvcha.2014.04.002.

De Groot, Brander, van der Ploeg, Costanza, Bernard, Braat, Christie, et al. 2012.“Global Estimates of the Value of Ecosystems and Their Services in Monetary Units.” *Ecosystem Services* 1 (1): 50–61. doi.org/10.1016/j.ecoser.2012.07.005.

Dickinson, Zuckerberg, & Bonter. 2010. “Citizen Science as an Ecological Research Tool: Challenges and Benefits.” *Annual Review of Ecology, Evolution, and Systematics* 41: 149–72. doi.org/10.1146/annurev-ecolsys-102209-144636.

Dresher. 2019. “Urban Heating and Canopy Cover Need to be Considered as Matters of Environmental Justice.” *Proceedings of the National Academy of Sciences* 116 (52): 26153–54.

Fernandez-Duque & Valeggia. 1994. “Meta-Analysis: A Valuable Tool in Conservation Research.” *Conservation Biology* 8: 555–61. doi.org/10.1046/j.1523-1739.1994.08020555.x.

Fortmann. 2008. *Participatory Research in Conservation and Rural Livelihoods: Doing Science Together*. John Wiley & Sons, West Sussex, UK

Jaffe, Franks, Roberts, Mirza, Schurgers, Kastner, & Boch. 2017. “A Swarm of Autonomous Miniature Underwater Robot Drifters for Exploring Submesoscale Ocean Dynamics.” *Nature Communications* 8: 1–8.

doi.org/10.1038/ncomms14189.

Kelly-Reif & Wing. 2016. “Urban-Rural Exploitation: An Underappreciated Dimension of Environmental Injustice.” *Journal of Rural Studies* 47: 350–58. doi.org/10.1016/j.jrurstud.2016.03.010.

Kuras, Warren, Zinda, Aronson, Cilliers, et al. 2020. “Urban Socioeconomic Inequality and Biodiversity often Converge, but not Always: A Global Meta-Analysis.” *Landscape and Urban Planning* 198: 103799. doi.org/10.1016/j.landurbplan.2020.103799.

Leong, Dunn, & Trautwein. 2018. “Biodiversity and Socioeconomics in the City: A Review of the Luxury Effect.” *Biology Letters* 14 (5): 20180082 doi.org/10.1098/rsbl.2018.0082

Makondo & Thomas. 2018. “Climate Change Adaptation: Linking Indigenous Knowledge with Western Science for Effective Adaptation.” *Environmental Science and Policy* 88 (October): 83–91. doi.org/10.1016/j.envsci.2018.06.014.

Middleton, Talaugon, Young, Wong, Fluharty, Reed, Cosby, & Myers. 2019. “Bi-Directional Learning: Identifying Contaminants on the Yurok Indian Reservation.” *International Journal of Environmental Research and Public Health* 16 (19): 3513. doi.org/10.3390/ijerph 16193513.

Nagajyoti, Lee, & Sreekanth. 2010. “Heavy Metals, Occurrence and Toxicity for Plants: A Review.” *Environmental Chemistry Letters* 8 (3): 199–216. doi.org/10.1007/s10311-010-0297-8.

Nakagawa, Poulin, Mengersen, Reinhold, Engqvist, Lagisz, & Senior. 2015. “Meta-Analysis of Variation: Ecological and Evolutionary Applications and Beyond.” *Methods in Ecology and Evolution* 6 (2): 143–52. doi.org/10.1111/2041-210X.12309.

Natesh, Taylor, Truelove, Palumbi, Hadly, Petrov, & Ramakrishnan. 2019. “Empowering Conservation Science and Practice with Efficient and Economical Genotyping from Poor Quality Samples.” *Methods in Ecology and Evolution* 10 (6): 853–9. doi.org/10.1111/2041-210X.13173.

Puritty, Strickland, Alia, Blonder, Klein, et al. 2017. “Without Inclusion, Diversity Initiatives May Not Be Enough.” *Science* 357 (6356): 1101–2. DOI: 10.1126/science.aai9054.

Ramirez. 2019. *Environmental Health, Community Engagement, and Environmental Justice. In Environmental and Pollution Science*, 3rd Edition. Academic Press, London.

Ramirez-Andreotta, Brusseau, Artiola, Maier, & Gandolfi. 2015. “Building a Co-Created Citizen Science Program with Gardeners Neighboring a Superfund Site: The Gardenroots Cast Study.” *International Public Health Journal* 7 (1): 13.

Rosenthal. 1979. “The File Drawer Problem and Tolerance for Null Results.” *Psychological Bulletin* 86 (3): 638–41.

Schell, Guy, Shelton, Campbell-Staton, Sealey, Lee, & Harris. 2020a. “Recreating Wakanda by Promoting Black Excellence in Ecology and Evolution.” *Nature Ecology and Evolution*. doi.org/10.1038/s41559-020-1266-7.

Schell, Dyson, Fuentes, De Roches, Harris, Miller, Woelfle-Erskine, & Lambert. 2020b. “The Ecological and Evolutionary Consequences of Systemic Racism in Urban Environments.” *Science*: eaay4497. doi.org/10.1126/science/aay4497.

Selin. 2008. *Encyclopaedia of the History of Science, Technology, and Medicine in Non-Western Cultures*. Springer Netherlands.

Soleri, Long, Ramirez-Andreotta, Eitemiller, & Pandya. 2016. “Finding Pathways to More Equitable and Meaningful Public-Scientist Partnerships.” *Citizen Science: Theory and Practice* 1 (1): 9. doi.org/10.5334/cstp.46.

Soroye, Ahmed, & Kerr. 2018. “Opportunistic Citizen Science Data Transform Understanding of Species Distributions, Phenology, and Diversity Gradients for Global Change Research.” *Global Change Biology* 24 (11): 5281–91.

Theobald, Ettingera, Burgess, DeBeya, Schmidt, et al. 2015. “Global Change and Local Solutions: Tapping the Unrealized Potential of Citizen Science for Biodiversity Research.” *Biological Conservation* 181: 236–44.

Vaughan, Miegroet, Pennino, Pressler, Duball, Brevik, Berhe, & Olson. 2019. “Women in Soil Science: Growing Participation, Emerging Gaps, and the Opportunities for Advancement in the USA.” *Soil Science Society of America Journal* 83 (5): 1278–89. doi.org/10.2136/sssaj2019.03.0085.

Vetter, Rucker, & Storch. 2013. “Meta-Analysis: A Need for Well-Defined Usage in Ecology and Conservation

Biology." *Ecosphere* 4 (6): 1–24. doi.org/10.1890/ES13-00062.1.

2 章

Albani, Bengtson, Canfield, Bekker, Mac-Chiarelli, Mazurier, Hammarlund, et al. 2010. "Large Colonial Organisms with Coordinated Growth in Oxygenated Environments 2.1 Gyr Ago." *Nature* 466 (7302): 100–104. doi.org/10.1038/nature09166.

Algeo, Scheckler, & Maynard. 2001. "Effects of the Middle to Late Devonian Spread of Vascular Land Plants on Weathering Regimes, Marine Biotas, and Global Climate." In *Plants Invade the Land: Evolutionary and Environmental Perspectives*, 213–36. New York: Columbia University Press.

Avise. 2000. *Phylogeography: The History and Formation of Species*. Cambridge, MA: Harvard University Press.

Barnosky, Matzke, Tomiya, Wogan, Swartz, Quental, Marshall, et al. 2011. "Has the Earth's Sixth Mass Extinction Already Arrived?" *Nature* 471: 51–57. doi.org/10.1038/nature09678.

Bateman, Crane, DiMichele, Kendrick, Rowe, et al. 1998. "Early Evolution of Land Plants: Phylogeny, Physiology, and Ecology of the Primary Terrestrial Radiation." *Annual Review of Ecology and Systematics* 29 (1): 263–92. www.annualreviews.org/doi/abs/10.1146/annurev.ecolsys.29.1.263

Belahbib, Pemonge, Ouassou, Sbay, Kremer, & Petit. 2001. "Frequent Cytoplasmic Exchanges Between Oak Species That Are Not Closely Related: Quercus Suber and Q. Ilex in Morocco." *Molecular Ecology* 10 (8): 2003–12. doi.org/10.1046/j.0962-1083.2001.01330.x.

Darwin. 1859. *On the Origin of Species by Means of Natural Selection, or Preservation of Favoured Races in the Struggle for Life*. London: John Murray.

Dawkins. 1976. *The Selfish Gene*. London: Oxford University Press.

De Queiroz. 1999. "The General Lineage Concept of Species and the Defining Properties of the Species Category." *Species: New Interdisciplinary Essays*, November: 49–89. http://hdl.handle.net/10088/4651

Dismukes, Klimov, Baranov, Kozlov, Das-Gupta, & Tyryshkin. 2001. "The Origin of Atmospheric Oxygen on Earth: The Innovation of Oxygenic Photosynthesis." *Proceedings of the National Academy of Sciences of the United States of America* 98 (5): 2170–75. doi.org/10.1073/pnas.061514798.

Gilbert. 1986. "Origin of Life—The RNA World." *Nature* 319: 618.

Joyce. 2002. "The Antiquity of RNA-Based Evolution." *Nature* 418 (6894): 214–21. doi.org/10.1038/418214a.

Kemp & Kemp. 2005. *The Origin and Evolution of Mammals*. London: Oxford University Press.

Kenrick & Crane. 1997. "The Origin and Early Evolution of Plants on Land." *Nature* 389 (6646): 33–39. doi.org/10.1038/37918.

Knoll & Carroll. 1999. "Early Animal Evolution: Emerging Views from Comparative Biology and Geology." *Science* 284 (5423): 2129–37. doi.org/10.1126/science.284.5423.2129.

Ku, Nelson-Sathi, Roettger, Sousa, Lockhart, Bryant, Hazkani-Covo, McInerney, Landan, & Martin. 2015. "Endosymbiotic Origin and Differential Loss of Eukaryotic Genes." *Nature* 524 (7566): 427–32. doi.org/10.1038/nature14963.

Leslie. 2009. "On the Origin of Photosynthesis." *Science* 323 (5919): 1286–87. science.sciencemag.org/content/323/5919/1286.short.

Libby, Conlin, Kerr, & Ratcliff. 2016. "Stabilizing Multicellularity Through Ratcheting." *Philosophical Transactions of the Royal Society B: Biological Sciences* 371 (1701). doi.org/10.1098/rstb.2015.0444.

Linnaeus. 1735. *Systema Naturae*. Nieuwkoop.

Linnaeus. 1753. *Species Plantarum*. Stockholm: Laurentius Salvius.

Lyell. 1830. *Principles of Geology*. London: John Murray.

Margulis. 1971. "The Origin of Plant and Animal Cells." *American Scientist* 59: 230–35.

Marshall. 2006. "Explaining the Cambrian 'Explosion' of Animals." *Annual Review of Earth and Planetary Sciences* 34 (1): 355–84. doi.org/10.1146/annurev.earth.33.031504.103001.

Martin, Garg, & Zimorski. 2015. "Endosymbiotics Theories for Eukaryote Origin." *Philosophical Transactions of the Royal Society B: Biological Sciences* 370 (1678). doi.org/10.1098/rstb.2014.0330.

McCollom. 2013. “Miller-Urey and Beyond: What Have We Learned About Prebiotic Organic Synthesis Reactions in the Past 60 Years?” *Annual Review of Earth and Planetary Sciences* 41 (1): 207–29. doi.org/10.1146/annurev-earth-040610-133457.

McInerney, Pisani, & O’Connell. 2015. “The Ring of Life Hypothesis for Eukaryote Origins Is Supported by Multiple Kinds of Data.” *Philosophical Transactions of the Royal Society B: Biological Sciences* 370 (1678). doi.org/10.1098/rstb.2014.0322.

McPeek & Brown. 2007. “Clade Age and Not Diversification Rate Explains Species Richness Among Animal Taxa.” *The American Naturalist* 169 (4): E97–106. doi.org/10.1086/512135.

Meredith, Janecˇka, Gatesy, Ryder, Fisher, Teeling, Goodbla, et al. 2011. “Impacts of the Cretaceous Terrestrial Revolution and KPg Extinction on Mammal Diversification.” *Science (New York, N.Y.)* 334 (6055): 521–24. doi.org/10.1126/science.1211028.

Miller. 1953. “A Production of Amino Acids Under Possible Primitive Earth Conditions.” *Science* 117 (3046): 528–29. doi.org/10.1126/science.117.3046.528.

Miller & Urey. 1959. “Organic Compound Synthesis on the Primitive Earth.” *Science* 130: 245–51.

Nosil, Vines, & Funk. 2005. “Reproductive Isolation Caused by Natural Selection against Immigrants from Divergent Habitats.” *Evolution* 59 (4): 705–19. doi.org/10.1111/j.0014-3820.2005.tb01747.x.

Pace, Gilbert, Clark, & Feschotte. 2008. “Repeated Horizontal Transfer of a DNA Transposon in Mammals and Other Tetrapods.” *Proceedings of the National Academy of Sciences* 105 (44): 17023–28. doi.org/10.1073/pnas.0806548105.

Petigura, Howard, & Marcy. 2013. “Prevalence of Earth-Size Planets Orbiting Sun-like Stars.” *Proceedings of the National Academy of Sciences* 110 (48): 19273–78. doi.org/10.1073/pnas.1319909110.

Powner, Gerland, & Sutherland. 2009. “Synthesis of Activated Pyrimidine Ribonucleotides in Prebiotically Plausible Conditions.” *Nature* 459 (7244): 239–42. doi.org/10.1038/nature08013.

Ratcliff, Denison, Borrello, & Travisano. 2012. “Experimental Evolution of Multicellularity.” *Proceedings of the National Academy of Sciences* 109 (5): 1595–600. doi.org/10.1073/pnas.1115323109.

Ratcliff, Fankhauser, Rogers, Greig, & Travisano. 2015. “Origins of Multicellular Evolvability in Snowflake Yeast.” *Nature Communications* 6 (May 2014): 1–9. doi.org/10.1038/ncomms7102.

Raup. 1991a. *Extinction: Bad Genes or Bad Luck?* New York: Norton.

Raup. 1991b. “A Kill Curve for Phanerozoic Marine Species.” *Paleobiology* 14: 34–48.

Rivera, Jain, Moore, & Lake. 1998. “Genomic Evidence for Two Functionally Distinct Gene Classes.” *Proceedings of the National Academy of Sciences of the United States of America* 95 (11): 6239–44. doi.org/10.1073/pnas.95.11.6239.

Rivera & Lake. 2004. “The Ring of Life Provides Evidence for a Genome Fusion Origin of Eukaryotes.” *Nature* 431 (7005): 152–55. doi.org/10.1038/nature02848.

Robinson. 2005. “Jump-Starting a Cellular World: Investigating the Origin of Life, from Soup to Networks.” *PLoS Biology* 3 (11): 1860–63. doi.org/10.1371/journal.pbio.0030396.

Ruggiero, Gordon, Orrell, Bailly, Bourgoin, Brusca, Cavalier-Smith, Guiry, & Kirk. 2015. “A Higher Level Classification of All Living Organisms.” *PLoS ONE* 10 (4): 1–60. doi.org/10.1371/journal.pone.0119248.

Schulte, Alegret, Arenillas, Arz, Barton, et al. 2010. “The Chicxulub Asteroid Impact and Mass Extinction at the Cretaceous-Paleogene Boundary.” *Science* 327 (5970): 1214–1218.science.sciencemag.org/content/327/5970/1214.short.

Sender, Fuchs, & Milo. 2016. “Are We Really Vastly Outnumbered? Revisiting the Ratio of Bacterial to Host Cells in Humans.” *Cell* 164 (3): 337–40. doi.org/10.1016/j.cell.2016.01.013.

Sepkoski. 1998. “Rates of Speciation in the Fossil Record.” Edited by A. E. Magurran and R. M. May. *Philosophical Transactions of the Royal Society of London. Series* B: Biological Sciences 353 (1366): 315–26. doi.org/10.1098/rstb.1998.0212.

Thoreau. 1860. “*The Succession of Forest Trees, and Wild Apples*.” New York: The New York Weekly Tribune.

Valentine, Jablonski, & Erwin. 1999. “Fossils, Molecules and Embryos: New Perspectives on the Cambrian Explosion.” *Development* 126 (5): 851–59. http://www.ncbi.nlm.nih.gov/pubmed/9927587.

Woese, Kandlert, & Wheelis. 1990. “Towards a Natural System of Organisms: Proposal for the Domains Archaea, Bacteria, and Eucarya (Euryarchaeota/Crenarchaeota/Kingdom/Evolu-tion).” *Proceedings of the*

National Academy of Sciences USA 87 (June): 4576–79. doi.org/10.1136/bmj.1.4540.46.

Yoder, Clancey, Des Roches, Eastman, Gentry, Godsoe, Hagey, et al. 2010. "Ecological Opportunity and the Origin of Adaptive Radiations." *Journal of Evolutionary Biology* 23 (8): 1581–96. doi.org/10.1111/j.1420-9101.2010.02029.x.

3 章

Allentoft, Heller, Oskam, Lorenzen, Hale, Gilbert, Jacomb, Holdaway, & Bunce. 2014. "Extinct New Zealand Megafauna Were Not in Decline Before Human Colonization." *Proceedings of the National Academy of Sciences* 111 (13): 4922–27. doi.org/10.1073/pnas.1314972111.

Armelagos, Goodman, & Jacobs. 1991. "The Origins of Agriculture: Population Growth During a Period of Declining Health." *Population and Environment* 13 (1): 9–22. doi.org/10.1007/BF01256568.

Barnosky, Koch, Feranec, Wing, & Shabel. 2004. "Assessing the Causes of Late Pleistocene Extinctions on the Continents." *Science* 306 (5693): 70–75. doi.org/10.1126/science.1101476.

Bocquet-Appel. 2011. "When the World's Population Took Off: The Springboard of the Neolithic Demographic Transition." *Science* 333 (6042): 560–61. doi.org/10.1126/science.1208880.

Boulanger & Lyman. 2014. "Northeastern North American Pleistocene Megafauna Chronologically Overlapped Minimally with Paleoindians." *Quaternary Science Reviews* 85: 35–46. doi.org/10.1016/j.quascirev.2013.11.024.

Boyd & Silk. 2018. *How Humans Evolved*. New York: W. W. Norton & Company.

Brown, Sutikna, Morwood, Soejono, Jatmiko, Saptomo, & Due. 2004. "A New Small-Bodied Hominin from the Late Pleistocene of Flores, Indonesia." *Nature* 431 (7012): 1055. doi.org/10.1038/nature02999.

Cavalli-Sforza. 1998. "The DNA Revolution in Population Genetics." *Trends in Genetics* 14 (2): 60–65. doi.org/10.1016/S0168-9525 (97)01327-9.

Chen & Li. 2001. "Genomic Divergences Between Humans and Other Hominoids and the Effective Population Size of the Common Ancestor of Humans and Chimpanzees." *The American Journal of Human Genetics* 68 (2): 444–56. doi.org/10.1086/318206.

Chen, Torroni, Excoffier, Santachiara-Benerecetti, & Wallace. 1995. "Analysis of MtDNA Variation in African Populations Reveals the Most Ancient of All Human Continent-Specific Haplogroups." *American Journal of Human Genetics* 57 (1):133–49.

Diamond & Bellwood. 2003. "Farmers and Their Languages: The First Expansions." *Science* 300 (5619): 597–603. https://doi.org/10.1126/science.1078208.

Duncan, Blackburn, & Worthy. 2002. "Prehistoric Bird Extinctions and Human Hunting." *Proceedings of the Royal Society* B: Biological Sciences 269 (1490): 517–21. doi.org/10.1098/rspb.2001.1918.

Feakins & de Menocal. 2010. "Global and

African Regional Climate During the Cenozoic." In *Cenozoic Mammals of Africa*, edited by Lars Werdelin, 45–55. Berkeley: University of California Press.

Ferraro, Plummer, Pobiner, Oliver, Bishop, Braun, Ditchfield, et al. 2013. "Earliest Archaeological Evidence of Persistent Hominin Carnivory." *PLoS ONE* 8 (4):e62174. doi.org/10.1371/journal.pone.0062174.

Fu, Posth, Hajdinjak, Petr, Mallick, Fernandes, Furtwängler, et al. 2016. "The Genetic History of Ice Age Europe." *Nature* 534 (7606): 200–205. doi.org/10.1038/nature17993.

Gignoux, Henn, & Mountain. 2011. "Rapid, Global Demographic Expansions After the Origins of Agriculture." *Proceedings of the National Academy of Sciences* 108 (15): 6044–49. doi.org/10.1073/pnas.0914274108.

Green, Krause, Briggs, Maricic, Stenzel, Kircher, Patterson, et al. 2010. "A Draft Sequence of the Neandertal Genome." *Science* 328 (5979): 710–22. doi.org/10.1126/science.1188021.

Gunz, Bookstein, Mitteroecker, Stadlmayr, Seidler, & Weber. 2009. "Early Modern Human Diversity Suggests Subdivided Population Structure and a Complex Out-of-Africa Scenario." *Proceedings of the National Academy of Sciences* 106 (15): 6094–98. doi.org/10.1073/pnas.0808160106.

Hare. 2017. "Survival of the Friendliest: *Homo Sapiens* Evolved via Selection for Prosociality." *Annual Review*

of Psychology 68: 155–86. doi.org/10.1146/annurev-psych-010416-044201.

Hare. 2018. "Domestication Experiments Reveal Developmental Link Between Friendliness and Cognition." *Journal of Bioeconomics* 20 (1): 159–63. doi.org/10.1007/s10818-017-9264-9.

Harvati, Röding, Bosman, Karakostis, Grün, Stringer, Karkanas, et al. 2019. "Apidima Cave Fossils Provide Earliest Evidence of Homo Sapiens in Eurasia." *Nature* 571: 500–504. doi.org/10.1038/s41586-019-1376-z.

Henshilwood & d'Errico. 2011. *Homo Symbolicus: The Dawn of Language, Imagination and Spirituality*. Philadelphia, PA: John Benjamins.

Hublin, Ben-Ncer, Bailey, Freidline, Neubauer, Skinner, Bergmann, et al. 2017. "New Fossils from Jebel Irhoud, Morocco and the Pan-African Origin of Homo Sapiens." *Nature* 546 (7657): 289–92. doi.org/10.1038/nature22336.

Jablonski & Chaplin. 2017. "The Colours of Humanity: The Evolution of Pigmentation in the Human Lineage." *Philosophical Transactions of the Royal Society B: Biological Sciences* 372 (1724). doi.org/10.1098/rstb.2016.0349.

King & Bailey. 2006. "Tectonics and Human Evolution." *Antiquity* 80 (308): 265–86. doi.org/10.1017/S0003598X00093613.

Koch & Barnosky. 2006. "Late Quaternary Extinctions: State of the Debate." *Annual Review of Ecology, Evolution, and Systematics* 37 (1): 215–50. doi.org/10.1146/annurev.ecolsys.34.011802.132415.

Langergraber, Prufer, Rowney, Boesch, Crockford, Fawcett, Inoue, et al. 2012. "Generation Times in Wild Chimpanzees and Gorillas Suggest Earlier Divergence Times in Great Ape and Human Evolution." *Proceedings of the National Academy of Sciences* 109 (39): 15716–21. doi.org/10.1073/pnas.1211740109.

Levin. 2015. "Environment and Climate of Early Human Evolution." *Annual Review of Earth and Planetary Sciences* 43: 405–29. doi.org/10.1146/annurev-earth-060614-105310.

Lewin & Foley. 2004. *Principles of Human Evolution*. 2nd ed. Malden, MA: Blackwell.

Lima-Ribeiro & Diniz-Filho. 2013. "American Megafaunal Extinctions and Human Arrival: Improved Evaluation Using a Meta-Analytical Approach." *Quaternary International* 299: 38–52. doi.org/10.1016/j.quaint.2013.03.007.

Locey & Lennon. 2016. "Scaling Laws Predict Global Microbial Diversity." *Proceedings of the National Academy of Sciences* 113 (21): 5970–75. doi.org/10.1073/pnas.1521291113.

López, van Dorp, & Hellenthal. 2015. "Human Dispersal out of Africa: A Lasting Debate." *Evolutionary Bioinformatics* 11: EBO-S33489. doi.org/10.4137/EBo.s33489.

Lovejoy, Suwa, Spurlock, Asfaw, & White. 2009. "The Pelvis and Femur of Ardipithecus ramidus: The Emergence of Upright Walking." *Science* 326 (5949): 71–71e6. doi.org/10.1126/science.1175831.

Martin & Klein. 1989. *Quaternary Extinctions: A Prehistoric Revolution*. Tuscon, AZ: University of Arizona Press.

Maslin, Brierley, Milner, Shultz, Trauth, & Wilson. 2014. "East African Climate Pulses and Early Human Evolution." *Quaternary Science Reviews* 101: 1–17. doi.org/10.1016/j.quascirev.2014.06.012.

Mekel-Bobrov, Gilbert, Evans, Vallender, Anderson, Hudson, Tishkoff, & Lahn. 2005. "Ongoing Adaptive Evolution of ASPM, a Brain Size Determinant in Homo Sapiens." *Science* 309 (5741): 1720–22. doi.org/10.1126/science.1116815.

Mora, Tittensor, Adl, Simpson, & Worm. 2011. "How Many Species Are There on Earth and in the Ocean?" *PLoS Biology* 9 (8): e1001127. doi.org/10.1371/journal.pbio.1001127.

Oates. 1934. "The Population of Rome." *Classical Philology* 29 (2): 101–16.

Palumbi. 2001. "Humans as the World's Greatest Evolutionary Force." *Science* 293 (5536): 1786–90. doi.org/10.1126/science.293.5536.1786.

Petr, Pääbo, Kelso, & Vernot. 2019. "Limits of Long-Term Selection Against Neandertal Introgression." *Proceedings of the National Academy of Sciences* 116 (5): 1639–44. doi.org/10.1073/pnas.1814338116.

Plummer, Ditchfield, Bishop, Kingston, Ferraro, Braun, Hertel, & Potts. 2009. "Oldest Evidence of Toolmaking Hominins in a Grassland-Dominated Ecosystem." *PLoS ONE* 4 (9): e7199. doi.org/10.1371/journal.pone.0007199.

Prüfer, De Filippo, Grote, Mafessoni, Korlević, Hajdinjak, Vernot, et al. 2017. "A High-Coverage Neandertal

Genome from Vindija Cave in Croatia." *Science* 358 (6363): 655–58. doi.org/10.1126/science.aao1887.

Prüfer, Racimo, Patterson, Jay, Sankararaman, Sawyer, Heinze, et al. 2014. "The Complete Genome Sequence of a Neanderthal from the Altai Mountains." *Nature* 505 (7481): 43. doi.org/10.1038/nature12886.

Ramachandran, Deshpande, Roseman, Rosenberg, Feldman, & Cavalli-Sforza. 2005. "Support from the Relationship of Genetic and Geographic Distance in Human Populations for a Serial Founder Effect Originating in Africa." *Proceedings of the National Academy of Sciences* 102 (44): 15942–47. doi.org/10.1073/pnas.0507611102.

Reyes-Centeno, Ghirotto, Detroit, Grimaud-Herve, Barbujani, & Harvati. 2014. "Genomic and Cranial Phenotype Data Support Multiple Modern Human Dispersals from Africa and a Southern Route into Asia." *Proceedings of the National Academy of Sciences* 111 (20): 7248–53. doi.org/10.1073/pnas.1323666111.

Reyes-Centeno, Hubbe, Hanihara, Stringer, & Harvati. 2015. "Testing Modern Human Out-of-Africa Dispersal Models and Implications for Modern Human Origins." *Journal of Human Evolution* 87: 95–106. doi.org/10.1016/j.jhevol.2015.06.008.

Richter, Grün, Joannes-Boyau, Steele, Amani, Rué, Fernandes, et al. 2017. "The Age of the Hominin Fossils from Jebel Irhoud, Morocco, and the Origins of the Middle Stone Age." *Nature* 546: 293–96. doi.org/10.1038/nature22335.

Rowthorn & Seabright. 2010. "Property

Rights, Warfare and the Neolithic Transition." TSE Working Papers 10-207, Toulouse School of Economics (TSE).

Ruddiman. 2003. "The Anthropogenic

Greenhouse Era Began Thousands of Years Ago." *Climatic Change* 61 (3): 261–93. doi.org/10.1023/B:CLIM.0000004577.17928.fa.

Sandom, Faurby, Sandel, & Svenning. 2014. "Global Late Quaternary Megafauna Extinctions Linked to Humans, Not Climate Change." *Proceedings of the Royal Society B: Biological Sciences* 281 (1787). doi.org/10.1098/rspb.2013.3254.

Schlebusch, Malmström, Günther, Sjödin, Coutinho, Edlund, Munters, et al. 2017. "Southern African Ancient Genomes Estimate Modern Human Divergence to 350,000 to 260,000 Years Ago." *Science* 358 (6363): 652–55. doi.org/10.1126/science.aao6266.

Spoor, Leakey, Gathogo, Brown, Antón, Mc-Dougall, Kiarie, Manthi, & Leakey. 2007. "Implications of New Early Homo Fossils from Ileret, East of Lake Turkana, Kenya." *Nature* 448 (7154): 688–91. doi.org/10.1038/nature05986.

Steadman. 1995. "Prehistoric Extinctions of Pacific Island Birds: Biodiversity Meets Zooarchaeology." *Science* 267 (5201): 1123–31. doi.org/10.1126/science.267.5201.1123.

Sullivan, Bird, & Perry. 2017. "Human Behaviour as a Long-Term Ecological Driver of Non-Human Evolution." *Nature Ecology and Evolution* 1 (3): 0065. doi.org/10.1038/s41559-016-0065.

Tanabe, Mita, Jombart, Eriksson, Horibe, Palacpac, Ranford-Cartwright, et al. 2010. "Plasmodium Falciparum Accompanied the Human Expansion out of Africa." *Current Biology* 20 (14): 1283–89. doi.org/10.1016/j.cub.2010.05.053.

Teaford & Ungar. 2000. "Diet and the Evolution of the Earliest Human Ancestors." *Proceedings of the National Academy of Sciences* 97 (25): 13506–11. doi.org/10.1073/pnas.260368897.

The Chimpanzee Sequencing and Analysis Consortium. 2005. Initial sequence of the chimpanzee genome and comparison with the human genome. *Nature* 437: 69–87. doi.,org/10.1038/nature04072

United States Census Bureau. 2013. "Historical Estimates of World Population." 2013. https://www.census.gov/population/international/data/worldpop/table_history.php.

United Nations Department of Economic and Social Affairs. 2015. World Population Prospects. https://population.un.org/wpp/Publications/Files/Key_Findings_WPP_2015.pdf

Weisdorf. 2005. "From Foraging to Farming: Explaining the Neolithic Revolution." *Journal of Economic Surveys* 19 (4): 561–86. doi.org/10.1111/j.0950-0804.2005.00259.x.

Wirth. 1938. "Urbanism as a Way of Life (L'urbanesimo Come Modo Di Vita)." *American Journal of Sociology* 44 (1): 1–24. doi.org/10.1086/217913.

Wrangham. 2009. Catching Fire: How *Cooking Made Us Human*. New York: Basic Books.

Zheng, Yan, Qin, Wang, Tan, Li, & Jin. 2011. “Major Population Expansion of East Asians Began Before Neolithic Time: Evidence of MtDNA Genomes.” *PLoS ONE* 6 (10): e25835. doi.org/10.1371/journal.pone.0025835.

4 章

Barnosky. 2013. “Palaeontological Evidence for Defining the Anthropocene.” *Geological Society, London, Special Publications* 395 (1): 149. doi.org/10.1144/SP395.6.

Brook, Sodhi & Bradshaw. 2008. Synergies among extinction drivers under global change. Trends in Ecology and Evolution 23 (8): 453–460.

Clark & Mix. 2002. “Ice Sheets and Sea Level of the Last Glacial Maximum.” *Quaternary Science Reviews* 21 (1): 1–7. doi.org/10.1016/S0277-3791(01)00118-4.

Crutzen. 2002. “Geology of Mankind.” *Nature* 415 (23): 4153.

Dachs & Méjanelle. 2010. “Organic Pollutants in Coastal Waters, Sediments, and Biota: A Relevant Driver for Ecosystems during the Anthropocene?” *Estuaries and Coasts* 33: 1–14. doi.org/10.1007/s12237-009-9255-8.

Danforth, Sipes, & Fang. 2006. “The History of Early Bee Diversification Based on Five Genes plus Morphology.” *Proceedings of the National Academy of Sciences* 103 (41): 15118–23. doi.org/10.1073/pnas.0604033103.

Duffy, Field, Diffenbaugh, Doney, Dutton, Goodman, Heinzerling, et al. 2019. “Strengthened Scientific Support for the Endangerment Finding for Atmospheric Greenhouse Gases.” *Science* 262 (6427): eaat5982. doi.org/10.1126/science.aat5982.

Eberle & Greenwood. 2012. “Life at the Top of the Greenhouse Eocene World—A Review of the Eocene Flora and Vertebrate Fauna from Canada’s High Arctic.” *Bulletin of the Geological Society of America* 124 (1–2): 3–23. doi.org/10.1130/B30571.1.

Ellis. 2011. “Anthropogenic Transformation of the Terrestrial Biosphere.” *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences* 369: 1010–35. doi.org/10.1098/rsta.2010.0331.

Ellis, Kaplan, Fuller, Vavrus, Klein Goldewijk, & Verburg. 2013. “Used Planet: A Global History.” *Proceedings of the National Academy of Sciences*. 110 (20): 7978–7985 doi.org/10.1073/pnas.1217241110.

Gallai, Salles, Settele, & Vaissière. 2009. “Economic Valuation of the Vulnerability of World Agriculture Confronted with Pollinator Decline.” *Ecological Economics* 68 (3): 810–821. doi.org/10.1016/j.ecolecon.2008.06.014.

Goulson, Nicholls, Botías, & Rotheray. 2015. “Bee Declines Driven by Combined Stress from Parasites, Pesticides, and Lack of Flowers.” *Science* 347 (6229): 1255957. doi.org/10.1126/science.1255957.

Hathaway, Wilson, & Reichmann. 2002. “Group Sunspot Numbers: Sunspot Cycle Characteristics.” *Solar Physics* 211: 357–70. doi.org/10.1023/A:1022425402664.

Holden. 2006. “Ecology. Report Warns of Looming Pollination Crisis in North America.” *Science* 314 (5798): 397. doi.org/10.1126/science.314.5798.397.

Huybers. 2011. “Combined Obliquity and Precession Pacing of Late Pleistocene Deglaciations.” *Nature* 480 (7376): 229–32. doi.org/10.1038/nature10626.

Intergovernmental Panel on Climate Change. 2014. *Climate Change 2014: Synthesis Report*. Geneva, Switzerland.

Kopp, Kirschvink, Hilburn, & Nash. 2005. “The Paleoproterozoic Snowball Earth: A Climate Disaster Triggered by the Evolution of Oxygenic Photosynthesis.” *Proceedings of the National Academy of Sciences* 102 (32): 11131–36. doi.org/10.1073/pnas.0504878102.

Lashof & Ahuja. 1990. “Relative Contributions of Greenhouse Gas Emissions to Global Warming.” *Nature* 344: 529–31. doi.org/10.1038/344529a0.

Lehmann, Marcet, Graham, Dahl, & Dubey. 2006. “Globalization and the Population Structure of Toxoplasma Gondii.” *Proceedings of the National Academy of Sciences* 103 (30): 11423–28.

doi.org/10.1073/pnas.0601438103.

Lewis & Maslin. 2015. “Defining the Anthropocene.” *Nature* 519 (7542): 171–180. doi.org/10.1038/nature14258.

Lisiecki. 2010. “Links between Eccentricity Forcing and the 100,000-Year Glacial Cycle.” *Nature Geoscience* 3 (5): 349–52. doi.org/10.1038/ngeo828.

Marsh. 1864. *Man and Nature: Or, Physical Geography as Modified by Human Action. Scribner*.

Moritz & Agudo. 2013. “The Future of Species Under Climate.” *Science* 341 (6145): 504–8. doi.org/10.1126/science.1237190.

Mullin, Frazier, Frazier, Ashcraft, Simonds, vanEngelsdorp, & Pettis. 2010. “High Levels of Miticides and Agrochemicals in North American Apiaries: Implications for Honey Bee Health.” *PLoS ONE* 5 (3): e9754. doi.org/10.1371/journal.pone.0009754.

Oreskes. 2004. “The Scientific Consensus on Climate Change.” *Science 306* (5702): 1686. doi.org/10.1126/science.1103618.

Peñalosa, Muñiz, & Valle. 2006. Tópicos de Genética. Mexico City: UAEMEX.

Pereira, Navarro, & Martins. 2012. “Global Biodiversity Change: The Bad, the Good, and the Unknown.” *Annual Review of Environment and Resources* 37: 25–50. doi.org/10.1146/annurev-environ-042911-093511.

Rahmstorf & Schellnhuber. 2012. Der Klimawandel: *Diagnose, Prognose, Therapie*. doi.org/10.17104/9783406726736.

Rodrigue, Comtois, & Slack. 2016. The Geography of Transport Systems. New York: Routledge.

Rundlöf, Andersson, Bommarco, Fries, Hederström, Herbertsson, Jonsson, et al. 2015. “Seed Coating with a Neonicotinoid Insecticide Negatively Affects Wild Bees.” Nature 521: 77–80. doi.org/10.1038/nature14420.

Sessions, Doughty, Welander, Summons, & Newman. 2009. “The Continuing Puzzle of the Great Oxidation Event.” *Current Biology* 19 (14): R567–74. doi.org/10.1016/J.CUB.2009.05.054.

Sonter, Moran, Barrett, & Soares-Filho. 2014. “Processes of Land Use Change in Mining Regions.” *Journal of Cleaner Production* 84: 494–501. doi.org/10.1016/j.jclepro.2014.03.084.

Steffen, Broadgate, Deutsch, Gaffney, & Ludwig. 2015. “The Trajectory of the Anthropocene: The Great Acceleration.” *The Anthropocene Review* 2 (1): 81–98. doi.org/10.1177/2053019614564785.

Steffen, Persson, Deutsch, Zalasiewicz, Williams, Richardson, Crumley, et al. 2011. “The Anthropocene: From Global Change to Planetary Stewardship.” *Ambio* 40 (7): 739–61. doi.org/10.1007/s13280-011-0185-x.

United Nations Department of Economic and Social Affairs. 2015. “The World Population Prospects: 2015 Revision.” www.un.org/en/development/desa/publications/world-population-prospects-2015-revision.html.

United States Census Bureau. 2013. “Historical Estimates of World Population.” www.census.gov/population/international/data/worldpop/table_history.php.

Vellekoop, Sluijs, Smit, Schouten, Weijers, Sinninghe Damste, & Brinkhuis. 2014. “Rapid Short-Term Cooling Following the Chicxulub Impact at the Cretaceous-Paleogene Boundary.” *Proceedings of the National Academy of Sciences* 111 (21): 7537–41. doi.org/10.1073/pnas.1319253111.

Weinstock, Robinson, Gibbs, Worley, Evans, Maleszka, Robertson, et al. 2006. “Insights into Social Insects from the Genome of the Honeybee Apis Mellifera.” *Nature* 443 (7114): 31–49. doi.org/10.1038/nature05260.

Zalasiewicz, Williams, Haywood, & Ellis. 2011. “The Anthropocene: A New Epoch of Geological Time?” *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences* 369: 835–41. doi.org/10.1098/rsta.2010.0339.

5 章

Allison, Perry, Badjeck, Neil Adger, Brown, Conway, Halls, et al. 2009. “Vulnerability of National Economies to the Impacts of Climate Change on Fisheries.” *Fish and Fisheries* 10 (2): 173–96. doi.org/10.1111/j.1467-2979.2008.00310.x.

Ballew, Bacheler, Kellison, & Schueller. 2016. “Invasive Lionfish Reduce Native Fish Abundance on a Re-

gional Scale." *Scientific Reports* 6: 32169. doi.org/10.1038/srep32169.

Beever & Smith. 2014. "Ochotona Princeps." *The IUCN Red List of Threatened Species*. http://www.iucnredlist.org

Buckley, Urban, Angilletta, Crozier, Rissler, & Sears. 2010. "Can Mechanism Inform Species' Distribution Models?" *Ecology Letters* 13 (8): 1041–51. doi.org/10.1111/j.1461-0248.2010.01479.x.

Cariton & Geller. 1993. *Ecological Roulette: The Global Transport of Nonindigenous Marine Organisms. Science* 261 (5117): 78–82. doi.org/10.1126/science.261.5117.78

Chase & Leibold. 2003. *Ecological Niches: Linking Classical and Contemporary Approaches*. Chicago: University of Chicago Press.

Chen, Hill, Ohlemüller, Roy, & Thomas. 2011. "Rapid Range Shifts of Species Associated with High Levels of Climate Warming." *Science* 333 (6045): 1024–26. doi.org/10.1126/science.1206432.

Cheung, Watson, & Pauly. 2013. "Signature of Ocean Warming in Global Fisheries Catch." *Nature* 497: 365–68. doi.org/10.1038/nature12156.

Cohen & Carlton. 1998. "Accelerating Invasion Rate in a Highly Invaded Estuary." *Science* 279 (5350): 555–58. doi.org/10.1126/science.279.5350.555.

Conser & Connor. 2009. "Assessing the Residual Effects of Carpobrotus Edulis Invasion, Implications for Restoration." *Biological Invasions* 11 (2): 349–58. doi.org/10.1007/s10530-008-9252-z.

DeMars & Roettgering. 1982. "Western Pine Beetle." *US Department of Agriculture Forest Service: Forest Insect & Disease Leaflet* 1. http://www.na.fs.fed.us/spfo/pubs/fidls/we_pine_beetle/wpb.htm

Elias, Short, & Birks. 1997. "Late Wisconsin Environments of the Bering Land Bridge." *Palaeogeography, Palaeoclimatology, Palaeoecology* 136 (1–4): 293–308. doi.org/10.1016/S0031-0182(97)00038-2.

Elith & Leathwick. 2009. "Species Distribution Models: Ecological Explanation and Prediction Across Space and Time." *Annual Review of Ecology, Evolution, and Systematics* 40: 677–97. doi.org/10.1146/annurev.ecolsys.110308.120159.

Elton. 1927. *Animal Ecology*. Chicago: University of Chicago Press.

Estrada, Meireles, Morales-Castilla, Poschlod, Vieites, Araújo, & Early. 2015. "Species' Intrinsic Traits Inform Their Range Limitations and Vulnerability under Environmental Change." *Global Ecology and Biogeography* 24 (7): 849–58. doi.org/10.1111/geb.12306.

Evangelista, Kumar, Stohlgren, & Young. 2011. "Assessing Forest Vulnerability and the Potential Distribution of Pine Beetles Under Current and Future Climate Scenarios in the Interior West of the US." *Forest Ecology and Management* 262 (3): 307–16. doi.org/10.1016/j.foreco.2011.03.036.

Flockhart, Wassenaar, Martin, Hobson, Wunder, & Norris. 2013. "Tracking Multi-Generational Colonization of the Breeding Grounds by Monarch Butterflies in Eastern North America." *Proceedings of the Royal Society B: Biological Sciences* 280 (1768). doi.org/10.1098/rspb.2013.1087.

Grinnell. 1917. "The Niche-Relationships of the California Thrasher." *Auk* 34: 427–33.

Grinnell & Storer. 1924. *Animal Life in the Yosemite*. Berkeley: University of California Press.

Hilbert, Graham, & Hopkins. 2007. "Glacial and Interglacial Refugia Within a Long-Term Rainforest Refugium: The Wet Tropics Bioregion of NE Queensland, Australia." *Palaeogeography, Palaeoclimatology, Palaeoecology* 251 (1): 104–18. doi.org/10.1016/j.palaeo.2007.02.020.

Holyoak, Casagrandi, Nathan, Revilla, & Spiegel. 2008. "Trends and Missing Parts in the Study of Movement Ecology." *Proceedings of the National Academy of Sciences* 105 (49): 1090–65. doi.org/10.1073/pnas.0800483105.

Hopkins. 1959. "Cenozoic History of the Bering Land Bridge." *Science* 129 (3362): 1519–28. www.jstor.org/stable/1757656.

Hufbauer, Facon, Ravigné, Turgeon, Foucaud, Lee, Rey, & Estoup. 2012. "Anthropogenically Induced Adaptation to Invade (AIAI): Contemporary Adaptation to Human-Altered Habitats within the Native Range Can Promote Invasions." *Evolutionary Applications* 5 (1): 89–101. doi.org/10.1111/j.1752-4571.2011.00211.x.

Hulme. 2009. "Trade, Transport and Trouble: Managing Invasive Species Pathways in an Era of Globalization." *Journal of Applied Ecology* 46 (1): 10–18. doi.org/10.1111/j.1365-2664.2008.01600.x.

Huntley, Barnard, Altwegg, Chambers, Coetzee, Gibson, Hockey, et al. 2010. "Beyond Bioclimatic Envelopes:

Dynamic Species' Range and Abundance Modelling in the Context of Climatic Change." *Ecography* 33 (3): 621–26. doi.org/10.1111/j.1600-0587.2009.06023.x.

Hutchinson. 1957. "Concluding Remarks" *Cold Spring Harbor Symposia on Quantitative Biology* 22: 415–27. http://dx.doi.org/10.1101/SQB.1957.022.01.039

Jenouvrier, Holland, Stroeve, Serreze, Barbraud, Weimerskirch, & Caswell. 2014. "Projected Continent-Wide Declines of the Emperor Penguin under Climate Change." *Nature Climate Change* 4: 715–18. doi.org/10.1038/NCLIMATE2280.

Kearney & Porter. 2009. "Mechanistic Niche Modelling: Combining Physiological and Spatial Data to Predict Species' Ranges." *Ecology Letters* 12 (4): 334–50. doi.org/10.1111/j.1461-0248.2008.01277.x.

Koh & Wilcove. 2008. "Is Oil Palm Agriculture Really Destroying Tropical Biodiversity?" *Conservation Letters* 1 (2): 60–64. doi.org/10.1111/j.1755-263X.2008.00011.x.

Kolar & Lodge. 2001. "Progress in Invasion Biology: Predicting Invaders." *Trends in Ecology and Evolution* 16 (4): 199–204. doi.org/10.1016/S0169-5347(01)02101-2.

Lavergne, Mouquet, Thuiller, & Ronce. 2010. "Biodiversity and Climate Change: Integrating Evolutionary and Ecological Responses of Species and Communities." *Annual Review of Ecology, Evolution, and Systematics* 41: 321–50. doi.org/10.1146 /annurev-ecolsys-102209-144628.

Leibold. 1995. "The Niche Concept Revisited: Mechanistic Models and Community Context." *Ecology* 76 (5): 1370–82. doi.org/10.2307/1938141.

Lenoir & Svenning. 2015. "Climate-Related Range Shifts—A Global Multidimensional Synthesis and New Research Directions." *Ecography* 38 (1): 15–28. /urldoi.org/10.1111/ecog.00967.

Lockwood, Hoopes, & Marchetti. 2013. *Invasion Ecology*. 2nd ed. Malden, MA: John Wiley & Sons.

Maggini, Lehmann, Kéry, Schmid, Beniston, Jenni, & Zbinden. 2011. "Are Swiss Birds Tracking Climate Change? Detecting Elevational Shifts Using Response Curve Shapes." *Ecological Modelling* 222 (1): 21–32. doi.org/10.1016/j.ecolmodel.2010.09.010.

McKinney & Lockwood. 1999. "Biotic Homogenization: A Few Winners Replacing Many Losers in the next Mass Extinction." *Trends in Ecology and Evolution* 14 (11): 450–53. doi.org/10.1016/S0169-5347(99)01679-1.

Moritz, Patton, Conroy, Parra, White, & Beissinger. 2008. "Impact of a Century of Climate Change on Small-Mammal Communities in Yosemite National Park, USA." *Science* 322 (5899): 261–64. doi.org/10.1126/science.1163428.

National Oceanic and Atmospheric Administration (NOAA). 2014. "Blue Whale (*Balaenoptera Musculus*)." http://www.nmfs.noaa.gov/pr/species/mammals/cetaceans/bluewhale.htm

Olden. 2006. "Biotic Homogenization: A New Research Agenda for Conservation Biogeography." *Journal of Biogeography* 33 (12): 2027–39. doi.org/10.1111/j.1365-2699.2006.01572.x.

Parmesan. 1996. "Climate and Species' Range." *Nature* 382: 765–66.

Parmesan & Yohe. 2003. "A Globally Coherent Fingerprint of Climate Change Impacts Across Natural Systems." *Nature* 421: 37–42. doi.org/10.1038/nature01286.

Peterson & Robins. 2003. "Using Ecological-Niche Modeling to Predict Barred Owl Invasions with Implications for Spotted Owl Conservation." *Conservation Biology* 17 (4): 1161–65. doi.org/10.1046/j.1523-1739.2003.02206.x.

Petit & Hampe. 2006. "Some Evolutionary Consequences of Being a Tree." *Annual Review of Ecology, Evolution, and Systematics* 37: 187–214. doi.org/10.1146/annurev.ecolsys.37.091305.110215.

Pimentel, Zuniga, & Morrison. 2005. "Update on the Environmental and Economic Costs Associated with Alien-Invasive Species in the United States." *Ecological Economics* 52 (3): 273–88. doi.org/10.1016/j.ecolecon.2004.10.002.

Poloczanska, Burrows, Brown, García Molinos, Halpern, Hoegh-Guldberg, Kappel, et al. 2016. "Responses of Marine Organisms to Climate Change Across Oceans." *Frontiers in Marine Science* 3: 62. doi.org/10.3389/fmars.2016.00062.

Rahel. 2002. "Homogenization of Freshwater Faunas." *Annual Review of Ecology and Systematics* 33 (1): 291–315. doi.org/10.1146/annurev.ecolsys.33.010802.150429.

Reppert & de Roode. 2018. "Demystifying Monarch Butterfly Migration." *Current Biology* 28 (17): R1009–22.

doi.org/10.1016/j.cub.2018.02.067.

Root, Price, Hall, Schneider, Rosenzweig, & Pounds. 2003. “Fingerprints of Global Warming on Wild Animals and Plants.” *Nature* 421: 57–60. doi.org/10.1038/nature01333.

Rougier, Lassalle, Drouineau, Dumoulin, Faure, Deffuant, Rochard, & Lambert. 2015. “The Combined Use of Correlative and Mechanistic Species Distribution Models Benefits Low Conservation Status Species.” *PLoS ONE* 10 (10): e0139194. doi.org/10.1371/journal.pone.0139194.

Sanderson, Redford, Weber, Aune, Baldes, Berger, Carter, et al. 2008. “The Ecological Future of the North American Bison: Conceiving Long-Term, Large-Scale Conservation of Wildlife.” *Conservation Biology* 22 (2): 252–66. doi.org/10.1111/j.1523-1739.2008.00899.x.

Schick, Loarie, Colchero, Best, Boustany, Conde, Halpin, Joppa, McClellan, & Clark. 2008. “Understanding Movement Data and Movement Processes: Current and Emerging Directions.” *Ecology Letters* 11 (12): 1338–50. doi.org/10.1111/j.1461-0248.2008.01249.x.

Sohl. 2014. “The Relative Impacts of Climate and Land-Use Change on Conterminous United States Bird Species from 2001 to 2075.” *PLoS ONE* 9 (11): e112251. doi.org/10.1371/journal.pone.0112251.

Sorte, Williams, & Carlton. 2010. “Marine Range Shifts and Species Introductions: Comparative Spread Rates and Community Impacts.” *Global Ecology and Biogeography* 19 (3): 303–16. doi.org/10.1111/j.1466-8238.2009.00519.x.

Stachowicz, Whitlatch, & Osman. 1999. “Species Diversity and Invasion Resistance in a Marine Ecosystem.” *Science* 286 (5444): 1577–79. doi.org/10.1126/science.286.5444.1577.

Suarez & Case. 2002. “Bottom-up Effects on Persistence of a Specialist Predator: Ant Invasions and Horned Lizards.” *Ecological Applications* 12 (1): 291–98. doi.org/10.1890/1051-0761(2002)012[0291:BUEOPO]2.0.CO;2.

Suarez, Tsutsui, Holway, & Case. 1999. “Behavioral and Genetic Differentiation Between Native and Introduced Populations of the Argentine Ant.” *Biological Invasions* 1 (1): 43–53. doi.org/10.1023/A:1010038413690.

Svenning, Fløjgaard, Marske, Nógues-Bravo, & Normand. 2011. “Applications of Species Distribution Modeling to Paleobiology.” *Quaternary Science Reviews* 30 (21–22): 2930–47. doi.org/10.1016/j.quascirev.2011.06.012.

Thomas, Cameron, Green, Bakkenes, Beaumont, Collingham, Erasmus, et al. 2004. “Extinction Risk from Climate Change.” *Nature* 427: 145–48. doi.org/10.1038/nature02121.

Torchin, Lafferty, Dobson, McKenzie, & Kuris. 2003. “Introduced Species and Their Missing Parasites.” *Nature* 421: 628–30. doi.org/10.1038/nature01346.

Torchin & Mitchell. 2004. “Parasites, Pathogens, and Invasions by Plants and Animals.” *Frontiers in Ecology and the Environment* 2 (4): 183–90. doi.org/10.1890/1540-9295(2004)002[0183:PPAIBP]2.0.CO;2.

Tsutsui, Suarez, Holway, & Case. 2000. “Reduced Genetic Variation and the Success of an Invasive Species.” *Proceedings of the National Academy of Sciences* 97 (11): 5948–53. doi.org/10.1073/pnas.100110397.

United States Fish and Wildlife Service. 2013. “Devils Hole Pupfish.” http://www.fws.gov/nevada/protected_species/fish/species/dhp/dhp.html.

United States Fish and Wildlife Service. 2014. “Timeline of the American Bison.” http://www.fws.gov/bisonrange/timeline.htm.

Vergés, Steinberg, Hay, Poore, Campbell, Ballesteros, Wilson, et al. 2014. “The Tropicalization of Temperate Marine Ecosystems: Climate-Mediated Changes in Herbivory and Community Phase Shifts.” *Proceedings of the Royal Society B: Biological Sciences* 281(1789): 20140846. doi:10.1098/rspb.2014.0846.

Weber. 2017. *Invasive Plant Species of the World: A Reference Guide to Environmental Weeds*. 2nd ed. Boston, MA: CABI.

Wiens, Ackerly, Allen, Anacker, Buckley, Cornell, Damschen, et al. 2010. “Niche Conservatism as an Emerging Principle in Ecology and Conservation Biology.” *Ecology Letters* 13 (10): 1310–24.

Wilcove, Rothstein, Dubow, Phillips, & Losos. 1998. “Quantifying Threats to Imperiled Species in the United States.” *BioScience* 48 (8): 607–15. doi.org/10.2307/1313420.

Wolfe. 2002. “Why Alien Invaders Succeed: Support for the Escape-from-Enemy Hypothesis.” *The American Naturalist* 160 (6): 705–11. doi.org/10.1086/343872.

Worm & Tittensor. 2011. “Range Contraction in Large Pelagic Predators.” *Proceedings of the National Academy of Sciences* 108 (29): 11942–97. doi.org/10.1073/pnas.1102353108.

Yalcin & Leroux. 2017. “Diversity and Suitability of Existing Methods and Metrics for Quantifying Species Range Shifts.” *Global Ecology and Biogeography* 26 (6): 609–24. doi.org/10.1111/geb.12579.

Yamano, Sugihara, & Nomura. 2011. “Rapid Poleward Range Expansion of Tropical Reef Corals in Response to Rising Sea Surface Temperatures.” *Geophysical Research Letters* 38(4). doi.org/10.1029/2010GL046474.

6 章

Angilletta, Wilson, Niehaus, Sears, Navas, & Ribeiro. 2007. “Urban Physiology: City Ants Possess High Heat Tolerance.” *PLoS ONE* 2: e258. doi.org/10.1371/journal.pone.0000258.

Avolio, Hoffman, & Smith. 2018. “Linking Gene Regulation, Physiology, and Plant Biomass Allocation in Andropogon gerardii in Response to Drought.” *Plant Ecology* 219 (1): 1–15. doi.org/10.1007/s11258-017-0773-3.

Binks, Meir, Rowland, Da Costa, Vasconcelos, De Oliveira, Ferreira, & Mencuccini. 2016. “Limited Acclimation in Leaf Anatomy to Experimental Drought in Tropical Rainforest Trees.” *Tree Physiology* 36 (12): 1550–61. doi.org/10.1093/treephys/tpw078.

Bossdorf, Richards, & Pigliucci. 2008. “Epigenetics for Ecologists.” *Ecology Letters* 11 (2): 106–15. doi.org/10.1111/j.1461-0248.2007.01130.x.

Campbell-Staton, Winchell, Rochette, Fredette. Maayan, Schweizer, & Catchen. 2020. “Parallel Selection on Thermal Physiology Facilitates Repeated Adaptation of City Lizards to Urban Heat Islands.” *Nature Ecology and Evolution* 4: 652–58. doi.org/10.1038/s41559-020-1131-8.

Chuine, Yiou, Viovy, Seguin, Daux, & Ladurie. 2004. “Grape Ripening as a Past Climate Indicator.” *Nature* 432 (7015): 289–90. doi.org/10.1038/432289a.

Cobb. 2006. “Heredity Before Genetics: A History.” *Nature Reviews Genetics* 7 (12): 953–58. doi.org/10.1038/nrg1948.

Cook, Wolkovich, & Parmesan. 2012. “Divergent Responses to Spring and Winter Warming Drive Community Level Flowering Trends.” *Proceedings of the National Academy of Sciences* 109 (23): 9000–9005. doi.org/10.1073/pnas.1118364109.

Crews, Gillette, Scarpino, Manikkam, Savenkova, & Skinner. 2012. “Epigenetic Transgenerational Inheritance of Altered Stress Responses.” *Proceedings of the National Academy of Sciences* 109 (23): 9143–48. doi.org/10.1073/pnas.1118514109.

Davidson, Jennions, & Nicotra. 2011. “Do Invasive Species Show Higher Phenotypic Plasticity than Native Species and, If So, Is It Adaptive? A Meta-Analysis.” *Ecology Letters* 14 (4): 419–31. doi.org/10.1111/j.1461-0248.2011.01596.x.

Davis, Flynn, Miller, Nelson, Fangue, & Todgham. 2018. “Antarctic Emerald Rockcod Have the Capacity to Compensate for Warming When Uncoupled from CO2 Acidification.” *Global Change Biology* 24 (2): e655–70. doi.org/10.1111/gcb.13987.

DeCandido & Allen. 2006. “Nocturnal Hunting by Peregrine Falcons at the Empire State Building, New York City.” *The Wilson Journal of Ornithology* 118 (1): 53–58. doi.org/10.1676/1559-4491(2006)118[0053:nhbpf a]2.0.co;2.

Des Roches, Brans, Lambert, Rivkin, Savage, Schell, et al. 2020. “Socio-Eco-Evolutionary Dynamics in Cities.” *Evolutionary Applications* 00: 1-20. DOI: 10.1111/eva.13065

Diamond, Chick, Perez, Strickler, & Zhao. 2018. “Evolution of Plasticity in the City: Urban Acorn Ants can Better Tolerate more Rapid Increases in Environmental Temperature.” *Conservation Physiology* 6 (1): coy030. doi.org/10.1093/conphys/coy030

Diamond & Martin. 2016. “The Interplay Between Plasticity and Evolution in Response to Human-Induced Environmental Change.” *F1000Research* 5: 2835. doi.org/10.12688/f1000research.9731.1.

Díaz, Pascual, Stenseke, Martín-López, Watson, et al. 2018. “Assessing Nature’s Contributions to People.” *Science* 359 (6373), 270–72. doi.org/10.1126/science.aap8826.

Dodson. 1989. “The Ecological Role of Chemical Stimuli for the Zooplankton: Predator-Induced Morphology in *Daphnia*.” *Oecologia* 78 (3): 361–67. doi.org/10.1007/BF00379110.

Donihue & Lambert. 2015. “Adaptive Evolution in Urban Ecosystems.” *Ambio* 44 (3): 194–203. doi.org/10.1007/s13280-014-0547-2.

Drescher. 2019. “Urban Heating and Canopy Cover Need to be Considered as Matters of Environmental Justice.” *Proceedings of the National Academy of Sciences* 116 (52): 26153–54. doi.org/10.1073/pnas.1917213116

Dunham, Kundaje, Aldred, Collins, Davis, Doyle, Epstein, et al. 2012. “An Integrated Encyclopedia of DNA Elements in the Human Genome.” *Nature* 489 (7414): 57–74. doi.org/10.1038/nature11247.

Ehrenreich & Pfennig. 2016. “Genetic Assimilation: A Review of Its Potential Proximate Causes and Evolutionary Consequences.” *Annals of Botany* 117 (5): 769–79. doi.org/10.1093/aob/mcv130.

Epperson & Clegg. 1988. “Genetics of Flower Color Polymorphism in the Common Morning Glory (*Ipomoea purpurea*).” *Journal of Heredity* 79 (1): 64–68. doi.org/10.1093/oxfordjournals.jhered.a110450.

Esbaugh. 2018. “Physiological Implications of Ocean Acidification for Marine Fish: Emerging Patterns and New Insights.” *Journal of Comparative Physiology B: Biochemical, Systemic, and Environmental Physiology* 188 (1): 1–13. doi.org/10.1007/s00360-017-1105-6.

Ezzat, Maguer, Grover, Rottier, Tremblay, & Ferrier-Pagès. 2019. “Nutrient Starvation Impairs the Trophic Plasticity of Reef-Building Corals Under Ocean Warming.” *Functional Ecology* 33 (4): 643–53. doi.org/10.1111/1365-2435.13285.

Forsman. 2015. “Rethinking Phenotypic Plasticity and Its Consequences for Individuals, Populations and Species.” *Heredity* 15: 276–84. doi.org/10.1038/hdy.2014.92.

Fox, Donelson, Schunter, Ravasi, & Gaitán-Espitia. 2019. “Beyond Buying Time: The Role of Plasticity in Phenotypic Adaptation to Rapid Environmental Change.” *Philosophical Transactions of the Royal Society B: Biological Sciences* 374: 20180174. doi.org/10.1098/rstb.2018.0174.

Fusco & Minelli. 2010. “Phenotypic Plasticity in Development and Evolution: Facts and Concepts.” *Philosophical Transactions of the Royal Society B: Biological Sciences* 265: 547–56. doi.org/10.1098/rstb.2009.0267.

Gabriel, Luttbeg, Sih, & Tollrian. 2017. “Environmental Tolerance, Heterogeneity, and the Evolution of Reversible Plastic Responses.” *The American Naturalist* 166 (3): 339–53. doi.org/10.2307/3473313.

Gardner, Amano, Backwell, Ikin, Sutherland, & Peters. 2014. “Temporal Patterns of Avian Body Size Reflect Linear Size Responses to Broadscale Environmental Change over the Last 50 Years.” *Journal of Avian Biology* 45 (6): 529–35. doi.org/10.1111/jav.00431.

Gardner, Peters, Kearney, Joseph, & Heinsohn. 2011. “Declining Body Size: A Third Universal Response to Warming?” *Trends in Ecology and Evolution* 26 (6): 285–91. doi.org/10.1016/j.tree.2011.03.005.

Geng, Pan, Xu, Zhang, Li, Chen, Lu, & Song. 2007. “Phenotypic Plasticity Rather Than Locally Adapted Ecotypes Allows the Invasive Alligator Weed to Colonize a Wide Range of Habitats.” *Biological Invasions* 9 (3): 245–56. doi.org/10.1007/s10530-006-9029-1.

Gentry, Derryberry, Danner, Danner, & Luther. 2017. “Immediate Signaling Flexibility in Response to Experimental Noise in Urban, but Not Rural, White-Crowned Sparrows.” *Ecosphere* 8 (8): e01916. doi.org/10.1002/ecs2.1916.

Gormezano & Rockwell. 2013. “What to Eat Now? Shifts in Polar Bear Diet During the Ice-Free Season in Western Hudson Bay.” *Ecology and Evolution* 3 (10): 3509–23. doi.org/10.1002/ece3.740.

Green. 1967. “The Distribution and Variation of Daphnia lumholtzi (Crustacea: Cladocera) in Relation to Fish Predation in Lake Albert, East Africa.” *Journal of Zoology* 151 (2): 181–97. doi.org/10.1111/j.1469-7998.1967.tb02109.x.

Greene. 1989. “A Diet-Induced Developmental Polymorphism in a Caterpillar.” *Science (New York, N.Y.)* 243 (4891): 643–46. doi.org/10.1126/science.243.4891.643.

Grimm, Grimm, Faeth, Golubiewski, Redman, Wu, Bai, et al. 2008. “Global Change and the Ecology of Cities.” *Science* 319 (5864): 756–60. doi.org/10.1126/science.1150195.

Gross, Pasinelli, & Kunc. 2010. “Behavioral Plasticity Allows Short-Term Adjustment to a Novel Environment.” *The American Naturalist* 176 (4): 456–64. doi.org/10.1086/655428.

Habary, Johansen, Nay, Steffensen, & Rummer. 2017. “Adapt, Move or Die—How Will Tropical Coral Reef Fishes Cope with Ocean Warming?” *Global Change Biology* 23 (2): 566–77. doi.org/10.1111/gcb.13488.

Hayes, Khoury, Narayan, Nazir, Park, Brown, Adame, et al. 2010. “Atrazine Induces Complete Feminization and Chemical Castration in Male African Clawed Frogs (Xenopus laevis).” *Proceedings of the National Academy of Sciences* 107 (10): 4612–17. doi.org/10.1073/pnas.0909519107.

Heuer & Grosell. 2014. “Physiological Impacts of Elevated Carbon Dioxide and Ocean Acidification on Fish.” *American Journal of Physiology-Regulatory, Integrative and Comparative Physiology* 307 (9): R1061–84. doi.org/10.1152/ajpregu.00064.2014.

Hiyama, Nohara, Kinjo, Taira, Gima, Tanahara, & Otaki. 2012. “The Biological Impacts of the Fukushima Nuclear Accident on the Pale Grass Blue Butterfly.” *Scientific Reports* 2: 570. doi.org/10.1038/srep00570.

Hope, Gries, Zhu, Fagan, Redman, Grimm, Nelson, Martin, Kinzig. 2003. “Socioeconomics Drive Urban Plant Diversity.” *Proceedings of the National Academy of Sciences* 100: 8788–92. doi:10.1073/pnas.1537557100.

International Human Genome Sequencing Consortium. 2004. “Finishing the Euchromatic Sequence of the Human Genome International Human Genome Sequencing Consortium*.” *Nature* 431 (7011): 931–45. http://www.genome.gov/10000923.

Ishizuka & Goto. 2012. “Modeling Intraspecific Adaptation of Abies sachalinensis to Local Altitude and Responses to Global Warming, Based on a 36-Year Reciprocal Transplant Experiment.” *Evolutionary Applications* 5 (3): 229–44. doi.org/10.1111/j.1752-4571.2011.00216.x.

Iverson, Gilchrist, Smith, Gaston, & Forbes. 2014. “Longer Ice-Free Seasons Increase the Risk of Nest Depredation by Polar Bears for Colonial Breeding Birds in the Canadian Arctic.” *Proceedings of the Royal Society B: Biological Sciences* 281 (1779): 20133128. doi.org/10.1098/rspb.2013.3128.

Iwanowicz, Blazer, Pinkney, Guy, Major, Munney, Mierzykowski, et al. 2016. “Evidence of Estrogenic Endocrine Disruption in Smallmouth and Largemouth Bass Inhabiting Northeast U.S. National Wildlife Refuge Waters: A Reconnaissance Study.” *Ecotoxicology and Environmental Safety* 124: 50–59. doi.org/10.1016/j.ecoenv.2015.09.035.

Jablonka & Raz. 2009. “Transgenerational Epigenetic Inheritance: Prevalence, Mechanisms, and Implications for the Study of Heredity and Evolution.” *The Quarterly Review of Biology* 84 (2): 131–76. doi.org/10.1086/598822.

Janzen & Phillips. 2006. “Exploring the Evolution of Environmental Sex Determination, Especially in Reptiles.” *Journal of Evolutionary Biology* 19 (6): 1775–84. doi.org/10.1111/j.1420-9101.2006.01138.x.

Kelly, Panhuis, & Stoehr. 2012. “Phenotypic Plasticity: Molecular Mechanisms and Adaptive Significance.” In *Comprehensive Physiology*, vol. 2, 1417–39. Hoboken, NJ: John Wiley & Sons. doi.org/10.1002/cphy.c110008.

Kowarik. 2011. “Novel Urban Ecosystems, Biodiversity, and Conservation.” *Environmental Pollution* 159 (8–9): 1974–83. doi.org/10.1016/j.envpol.2011.02.022.

Kucharski, Maleszka, Foret, & Maleszka. 2008. “Nutritional Control of Reproductive Status in Honeybees via DNA Methylation.” *Science* 319 (5871): 1827–30. doi.org/10.1126/science.1153069.

Kunc, Lyons, Sigwart, McLaughlin, & Houghton. 2014. “Anthropogenic Noise Affects Behavior Across Sensory Modalities.” *The American Naturalist* 184 (4): E93–100. doi.org/10.1086/677545.

Lachapelle, Bell, & Colegrave. 2015. “Experimental Adaptation to Marine Conditions by a Freshwater Alga.” *Evolution* 69 (10): 2662–75. doi.org/10.1111/evo.12760.

Laforsch, Beccara, & Tollrian. 2006. “Inducible Defenses: The Relevance of Chemical Alarm Cues in *Daphnia*.” *Limnology and Oceanography* 51 (3): 1466–72. doi.org/10.4319/lo.2006.51.3.1466.

Lambert, Giller, Barber, Fitzgerald, & Skelly. 2015. “Suburbanization, Estrogen Contamination, and Sex Ratio in Wild Amphibian Populations.” *Proceedings of the National Academy of Sciences* 112 (38): 11881–86. doi.org/10.1073/pnas.1501065112.

Leong, Dunn, & Trautwein. 2018. “Biodiversity and Socioeconomics in the City: A Review of the Luxury Effect.” *Biology Letters* 14 (5): 20180082. doi.org/10.1098/rsbl.2018.0082

Liu, Wollstein, Hysi, Ankra-Badu, Spector, Park, Zhu, et al. 2010. “Digital Quantification of Human Eye Color Highlights Genetic Association of Three New Loci.” Edited by Mark I. McCarthy. *PLoS Genetics* 6 (5):

e1000934. doi.org/10.1371/journal.pgen.1000934.

Lundholm & Richardson. 2010. “Habitat Analogues for Reconciliation Ecology in Urban and Industrial Environments.” *Journal of Applied Ecology* 47 (5): 966–75. doi.org/10.1111/j.1365-2664.2010.01857.x.

Mao, Schuler, & Berenbaum. 2015. “A Dietary Phytochemical Alters Caste-Associated Gene Expression in Honey Bees.” *Science Advances* 1 (7): e1500795. doi.org/10.1126/sciadv.1500795.

Martin, Chick, Yilmaz, & Diamond. 2019. “Evolution, Not Transgenerational Plasticity, Explains the Adaptive Divergence of Acorn Ant Thermal Tolerance Across an Urban–Rural Temperature Cline.” *Evolutionary Applications* 12: 1678–87. DOI: 10.1111/eva.12826

Marzluff, Bowman, & Donnelly. 2001. “A Historical Perspective on Urban Bird Research: Trends, Terms, and Approaches.” In *Avian Ecology and Conservation in an Urbanizing World*, 1–17. Boston, MA: Springer. doi.org/10.1007/978-1-4615-1531-9_1.

Mitton & Ferrenberg. 2012. “Mountain Pine Beetle Develops an Unprecedented Summer Generation in Response to Climate Warming.” *The American Naturalist* 179 (5): E163–71. doi.org/10.1086/665007.

Morley, Jones, & Radford. 2014. “The Importance of Invertebrates When Considering the Impacts of Anthropogenic Noise.” *Proceedings of the Royal Society of London: Biological Sciences* 281: 20132683. doi.org/10.1098/rspb.2013.2683

Oates. 1934. “The Population of Rome.” In *Classical Philology*. Chicago: The University of Chicago Press. Accessed August 6, 2019. doi.org/10.2307/264523.

O’Neill, Jerrett, Kawachi, Levy, Cohen, et al. 2003. Health, Wealth, and Air Pollution: Advancing Theory and Methods. *Environmental Health Perspectives* 111 (16): 1861–70. doi:10.1289/ehp.6334.

Orci, Petróczki, & Barta. 2016. “Instantaneous Song Modification in Response to Fluctuating Traffic Noise in the Tree Cricket Oecanthus Pellucens.” *Animal Behaviour* 112: 187–94. doi.org/10.1016/j.anbehav.2015.12.008.

Paquette, Pelletier, Garant, & Bélisle. 2014. “Severe Recent Decrease of Adult Body Mass in a Declining Insectivorous Bird Population Is Not Related to Breeding Habitat Quality.” *Proceedings of the Royal Society B: Biological Sciences* 281: 1–26.

Parmesan & Yohe. 2003. “A Globally Coherent Fingerprint of Climate Change Impacts Across Natural Systems.” *Nature* 421 (6918): 37–42. doi.org/10.1038/nature01286.

Richter, Haslbeck, & Buchner. 2010. “The Heat Shock Response: Life on the Verge of Death.” *Molecular Cell* 40 (2): 253–66. doi.org/10.1016/j.molcel.2010.10.006.

Robinson. 2013. “Evolution of Growth by Genetic Accommodation in Icelandic Freshwater Stickleback.” *Proceedings of the Royal Society B: Biological Sciences* 280 (1772): 20132197. doi.org/10.1098/rspb.2013.2197.

Root, Price, Hall, Schneider, Rosenzweig, & Pounds. 2003. “Fingerprints of Global Warming on Wild Animals and Plants.” *Nature* 421 (6918): 57–60. doi.org/10.1038/nature01333.

Roy & Sparks. 2000. “Phenology of British Butterflies and Climate Change.” *Global Change Biology* 6 (4): 407–16. doi.org/10.1046/j.1365-2486.2000.00322.x.

Ryu, Veilleux, Donelson, Munday, & Ravasi. 2018. “The Epigenetic Landscape of Transgenerational Acclimation to Ocean Warming.” *Nature Climate Change* 8: 504–9. doi.org/10.1038/s41558-018-0159-0.

Sahanatien & Derocher. 2012. “Monitoring Sea Ice Habitat Fragmentation for Polar Bear Conservation.” *Animal Conservation* 15 (4): 397–406. doi.org/10.1111/j.1469-1795.2012.00529.x.

Sanger, Coulson, Friedmann, Air, Barrell, Brown, Fiddes, Hutchison, & Slocombe. 1978. “Nuclotide-Sequence of Bacteriophage-PHI-X174.” *Journal of Molecular Biology* 125: 225–46.

Schell, Dyson, Fuentes, De Roches, Harris, Miller, Woelfle-Erskine, & Lambert. 2020. “The Ecological and Evolutionary Consequences of Systemic Racism in Urban Environments.” *Science*: eaay4497. DOI: 10.1126/science/aay4497.

Schlichting & Wund. 2014. “Phenotypic Plasticity and Epigenetic Marking: An Assessment of Evidence for Genetic Accommodation.” *Evolution* 68 (3): 656–72. doi.org/10.1111/evo.12348.

Schwander & Leimar. 2011. “Genes as Leaders and Followers in Evolution.” *Trends in Ecology & Evolution* 26 (3): 143–51. doi.org/10.1016/j.tree.2010.12.010.

Slabbekoorn & Peet. 2003. “Birds Sing at a Higher Pitch in Urban Noise.” *Nature* 424 (6946): 267–67.

doi.org/10.1038/424267a.

Stamps. 2016. “Individual Differences in Behavioural Plasticities.” *Biological Reviews* 91 (2): 534–67. doi.org/10.1111/brv.12186.

Sturm, Duffy, Zhao, Leite, Stark, Hayward, Martin, & Montgomery. 2008. “A Single SNP in an Evolutionary Conserved Region Within Intron 86 of the HERC2 Gene Determines Human Blue-Brown Eye Color.” *American Journal of Human Genetics* 82 (2): 424–31. doi.org/10.1016/j.ajhg.2007.11.005.

Swaddle, Francis, Barber, Cooper, Kyba, Dominoni, Shannon, et al. 2015. “A Framework to Assess Evolutionary Responses to Anthropogenic Light and Sound.” *Trends in Ecology & Evolution* 30 (9): 550–60. doi.org/10.1016/J.TREE.2015.06.009.

Tollrian & Dodson. 1999. “Inducible Defenses in Cladocera: Constraints, Costs, and Multipredator Environments.” In *The Ecology and Evolution of Inducible Defenses*, eds. Tollrian & Harvell, 177–202. Princeton, NJ: Princeton University Press.

United Nations. 2014. “World Urbanization Prospects: The 2014 Revision, Highlights. Department of Economic and Social Affairs.” population.un.org/wup/.

Verhoeven, von Holdt, & Sork. 2016. “Epigenetics in Ecology and Evolution: What We Know and What We Need to Know.” *Molecular Ecology* 25 (8): 1631–38. doi.org/10.1111/mec.13617.

Verhoeven, Jansen, van Dijk, & Biere. 2010. “Stress-Induced DNA Methylation Changes and Their Heritability in Asexual Dandelions.” *New Phytologist* 185 (4): 1108–18. doi.org/10.1111/j.1469-8137.2009.03121.x.

De Villemereuil, Gaggiotti, Mouterde, & Till-Bottraud. 2016. “Common Garden Experiments in the Genomic Era: New Perspectives and Opportunities.” *Heredity* 116 (3): 249–54. doi.org/10.1038/hdy.2015.93.

Whitehead, Roach, Zhang, & Galvez. 2011. “Genomic Mechanisms of Evolved Physiological Plasticity in Killifish Distributed Along an Environmental Salinity Gradient.” *Proceedings of the National Academy of Sciences* 108 (15): 6193–98. doi.org/10.1073/pnas.1017542108.

Winter & Holtum. 2014. “Facultative Crassulacean Acid Metabolism (CAM) Plants: Powerful Tools for Unravelling the Functional Elements of CAM Photosynthesis.” *Journal of Experimental Botany* 65 (13): 3425–41. doi.org/10.1093/jxb/eru063.

Wirth. 1938. “Urbanism as a Way of Life.” *American Journal of Sociology* 44 (1): 1–24. doi.org/10.1086/217913.

Zufall & Rausher. 2003. “The Genetic Basis of a Flower Color Polymorphism in the Common Morning Glory (*Ipomoea purpurea*).” *Journal of Heredity* 94 (6): 442–48. doi.org/10.1093/jhered/esg098.

7 章

Altermatt & Ebert. 2016. “Reduced Flight-to-Light Behaviour of Moth Populations Exposed to Long-Term Urban Light Pollution.” *Biology letters* 12(4): 20160111. doi:10.1098/rsbl.2016.0111.

Anderson, Mao, Scott, & Crowder. 2009. “Survival from Hypoxia in C. *elegans* by Inactivation of Aminoacyl-tRNA Synthetases.” *Science* 323: 630–34.

Arnold & Kunte. 2017. “Adaptive Genetic Exchange: A Tangled History of Admixture and Evolutionary Innovation.” *Trends in Ecology and Evolution* 32 (8): 601–44. doi.org/10.1016/j.tree.2017.05.007.

Baker. 2003. “Flexibility and Specificity in Coral-Algal Symbiosis: Diversity, Ecology, and Biogeography of Symbiodinium.” *Annual Review of Ecology, Evolution, and Systematics* 34 (1): 661–89. doi.org/10.1146/annurev.ecolsys.34.011802.132417.

Balanyá, Oller, Huey, Gilchrist, & Serra. 2006. “Global Genetic Change Tracks Global Climate Warming in Drosophila subobscura.” *Science* 313 (5794): 1773–75. doi.org/10.1126/science.1131002.

Banerjee, Hasler, Meagher, Nagoshi, Hietala, Huang, Narva, & Jurat-Fuentes. 2017. “Mechanism and DNA-Based Detection of Field-Evolved Resistance to Transgenic Bt Corn in Fall Armyworm (*Spodoptera frugiperda*).” *Scientific Reports* 7 (1): 1–10. doi.org/10.1038/s41598-017-09866-y.

Barrett & Schluter. 2008. “Adaptation from Standing Genetic Variation.” *Trends in Ecology and Evolution* 23 (1): 38–44. doi.org/10.1016/j.tree.2007.09.008.

Barshis, Ladner, Oliver, Seneca, Traylor-Knowles, & Palumbi. 2013. “Genomic Basis for Coral Re-

silience to Climate Change." *Proceedings of the National Academy of Sciences* 110 (4): 1387–92. doi.org/10.1073/pnas.1210224110.

Bell. 2017. "Evolutionary Rescue." *Annual Review of Ecology, Evolution, and Systematics* 48: 605–27. doi.org/10.1146/annurev-ecolsys-110316-023011.

Bell & Gonzalez. 2009. "Evolutionary Rescue Can Prevent Extinction Following Environmental Change." *Ecology Letters* 12 (9): 942–48. doi.org/10.1111/j.1461-0248.2009.01350.x.

Bell & Gonzalez. 2011. "Adaptation and Evolutionary Rescue Environmental Deterioration." *Science* 332 (June): 1327–30. doi.org/10.1126/science.1203105.

Berkelmans, De'ath, Kininmonth, & Skirving. 2004. "A Comparison of the 1998 and 2002 Coral Bleaching Events on the Great Barrier Reef: Spatial Correlation, Patterns, and Predictions." *Coral Reefs* 23 (1): 74–83. doi.org/10.1007/s00338-003-0353-y.

Both, Bouwhuis, Lessells, & Visser. 2006. "Climate Change and Population Declines in a Long-Distance Migratory Bird." *Nature* 441: 81–83. 10.1038/nature04539

Bradshaw & Holzapfel. 2001. "Genetic Shift in Photoperiodic Response Correlated with Global Warming." *Proceedings of the National Academy of Sciences* 98 (25): 14509–11. doi.org/10.1073/pnas.241391498.

Brierley & Kingsford. 2009. "Impacts of Climate Change on Marine Organisms and Ecosystems." *Current Biology* 19 (14): R602–14. doi.org/10.1016/j.cub.2009.05.046.

Campbell-Staton, Winchell, Rochette, Fredette, Maayan, Schweizer & Catchen. 2020. "Parallel Selection on Thermal Physiology Facilitates Repeated Adaptation of City Lizards to Urban Heat Islands." *Nature Ecology and Evolution* 4(4): 652–58. doi.org/10.1038/s41559-020-1131-8.

Carlson, Cunningham, & Westley. 2014. "Evolutionary Rescue in a Changing World." *Trends in Ecology and Evolution* 29 (9): 521–30. doi.org/10.1016/j.tree.2014.06.005.

Carpenter, Abrar, Aeby, Aronson, Banks, Bruckner, Chiriboga, et al. 2008. "One-Third of Reef-Building Corals Face Elevated Extinction Risk from Climate Change and Local Impacts." *Science* 321 (5888): 560–63. doi.org/10.1126/science.1159196.

Cesar & Chong. 2004. "Economic Valuation and Socioeconomics of Coral Reefs: Methodological Issues and Three Case Studies." In *Economic Valuation and Policy Priorities for Sustainable Management of Coral Reefs*, edited by Ahmed, Chong, & Cesar, pages 14–215. Penang, Malaysia.

Cheptou, Carrue, Rouifed, & Cantarel. 2008. "Rapid Evolution of Seed Dispersal in an Urban Environment in the Weed *Crepis sancta*." *Proceedings of the National Academy of Sciences* 105(10): 3796–99. doi:10.1073/pnas.0708446105.

Colbourne, Pfrender, Gilbert, Thomas, Tucker, Oakley, Tokishita, et al. 2011. "The Ecoresponsive Genome of *Daphnia pulex*." *Science* 331 (6017): 555–61. doi.org/10.1126/science.1197761.

Collins. 2011. "Many Possible Worlds: Expanding the Ecological Scenarios in Experimental Evolution." *Evolutionary Biology* 38: 3–14. doi.org/10.1007/s11692-010-9106-3.

Collins & Bell. 2004. "Phenotypic Consequences of 1,000 Generations of Selection at Elevated CO_2 in a Green Alga." *Nature* 431 (7008): 566–69. doi.org/10.1038/nature02945.

Cook. 2003. "The Rise and Fall of the Carbonaria Form of the Peppered Moth." *The Quarterly Review of Biology* 78 (4): 399–417. doi.org/10.1086/378925.

Cook, Grant, Saccheri, & Mallet. 2012. "Selective Bird Predation on the Peppered Moth: The Last Experiment of Michael Majerus." *Biology Letters* 8 (4): 609–12. doi.org/10.1098/rsbl.2011.1136.

Cook & Muggleton. 2003. "The Peppered Moth, Biston betularia (Linnaeus, 1758) (Lepidoptera: Geometridae): A Matter of Names." *Entomologist's Gazette* 54 (4): 211–21.

Cook & Saccheri. 2013. "The Peppered Moth and Industrial Melanism: Evolution of a Natural Selection Case Study." *Heredity* 110 (3): 207–12. doi.org/10.1038/hdy.2012.92.

Crook, Cohen, Rebolledo-Vieyra, Hernandez, & Paytan. 2013. "Reduced Calcification and Lack of Acclimatization by Coral Colonies Growing in Areas of Persistent Natural Acidification." *Proceedings of the National Academy of Sciences* 110 (27): 11044–49. doi.org/10.1073/pnas.1301589110.

Darwin. 1859. *On the Origin of Species*. doi.org/10.4324/9780203509104.

Deatherage, Kepner, Bennett, Lenski, & Barrick. 2017. "Specificity of Genome Evolution in Experimental Populations of *Escherichia coli* Evolved at Different Temperatures." *Proceedings of the National Academy of*

Sciences 114 (10): E1904–12. doi.org/10.1073/pnas.1616132114.

Diaz-Pulido, McCook, Dove, Berkelmans, Roff, Kline, Weeks, Evans, Williamson, & Hoegh-Guldberg. 2009. "Doom and Boom on a Resilient Reef: Climate Change, Algal Overgrowth and Coral Recovery." *PLoS ONE* 4 (4): e5239. doi.org/10.1371/journal.pone.0005239.

Egan, Ragland, Assour, Powell, Hood, Emrich, Nosil, & Feder. 2015. "Experimental Evidence of Genome-Wide Impact of Ecological Selection During Early Stages of Speciation-with-Gene-Flow." *Ecology Letters* 18 (8): 817–25. doi.org/10.1111/ele.12460.

Elena & Lenski. 2003. "Evolution Experiments with Microorganisms: The Dynamics and Genetic Bases of Adaptation." *Nature Reviews Genetics* 4 (6): 457–69. doi.org/10.1038/nrg1088.

Ellegren. 2014. "Genome Sequencing and Population Genomics in Non-Model Organisms." *Trends in Ecology and Evolution* 29 (1): 51–63. doi.org/10.1016/j.tree.2013.09.008.

Etterson & Shaw. 2001. "Constraint to Adaptive Evolution in Response to Global Warming." *Science* 294 (5540): 151–54. doi.org/10.1126/science.1063656.

Fenner. 2010. "Deliberate Introduction of European Rabbit, Oryctolagus cuniculus, into Australia." *Revue Scientifique et Technique de l'OIE* 29 (1): 103–11. doi.org/10.20506/rst.29.1.1964.

Filchak, Roethele, & Feder. 2000. "Natural Selection and Sympatric Divergence in the Apple Maggot *Rhagoletis pomonella*." *Nature* 407 (6805): 739–42. doi.org/10.1038/35037578.

French. 2010. "The Continuing Crisis in Antibiotic Resistance." *International Journal of Antimicrobial Agents* 36 (Suppl. 3): S3–7. doi.org/10.1016/S0924-8579(10)70003-0.

Frisch, Morton, Chowdhury, Culver, Colbourne, Weider, & Jeyasingh. 2014. "A Millennial-Scale Chronicle of Evolutionary Responses to Cultural Eutrophication in Daphnia." *Ecology Letters* 17 (3): 360–68. doi.org/10.1111/ele.12237.

Fukano, Yamori, Misu, Sato, Shirasawa, Tachiki, & Uchida. 2023. "From Green to Red: Urban Heat Stress Drives Leaf Color Evolution." *Science Advances* 9(42): eabq3542. doi:10.1126/sciadv.abq3542.

Geerts, Vanoverbeke, Vanschoenwinkel, Van Doorslaer, Feuchtmayr, Atkinson, Moss, Davidson, Sayer, & De Meester. 2015. "Rapid Evolution of Thermal Tolerance in the Water Flea Daphnia." *Nature Climate Change* 5 (7): 665–68. doi.org/10.1038/nclimate2628.

Gilchrist, Huey, Balanyá, Pascual, & Serra. 2004. "A Time Series of Evolution in Action: A Latitudinal Cline in Wing Size in South American *Drosophila subobscura*." *Evolution* 58 (4): 768–80. doi.org/10.1111/j.0014-3820.2004.tb00410.x.

Gonzalez, Ronce, Ferriere, & Hochberg. 2013. "Evolutionary Rescue: An Emerging Focus at the Intersection between Ecology and Evolution." *Philosophical Transactions of the Royal Society B: Biological Sciences* 368: 20120404. doi.org/10.1098/rstb.2012.0404.

Goulet & Coffroth. 2003. "Stability of an Octocoral–Algal Symbiosis over Time and Space." *Marine Ecology Progress Series* 250: 117–24. doi.org/10.3354/meps250117.

Graham, Wilson, Jennings, Polunin, Robinson, Bijoux, & Daw. 2007. "Lag Effects in the Impacts of Mass Coral Bleaching on Coral Reef Fish, Fisheries, and Ecosystems." *Conservation Biology* 21 (5): 1291–300. doi.org/10.1111/j.1523-1739.2007.00754.x.

Grant and Grant. 2014. *40 Years of Evolution: Darwin's Finches on Daphne Major Island*. Princeton, NJ: Princeton University Press.

Groot, de, Brander, van der Ploeg, Costanza, Bernard, Braat, Christie, et al. 2012. "Global Estimates of the Value of Ecosystems and Their Services in Monetary Units." *Ecosystem Services* 1 (1): 50–61. doi.org/10.1016/j.ecoser.2012.07.005.

Halpern, Walbridge, Selkoe, Kappel, Micheli, D'Agrosa, Bruno, et al. 2008. "A Global Map of Human Impact on Marine Ecosystems." *Science* 319 (5865): 948–52. doi.org/10.1126/science.1149345.

Harborne, Rogers, Bozec, & Mumby. 2017. "Multiple Stressors and the Functioning of Coral Reefs." *Annual Review of Marine Science* 9 (1): 445–68. doi.org/10.1146/annurev-marine-010816-060551.

Hardwick, Harmon, Hardwick, & Rosenblum. 2015. "When Field Experiments Yield Unexpected Results: Lessons Learned from Measuring Selection in White Sands Lizards." *PLoS ONE* 10 (2): 1–18. doi.org/10.1371/journal.pone.0118560.

Hedrick. 2013. "Adaptive Introgression in Animals: Examples and Comparison to New Mutation and

Standing Variation as Sources of Adaptive Variation." *Molecular Ecology* 22 (18): 4606–18. doi.org/10.1111/mec.12415.

Hoegh-Guldberg, Kennedy, Beyer, McClennen, & Possingham. 2018. "Securing a Long-Term Future for Coral Reefs." *Trends in Ecology and Evolution* 33 (12): 936–44. doi.org/10.1016/j.tree.2018.09.006.

Hoegh-Guldberg, Mumby, Hooten, Steneck, Greenfield, Gomez, Harvell, et al. 2007. "Coral Reefs Under Rapid Climate Change and Ocean Acidification." *Science* 318 (5857): 1737–42. doi.org/10.1126/science.1152509.

Hoekstra, Hoekstra, Berrigan, Vignieri, Hoang, Hill, Beerli, & Kingsolver. 2001. "Strength and Tempo of Directional Selection in the Wild." *Proceedings of the National Academy of Sciences* 98 (16): 9157–60. doi.org/10.1073/pnas.161281098.

Howells, Abrego, Meyer, Kirk, & Burt. 2016. "Host Adaptation and Unexpected Symbiont Partners Enable Reef-Building Corals to Tolerate Extreme Temperatures." *Global Change Biology* 22 (8): 2702–14. doi.org/10.1111/gcb.13250.

Howells, Beltran, Larsen, Bay, Willis, & Van Oppen. 2012. "Coral Thermal Tolerance Shaped by Local Adaptation of Photosymbionts." *Nature Climate Change* 2 (2): 116–20. doi.org/10.1038/nclimate1330.

Hughes, Barnes, Bellwood, Cinner, Cumming, Jackson, Kleypas, et al. 2017. "Coral Reefs in the Anthropocene." *Nature* 546: 82–90. doi.org/10.1038/nature22901.

Huston. 1985. "Patterns of Species Diversity on Coral Reefs." *Annual Review of Ecology and Systematics* 16 (1): 149–77. doi.org/10.1146/annurev.es.16.110185.001053.

Jain & Bradshaw. 1966. "Evolutionary Divergence Among Adjacent Plant Populations. I. The Evidence and Its Theoretical Analysis." *Heredity* 21 (3): 407–41. doi.org/10.1038/hdy.1966.42.

Jansen, Geerts, Rago, Spanier, Denis, de Meester, & Orsini. 2017. "Thermal Tolerance in the Keystone Species *Daphnia magna*—A Candidate Gene and an Outlier Analysis Approach." *Molecular Ecology* 26 (8): 2291–305. doi.org/10.1111/mec.14040.

Kingsolver, Diamond, Siepielski, & Carlson. 2012. "Synthetic Analyses of Phenotypic Selection in Natural Populations: Lessons, Limitations and Future Directions." *Evolutionary Ecology* 26 (5): 1101–18. doi.org/10.1007/s10682-012-9563-5.

Lamichhaney, Han, Berglund, Wang, Almén, Webster, Grant, Grant, & Andersson. 2016. "A Beak Size Locus in Darwin's Finches Facilitated Character Displacement During a Drought." *Science* 352 (6284): 470–474. DOI: 10.1126/science.aad8786

Lapiedra, Schoener, Leal, Losos, & Kolbe. 2018. "Predator-Driven Natural Selection on Risk-Taking Behavior in Anole Lizards." *Science* 360 (6392): 1017–20. doi.org/10.1126/science.aap9289.

Laughlin & Messier. 2015. "Fitness of Multidimensional Phenotypes in Dynamic Adaptive Landscapes." *Trends in Ecology and Evolution* 30 (8): 487–96. doi.org/10.1016/j.tree.2015.06.003.

Lenski. 2017. "Convergence and Divergence in a Long-Term Experiment with Bacteria." *The American Naturalist* 190 (S1): S57–68. doi.org/10.1086/691209.

Logan, Dunne, Eakin, & Donner. 2014. "Incorporating Adaptive Responses into Future Projections of Coral Bleaching." *Global Change Biology* 20 (1): 125–39. doi.org/10.1111/gcb.12390.

Lohbeck, Riebesell, & Reusch. 2012. "Adaptive Evolution of a Key Phytoplankton Species to Ocean Acidification." *Nature Geoscience* 5 (5): 346–51. doi.org/10.1038/ngeo1441.

Losos, Schoener, & Spiller. 2004. "Predator-Induced Behaviour Shifts and Natural Selection in Field-Experimental Lizard Populations." *Nature* 432: 505–8. doi.org/10.1038/nature03039.

Loya, Sakai, Yamazato, Nakano, Sambali, & Van Woesik. 2001. "Coral Bleaching: The Winners and the Losers." *Ecology Letters* 4 (2): 122–31. doi.org/10.1046/j.1461-0248.2001.00203.x.

Lynch. 2010. "Evolution of the Mutation Rate." *Trends in Genetics* 26 (8): 345–52. doi.org/10.1016/j.tig.2010.05.003.Evolution.

Marshall, Burgess, & Connallon. 2016. "Global Change, Life-History Complexity and the Potential for Evolutionary Rescue." *Evolutionary Applications* 9 (9): 1189–201. doi.org/10.1111/eva.12396.

McAllister. 1991. "What Is the Status of the World's Coral Reef Fishes?" *Sea Wind* 5 (1): 14–18.

McManus, Reyes Jr., & Nañola Jr. 1997. "Effects of Some Destructive Fishing Methods on Coral Cover and Potential Rates of Recovery." *Environmental Management* 21 (1): 69–78. doi.org/10.1007/s002679 900006.

McPheron, Smith, & Berlocher. 1988. “Genetic Differences Between Host Races of *Rhagoletis pomonella*.” *Nature* 336 (6194): 64–66. doi.org/10.1038/336064a0.

Merilä & Hendry. 2014. “Climate Change, Adaptation, and Phenotypic Plasticity: The Problem and the Evidence.” *Evolutionary Applications* 7 (1): 1–14. doi.org/10.1111/eva.12137.

Moberg & Folke. 1999. “Ecological Goods and Services of Coral Reef Ecosystems.” *Ecological Economics* 29 (2): 215–33.

Munshi-South & Kharchenko. 2010. “Rapid, Pervasive Genetic Differentiation of Urban White-Footed Mouse (*Peromyscus leucopus*) Populations in New York City.” *Molecular Ecology* 19(19): 4242–54. doi:10.1111/j.1365-294X.2010.04816.x.

Nielsen. 2005. “Molecular Signatures of Natural Selection.” *Annual Review of Genetics* 39 (1): 197–218. doi.org/10.1146/annurev.genet.39.073003.112420.

Orr, Fabry, Aumont, Bopp, Doney, Feely, Gnanadesikan, et al. 2005. “Anthropogenic Ocean Acidification over the Twenty-First Century and Its Impact on Calcifying Organisms.” *Nature* 437 (7059): 681–86. doi.org/10.1038/nature04095.

Orsini, Gilbert, Podicheti, Jansen, Brown, Solari, Spanier, et al. 2016. “*Daphnia magna* Transcriptome by RNA-Seq Across 12 Environmental Stressors.” *Scientific Data* 3: 160030. doi.org/10.1038/sdata.2016.30.

Orsini, Schwenk, de Meester, Colbourne, Pfrender, & Weider. 2013. “The Evolutionary Time Machine: Using Dormant Propagules to Forecast How Populations Can Adapt to Changing Environments.” *Trends in Ecology and Evolution* 28 (5): 274–82. doi.org/10.1016/j.tree.2013.01.009.

Orsini, Spanier, & De Meester. 2012. “Genomic Signature of Natural and Anthropogenic Stress in Wild Populations of the Waterflea *Daphnia magna*: Validation in Space, Time and Experimental Evolution.” *Molecular Ecology* 21 (9): 2160–75. doi.org/10.1111/j.1365-294X.2011.05429.x.

Palumbi, Barshis, Traylor-Knowles, & Bay. 2014. “Mechanisms of Reef Coral Resistance to Future Climate Change.” *Science* 344 (6186): 895–98. doi.org/10.1126/science.1251336.

Putnam, Barott, Ainsworth, & Gates. 2017. “The Vulnerability and Resilience of Reef-Building Corals.” *Current Biology* 27 (11): R528–40. doi.org/10.1016/j.cub.2017.04.047.

Réale, McAdam, Boutin, & Berteaux. 2003. “Genetic and Plastic Responses of a Northern Mammal to Climate Change.” *Proceedings of the Royal Society B: Biological Sciences* 270 (1515): 591–96. doi.org/10.1098/rspb.2002.2224.

Rezende, Balanyà, Rodríguez-Trelles, Rego, Fragata, Matos, Serra, & Santos. 2010. “Climate Change and Chromosomal Inversions in *Drosophila subobscura*.” *Climate Research* 43 (1–2): 103–14. doi.org/10.3354/cr00869.

Rowan. 2004. “Coral Bleaching: Thermal Adaptation in Reef Coral Symbionts.” *Nature* 430 (7001): 742.

Sandberg, Pedersen, Lacroix, Ebrahim, Bonde, Herrgard, Palsson, Sommer, & Feist. 2014. “Evolution of *Escherichia coli* to 42 °C and Subsequent Genetic Engineering Reveals Adaptive Mechanisms and Novel Mutations.” *Molecular Biology and Evolution* 31 (10): 2647–62. doi.org/10.1093/molbev/msu209.

Saunders, Cooke, McColl, Shine, & Peacock. 2010. “Modern Approaches for the Biological Control of Vertebrate Pests: An Australian Perspective.” *Biological Control* 52 (3): 288–95. doi.org/10.1016/j.biocontrol.2009.06.014.

Schiffers, Bourne, Lavergne, Thuiller, & Travis. 2013. “Limited Evolutionary Rescue of Locally Adapted Populations Facing Climate Change.” *Philosophical Transactions of the Royal Society B: Biological Sciences* 368 (1610): 20120083. doi.org/10.1098/rstb.2012.0083.

Schoener & Schoener. 1983. “Distribution of Vertebrates on Some Very Small Islands. II. Patterns in Species Number.” *The Journal of Animal Ecology* 52 (1): 237–62. doi.org/10.2307/4598.

Sinervo, Méndez-de-la-Cruz, Miles, Heulin, Bastiaans, Cruz, Lara-Resendiz, et al. 2010. “Erosion of Lizard Diversity by Climate Change and Altered Thermal Niches.” *Science* 328 (5980): 894–99. doi.org/10.1126/science.1184695.

Song, Endepols, Klemann, Richter, Matuschka, Shih, Nachman, & Kohn. 2011. “Adaptive Introgression of Anticoagulant Rodent Poison Resistance by Hybridization Between Old World Mice.” *Current Biology* 21 (15): 1296–301. doi.org/10.1016/j.cub.2011.06.043.

Spalding & Grenfell. 1997. “New Estimates of Global and Regional Coral Reef Areas.” *Coral Reefs* 16 (4):

225–30.

Springael & Top. 2004. “Horizontal Gene Transfer and Microbial Adaptation to Xenobiotics: New Types of Mobile Genetic Elements and Lessons from Ecological Studies.” *Trends in Microbiology* 12 (2): 53–58. www.sciencedirect.com/science/article/pii/S0966842X03003378.

Stinchcombe & Hoekstra. 2008. “Combining Population Genomics and Quantitative Genetics: Finding the Genes Underlying Ecologically Important Traits.” *Heredity* 100 (2): 158–70. doi.org/10.1038/sj.hdy.6800937.

Swaegers, Mergeay, Van Geystelen, Therry, Larmuseau, & Stoks. 2015. “Neutral and Adaptive Genomic Signatures of Rapid Poleward Range Expansion.” *Molecular Ecology* 24 (24): 6163–76. doi.org/10.1111/mec.13462.

Tabashnik & Carrière. 2017. “Surge in Insect Resistance to Transgenic Crops and Prospects for Sustainability.” *Nature Biotechnology* 35 (10): 926–35. doi.org/10.1038/nbt.3974.

Thornhill, Howells, Wham, Steury, & Santos. 2017. “Population Genetics of Reef Coral Endosymbionts (Symbiodinium, Dinophyceae).” *Molecular Ecology* 26 (10): 2640–59. doi.org/10.1111/mec.14055.

Vander Wal, Garant, Festa-Bianchet, & Pelletier. 2013. “Evolutionary Rescue in Vertebrates: Evidence, Applications and Uncertainty.” *Philosophical Transactions of the Royal Society B: Biological Sciences* 368 (1610): 20120090. doi.org/10.1098/rstb.2012.0090.

van’t Hof, Edmonds, Dalíková, & Saccheri. 2011. “Industrial Melanism in British Peppered Moths Has a Singular and Recent Mutational Origin.” *Science* 332 (6032): 958–60.

Wilcox. 2000. “Soap.” In *Poucher’s Perfumes, Cosmetics and Soaps*, edited by Hilda Butler, pages 453–65. Dordrecht: Springer Netherlands.

Wray & Visscher. 2008. “Estimating Trait Heritability.” *Nature Education* 1 (1): 29.

8 章

Barnosky, Matzke, Tomiya, Wogan, Swartz, Quental, Marshall, et al. 2011. “Has the Earth’s Sixth Mass Extinction Already Arrived?” *Nature* 471 (7336): 51–57. doi.org/10.1038/nature09678.

Berger, Speare, Daszak, Green, Cunningham, Goggin, Slocombe, et al. 1998. “Chytridiomycosis Causes Amphibian Mortality Associated with Population Declines in the Rain Forests of Australia and Central America.” *Proceedings of the National Academy of Sciences* 95 (15): 9031–36. doi.org/10.1073/pnas.95.15.9031.

Blaustein, Gervasi, Johnson, Hoverman, Belden, Bradley, & Xie. 2012. “Ecophysiology Meets Conservation: Understanding the Role of Disease in Amphibian Population Declines.” *Philosophical Transactions of the Royal Society B: Biological Sciences* 367 (1596): 1688–707. doi.org/10.1098/rstb.2012.0011.

Botkin, Saxe, Araújo, Betts, Bradshaw, Cedhagen, Chesson, et al. 2007. “Forecasting the Effects of Global Warming on Biodiversity.” *BioScience* 57 (3): 227–36. doi.org/10.1641/B570306.

Bruegmann & Caraway. 2003. “Cyanea Superba.” The IUCN Red List of Threatened Species. http://www.iucnredlist.org.

Bucciarelli, Blaustein, Garcia, & Kats. 2014. “Invasion Complexities: The Diverse Impacts of Nonnative Species on Amphibians.” *Copeia* 2014 (4): 611–32. doi.org/10.1643/ot-14-014.

Burkhead. 2012. “Extinction Rates in North American Freshwater Fishes, 1900–2010.” *BioScience* 62 (9): 798–808. doi.org/10.1525/bio.2012.62.9.5.

Carlson, Burgio, Dougherty, Phillips, Bueno, Clements, Castaldo, et al. 2017. “Parasite Biodiversity Faces Extinction and Redistribution in a Changing Climate.” *Science Advances* 3 (9): e1602422. doi.org/10.1126/sciadv.1602422.

Carpenter, Abrar, Aeby, Aronson, Banks, Bruckner, Chiriboga, et al. 2008. “One-Third of Reef-Building Corals Face Elevated Extinction Risk from Climate Change and Local Impacts.” *Science* 321 (5888): 560–63. doi.org/10.1126/science.1159196.

Carpenter, Andreone, Moore, & Griffiths. 2014. “A Review of the International Trade in Amphibians: The Types, Levels and Dynamics of Trade in CITES-Listed Species.” *Oryx* 48 (4): 565–74.

doi.org/10.1017/S0030605312001627.

Ceballos, Ehrlich, Barnosky, García, Pringle, & Palmer. 2015. "Accelerated Modern Human–Induced Species Losses: Entering the Sixth Mass Extinction." *Science Advances* 1 (5): e1400253. doi.org/10.1126/sciadv.1400253.

Coote. 2009. "*Partula nodosa*." The IUCN Red List of Threatened Species. http://www.iucnredlist.org.

Cushman. 2006. "Effects of Habitat Loss and Fragmentation on Amphibians: A Review and Prospectus." *Biological Conservation* 128 (2): 231–40. doi.org/10.1016/j.biocon.2005.09.031.

Egea-Serrano, Relyea, Tejedo, & Torralva. 2012. "Understanding of the Impact of Chemicals on Amphibians: A Meta-Analytic Review." *Ecology and Evolution* 2 (7): 1382–97. doi.org/10.1002/ece3.249.

Ehrlich, Dobkin, & Wheye. 1988. "The Passenger Pigeon." Stanford University. http://web.stanford.edu/group/stanfordbirds/text/essays/Passenger_Pigeon.html.

Fagan & Holmes. 2006. "Quantifying the Extinction Vortex." *Ecology Letters* 9 (1): 51–60. doi.org/10.1111/j.1461-0248.2005.00845.x.

Farrer, Weinert, Bielby, Garner, Balloux, Clare, Bosch, et al. 2011. "Multiple Emergences of Genetically Diverse Amphibian-Infecting Chytrids Include a Globalized Hypervirulent Recombinant Lineage." *Proceedings of the National Academy of Sciences* 108 (46): 18732–36. doi.org/10.1073/pnas.1111915108.

Fisher & Garner. 2007. "The Relationship between the Emergence of *Batrachochytrium dendrobatidis*, the International Trade in Amphibians and Introduced Amphibian Species." *Fungal Biology Reviews* 21 (1): 2–9. doi.org/10.1016/j.fbr.2007.02.002.

Gilpin & Soulé. 1986. "Minimum Viable Populations: Processes of Species Extinction." In *Conservation Biology: The Science of Scarcity and Diversity*, pages 19–34. Sunderland, MA: Sinaeur Associates.

Goldingay & Possingham. 1995. "Area Requirements for Viable Populations of the Australian Gliding Marsupial Petaurus Australis." *Biological Conservation* 73 (2): 161–67. doi.org/10.1016/0006-3207(95)90043-8.

Hanski. 1998. "Metapolulation Dynamics." *Nature* 396: 41–49.

Harfoot, Newbold, Tittensor, Emmott, Hutton, Lyutsarev, Smith, Scharlemann, & Purves. 2014. "Emergent Global Patterns of Ecosystem Structure and Function from a Mechanistic General Ecosystem Model." *PLoS Biology* 12 (4): e1001841. doi.org/10.1371/journal.pbio.1001841.

Hayes, Khoury, Narayan, Nazir, Park, Brown, Adame, et al. 2010. "Atrazine Induces Complete Feminization and Chemical Castration in Male African Clawed Frogs (*Xenopus Laevis*)." *Proceedings of the National Academy of Sciences* 107 (10): 4612–17. doi.org/10.1073/pnas.0909519107.

Hylander & Ehrlén. 2013. "The Mechanisms Causing Extinction Debts." *Trends in Ecology and Evolution* 28 (6): 341–346. doi.org/10.1016/j.tree.2013.01.010.

Internatoinal Union for Consevation of Nature (IUCN). 2016. International Union for Conservation of Nature Annual Report 2016.portals.iucn.org/library/node/46619

Jones. 2012. "Lonesome George, Last of the Pinta Island Tortoises, Dies." *CNN*. http://www.cnn.com/2012/06/25/world/americas/lonesomegeorge-giant-tortoise-dies/index.html.

Jones, Patel, Levy, Storeygard, Balk, Gittleman, & Daszak. 2008. "Global Trends in Emerging Infectious Diseases." *Nature* 251 (7181): 900–93. doi.org/10.1038/nature06536.

Keeley & Keeley. 1987. "Role of Fire in the Germination of Chaparral Herbs and Suffrutescents." *California Botanical Society* 34 (3): 240–49.

Kramer, Dennis, Liebhold, & Drake. 2009. "The Evidence for Allee Effects." *Population Ecology* 51 (3): 341–54. doi.org/10.1007/s10144-009-0152-6.

Labrum. 2011. "Allee Effects and Extinction Debt." *Ecological Modelling* 222 (5): 1205–7. doi.org/10.1016/j.ecolmodel.2010.12.013.

Levins. 1969. "Some Demographic and Genetic Consequences of Environmental Heterogeneity for Biological Control." *Bulletin of the Entomological Society of America* 15 (3): 237–40.

Li, Cohen, & Rohr. 2013. "Review and Synthesis of the Effects of Climate Change on Amphibians." *Integrative Zoology* 8 (2): 145–61. doi.org/10.1111/1749-4877.12001.

Lindenmayer & McCarthy. 2006. "Evaluation of PVA Models of Arboreal Marsupials: Coupling Models with Long-Term Monitoring Data." *Biodiversity and Conservation* 15 (13): 4079–96. doi.org/10.1007/s10531-

005-3367-7.

Longcore & Simmons. 2012. “Chytridiomycota.” In *ELS*. Chichester, UK: John Wiley & Sons. doi.org/DOI: 10.1002/9780470015902.a0000349.pub3.

Longcore, Pessier, & Nichols. 1999. “*Batrachochytrium dendrobatidis* gen. et sp. nov., a Chytrid Pathogenic to Amphibians.” *Mycologia* 91 (2): 219. doi.org/10.2307/3761366.

Mace, Collar, Gaston, Hilton-Taylor, Akçakaya, Leader-Williams, Milner-Gulland, & Stuart. 2008. “Quantification of Extinction Risk: IUCN’s System for Classifying Threatened Species.” Conservation Biology 22 (6): 1424–42. doi.org/10.1111/j.1523-1739.2008.01044.x.

Maclean & Wilson. 2011. “Recent Ecological Responses to Climate Change Support Predictions of High Extinction Risk.” *Proceedings of the National Academy of Sciences* 108 (30): 12337–42. doi.org/10.1073/pnas.1017352108.

Maisels, Strindberg, Blake, Wittemyer, Hart, Williamson, Aba’a, et al. 2013. “Devastating Decline of Forest Elephants in Central Africa.” *PLoS ONE* 8 (3): e59469. doi.org/10.1371/journal.pone.0059469.

Martel, Spitzen-van der Sluijs, Blooi, Bert, Ducatelle, Fisher, Woeltjes, et al. 2013. “*Batrachochytrium salamandrivorans* sp. nov. Causes Lethal Chytridiomycosis in Amphibians.” *Proceedings of the National Academy of Sciences* 110 (38): 15325–15329. doi.org/10.1073/pnas.1307356110.

McPherson, Mori, Wood, Storer, Svihra, Kelly, & Standiford. 2005. “Sudden Oak Death in California: Disease Progression in Oaks and Tanoaks.” *Forest Ecology and Management* 213 (1–3): 71–89. doi.org/10.1016/j.foreco.2005.03.048.

Melamed, Israely, & Paran. 2018. “Challenges and Achievements in Prevention and Treat ment of Smallpox.” *Vaccines* 6 (1): 8. doi.org/10.3390/vaccines6010008.

Miller, Hayes, Ratan, Peterson, Wittekindt, et al. 2011. Causes Lethal Chytridiomycosis in Amphibians.” *Proceedings of the National Academy of Sciences* 108 (3): 12348–53. rg/cgi/doi/10.1073/pnas.1102838108

Morris, Wright, Grueber, Hogg, & Belov. 2015. “Lack of Genetic Diversity Across Diverse Immune Genes in an Endangered Mammal, the Tasmanian Devil (*Sarcophilus harrisii*).” Molecular Ecology 24 (15): 3860–72. doi.org/10.1111/mec.13291.

Ødegaard. 2000. “How Many Species of Arthropods? Erwin’s Estimate Revised.” *Biological Journal of the Linnean Society* 71 (4): 583–97. doi.org/10.1006/bijl.2000.0468.

O’Hanlon, Rieux, Farrer, Rosa, Waldman, Bataille, Kosch, et al. 2018. “Recent Asian Origin of Chytrid Fungi Causing Global Amphibian Declines.” *Science* 360 (6389): 621–27. doi.org/10.1126/science.aar1965.

Ojanen, Nieminen, Meyke, Pöyry, & Hanski. 2013. “Long-Term Metapopulation Study of the Glanville Fritillary Butterfly (*Melitaea cinxia*): Survey Methods, Data Management, and Long-Term Population Trends.” *Ecology and Evolution* 3 (11): 3713–37. doi.org/10.1002/ece3.733.

Pimm, Raven, Peterson, Sekercioglu, & Ehrlich. 2006. “Human Impacts on the Rates of Recent, Present, and Future Bird Extinctions.” *Proceedings of the National Academy of Sciences* 103 (29): 10941–46. doi.org/10.1073/pnas.0604181103.

Possingham, Lindenmayer, & Norton. 1993. “A Framework for the Improved Management of Threatened Species Based on Population Viability Analysis (PVA).” *Pacific Conservation Biology* 1 (1): 39–45.

Reed, Grady, Brook, Ballou, & Frankham. 2003. “Estimates of Minimum Viable Population Sizes for Vertebrates and Factors Influencing Those Estimates.” *Biological Conservation* 113: 23–34.

Rizzo, Garbelotto, Davidson, Slaughter, & Koike. 2002. “*Phytophthora ramorum* as the Cause of Extensive Mortality of *Quercus* spp. and *Lithocarpus densiflorus* in California.” *Plant Disease* 86 (3): 205–14. doi.org/10.1094/pdis.2002.86.3.205.

Rodrigues, Pilgrim, Lamoreux, Hoffmann, & Brooks. 2006. “The Value of the IUCN Red List for Conservation.” *Trends in Ecology and Evolution* 21 (2): 71–76. doi.org/10.1016/j.tree.2005.10.010.

Rosenblum, James, Zamudio, Poorten, Ilut, Rodriguez, Eastman, et al. 2013. “Complex History of the Amphibian-Killing Chytrid Fungus Revealed with Genome Resequencing Data.” *Proceedings of the National Academy of Sciences* 110 (23): 9385–90. doi.org/10.1073/pnas.1300130110.

Simberloff & Abele. 1982. “Refuge Design and Island Biogeographic Theory: Effects of Fragmentation” 120 (1): 41–50.

Sinervo, Méndez-de-la-Cruz, Miles, Heulin, Bastiaans, Cruz, Lara-Resendiz, et al. 2010. “Erosion of

Lizard Diversity by Climate Change and Altered Thermal Niches." Science 328 (5980): 894–99. doi.org/10.1126/science.1184695.

Skerratt, Berger, Speare, Cashins, McDonald, Phillott, Hines, & Kenyon. 2007. "Spread of Chytridiomycosis Has Caused the Rapid Global Decline and Extinction of Frogs." *EcoHealth* 4 (2): 125–34. doi.org/10.1007/s10393-007-0093-5.

Smith, Zhou, Reeves, Barlow, Taylor, & Pitman. 2008. "*Lipotes vexillifer*." The IUCN Red List of Threatened Species. http://www.iucnredlist.org.

Sommer. 2005. "The Importance of Immune Gene Variability (MHC) in Evolutionary Ecology and Conservation." *Frontiers in Zoology* 2: 16. doi.org/10.1186/1742-9994-2-16.

Sutton & Morgan. 2009. "Functional Traits and Prior Abundance Explain Native Plant Extirpation in a Fragmented Woodland Landscape." *Journal of Ecology* 97 (4): 718–27. doi.org/10.1111/j.1365-2745.2009.01517.x.

Thomas, Cameron, Green, Bakkenes, Beaumont, Collingham, Erasmus, et al. 2004. "Extinction Risk from Climate Change." *Nature* 427 (6970): 145–48. doi.org/10.1038/nature02121.

Tilman, May, Lehman, & Nowak. 1994. "Habitat Destruction and the Extinction Debt." *Nature* 371: 65–66. DOI: 10.1038/371065a0

Tonge & Bloxam. 1991. "A Review of the Captive-Breeding Programme for Polynesian Tree Snails Partula spp." *International Zoo Yearbook* 30 (1): 51–59. doi.org/10.1111/j.1748-1090.1991.tb03465.x.

Turvey, Pitman, Taylor, Barlow, Akamatsu, Barrett, Zhao, et al. 2007. "First Human-Caused Extinction of a Cetacean Species?" *Biology Letters* 3 (5): 537–40. doi.org/10.1098/rsbl.2007.0292.

United States Fish and Wildlife Service. 2007. "*Cyanea superba* (Haha): 5-Year Review, Summary and Evaluation." http://ecos.fws.gov/docs/five_year_review/doc1131.pdf.

Urban. 2015. "Accelerating Extinction Risk from Climate Change." *Science* 348 (6234): 571–73.

Vellend, Verheyen, Jacquemyn, Kolb, Calster, Peterken, & Hermy. 2006. "Extinction Debt of Forest Plants Persists for More than a Century Following Habitat Fragmentation." *Ecology* 87 (3): 542–48.

Wake & Vredenburg. 2008. "Are We in the Midst of the Sixth Mass Extinction? A View from the World of Amphibians." *Proceedings of the National Academy of Sciences* 105 (supplement 1): 11466–73. doi.org/10.1073/pnas.0801921105.

Wilson. 1999. *The Diversity of Life*. New York: W.W. Norton.

Winship & Trites. 2006. "Risk of Extirpation of Steller Sea Lions in the Gulf of Alaska and Aleutian Islands: A Population Viability Analysis Based on Alternative Hypotheses for Why Sea Lions Declined in Western Alaska." *Marine Mammal Science* 22 (January): 124–55.

9 章

Allentoft, Heller, Oskam, Lorenzen, Hale, Gilbert, Jacomb, Holdaway, & Bunce. 2014. "Extinct New Zealand Megafauna Were Not in Decline Before Human Colonization." *Proceedings of the National Academy of Sciences* 111 (13): 4922–27. doi.org/10.1073/pnas.1314972111.

Anthony, Estes, Ricca, Miles, & Forsman. 2008. "Bald Eagles and Sea Otters in the Aleutian Archipelago: Indirect Effects of Trophic Cascades." *Ecology* 89 (10): 2725–35. doi.org/10.1890/07-1818.1.

Atobe, Osada, Takeda, Kuroe, & Miyashita. 2014. "Habitat Connectivity and Resident Shared Predators Determine the Impact of Invasive Bullfrogs on Native Frogs in Farm Ponds." *Proceedings of the Royal Society B* 281(1786): 20132621. doi:10.1098/rspb.2013.2621.

Bartley, McCann, Bieg, Cazelles, Granados, Guzzo, MacDougall, Tunney, & McMeans. 2019. "Food Web Rewiring in a Changing World." *Nature Ecology and Evolution* 3: 345–54. doi.org/10.1038/s41559-018-0772-3.

Biesmeijer, Roberts, Reemer, Ohlemüller, Edward, et al. 2006. "Parallel Declines in Pollinators and Insect-Pollinated Plants in the Britain and the Netherlands" *Science* 313 (5785): 351–54. DOI: 10.1126/science.1127863.

Brodie, Aslan, Rogers, Redford, Maron, Bronstein, & Groves. 2014. "Secondary Extinctions of Biodiversity."

Trends in Ecology and Evolution 29 (12): 664–72. doi.org/10.1016/j.tree.2014.09.012.

Cahill, Llimona, Cabaneros, & Calomardo. 2012. "The Increasing Dilemma of Wild Boar (*Sus scrofa*) Habituation to Urban Areas: Traits from Collserola Park (Barcelona) and Comparison with This Problem in Other Cities." *Animal Biodiversity and Conservation* 35 (2): 221–23.

Civitello, Cohen, Fatima, Halstead, Liriano, McMahon, Ortega, et al. 2015. "Biodiversity Inhibits Parasites: Broad Evidence for the Dilution Effect." *Proceedings of the National Academy of Sciences of the United States of America* 112 (28): 8667–71. doi.org/10.1073/pnas.1506279112.

Cizauskas, Carlson, Burgio, Clements, Dougherty, Harris, & Phillips. 2017. "Parasite Vulnerability to Climate Change: An Evidence-Based Functional Trait Approach." *Royal Society Open Science* 4 (1): 160535. doi.org/10.1098/rsos.160535.

Clasen & Shurin. 2015. "Kelp Forest Size Alters Microbial Community Structure and Function on Vancouver Island, Canada." *Ecology* 96 (3): 862–72. doi.org/10.1890/13-2147.1.sm.

Colwell, Dunn, & Harris. 2012. "Coextinction and Persistence of Dependent Species in a Changing World." *Annual Review of Ecology, Evolution, and Systematics* 43 (1): 183–203. doi.org/10.1146/annurev-ecolsys-110411-160304.

Craven, Thakur, Cameron, Frelich, Beauséjour, Blair, Blossey, et al. 2017. "The Unseen Invaders: Introduced Earthworms as Drivers of Change in Plant Communities in North American Forests (a Meta-Analysis)." *Global Change Biology* 23 (3): 1065–74. doi.org/10.1111/gcb.13446.

Darwin. 1862. *On the Various Contrivances by Which British and Foreign Orchids Are Fertilised by Insects, and on the Good Effects of Intercrossing*. London: John Murray.

Dayton, Tegner, Edwards, & Riser. 1999. "Temporal and Spatial Scales of Kelp Demography: The Role of Oceanographic Climate." *Ecological Monographs* 69 (2): 219–50.

Dayton, Tegner, Edwards, & Riser. 1998. "Sliding Baselines, Ghosts, and Reduced Expectations in Kelp Forest Communities." *Ecological Applications* 2: 309–22. doi.org/10.1890/1051-0761(1998)008[0309:SBGARE]2.0.CO;2.

Deacy, Armstrong, Leacock, Robbins, Gustine, Ward, Erlenbach, & Stanford. 2017. "Phenological Synchronization Disrupts Trophic Interactions Between Kodiak Brown Bears and Salmon." *Proceedings of the National Academy of Sciences* 114 (39): 10432–37. doi.org/10.1073/pnas.1705248114.

Donohue, Petchey, Kéfi, Génin, Jackson, Yang, & O'Connor. 2017. "Loss of Predator Species, Not Intermediate Consumers, Triggers Rapid and Dramatic Extinction Cascades." *Global Change Biology* 23 (8): 2962–72. doi.org/10.1111/gcb.13703.

Dunn, Harris, Colwell, Koh, & Sodhi. 2009. "The Sixth Mass Coextinction: Are Most Endangered Species Parasites and Mutualists?" *Proceedings of the Royal Society B: Biological Sciences* 276 (1670): 3037–45. doi.org/10.1098/rspb.2009.0413.

Estes, Estes, Terborgh, Brashares, Power, Berger, Bond, et al. 2011. "Trophic Downgrading of Planet Earth." *Science* 333 (6040): 301–6. doi.org/10.1126/science.1205106.

Garner, Perkins, Govindarajulu, Seglie, Walker, Cunningham, & Fisher. 2006. "The Emerging Amphibian Pathogen *Batrachochytrium dendrobatidis* Globally Infects Introduced Populations of the North American Bullfrog, *Rana Catesbeiana*." *Biology Letters* 2 (3): 455–59. doi.org/10.1098/rsbl.2006.0494.

Gilljam, Curtsdotter, & Ebenman. 2015. "Adaptive Rewiring Aggravates the Effects of Species Loss in Ecosystems." *Nature Communications* 6: 1–10. doi.org/10.1038/ncomms9412.

Hale, Frelich, Reich, & Pastor. 2008. "Exotic Earthworm Effects on Hardwood Forest Floor, Nutrient Availability and Native Plants: A Mesocosm Study." *Oecologia* 155 (3): 509–18. doi.org/10.1007/s00442-007-0925-6.

Irons, Anthony, & Estes. 1986. "Foraging Strategies of Glaucous-Winged Gulls in a Rocky Intertidal Community." *Ecology* 67 (6): 1460–74.

Kharouba, Ehrlén, Gelman, Bolmgren, Allen, Travers, & Wolkovich. 2018. "Global Shifts in the Phenological Synchrony of Species Interactions over Recent Decades." *Proceedings of the National Academy of Sciences* 115 (20): 5211–16. doi.org/10.1073/pnas.1714511115.

Kiers, Palmer, Ives, Bruno, & Bronstein. 2010. " Mutualisms in a Changing World: An Evolutionary Perspective." *Ecology Letters* 13 (12): 1459–74. doi.org/10.1111/j.1461-0248.2010.01538.x.

Koh, Dunn, Sodhi, Colwell, Proctor, & Smith. 2004. “Species Coextinctions and the Biodiversity Crisis.” *Science* 305 (5690): 1632–34. doi.org/10.1126/science.1101101.

Kuker & Barrett-Lennard. 2010. “A Re-Evaluation of the Role of Killer Whales Orcinus Orca in a Population Decline of Sea Otters *Enhydra lutris* in the Aleutian Islands and a Review of Alternative Hypotheses.” *Mammal Review* 40 (2): 103–24. doi.org/10.1111/j.1365-2907.2009.00156.x.

Lynam, Llope, Möllmann, Helaouët, Bayliss-Brown, & Stenseth. 2017. “Interaction Between Top-down and Bottom-up Control in Marine Food Webs.” *Proceedings of the National Academy of Sciences* 114 (8): 1952–57. doi.org/10.1073/pnas.1621037114.

Maezono & Miyashita. 2004. “Impacts of Removal of Exotic Fishes on Native Communities in Farm Ponds.” *Ecological Research* 19: 263–67. doi.org/10.1111/j.1440-1703.2004.00634.x.

Markel & Shurin. 2015. “Indirect Effects of Sea Otters on Rockfish (*Sebastes* spp.) in Giant Kelp Forests.” *Ecology* 96 (11): 2877–90.

Markl, Schleuning, Forget, Jordano, Lambert, Traveset, Wright, & Böhning-Gaese. 2012. “Meta-Analysis of the Effects of Human Disturbance on Seed Dispersal by Animals.” *Conservation Biology* 26 (6): 1072–81. doi.org/10.1111/j.1523-1739.2012.01927.x.

Miaud, Dejean, Savard, Millery-Vigues, Valentini, Gaudin, & Garner. 2016. “Invasive North American Bullfrogs Transmit Lethal Fungus *Batrachochytrium dendrobatidis* Infections to Native Amphibian Host Species.” *Biological Invasions* 18 (8): 2299–308. doi.org/10.1007/s10530-016-1161-y.

Ness & Bronstein. 2004. “The Effects of Invasive Ants on Prospective Ant Mutualists.” *Biological Invasions* 6 (4): 445–61. doi.org/10.1023/B:BINV.0000041556.88920.dd.

Oksanen, Fretwell, Arruda, & Niemela. 1981. “Exploitation Ecosystems in Gradients of Primary Productivity.” *The American Naturalist* 18 (2): 240–61. doi.org/10.1086/283817.

Pauli, Peery, Carey, Mendoza, Steffan, & Weimer. 2014. “A Syndrome of Mutualism Reinforces the Lifestyle of a Sloth.” *Proceedings of the Royal Society B: Biological Sciences* 281 (1778): 20133006. doi.org/10.1098/rspb.2013.3006.

Portman, Tepedino, Tripodi, Szalanski, & Durham. 2018. “Local Extinction of a Rare Plant Pollinator in Southern Utah (USA) Associated with Invasion by Africanized Honey Bees.” *Biological Invasions* 20 (3): 593–606. doi.org/10.1007/s10530-017-1559-1.

Renner & Zohner. 2018. “Climate Change and Phenological Mismatch in Trophic Interactions Among Plants, Insects, and Vertebrates.” *Annual Review of Ecology, Evolution, and Systematics* 49: 165–82. doi.org/10.1146/annurev-ecolsys-110617-062535.

Ripple & Beschta. 2006. “Linking a Cougar Decline, Trophic Cascade, and Catastrophic Regime Shift in Zion National Park.” *Biological Conservation* 133 (4): 397–408. doi.org/10.1016/j.biocon.2006.07.002.

Rodriguez-Cabal, Barrios-Garcia, Amico, Aizen, & Sanders. 2013. “Node-by-Node Disassembly of a Mutualistic Interaction Web Driven by Species Introductions.” *Proceedings of the National Academy of Sciences* 110 (41): 16503–7. doi.org/10.1073/pnas.1300131110.

Rodriguez-Cabal, Stuble, Guénard, Dunn, & Sanders. 2012. “Disruption of Ant-Seed Dispersal Mutualisms by the Invasive Asian Needle Ant (*Pachycondyla chinensis*).” *Biological Invasions* 14 (3): 557–65. doi.org/10.1007/s10530-011-0097-5.

Rodriguez-Cabal, Stuble, Nuñez, & Sanders. 2009. “Quantitative Analysis of the Effects of the Exotic Argentine Ant on Seed-Dispersal Mutualisms.” *Biology Letters* 5 (4): 499–502. doi.org/10.1098/rsbl.2009.0297.

Ross, Alisauskas, Douglas, & Kellett. 2017. “Decadal Declines in Avian Herbivore Reproduction: Density-Dependent Nutrition and Phenological Mismatch in the Arctic.” *Ecology* 98 (7): 1869–83. doi.org/10.1002/ecy.1856.

Simenstad, Estes, & Kenyon. 1978. “Aleuts, Sea Otters, and Alternate Stable-State Communities.” *Science* 200 (4340): 403–11. doi. org/10.2307/1746443.

Steneck, Graham, Bourque, Corbett, Erlandson, Estes, & Tegner. 2002. “Kelp Forest Ecosystems: Biodiversity, Stability, Resilience and Future.” *Marine Sciences Faculty Scholarship* 29 (4): 436–59. doi.org/10.1017/S0376892902000322.

Strona. 2015. “Past, Present and Future of Host-Parasite Co-Extinctions.” *International Journal for Parasitology: Parasites and Wildlife* 4 (3): 431–41. doi.org/10.1016/j.ijppaw.2015.08.007.

Terborgh, Lopez, Nuñez, Rao, Shahabuddin, et al. 2001. “Ecological Meltdown in Predator-Free Forest Fragments.” *Science* 294 (5548): 1923–26. science.sciencemag.org/content/294/5548/1923.short.

Thackeray, Henrys, Hemming, Bell, Botham, Burthe, Helaouet, et al. 2016. “Phenological Sensitivity to Climate Across Taxa and Trophic Levels.” *Nature* 535: 241–45. doi.org/10.1038/nature18608.

Traveset & Richardson. 2014. “Mutualistic Interactions and Biological Invasions.” *Annual Review of Ecology, Evolution, and Systematics* 45: 89–113. doi.org/10.1146/annurev-ecolsys-120213-091857.

Valiente-Banuet, Aizen, Alcántara, Arroyo, Cocucci, Galetti, García, et al. 2015. “Beyond Species Loss: The Extinction of Ecological Interactions in a Changing World.” *Functional Ecology* 29 (3): 299–307. doi.org/10.1111/1365-2435.12356.

Wardle, Bardgett, Callaway, & Van der Putten. 2011. “Terrestrial Ecosystem Responses to Species Gains and Losses.” *Science* 332 (6035): 1273–77.

Whisson, Dixon, Taylor, & Melzer. 2016. “Failure to Respond to Food Resource Decline Has Catastrophic Consequences for Koalas in a High-Density Population in Southern Australia.” *PLoS ONE* 11 (1): 1–12. doi.org/10.1371/journal.pone.0144348.

Wilkinson & Sherratt. 2016. “Why Is the World Green? The Interactions of Top–down and Bottom–up Processes in Terrestrial Vegetation Ecology.” *Plant Ecology and Diversity* 9 (2): 127–40. doi.org/10.1080/17550874.201 6.1178353.

Wilmers, Estes, Edwards, Laidre, & Konar. 2012. “Do Trophic Cascades Affect the Storage and Flux of Atmospheric Carbon? An Analysis of Sea Otters and Kelp Forests.” *Frontiers in Ecology and the Environment* 10 (8): 409–15. doi.org/10.1890/110176.

Wood, Wilmshurst, Rawlence, Bonner, Worthy, Kinsella, & Cooper. 2013. “A Megafauna’s Microfauna: Gastrointestinal Parasites of New Zealand’s Extinct Moa (Aves: Dinornithiformes).” *PLoS ONE* 8 (2): e57315. doi.org/10.1371/journal.pone.0057315.

Young, Parker, Gilbert, Sofia Guerra, & Nunn. 2017. “Introduced Species, Disease Ecology, and Biodiversity–Disease Relationships.” *Trends in Ecology and Evolution*32 (1): 41–54. doi.org/10.1016/j.tree.2016.09.008.

Zou, Thébault, Lacroix, & Barot. 2016. “Interactions between the Green and Brown Food Web Determine Ecosystem Functioning.” *Functional Ecology* 30 (8): 1454–65. doi.org/10.1111/1365-2435.12626.

10 章

Alberti. 2005. “The Effects of Urban Patterns on Ecosystem Function.” *International Regional Science Review* 28 (2): 168–92. doi.org/10.1177/0160017605275160.

Altieri, Bertness, Coverdale, Herrmann, Angelini, Ecology, June, et al. 2012. “A Trophic Cascade Triggers Collapse of a Salt-Marsh Ecosystem with Intensive Recreational Fishing.” *Ecology* 93 (6): 1402–10.

Bello, Galetti, Pizo, Magnago, Rocha, Lima, Peres, Ovaskainen, & Jordano. 2015. “Defaunation Affects Carbon Storage in Tropical Forests.” *Science Advances* 1 (11): e1501105. doi.org/10.1126/sciadv.1501105.

Biggs, Schlüter, Biggs, Bohensky, BurnSilver, Cundill, Dakos, et al. 2012. “Toward Principles for Enhancing the Resilience of Ecosystem Services.” *Annual Review of Environmental Resources* 37: 421–48. doi.org/10.1146/annurev-environ-051211-123836.

Boettiger, Ross, & Hastings. 2013. “Early Warning Signals: The Charted and Uncharted Territories.” *Theoretical Ecology* 6 (3): 255–64. doi.org/10.1007/s12080-013-0192–6.

Böhm, Williams, Bramhall, Mcmillan, Davidson, Garcia, Bland, Bielby, & Collen. 2016. “Correlates of Extinction Risk in Squamate Reptiles: The Relative Importance of Biology, Geography, Threat and Range Size.” *Global Ecology and Biogeography* 25 (4): 391–405. doi.org/10.1111/geb.12419.

Brook, Bradshaw, Koh, & Sodhi. 2006. “Momentum Drives the Crash: Mass Extinction in the Tropics.” Biotropica 38 (3): 302–5. doi.org/10.1111/j.1744–7429.2006.00141.x.

Brook, Sodhi, & Bradshaw. 2008. “Synergies among Extinction Drivers Under Global Change.” *Trends in Ecology and Evolution* 23 (8): 453–60. doi.org/10.1016/j.tree.2008.03.011.

Brooks, Mittermeier, Mittermeier, da Fonseca, Rylands, et al. 2002. “Habitat Loss and Extinction in the

Hotspots of Biodiversity." *Conservation Biology* 16 (4): 909–23.

Brouillard, Dickenson, Mikkelson, & Sharp. 2016. "Water Quality Following Extensive Beetle-Induced Tree Mortality: Interplay of Aromatic Carbon Loading, Disinfection Byproducts, and Hydrologic Drivers." *Science of the Total Environment* 572: 649–59. doi.org/10.1016/j.scitotenv.2016.06.106.

Brouillard, Mikkelson, Bokman, Berryman, & Sharp. 2017. "Extent of Localized Tree Mortality Influences Soil Biogeochemical Response in a Beetle-Infested Coniferous Forest." *Soil Biology and Biochemistry* 114: 309–18. doi.org/10.1016/j.soilbio.2017.06.016.

Cavagnaro, Cunningham, & Fitzpatrick. 2016. "Pastures to Woodlands: Changes in Soil Microbial Communities and Carbon Following Reforestation." *Applied Soil Ecology* 107: 24–32. doi.org/10.1016/j.apsoil.2016.05.003.

Clark & Mix. 2002. "Ice Sheets and Sea Level of the Last Glacial Maximum." *Quaternary Science Reviews* 21 (1–3): 1–7. doi.org/10.1016/S0277–3791(01)00118–4.

Clark, Stark, Johnston, Runcie, Goldsworthy, Raymond & Riddle. 2013. Light-driven tipping points in polar ecosystems. *Global Change Biology* 19: 3749–3761. doi: 10.1111/gcb/12337

Costello, Ovando, Clavelle, Strauss, Hilborn, Melnychuk, Branch, et al. 2016. "Global Fishery Prospects Under Contrasting Management Regimes." *Proceedings of the National Academy of Sciences* 113 (18): 5125–29. doi.org/10.1073/pnas.1520420113.

Crowther, Todd-Brown, Rowe, Wieder, Carey, MacHmuller, Snoek, et al. 2016. "Quantifying Global Soil Carbon Losses in Response to Warming." *Nature* 540 (7631): 104–8. doi.org/10.1038/nature20150.

Cumming & Peterson. 2017. "Unifying Research on Social–Ecological Resilience and Collapse." *Trends in Ecology and Evolution* 32 (9): 695–713. doi.org/10.1016/j.tree.2017.06.014.

Curran, Van Ommen, Morgan, Phillips, & Palmer. 2003. "Ice Core Evidence for Antarctic Sea Ice Decline Since the 1950s." *Science* 302 (5648): 1203–6. doi.org/10.1126/science.1087888.

Davidson & Janssens. 2006. "Temperature Sensitivity of Soil Carbon Decomposition and Feedbacks to Climate Change." *Nature* 440 (7081): 165–73. doi.org/10.1038/nature04514.

De Lange, De, Sala, Vighi, & Faber. 2010. "Ecological Vulnerability in Risk Assessment: A Review and Perspectives." *Science of the Total Environment* 408 (18): 3871–79. doi.org/10.1016/j.scitotenv.2009.11.009.

Dirzo, Young, Galetti, Ceballos, Isaac, & Collen. 2014. "Defaunation in the Anthropocene." *Science* 345 (6195): 401–6. doi.org/10.1126/science.1251817.

Dixon, Brown, Houghton, Solomon, Trexler, & Wisniewski. 1994. "Carbon Pools and Flux of Global Forest Ecosystems." *Science* 263 (5144): 185–90. doi.org/10.1126/science.263.5144.185.

Durack, Wijffels, & Gleckler. 2014. "Long-Term Sea-Level Change Revisited: The Role of Salinity." *Environmental Research Letters* 9 (11): 114017. doi.org/10.1088/1748-9326/9/11/114017.

Ellis. 2011. "Anthropogenic Transformation of the Terrestrial Biosphere." *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences* 369 (1938): 1010–35. doi.org/10.1098/rsta.2010.0331.

Euskirchen, Goodstein, & Huntington. 2013. "An Estimated Cost of Lost Climate Regulation Services Caused by Thawing of the Arctic Cryosphere." *Ecological Applications* 23 (8): 1869–80. doi.org/10.1890/11–0858.1.

Flanner, Shell, Barlage, Perovich, & Tschudi. 2011. "Radiative Forcing and Albedo Feedback from the Northern Hemisphere Cryosphere Between 1979 and 2008." *Nature Geoscience* 4 (3): 151–55. doi.org/10.1038/ngeo1062.

Foley, Coe, Scheffer, & Wang. 2003. "Regime Shifts in the Sahara and Sahel: Interactions between Ecological and Climatic Systems in Northern Africa." *Ecosystems* 6 (6): 524–39. doi.org/10.1007/s10021–002–0227–0.

Fountain, Campbell, Schuur, Stammerjohn, Williams, & Ducklow. 2012. "The Disappearing Cryosphere: Impacts and Ecosystem Responses to Rapid Cryosphere Loss." *BioScience* 62 (4): 405–15. doi.org/10.1525/bio.2012.62.4.11.

Gleckler, Durack, Stouffer, Johnson, & Forest. 2016. "Industrial-Era Global Ocean Heat Uptake Doubles in Recent Decades." *Nature Climate Change* 6 (4): 394–98. doi.org/10.1038/nclimate2915.

Guinotte & Fabry. 2008. "Ocean Acidification and Its Potential Effects on Marine Ecosystems." *Annals of the*

New York Academy of Sciences 1134: 320–42. doi.org/10.1196/annals.1439.013.

Halpern, Walbridge, Selkoe, Kappel, Micheli, et al. 2008. “A Global Map of Human Impact on Marine Ecosystems.” *Science* 319 (5865): 948–52. doi.org/10.1126/science.1149345.

Harris & Pimm. 2008. “Range Size and Extinction Risk in Forest Birds.” *Conservation Biology* 22 (1): 163–71. doi.org/10.1111/j.1523-1739.2007.00798.x.

Harrison. 1980. “Dispersal Polymorphisms in Insects.” *Annual Review of Ecology and Systematics* 11 (1): 95–118. doi.org/10.1146/annurev.es.11.110180.000523.

Heimann & Reichstein. 2008. “Terrestrial Ecosystem Carbon Dynamics and Climate Feedbacks.” *Nature* 451 (7176): 289–92. doi.org/10.1038/nature06591.

Holdridge. 1947. “Determination of World Plant Formations from Simple Climatic Data.” *Science* 105 (2727): 367–68. doi.org/10.1126/science.105.2727.367.

Holling. 1996. “Engineering Resilience Versus Ecological Resilience.” In *Engineering Within Ecological Constraints*, pages 31–43. Washington, DC: National Academies Press. www.nap.edu/read/4919/chapter/4

Intergovernmental Panel on Climate Change (IPCC). 2014. *Climate Change 2014: Synthesis Report*. Geneva, Switzerland.

International Union for Conservation of Nature (IUCN). 2016. International Union for Conservation of Nature Annual Report 2016. portals.iucn.org/library/node/46619

Jackson, Lajtha, Crow, Hugelius, Kramer, & Piñeiro. 2017. “The Ecology of Soil Carbon: Pools, Vulnerabilities, and Biotic and Abiotic Controls.” *Annual Review of Ecology, Evolution, and Systematics* 48 (1): 419–45. doi.org/10.1146/annurev-ecolsys-112414-054234.

Johannessen, Bengtsson, Miles, Kuzmina, Semenov, Alekseev, Nagurnyi, et al. 2004. “Arctic Climate Change: Observed and Modelled Temperature and Sea-Ice Variability.” *Tellus, Series A: Dynamic Meteorology and Oceanography* 56 (4): 328–41. doi.org/10.1111/j.1600-0870.2004.00060.x.

Joppa, Roberts, Myers, & Pimm. 2011. “Biodiversity Hotspots House Most Undiscovered Plant Species.” *Proceedings of the National Academy of Sciences* 108 (32): 13171–76. doi.org/10.1073/pnas.1109389108.

Kang, Xu, You, Flügel, Pepin, & Yao. 2010. “Review of Climate and Cryospheric Change in the Tibetan Plateau.” *Environmental Research Letters* 5 (2010): 015101. doi.org/10.1088/1748-9326/5/1/015101.

Levitus, Antonov, & Boyer. 2005. “Warming of the World Ocean, 1955–2003.” *Geophysical Research Letters* 32 (2): 1–4. doi.org/10.1029/2004GL021592.

Locey & Lennon. 2016. “Scaling Laws Predict Global Microbial Diversity.” *Proceedings of the National Academy of Sciences* 113 (21): 5970–75. doi.org/10.1073/pnas.1521291113.

Lynch. 2010. “Evolution of the Mutation Rate.” *Trends in Genetics* 26 (8): 345–52. doi.org/10.1016/j.tig.2010.05.003.Evolution.

Marchese. 2015. “Biodiversity Hotspots: A Shortcut for a More Complicated Concept.” *Global Ecology and Conservation* 3: 297–309. doi.org/10.1016/j.gecco.2014.12.008.

Matthies, Brauer, Maibom, Matthies, & Tscharntke. 2004. “Population Size and Risk of Extinction: Empirical Evidence from Rare Plants.” *Oikos* 105: 481–88.

Meybeck. 2003. “Global Analysis of River Systems: From Earth System Controls to Anthropocene Syndromes.” *Philosophical Transactions of the Royal Society B: Biological Sciences* 358 (1440): 1935–55. doi.org/10.1098/rstb.2003.1379.

Millennium Ecosystem Assessment Report. 2005. *Ecosystems and Human Well-Being*. Washington, DC: Island Press.

Miller, Osbahr, Boyd, Thomalla, Bharwani, Ziervogel, Walker, et al. 2010. “Resilience and Vulnerability: Complementary or Conflicting Concepts?” *Ecology and Society* 15 (3): 11. http://www.ecologyandsociety.org/vol15/iss3/art11/

Milne, Gehrels, Hughes, & Tamisiea. 2009. “Identifying the Causes of Sea-Level Change.” *Nature Geoscience* 2 (7): 471–78. doi.org/10.1038/ngeo544.

Mori. 2016. “Resilience in the Studies of Biodiversity-Ecosystem Functioning.” *Trends in Ecology and Evolution* 31 (2): 87–89. doi.org/10.1016/j.tree.2015.12.010.

Myers, Mittermeier, Mittermeier, Fonseca, & Kent. 2000. “Biodiversity Hotspots for Conservation Priorities.” *Nature* 403 (February): 853–58. doi.org/10.1038/35002501.

Ohmura. 2004. “Cryosphere During the Twentieth Century.” In *Geophysical Monograph Series*. doi.org/10.1029/150GM19.

Oreskes. 2004. “The Scientific Consensus on Climate Change.” *Science* 306 (January): 1686. doi.org/10.1126/science.1103618.

Pedersen, Link, Thompson, Taranu, Gonzalez, Ball, Moritz, et al. 2017. “Signatures of the Collapse and Incipient Recovery of an Overexploited Marine Ecosystem.” *Royal Society Open Science* 4 (7): 170215. doi.org/10.1098/rsos.170215.

Purcell, Polidoro, Hamel, Gamboa, & Mercier. 2014. “The Cost of Being Valuable: Predictors of Extinction Risk in Marine Invertebrates Exploited as Luxury Seafood.” *Proceedings of the Royal Society B: Biological Sciences* 281 (1781): 20133296. doi.org/10.1098/rspb.2013.3296.

Purvis, Gittleman, Cowlishaw, & Mace. 2000. “Predicting Extinction Risk in Declining Species.” *Proceedings of the Royal Society B: Biological Sciences* 267 (1456): 1947–52. doi.org/10.1098/rspb.2000.1234.

Rabalais, Diaz, & Gilbert. 2010. “Dynamics and Distribution of Natural and Human-Caused Hypoxia Recommended Citation.” *Biogeosciences* 7: 585–619. doi.org/10.5194/bg-7–585–2010.

Raffa, Aukema, Bentz, Carroll, Hicke, Turner, & Romme. 2008. “Cross-Scale Drivers of Natural Disturbances Prone to Anthropogenic Amplification: The Dynamics of Bark Beetle Eruptions.” *BioScience* 58 (6): 501–17. doi.org/10.1641/B580607.

Reygondeau, Guidi, Beaugrand, Henson, Koubbi, MacKenzie, Sutton, Fioroni, & Maury. 2018. “Global Biogeochemical Provinces of the Mesopelagic Zone.” *Journal of Biogeography*. doi.org/10.1111/jbi.13149.

Ripple, Wolf, Newsome, Hoffmann, Wirsing, & McCauley. 2017. “Extinction Risk Is Most Acute for the World’s Largest and Smallest Vertebrates.” *Proceedings of the National Academy of Sciences* 114 (40): 10678–83. doi.org/10.1073/pnas.1702078114.

Roberts, McClean, Veron, Hawkins, Allen, McAllister, Mittermeier, et al. 2002. “Marine Biodiversity Hotspots and Conservation Priorities for Tropical Reefs.” *Science* 295 (5558): 1280–84. doi.org/10.1126/science.1067728.

Romanovsky, Drozdov, Oberman, Malkova, Kholodov, Marchenko, Moskalenko, et al. 2010. “Thermal State of Permafrost in Russia.” *Permafrost and Periglacial Processes* 21 (2): 136–55. doi.org/10.1002/ppp.683.

Rosselló-Mora & Amann. 2001. “The Species Concept for Prokaryotes.” *FEMS Microbiology Reviews* 25 (1): 39–67. doi.org/10.1016/s0168-6445(00)00040-1.

Rowland, Nicholson, Murray, Keith, Lester, & Bland. 2018. “Selecting and Applying Indicators of Ecosystem Collapse for Risk Assessments.” *Conservation Biology* 32 (6): 1233–45. doi.org/10.1111/cobi.13107.

Sato & Lindenmayer. 2018. “Meeting the Global Ecosystem Collapse Challenge.” *Conservation Letters* 11 (1): 1–7. doi.org/10.1111/conl.12348.

Scheffer, Bascompte, Pascual, Brock, Carpenter, van Nes, van de Leemput, et al. 2012. “Anticipating Critical Transitions.” *Science* 338 (6105): 344–48. doi.org/10.1126/science.1225244.

Schuur, McGuire, Schädel, Grosse, Harden, Hayes, Hugelius, et al. 2015. “Climate Change and the Permafrost Carbon Feedback.” *Nature* 520 (7546): 171–79. doi.org/10.1038/nature14338.

Somveille, Manica, Butchart, & Rodrigues. 2013. “Mapping Global Diversity Patterns for Migratory Birds.” *PLoS ONE* 8 (8): e70907. doi.org/10.1371/journal.pone.0070907.

Spielman, Brook, & Frankham. 2004. “Most Species Are Not Driven to Extinction before Genetic Factors Impact Them.” *Proceedings of the National Academy of Sciences* 101 (42): 15261–64. doi.org/10.1073/pnas.0403809101.

Stachowicz, Whitlatch, & Osman. 1999. “Species Diversity and Invasion Resistance in a Marine Ecosystem.” *Science* 286: 1577–80. doi.org/10.1126/science.286.5444.1577.

Standish, Hobbs, Mayfield, Bestelmeyer, Suding, Battaglia, Eviner, et al. 2014. “Resilience in Ecology: Abstraction, Distraction, or Where the Action Is?” *Biological Conservation* 177: 43–51. doi.org/10.1016/j.biocon.2014.06.008.

Sterling, Ducharne, & Polcher. 2013. “The Impact of Global Land-Cover Change on the Terrestrial Water Cycle.” *Nature Climate Change* 3 (4): 385–90. doi.org/10.1038/nclimate1690.

Sunday, Pecl, Frusher, Hobday, Hill, Holbrook, Edgar, et al. 2015. “Species Traits and Climate Velocity Explain Geographic Range Shifts in an Ocean-Warming Hotspot.” *Ecology Letters* 18 (9): 944–53.

doi.org/10.1111/ele.12474.

Vasilakopoulos & Marshall. 2015. “Resilience and Tipping Points of an Exploited Fish Population over Six Decades.” *Global Change Biology* 21 (5): 1834–47. doi.org/10.1111/gcb.12845.

Voigt, Lamprecht, Marushchak, Lind, Novakovskiy, Aurela, Martikainen, & Biasi. 2017. “Warming of Subarctic Tundra Increases Emissions of All Three Important Greenhouse Gases—Carbon Dioxide, Methane, and Nitrous Oxide.” *Global Change Biology* 23: 3121–38. doi.org/10.1111/gcb.13563.

Weeks. 2010. On Sea Ice. Fairbanks: University of Alaska Press.

Whitman, Coleman, & Wiebe. 1998. “Prokaryotes: The Unseen Majority.” *Proceedings of the National Academy of Sciences* 95 (12): 6578–83. doi.org/10.1073/pnas.95.12.6578.

Wigley. 2005. “The Climate Change Commitment.” *Science* 307 (5716): 1766–69

Zera & Denno. 1997. “Physiology and Ecology of Dispersal Polymorphism in Insects.” *Annual Review of Entomology* 42 (1): 207–30. doi.org/10.1146/annurev.ento.42.1.207.

Zhou, Li, Zhao, Gao, Yun, Saino, & Wang. 2016. “Experimental Comparisons of Three Submerged Plants for Reclaimed Water Purification through Nutrient Removal.” *Desalination and Water Treatment* 57 (26): 12037–46. doi.org/10.1080/19443994.2015.1048736.

11 章

Alagona. 2004. “Biography of a ‘Feathered Pig’: The California Condor Conservation Controversy.” *Journal of the History of Biology* 37: 557–83.

Backer, Jensen, & Mcpherson. 2004. “Impacts of Fire-Suppression Activities on Natural Communities.” *Conservation Biology* 18 (4): 937–46.

Belote, Dietz, Jenkins, McKinley, Irwin, Fullman, Leppi, & Aplet. 2017. “Wild, Connected, and Diverse: Building a More Resilient System of Protected Areas.” *Ecological Applications* 27 (4): 1050–56. doi.org/10.1002/eap.1527.

Bennett, Maloney, Steeves, Brazill-Boast, Possingham, & Seddon. 2017. “Spending Limited Resources on De-Extinction Could Lead to Net Biodiversity Loss.” *Nature Ecology and Evolution* 1 (4): 1–4. doi.org/10.1038/s41559-016-0053.

Blockstein. 2017. “We Can’t Bring Back the Passenger Pigeon: The Ethics of Deception Around De-Extinction.” *Ethics, Policy and Environment* 20 (1): 33–37. doi.org/10.1080/21550085.2017.1291826.

Bower, Brownscombe, Birnie-Gauvin, Ford, Moraga, Pusiak, Turenne, Zolderdo, Cooke, & Bennett. 2018. “Making Tough Choices: Picking the Appropriate Conservation Decision-Making Tool.” *Conservation Letters* 11 (2): 1–7. doi.org/10.1111/conl.12418.

Braverman. 2014. “Conservation without Nature: The Trouble with in Situ Versus Ex Situ Conservation.” *Geoforum* 51 (October): 47–57. doi.org/10.1016/j.geoforum.2013.09.018.

Bruskotter. 2013. “The Predator Pendulum Revisited: Social Conflict over Wolves and Their Management in the Western United States.” *Wildlife Society Bulletin* 37 (3): 674–79. doi.org/10.1002/wsb.293.

Buckley. 2016. “Triage Approaches Send Adverse Political Signals for Conservation.” *Frontiers in Ecology and Evolution* 4: 39. doi.org/10.3389/fevo.2016.00076.

Carlin, Wurman, & Zakim. 2013. “How to Permit Your Mammoth: Some Legal Implications of De-Extinction.” *Stanford Environmental Law Journal* 33 (1): 3–57.

Carpenter, Andreone, Moore, & Griffiths. 2014. “A Review of the International Trade in Amphibians: The Types, Levels and Dynamics of Trade in CITES-Listed Species.” *Oryx* 48 (4): 565–74. doi.org/10.1017/S0030605312001627.

Cohen. 2014. “The Ethics of De-Extinction.” *NanoEthics* 8 (2): 165–78. doi.org/10.1007/s11569-014-0201-2.

Conservation Evidence. 2017. www.conserva tionevidence.com/.

Donlan, Berger, Bock, Bock, Burney, Estes, Foreman, et al. 2006. “Pleistocene Rewilding: An Optimistic Agenda for Twenty-First Century Conservation.” *The American Naturalist* 168 (5): 660–81. doi.org/10.2307/3873461.

Eckert, Ban, Tallio, & Turner. 2018. “Linking Marine Conservation and Indigenous Cultural Revitalization:

First Nations Free Themselves From Externally Imposed Social-Ecological Traps." *Ecology and Society* 23 (4): 23. doi/org/10.5751/.

Folch, Cocero, Chesné, Alabart, Domínguez, Cognié, Roche, et al. 2009. "First Birth of an Animal from an Extinct Subspecies (*Capra pyrenaica pyrenaica*) by Cloning." *Theriogenology* 71 (6): 1026–34. doi.org/10.1016/j.theriogenology.2008.11.005.

Forest, Grenyer, Rouget, Davies, Cowling, Faith, Balmford, et al. 2007. "Preserving the Evolutionary Potential of Floras in Biodiversity Hotspots." *Nature* 445: 757–60. doi.org/10.1038/nature05587.

Game, Kareiva, & Possingham. 2013. "Six Common Mistakes in Conservation Priority Setting." *Conservation Biology* 27 (3): 480–85. doi.org/10.1111/cobi.12051.

Garnett, Burgess, Fa, Fernández-Llamazares, Molnár, et. al. 2018. "A Spatial Overview of the Global Importance of Indigenous Lands for Conservation." *Nature Sustainability* 1: 369–74. doi.org/10.1038/s41893-018-0100-6

Godinot. 2006. "Lemuriform Origins as Viewed from the Fossil Record." *Folia Primatologica* 77 (6): 446–64. doi.org/10.1159/000095391.

Haddad. 2018. "Resurrection and Resilience of the Rarest Butterflies." *PLOS Biology* 16 (2): e2003488. doi.org/10.1371/journal.pbio.2003488.

Harley, Knight, Lardner, Wooding, & Gregor. 2009. "The Quagga Project: Progress Over 20 Years of Selective Breeding." *South African Journal of Wildlife Research* 39 (2): 155–63. doi.org/10.3957/056.039.0206.

Heller & Zavaleta. 2009. "Biodiversity Management in the Face of Climate Change: A Review of 22 Years of Recommendations." *Biological Conservation* 142 (1): 14–32. doi.org/10.1016/j.biocon.2008.10.006.

Heywood. 2013. "The Quagga and Science: What Does the Future Hold for This Extinct Zebra?" *Perspectives in Biology and Medicine* 56 (1): 53–64. doi.org/10.1353/pbm.2013.0008.

Hunter & Gibbs. 2014. "Densities of Ecological Replacement Herbivores Required to Restore Plant Communities: A Case Study of Giant Tortoises on Pinta Island, Galápagos." *Restoration Ecology* 22 (2): 248–56. doi.org/10.1111/rec.12055.

Ingledew. 2018. "Can IVF Save the Northern White Rhino from Extinction?" *The Veterinary Record* 182 (13): 366. http://www.ncbi.nlm.nih.gov/pubmed/29599255.

James, Gaston, & Balmford. 2001. "Can We Afford to Conserve Biodiversity?" *BioScience* 51 (1): 43–52. doi.org/10.1641/0006-3568 (2001)051[0043:cwatcb]2.0.co;2.

Johnson, Loss, Shawn Smallwood, & Erickson. 2016. "Avian Fatalities at Wind Energy Facilities in North America: A Comparison of Recent Approaches." *Human-Wildlife Interactions* 10 (1): 7–18.

Kelly & Phillips. 2015. "Targeted Gene Flow for Conservation." *Conservation Biology* 30 (2): 259–67. doi.org/10.1111/cobi.12623.

Kelly & Phillips. 2018. "Targeted Gene Flow and Rapid Adaptation in an Endangered Marsupial." *Conservation Biology* 33 (1): 112–21. doi.org/10.1111/cobi.13149.

Klein, Vaissière, Cane, Steffan-Dewenter, Cunningham, Kremen, & Tscharntke. 2007. "Importance of Pollinators in Changing Landscapes for World Crops." *Proceedings of the Royal Society B: Biological Sciences* 274 (1608): 303–13. doi.org/10.1098/rspb.2006.3721.

Krost, Goerres, & Sandow. 2018. "Wildlife Corridors Under Water: An Approach to Preserve Marine Biodiversity in Heavily Modified Water Bodies." *Journal of Coastal Conservation* 22: 87–104. doi.org/10.1007/s11852-017-0554-0.

Kukkala & Moilanen. 2013. "Core Concepts of Spatial Prioritisation in Systematic Conservation Planning." *Biological Reviews* 88 (2): 443–64. doi.org/10.1111/brv.12008.

Lorimer, Sandom, Jepson, Doughty, Barua, & Kirby. 2015. "Rewilding: Science, Practice, and Politics." *Annual Review of Environment and Resources* 40: 39–62. doi.org/10.1146/annurev-environ-102014-021406.

Loss, Will, Loss, & Marra. 2014. "Bird–Building Collisions in the United States: Estimates of Annual Mortality and Species Vulnerability." *The Condor* 116 (1): 8–23. doi.org/10.1650/condor-13-090.1.

Loss, Will, & Marra. 2015. "Direct Mortality of Birds from Anthropogenic Causes." *Annual Review of Ecology, Evolution, and Systematics* 46 (1): 99–120. doi.org/10.1146/annurev-ecolsys-112,414-054133.

M'Gonigle, Ponisio, Cutler, & Kremen. 2015. "Habitat Restoration Promotes Pollinator Persistence and Colonization in Intensively Managed Agriculture." *Ecological Applications* 25 (6): 1557–65.

doi.org/10.1890/14-1863.1.

Mackenzie & Keith. 2009. “Adaptive Management in Practice: Conservation of a Threatened Plant Population.” *Ecological Management and Restoration* 10 (Suppl. 1): 129–35. doi.org/10.1111/j.1442-8903.2009.00462.x.

Magnuson-Ford, Mooers, Paquette, & Steel. 2010. “Comparing Strategies to Preserve Evolutionary Diversity.” *Journal of Theoretical Biology* 266 (1): 107–16. doi.org/10.1016/j.jtbi.2010.06.004.

Maisels, Strindberg, Blake, Wittemyer, Hart, Williamson, Aba’a, et al. 2013. “Devastating Decline of Forest Elephants in Central Africa.” *PLoS ONE* 8 (3): e59469. doi.org/10.1371/journal.pone.0059469.

Margules & Pressey. 2000. “A Framework for Systematic Conservation Planning.” *Nature* 405: 243–53. doi.org/10.1038/35012251.

McCarthy, Donald, Scharlemann, Buchanan, Balmford, Green, Bennun, et al. 2012. “Financial Costs of Meeting Global Current Spending and Unmet Needs.” *Science* 338 (6109): 946–49.

Miller, Drautz, Ratan, Pusey, Qi, Lesk, Tomsho, et al. 2008. “Sequencing the Nuclear Genome of the Extinct Woolly Mammoth.” *Nature* 456 (7220): 387–90. doi.org/10.1038/nature07446.

Minckley. 1995. “Translocation as a Tool for Conserving Imperiled Fishes: Experiences in Western United States.” *Biological Conservation* 72: 297–09.

Morandin & Kremen. 2013. “Hedgerow Restoration Promotes Pollinator Populations and Exports Native Bees to Adjacent Fields.” *Ecological Applications* 23 (4): 829–39. doi.org/10.1890/12-1051.1.

Myers, Mittermeier, Mittermeier, Fonseca, & Kent. 2000. “Biodiversity Hotspots for Conservation Priorities.” *Nature* 403: 853–58. doi.org/10.1038/35002501.

Parsons & DeBenedetti. 1979. “Impact of Fire Suppression on a Mixed-Conifer Forest.” *Forest Ecology and Management* 2: 21–33. doi.org/10.1016/0378-1127(79)90034-3.

Pasquini, Fitzsimons, Cowell, Brandon, & Wescott. 2011. “The Establishment of Large Private Nature Reserves by Conservation NGOs: Key Factors for Successful Implementation.” *Oryx* 45 (3): 373–80. doi.org/10.1017/S0030605310000876.

Peers, Thornton, Majchrzak, Bastille-Rousseau, & Murray. 2016. “De-extinction Potential Under Climate Change: Extensive Mismatch Between Historic and Future Habitat Suitability for Three Candidate Birds.” *Biological Conservation* 197: 164–70. doi.org/10.1016/j.biocon.2016.03.003.

Pendoley, Schofield, Whittock, Ierodiaconou, & Hays. 2014. “Protected Species Use of a Coastal Marine Migratory Corridor Connecting Marine Protected Areas.” *Marine Biology* 161: 1455–66. doi.org/10.1007/s00227-014-2433-7.

Piaggio, Segelbacher, Seddon, Alphey, Bennett, Carlson, Friedman, et al. 2017. “Is It Time for Synthetic Biodiversity Conservation?” *Trends in Ecology and Evolution* 32 (2): 97–107. doi.org/10.1016/j.tree.2016.10.016.

Pimentel, Wilson, McCullum, Huang, Dwen, Flack, Tran, Saltman, & Cliff. 1997. “Economic and Environmental Benefits of Biodiversity.” *BioScience* 47 (11): 747–57. doi.org/10.2307/1313097.

Piña-Aguilar, Lopez-Saucedo, Sheffield, Ruiz-Galaz, de J. Barroso-Padilla, & Gutiérrez-Gutiérrez. 2009. “Revival of Extinct Species Using Nuclear Transfer: Hope for the Mammoth, True for the Pyrenean Ibex, But Is It Time for ‘Conservation Cloning’?” *Cloning and Stem Cells* 11 (3): 341–46. doi.org/10.1089/clo.2009.0026.

Possingham & Gerber. 2017. “Ecology: The Effect of Conservation Spending.” *Nature* 551 (7680): 309–10. doi.org/10.1038/nature24158.

Pounds, Carnaval, Puschendorf, Haddad, & Masters. 2006. “Responding to Amphibian Loss.” *Science* 314 (5805): 1541–42. doi.org/10.1126/science.314.5805.1541.

Pressey & Bottrill. 2008. “Opportunism, Threats, and the Evolution of Systematic Conservation Planning.” *Conservation Biology* 22 (5): 1340–45. doi.org/10.1111/j.1523-1739.2008.01032.x.

Pritchard, Fa, Oldfield, & Harrop. 2011. “Bring the Captive Closer to the Wild: Redefining the Role of Ex Situ Conservation.” *Oryx* 46 (1): 18–23. doi.org/10.1017/S0030605310001766.

Purcell, Polidoro, Hamel, Gamboa, & Mercier. 2014. “The Cost of Being Valuable: Predictors of Extinction Risk in Marine Invertebrates Exploited as Luxury Seafood.” *Proceedings of the Royal Society B: Biological Sciences* 281 (1781): 20133296. doi.org/10.1098/rspb.2013.3296.

Ralls & Ballou. 2004. “Genetic Status and Management of California Condors.” *The Condor* 106 (2): 215–28. doi.org/10.1650/7348.

Redding & Mooers. 2015. “Ranking Mammal Species for Conservation and the Loss of Both Phylogenetic and Trait Diversity.” *PLoS ONE* 10 (12): e0141435. doi.org/10.1371/journal.pone.0141435.

Riggio & Caro. 2017. “Structural Connectivity at a National Scale: Wildlife Corridors in Tanzania.” *PLoS ONE* 12 (11): 1–16. doi.org/10.1371/journal.pone.0187407.

Rist, Campbell, & Frost. 2013. “Adaptive Management: Where Are We Now?” *Environmental Conservation* 40 (1): 5–18. doi.org/10.1017/S0376892912000240.

Sarkar, Pressey, Faith, Margules, Fuller, Stoms, Moffett, et al. 2006. “Biodiversity Conservation Planning Tools: Present Status and Challenges for the Future.” *Annual Review of Environment and Resources* 31 (1): 123–59. doi.org/10.1146/annurev.energy.31.042606.085844.

Schneider. 2008. “Geoengineering: Could We or Should We Make It Work?” *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences* 366 (1882): 3843–62. doi.org/10.1098/rsta.2008.0145.

Schultz & Crone. 1998. “Burning Prairie to Restore Butterfly Habitat: A Modeling Approach to Management Tradeoffs for the Fender’s Blue.” *Restoration Ecology* 6 (3): 244–52. doi.org/10.1046/j.1526-100X.1998.00637.x.

Seddon, Moehrenschlager, & Ewen. 2014. “Reintroducing Resurrected Species: Selecting De-extinction Candidates.” *Trends in Ecology and Evolution* 29 (3): 140–47. doi.org/10.1016/j.tree.2014.01.007.

Shapiro. 2017. “Pathways to De-extinction: How Close Can We Get to Resurrection of an Extinct Species?” *Functional Ecology* 31 (5): 996–1002. doi.org/10.1111/1365-2435.12705.

Sisco, Monzer, Farajalla, Bashour, & Saoud. 2017. “Roof Top Gardens as a Means to Use Recycled Waste and A/C Condensate and Reduce Temperature Variation in Buildings.” *Building and Environment* 117: 127–34. www.sciencedirect.com/science/article/pii/S0360132317300847.

Sun, Xie, & Zhao. 2019. “Valuing Urban Green Spaces in Mitigating Climate Change: A City-Wide Estimate of Aboveground Carbon Stored in Urban Green Spaces of China’s Capital.” *Global Change Biology* 25 (5): 1717–32. doi.org/10.1111/gcb.14566.

Thaxter, Buchanan, Carr, Butchart, Newbold, Green, Tobias, Foden, O’Brien, & Pearce-Higgins. 2017. “Bird and Bat Species’ Global Vulnerability to Collision Mortality at Wind Farms Revealed Through a Trait-Based Assessment.” *Proceedings of the Royal Society B: Biological Sciences* 284 (1862): 20170829. doi.org/10.1098/rspb.2017.0829.

Tingley, Darling, & Wilcove. 2014. “Fine-and Coarse-Filter Conservation Strategies in a Time of Climate Change.” *Annals of the New York Academy of Sciences* 1322 (1): 92–109. doi.org/10.1111/nyas.12484.

van Oppen, Oliver, Putnam, & Gates. 2015. “Building Coral Reef Resilience Through Assisted Evolution.” *Proceedings of the National Academy of Sciences* 112 (8): 2307–13. doi.org/10.1073/pnas.1422301112.

van Wyk, & Prinsloo. 2018. “Medicinal Plant Harvesting, Sustainability and Cultivation in South Africa.” *Biological Conservation* 227 (July): 335–42. doi.org/10.1016/j.biocon.2018.09.018.

Waldron, Miller, Redding, Mooers, Kuhn, Nibbelink, Roberts, Tobias, & Gittleman. 2017. “Reductions in Global Biodiversity Loss Predicted from Conservation Spending.” *Nature* 552: 364–67. doi.org/10.1038/nature24295.

Westgate, Likens, & Lindenmayer. 2013. “Adaptive Management of Biological Systems: A Review.” *Biological Conservation* 158: 128–39. doi.org/10.1016/j.biocon.2012.08.016.

Wilson. 2016. “Half-Earth: Our Planet’s Fight for Life.”

Wittemyer, Northrup, Blanc, Douglas-Hamilton, Omondi, & Burnham. 2014. “Illegal Killing for Ivory Drives Global Decline in African Elephants.” *Proceedings of the National Academy of Sciences* 111 (36): 13117–21. doi.org/10.1073/pnas.1403984111.

Zeale, Stone, Zeale, Browne, Harris, & Jones. 2018. “Experimentally Manipulating Light Spectra Reveals the Importance of Dark Corridors for Commuting Bats.” *Global Change Biology* 24 (12): 5909–18. doi.org/10.1111/gcb.14462.

Zhang, Liu, Fu, Phillips, Zhang, & Zhang. 2016. “Bridging the ‘Gap’ in Systematic Conservation Planning.” *Journal for Nature Conservation* 31: 43–50. doi.org/10.1016/j.jnc.2016.03.003.

12 章

Allison, Ratner, Åsgård, Willmann, Pomeroy, & Kurien. 2012. "Rights-Based Fisheries Governance: From Fishing Rights toHumanRights." *Fish and Fisheries* 13(1): 14–29. doi.org/10.1111/j.1467-2979.2011.00405.x.

Althor, Watson, & Fuller. 2016. "Global Mismatch Between Greenhouse Gas Emissions and the Burden of Climate Change." *Scientific Reports* 6: 1–6. doi.org/10.1038/srep20281.

Altieri, Funes-Monzote, & Petersen. 2012. "Agroecologically Efficient Agricultural Systems for Smallholder Farmers: Contributions to Food Sovereignty." *Agronomy for Sustainable Development* 32 (1): 1–13. doi.org/10.1007/s13593-011-0065-6.

Bateman & Balmford. 2023. "Current Conservation Policies Risk Accelerating Biodiversity Loss." *Nature* 618(7966): 671–74. doi:10.1038/d41586-023-01979-x.

Berkes. 1985. "Fishermen and 'The Tragedy of the Commons.'" *Environmental Conservation* 12 (3): 199–206.

Boyce & Boyce. 2007. "Is Inequality Bad for the Environment?" Political Economy Research Institute Working Papers, no. 135. scholarworks. umass.edu/peri_workingpapers/121.

Brandt & Buckley. 2018. "A Global Systematic Review of Empirical Evidence of Ecotourism Impacts on Forests in Biodiversity Hotspots." *Current Opinion in Environmental Sustainability* 32: 112–18. doi.org/10.1016/j.cosust.2018.04.004.

Buckley, Morrison, & Castley. 2016. "Net Effects of Ecotourism on Threatened Species Survival." *PLoS ONE* 11 (2): 23–25. doi.org/10.1371/journal.pone.0147988.

Carter, Viña, Hull, McConnell, Axinn, Ghimire, & Liu. 2014. "Coupled Human and Natural Systems Approach to Wildlife Research and Conservation." *Ecology and Society* 19 (3): 43

Cassimon, Prowse, & Essers. 2011. "The Pitfalls and Potential of Debt-for-Nature Swaps: A US-Indonesian Case Study." *Global Environmental Change* 21 (1): 93–102. doi.org/10.1016/j.gloenvcha.2010.10.001.

Chang. 2011. "Feeling Ambivalent About Going Green: Implications for Green Advertising Processing." *Journal of Advertising* 40 (4): 19–31. doi.org/10.2753/JOA0091-3367400402.

Commoner. 1972. *The Closing Circle; Nature, Man, and Technology*. New York: Knopf.

Coria & Calfucura. 2012. "Ecotourism and the Development of Indigenous Communities: The Good, the Bad, and the Ugly." *Ecological Economics* 73: 47–55. doi.org/10.1016/j.ecolecon.2011.10.024.

Das & Chatterjee. 2015. "Ecotourism: A Panacea or a Predicament?" *Tourism Management Perspectives* 14: 3–16. doi.org/10.1016/j.tmp.2015.01.002.

de Vries & Hanley. 2016. "Incentive-Based Policy Design for Pollution Control and Biodiversity Conservation: A Review." *Environmental Resource Economics* 63: 687–702.

Dellink, den Elzen, Aiking, Bergsma, Berkhout, Dekker, & Gupta. 2009. "Sharing the Burden of Financing Adaptation to Climate Change." *Global Environmental Change* 19 (4): 411–21. doi.org/10.1016/j.gloenvcha.2009.07.009.

Doremus & Pagel. 2001. "Why Listing May Be Forever: Perspectives on Delisting Under the U.S. Endangered Species Act." *Conservation Biology* 15 (5): 1258–68. doi.org/10.1046/j.1523-1739.2001.00178.x.

Duruji, Olanrewaju, & Duruji-Moses. 2018. "From Kyoto to Paris: An Analysis of the Politics of Multilateralism on Climate Change" In *Promoting Global Environmental Sustainability and Cooperation. Hershey*, PA: IGI Global.

Ehrlich & Holdren. 1972. "Critique." *Bulletin of the Atomic Scientists* 28 (5): 16–27. doi.org/10.1080/00963402.1972.11457930.

Ehrlich & Pringle. 2008. "Where Does Biodiversity Go from Here? A Grim Business-as-Usual Forecast and a Hopeful Portfolio of Partial Solutions." *Proceedings of the National Academy of Sciences* 105 (suppl. 1): 11579–86. doi.org/10.1073/pnas.0801911105.

Fargani, Cheung, & Hasan. 2016. "An Empirical Analysis of the Factors that Support the Drivers of Sustainable Manufacturing." *Procedia CIRP* 56: 491–95. doi.org/10.1016/j.procir.2016.10.096.

Fiorella, Milner, Salmen, Hickey, Omollo, Odhiambo, Mattah, Bukusi, Fernald, & Brashares. 2017. "Human Health Alters the Sustainability of Fishing Practices in East Africa." *Proceedings of the National Academy*

of Sciences 114 (16): 4171–76. doi.org/10.1073/pnas.1613260114.

Fuchs, Brown, & Rounsevell. 2020. "Europe's Green Deal Offshores Environmental Damage to Other Nations." *Nature* 586(7831): 671–73. doi:10.1038/d41586-020-02991-1.

Fujita & Bonzon. 2005. "Rights-Based Fisheries Managements an Environmentalist Perspective." *Reviews in Fish Biology and Fisheries* 15 (3): 309–12. doi.org/10.1007/s11160-005-4867-y.

Gallo-Cajiao, Archibald, Friedman, Steven, Fuller, Game, Morrison, & Ritchie. 2018. "Crowdfunding Biodiversity Conservation." *Conservation Biology* 32 (6): 1426–35. doi.org/10.1111/cobi.13144.

Gibbs & Currie. 2012. "Protecting Endangered Species: Do the Main Legislative Tools Work?" *PLoS ONE* 7 (5): e35730. doi.org/10.1371/journal.pone.0035730.

Hansen. 1989. "Debt for Nature Swaps—Overview and Discussion of Key Issues." *Ecological Economics* 1 (1): 77–93. doi.org/10.1016/0921-8009(89)90025-6.

Hawkins, Singh, Majeau-Bettez, & Strømman. 2013. "Comparative Environmental Life Cycle Assessment of Conventional and Electric Vehicles." *Journal of Industrial Ecology* 17 (1): 53–64. doi.org/10.1111/j.1530-9290.2012.00532.x.

Himes Boor. 2014. "A Framework for Developing Objective and Measurable Recovery Criteria for Threatened and Endangered Species." *Conservation Biology* 28 (1): 33–43. doi.org/10.1111/cobi.12155.

Isbell, Gonzalez, Loreau, Cowles, Díaz, Hector, Mace, et al. 2017. "Linking the Influence and Dependence of People on Biodiversity Across Scales." *Nature* 546 (7656): 65–80. doi.org/10.1038/nature 22899.

Kareiva & Carranza. 2018. "Existential Risk Due to Ecosystem Collapse: Nature Strikes Back." *Futures* 102 (January): 39–50. doi.org/10.1016/j.futures.2018.01.001.

Kruijssen, Keizer, & Giuliani. 2009. "Collective Action for Small-Scale Producers of Agricultural Biodiversity Products." *Food Policy* 34 (1): 46–52. doi.org/10.1016/j.foodpol.2008.10.008.

Liu, Taylor, Dietz, Carpenter, Alberti, Folke, Moran, et al. 2007. "Complexity of Coupled Human and Natural Systems." *Science* 317 (5844): 1513–16. doi.org/10.1126/science.1144004.

Liu, Wu, & Huang. 2017. "An Equity-Based Framework for Defining National Responsibilities in Global Climate Change Mitigation." *Climate and Development* 9 (2): 152–63. doi.org/10.1080/17565529.2015.1085358.

Lu & Li. 2006. "Review of Rice–Fish Farming Systems in China—One of the Globally Important Ingenious Agricultural Heritage Systems (GIAHS)." *Aquaculture* 260: 106–13. doi.org/10.1016/j.aquaculture.2006.05.059.

Lubchenco, Cerny-Chipman, Reimer, & Levin. 2016. "The Right Incentives Enable Ocean Sustainability Successes and Provide Hope for the Future." *Proceedings of the National Academy of Sciences* 113 (51): 14507–14. doi.org/10.1073/pnas.1604982113.

Macy & Brown. 2014. *Coming Back to Life: The Guide to the Work that Reconnects*. Gabriola Island, Canada: New Society Publishers.

Marcovaldi & Dei Marcovaldi. 1999. "Marine Turtles of Brazil: The History and Structure of Projeto TAMAR-IBAMA." *Biological Conservation* 91 (1): 35–41. doi.org/10.1016/S0006-3207(99)00043-9.

McFarland. 2017. *Conservation of Tropical Rainforests*. Cham, Switzerland: Palgrave MacMillan. doi.org/10.1007/978-3-319-63236-0.

Mendoza-Ramos & Prideaux. 2018. "Assessing Ecotourism in an Indigenous Community: Using, Testing and Proving the Wheel of Empowerment Framework as a Measurement Tool." *Journal of Sustainable Tourism* 26: 277–91. doi.org/10.1080/09669582.2017.1347176.

Möllmann & Diekmann. 2012. "Marine Ecosystem Regime Shifts Induced by Climate and Overfishing." *Advances in Ecological Research* 47: 303–47. doi.org/10.1016/b978-0-12-398315-2.00004-1.

Monti, Duriez, Dominici, Sforzi, Robert, Fusani, & Grémillet. 2018. "The Price of Success: Integrative Long-Term Study Reveals Ecotourism Impacts on a Flagship Species at a UNESCO Site." *Animal Conservation* 21 (6): 448–58. doi.org/10.1111/acv.12407.

O'Rourke. 2014. "The Science of Sustainable Supply Chains." *Science* 344 (6188): 1124–27. doi.org/10.1126/science.1248526.

O'Rourke & Lollo. 2015. "Transforming Consumption: From Decoupling, to Behavior Change, to System Changes for Sustainable Consumption." *Annual Review of Environment and Resources* 40 (1): 233–59.

doi.org/10.1146/annurev-environ-102014-021224.

O'Rourke & Ringer. 2016. "The Impact of Sustainability Information on Consumer Decision Making." *Journal of Industrial Ecology* 20 (4): 882–92. doi.org/10.1111/jiec.12310.

Parkhurst, Shogren, Bastian, Kivi, Donner, & Smith. 2002. "Agglomeration Bonus: An Incentive Mechanism to Reunite Fragmented Habitat for Biodiversity Conservation." *Ecological Economics* 41 (2): 305–28. doi.org/10.1016/S0921-8009(02)00036-8.

Pecl, Araújo, Bell, Blanchard, Bonebrake, Chen, Clark, et al. 2017. "Biodiversity Redistribution Under Climate Change: Impacts on Ecosystems and Human Well-Being." *Science* 355 (6332): eaai9214. doi.org/10.1126/science.aai9214.

Pierre. 2020. "Temporal Impacts of Ecological Harms Across Human Populations." Figure at doi.org/10.6084/m9.figshare.12670916.v1.

Ponisio & Ehrlich. 2016. "Diversification, Yield and a New Agricultural Revolution: Problems and Prospects." *Sustainability* 8 (11): 1–15. doi.org/10.3390/su8111118.

Puckett, Kesler, & Greenwald. 2016. "Taxa, Petitioning Agency, and Lawsuits Affect Time Spent Awaiting Listing Under the US Endangered Species Act." *Biological Conservation* 201: 220–29. doi.org/10.1016/j.biocon.2016.07.005.

Quéré, Jackson, Jones, Smith, Abernethy, et al. 2020. Temporary reduction in daily global CO_2 emissions during the COVID-19 forced confinement. *Nature Climate Change* 10: 647–53.

Reynolds, Sullivan, Hallstein, Matsumoto, Merrifield, Spraycar, Golet, et al. 2017. "Dynamic Conservation for Migratory Species." *Science Advances* 3 (8): 1–9. doi.org/10.1126/sciadv.1700707.

Roca. 2002. "The IPAT Formula and Its Limitations." *Ecological Economics* 42: 1–2.

Runge, Watson, Butchart, Hanson, Possingham, & Fuller. 2015. "Protected Areas and Global Conservation of Migratory Birds." *Science* 350 (6265): 1255–58. doi.org/10.1126/science.aac9180.

Scherr & McNeely. 2008. "Biodiversity Conservation and Agricultural Sustainability: Towards a New Paradigm of 'Ecoagriculture' Landscapes." *Philosophical Transactions of the Royal Society B: Biological Sciences* 363 (1491): 477–94. doi.org/10.1098/rstb.2007.2165.

Shuford, Page, & Kjelmyr. 1998. "Patterns and Dynamics of Shorebird Use of California's Central Valley." *The Condor* 100 (2): 227–44. doi.org/10.2307/1370264.

Stralberg, Cameron, Reynolds, Hickey, Klausmeyer, Busby, Stenzel, Shuford, & Page. 2011. "Identifying Habitat Conservation Priorities and Gaps for Migratory Shorebirds and Waterfowl in California." *Biodiversity and Conservation* 20 (1): 19–40. doi.org/10.1007/s10531-010-9943-5.

Tolle. 2005. *A New Earth: Awakening to Your Life's Purpose*. New York: Penguin.

Tomich, Brodt, Ferris, Galt, Horwath, Kebreab, Leveau, et al. 2011. "Agroecology: A Review from a Global-Change Perspective." *Annual Review of Environment and Resources* 36: 193–222. doi.org/10.1146/annurev-environ-012110-121302.

Viana, Gelcich, Aceves-Bueno, Twohey, & Gaines. 2019. "Design Trade-Offs in Rights-Based Management of Small-Scale Fisheries." *Conservation Biology* 33 (2): 361–68. doi.org/10.1111/cobi.13208.

Waggoner & Ausubel. 2002. "A Framework for Sustainability Science: A Renovated IPAT Identity." *Proceedings of the National Academy of Sciences* 99 (12): 7860–65. doi.org/10.1073/pnas.122235999.

片山, 馬場, 大久保. 2020. "水田の生物多様性に配慮した農法の保全効果: これまでの成果と将来の課題." 日本生態学会誌 70(3): 201. doi.org/10.18960/seitai.70.3_201.