WILDERNESS LAW IN THE ANTHROPOCENE: PRAGMATISM AND PURISM[+]

BY

PHILLIPA C. MCCORMACK,[*] BENJAMIN J. RICHARDSON,[**] DAVID TAKACS,[***] & KEES BASTMEIJER[****]

Wilderness is vanishing. Despite explicit legislative protection of wilderness values for over half a century, rapid environmental degradation worldwide in recent decades has severely diminished the extent and quality of terrestrial and marine wilderness to the point where we must reassess the fundamental premises and future of wilderness law. With increased human demands on the natural world, and with climate breakdown looming, the very notion of "wilderness" itself may one day be considered meaningless or irrelevant. We examine legal developments in the United States, Australia, and Europe to critically evaluate the state of wilderness law. In this Anthropocene era, when humans control so much of Earth's resources, we examine whether the law should aim for a "purist" approach, in which wilderness areas are simply left untouched, or a "pragmatic"‟ approach, in which wilderness is actively managed to maintain its cherished values in the face of mounting adversity. A variety of intermediary positions are conceivable between these endpoints, and the best approach to wilderness management will likely depend on several considerations including who or what "wilderness" is meant to serve, the geographic and biological features of the landscape, environmental threats the area faces, the presence of Indigenous or other local communities, and

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[*] Lecturer, Faculty of Law, University of Tasmania, Australia. Ph.D., University of Tasmania. B.A., LLB, University of Tasmania.

[**] Professor of Environmental Law, Faculty of Law, University of Tasmania, Australia. Ph.D., Australian National University; B.A., L.L.B. Macquarie University.

[***] Professor of Law, University of California Hastings College of the Law, United States. J.D., University of California Hastings College of the Law; LL.M., School of Oriental and African Studies, University of London; Ph.D., M.A., B.S., Cornell University.

[****] Professor of Nature Conservation Law and Water Law, Tilburg Law School, Tilburg University, Netherlands. Ph.D., Tilburg University, Netherlands; LL.M., Nijmegen University, Netherlands.

the values that the guiding law means to serve. We offer recommendations to improve wilderness law to navigate the Anthropocene. We suggest proceeding with care and humility, staying as close to purism as possible, while acknowledging that sometimes we must take a pragmatic approach and intervene to preserve the wilderness qualities our laws are designed to protect.

I. INTRODUCTION: WILDERNESS GOVERNANCE AT A CROSSROADS

How should the law protect wilderness amidst growing environmental upheaval? Experts have named our era the "Anthropocene," because our species now dominates Earth's ecosystems

and processes.[1] Various experts estimate that the majority of terrestrial ecosystems have been converted to human use, seriously degraded, or both.[2] A recent study estimates that as much as 97% of global mammalian biomass consists of humans and our domestic animals.[3] Humanity is predicted to grow in population from 7 to 9 billion by 2050, and in some regions of the world, continue growing to 2100.[4] Between 500 million and 2.5 billion extra acres will be needed to accommodate the extra humans.[5]

As the Anthropocene unleashes global warming, disrupts food webs, spreads invasive species, and affects other changes that are rapidly degrading nature's riches,[6] one might validly query whether it makes sense to talk about "wilderness" at all. Furthermore, if some relatively unadulterated reservoirs of nature persist, we should not assume that past approaches to their conservation and management remain viable. Although wilderness protection is one of the oldest ideals of nature conservation, it now faces unprecedented challenges that warrant a fresh look at its future in twenty-first century environmental law. This Article takes up this challenge, focusing on laws in Australia, Europe, and the United States.

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[1] Tim Caro et al., *Conservation in the Anthropocene*, 26 CONSERVATION BIOLOGY 185, 185 (2012); Paul J. Crutzen & Eugene F. Stoermer, *The "Anthropocene"*, GLOBAL CHANGE NEWSL., May 2000, at 17; Working Group on the 'Anthropocene', *What is the 'Anthropocene'?– Current Definition and Status*, SUBCOMMISSION ON QUATERNARY STRATIGRAPHY, https://perma.cc/Z3K5-U8DL.

[2] *See* Shelley Welton et al., *Legal & Scientific Integrity in Advancing a "Land Degradation Neutral World"*, 40 COLUM. J. ENV'T L. 39, 40, 49 (2015) (noting that, according to the highest estimates, as much as 65% of the land worldwide may be degraded); Pete Smith et al., *Global Change Pressures on Soils from Land Use and Management*, 22 GLOBAL CHANGE BIOLOGY 1008, 1009 (2016) (citing an estimate that humans have modified over half of the ice-free land on Earth and noting that nearly one quarter of global land area is degraded); Katharine N. Suding, *Toward an Era of Restoration in Ecology: Successes, Failures, and Opportunities Ahead*, 42 ANN. REV. OF ECOLOGY, EVOLUTION, & SYSTEMATICS, 2011, at 465, 466 (describing that "more than one-third of ecosystems have been converted for human use such as ag cities, and at least another third have been heavily degraded" by various methods).

[3] Joel Berger et al., *Disassembled Food Webs and Messy Projections: Modern Ungulate Communities in the Face of Unabating Human Population Growth*, FRONTIERS ECOLOGY & EVOLUTION, June 2020, at 1, 2.

[4] *Compare* Stein Emil Vollset et al., *Fertility, Mortality, Migration, and Population Scenarios for 195 Countries and Territories from 2017 to 2100: A Forecasting Analysis for the Global Burden of Disease Study*, 396 LANCET 1285, 1290, 1301 (2020) (forecasting that the "global population will peak in 2064 at 9.73 billion and then decline to 8.79 billion in 2100"), *with* Damian Carrington, *World Population to Hit 11bn in 2100 – With 70% Chance of Continuous Rise*, GUARDIAN (Sept. 18, 2014), https://perma.cc/SA43-Q5GF (forecasting that the global population will peak around 9 billion people in 2050 and will range between 9.6 billion and 12.3 billion people in 2100).

[5] *See* Marine Maron et al., *Faustian Bargains? Restoration Realities in the Context of Biodiversity Offset Policies*, BIOLOGICAL CONSERVATION, 2012, at 141, 141 (2012) (describing that "[p]rojections suggest another 200 million to 1 billion hectares of terrestrial remnant vegetation will be converted for human land uses by 2050.").

[6] *See* JACK PEARCE, FUNDAMENTALS FOR THE ANTHROPOCENE 102–03 (Paulina Leśna-Szreter ed. 2017) (noting several sustainability and environmental concerns regarding the effects of humanity on the Earth system).

We hold that "wilderness" remains a valid concept and distinct type of environment, and thus we believe the key question to pursue is: When should the law protect and leave wilderness alone, and when should the law require that humans intervene and actively manage it? Put another way, when should the law adopt a "purist" stance, in which wilderness areas are passively managed on the assumption that "nature knows best," and when should it adopt a "pragmatist" approach of active management to maintain wilderness values from increasing disturbances? We consider these as endpoints along a spectrum with a variety of options between them.

This Article spans four further substantive parts. Part II introduces the key values of wilderness and threats to them, puts these issues in historical and contemporary context, and distills the key inquiries this Article investigates. Part III examines the history, purposes, and current state of wilderness governance, analyzing the domestic law in the United States, Australia, and selected countries in Europe. We aim to assess what each law seeks to protect and with what underlying values. This Article does not specifically consider wilderness governance in areas beyond national territorial jurisdiction (e.g., Antarctica or the high seas) nor dwell on international law, partly because these domains raise different governance challenges and also because wilderness law is relatively undeveloped in such domains. Part IV focuses on the choice between purist and pragmatic management approaches in light of the environmental upheavals of the Anthropocene, and particularly the effects of climate change. For instance, should endangered species not currently present in, or native to, a wilderness area be introduced there in order to facilitate their survival? The Article concludes in Part V with advice on what to do about wilderness and wilderness law in the rapidly changing Anthropocene. To preserve the multiple values that wilderness law is designed to protect, we recommend adhering to purism as far as possible but accepting the need for some pragmatism, implemented through limited, well-defined exceptions to the rule of non-intervention.

II. WILDERNESS: ITS VALUES AND THREATS

A. Identifying and "Defining" Wilderness Values

References to wilderness appear in legislation, policy guidance, and park management plans around the world. Although not always accompanied by an explicit definition, most of these documents describe wilderness as large areas, characterized by free functioning natural ecosystems, and subject to very limited past or present anthropogenic influence.[7]

[7] INT'L UNION FOR CONSERVATION OF NATURE, GUIDELINES FOR APPLYING PROTECTED AREA MANAGEMENT CATEGORIES 14–15 (Nigel Dudley ed. 2008); Kees Bastmeijer,

Today, many nations ostensibly prioritize wilderness for conservation, although the majority of potentially designated global wilderness is not formally protected.[8] Wilderness advocates ascribe a variety of values to wilderness to justify its legal protection.[9] Wildernesses have important ecological values: they protect ecosystem processes and their functions that flourish on a landscape scale, provide habitat for biodiversity,[10] and sequester carbon, thus mitigating greenhouse gas pollution and helping communities adapt to climate change.[11] Wilderness also has social or experiential values for people, including for self-reliant recreation, and as places for spiritual and aesthetic appreciation.[12] Scientists prize wilderness because it offers unique places for research into environmental systems and biodiversity and also as reference points for comparing environmental changes in other areas.[13] Wilderness also has economic value, both for the money tourists spend while exploring it,[14] but also because wilderness areas serve as some of the planet's best providers of ecosystem services essential to humanity flourishing.[15]

Introduction, *in* WILDERNESS PROTECTION IN EUROPE: THE ROLE OF INTERNATIONAL, EUROPEAN AND NATIONAL LAW 3, 3, 11 (Kees Bastmeijer ed. 2016).

[8] *See* Martin Fowlie, *Half of the World's Most Important Sites for Nature are Currently Unprotected*, BIRDLIFE INT'L (Mar. 21, 2012), https://perma.cc/9NGX-B6TX; *Study Discovers Just 13 Percent of World's Oceans are "Wilderness"*, WCS NEWSROOM (July 26, 2018), https://perma.cc/8VWS-CDZ5.

[9] *See* Martin Hawes & Grant Dixon, *A Remoteness-Oriented Approach to Defining, Protecting and Restoring Wilderness*, PARKS, Nov. 2020, at 23, 23–25 (broadly categorizing these values as ecological, Indigenous, experiential, sociocultural, and intrinsic, and exploring the coexistence of these values with each other).

[10] *See, e.g.*, Mark Fisher, *Ecological Values of Wilderness in Europe*, *in* WILDERNESS PROTECTION IN EUROPE: THE ROLE OF INTERNATIONAL, EUROPEAN AND NATIONAL LAW, *supra* note 7, at 67, 68–71 (discussing generally the ecological value of wilderness).

[11] *See* David Cole & Steven Boutcher, *Wilderness and Climate Change*, U.S. DEP'T OF AGRIC.: CLIMATE CHANGE RESOURCE CTR. (May 2012), https://perma.cc/8U24-VE2Y (explaining that the wilderness provides benefits to people and ecosystem services, which will become increasingly important in a changing climate, including carbon sequestration).

[12] Nicole Bauer, *The Social Values of Wilderness*, *in* WILDERNESS PROTECTION IN EUROPE: THE ROLE OF INTERNATIONAL, EUROPEAN AND NATIONAL LAW, *supra* note 7, at 94, 108–09.

[13] Remaining wildernesses also constitute areas for rewilding efforts. *See, e.g.*, James E.M. Watson et al., *Catastrophic Declines in Wilderness Areas Undermine Global Environment Targets*, 26 CURRENT BIOLOGY 2929, 2931–32 (2016) ("For instance, we are already seeing growing efforts to 'rewild' some human-dominated ecosystems in Europe and North America; remaining wilderness areas provide the reference points and biological feedstock for these initiatives.").

[14] For an early discussion of this issue, see John Ise, *Can Wilderness Areas be Economically Justified?*, 35 PROC. ANN. MEETING W. FARM ECONS. ASS'N 104, 106–08 (1962). More recently, see Nele Lienhoop & Bernd Hansjürgens, *Economic Values of Wilderness in Europe*, *in* WILDERNESS PROTECTION IN EUROPE: THE ROLE OF INTERNATIONAL, EUROPEAN AND NATIONAL LAW, *supra* note 7, at 114, 114–15 (discussing the economic impact of wilderness loss and extinction).

[15] Robert Costanza et al., *Changes in the Global Value of Ecosystem Services*, 26 GLOBAL ENV'T CHANGE, 152, 155 (2014) (estimating that nature provides us with $145 trillion/year of "free" ecosystem services).

Wilderness can also be defined by reference to visitors' perceptions and experiences. Tasmanian wilderness advocates Martin Hawes and Grant Dixon argue that "remoteness" should be a foremost criterion here.[16] Remoteness from human infrastructure and activity, in their view, protects the ecological and experiential values of wilderness, such as enabling visitors to experience solitude and a sense of place in nature.[17] Indeed, Hawes and Dixon argue that the concept of wilderness would be strengthened and enhanced if remoteness was recognized as its *primary* value, in essence, as a pre-requisite for the application of the wilderness moniker.[18] Later in this Article, we discuss in more detail the variety of ways wilderness is defined in law and the merits of these approaches.

Juggling these diverse wilderness values may lead to conflicts that require careful management. Law and policy aiming for the protection of these values raise various questions, including how wilderness protection may be shaped to ensure respect for the rights of Indigenous peoples, whether historic cultural sites (e.g., archaeological ruins) can co-exist in a wilderness, and the issue of a pedantically strict application of the requirement of large size, which may exclude small islands or fragmented landscapes containing important, relatively untouched natural values.[19] Promoting public access to wilderness to enable enjoyment of these areas' experiential values may eventually diminish the solitude and sense of place sought, and may degrade ecosystems or impair species' survival.[20] For example, almost 75,000 tourists visited Antarctica in the 2019-2020 season,[21] compared to just fifty-seven tourists in 1966.[22] Similarly, patronage of Tasmania's Wilderness World Heritage Area's principal park, at Cradle Mountain, jumped from 199,000 in the twelve months to June 30, 2015 to 280,000 in the twelve months to June 30, 2018.[23] Ecotourism may help pay for wilderness conservation, but it can also

16 Hawes & Dixon, *supra* note 9, at 25.

17 ANTJE NEUMANN, WILDERNESS PROTECTION IN POLAR REGIONS – ARCTIC LESSONS LEARNT FOR THE REGULATION AND MANAGEMENT OF TOURISM IN THE ANTARCTIC 14 (2020).

18 *See* Hawes & Dixon, *supra* note 9, at 25 (providing three reasons for why the experiential values of wilderness are strongly linked to its remoteness).

19 *See* Simon Marsden, *Wilderness Protection in Europe and Relevance of the World Heritage Convention*, *in* WILDERNESS PROTECTION IN EUROPE: THE ROLE OF INTERNATIONAL, EUROPEAN AND NATIONAL LAW, *supra* note 7, at 137, 138–39, 154 (discussing the legal obligations and policy requirements of wilderness protection and protection of fragmented islands).

20 *See* Mary Guiden, *Outdoor Recreation in Protected Areas Negatively Impacts Wildlife*, COLO. ST. U. (Dec. 14, 2016), https://perma.cc/9NBY-KH6Y (discussing how prolific outdoor recreation is having an increasingly negative impact on wildlife in protected spaces).

21 *See* INTERNATIONAL ASSOCIATION OF ANTARCTIC TOUR OPERATIONS, IAATO ANTARCTIC VISITOR FIGURES 2019–2020 (2020), https://perma.cc/BE4Y-5FVX (Between October 2019 and April 2020, there were 18,506 cruise-only visitors, 55,164 landed visits, and 731 deep field visitors. Excluding staff and logistic personnel, 74,401 tourists traveled to Antarctica during this aforementioned timeframe).

22 David McGonigal, *Which Cruise Ships Go to Antarctica? A Travel Guide to Earth's Final Frontier*, TRAVELLER (Nov. 18, 2019), https://perma.cc/273L-26TQ.

23 *Visitor Numbers to Selected Parks and Reserves – Financial Year*, TASMANIAN PARKS & WILDLIFE SERV., https://perma.cc/9M9W-PDAD (last visited Feb. 16, 2021).

undermine the very qualities that entice visitors and that merited legal protection in the first place.

B. Wilderness Increasingly Endangered

Wilderness areas are increasingly endangered. While the extent of protected natural areas has grown substantially in recent decades, in line with the Aichi targets of the Convention on Biological Diversity,[24] both the total wilderness area and the characteristics of wilderness are still declining.[25] Based on a definition of wilderness that is an area without significant human disturbance such as forestry, farming or mining, we are losing it rapidly: the planet lost one tenth of its wilderness between 1993 and 2016 (3.3 million km^2, an area larger than India).[26] Today, the largest wild areas within national borders are the Australian outback, Alaska's arctic tundra, Canada's and Russia's vast boreal forests, and the Amazon jungle.[27] The principal wilderness areas outside national borders are in Antarctica and the high seas, although even these wildernesses are declining. Recent research shows that less than 32% of the Antarctic continent may be considered inviolate wilderness,[28] and researchers consider only 13% of the oceans comprise wilderness, free from fishing, shipping or other disturbances.[29]

In addition to ongoing habitat destruction, fragmentation and degradation, the biggest anthropogenic threat to wilderness is climate change, which will increasingly engender drought and wildfires, acidify oceans, bleach coral reefs, and raise sea levels, among a variety of other impacts.[30] Some of these are already materializing, such as the

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[24] SECRETARIAT OF THE CONVENTION OF BIOLOGICAL DIVERSITY PROGRESS TOWARDS THE AICHI BIODIVERSITY TARGETS: AN ASSESSMENT OF BIODIVERSITY TRENDS, POLICY SCENARIOS AND KEY ACTIONS – GLOBAL BIODIVERSITY OUTLOOK 4 TECHNICAL REPORT, CBD TECHNICAL SERIES NO. 78 259 (2014), https://perma.cc/W9JE-7N9P. *See also Aichi Biodiversity Targets*, CONVENTION ON BIOLOGICAL DIVERSITY (Sept. 18, 2020), https://perma.cc/E7E5-JBGD (describing the twenty Aichi targets and explaining that one target goal is by 2020, at least 17 percent of terrestrial and inland water and 10 percent of coastal waters are effectively and equitably managed).

[25] James E.M. Watson et al., *Catastrophic Declines in Wilderness Areas Undermine Global Environment Targets*, 26 CURRENT BIOLOGY 2929, 2929–30 (2016) (mapping the decline of wilderness areas which demonstrates substantial losses over the past two decades).

[26] *Id.* at 2929.

[27] James E.M. Watson et al., *Protect the Last of the Wild*, 563 NATURE 27, 29 (2018).

[28] *See* Rachel I. Leihy et al., *Antarctica's Wilderness Fails to Capture Continent's Biodiversity*, 583 NATURE 567, 569 (2020) (Explaining that a strict definition of inviolate wilderness was applied, which consisted of "large (at least 10,000 km^2), contiguous areas with no historical human visitation records." In contrast, based on wilderness definitions applied to other parts of the world, the researchers found that more than 99% of Antarctica may still be considered wilderness).

[29] Kendall R. Jones et al., *The Location and Protection Status of Earth's Diminishing Marine Wilderness*, 28 CURRENT BIOLOGY 2506, 2506 (2018).

[30] *See* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE AND THE LAND 149 (Valerie Masson-Delmotte et al. eds., 2019) (describing increases in wildfire season globally and desertification due to ongoing drought); *How Does Climate Change Affect*

unprecedented, massive bushfires that devastated some 12 million hectares in southeastern Australia in 2019-2020, and smaller areas in the Tasmanian World Heritage Wilderness Area in 2016 and early 2019.[31] We are entering a world where many of the threats to wilderness no longer emanate from discrete sources such as a mine or road, but rather from a constellation of threats many of which originate very far from the wilderness itself.[32] Other examples of such threats include the remote seas degraded by plastic pollution carried on ocean currents,[33] accumulation of persistent organic pollutants,[34] and the worldwide spread of invasive alien species.[35]

C. Key Inquiries

These troubling effects, all manifestations of the Anthropocene, raise several issues for the future conservation of nature's gems and more particularly the role of law in protecting wilderness. First, can we, and should we, continue to define wilderness as a distinct place requiring bespoke governance that differs from other conservation areas? Second, has the time come to step up active management of wilderness areas to safeguard them from myriad threats, and if so, what type of management should occur? Central to this question is the debate about whether the law should adopt a "purist" stance, in which wilderness areas are passively managed on the assumption that "nature knows best", or a "pragmatist" approach of active management to protect wilderness values from increasing disturbances. These options should not be seen as discrete silos but rather end points along a spectrum with a variety of intermediary positions. Third, is "wilderness" a phenomenon that exists for its own sake—wild ecosystems and their constituent species having intrinsic value—or should the law protect wilderness for its instrumental

Coral Reefs?, NAT'L OCEANIC & ATMOSPHERIC ADMIN.: NAT'L OCEAN SERV. (Nov. 5, 2020), https://perma.cc/VC2Y-MHX4 (describing how coral reefs will be harmed by climate change).

[31] *Australia Fires: A Visual Guide to the Bushfire Crisis*, BBC NEWS (Jan. 31, 2020), https://perma.cc/8X33-G783; Erin Cooper & James Dunlevie, *Photos Reveal Bushfire Devastation in Tasmania's South-West Wilderness*, ABC NEWS (Feb. 12, 2019), https://perma.cc/Y7LV-NMAR.

[32] *See* Casey E. Davis Kaufman, *Climate Change Conversations: Causes, Impacts, Solutions: History of the Environmental Movement*, AM. ARCHIVE OF PUB. BROADCASTING, https://perma.cc/WLA6-A2EF (recognizing that addressing climate change is more difficult than addressing past environmental issues, like air and water pollution because climate change is less "local" and "visible").

[33] Elle Hunt, *38 Million Pieces of Plastic Waste Found on Uninhabited South Pacific Island*, GUARDIAN (May 16, 2017), https://perma.cc/4KUX-P6WY.

[34] *See* Tair Teran et al., *Climate Change Effects of POP's Environmental Behaviour: A Scientific Perspective for Future Regulatory Actions*, 4 ATMOSPHERIC POLLUTION RES. 466, 467 (2012) (describing the impacts climate change will have on persistent organic pollutants).

[35] Patrick Greenfield, *Increase in Invasive Species Poses Dramatic Threat to Biodiversity - Report*, GUARDIAN (July 14, 2020), https://perma.cc/AU6N-8SAR.

value for humanity, for the ecosystem services it provides, and the aesthetic and recreational values ascribed to such areas?

Our answers to that third question will inexorably color how we answer the first two questions. The values that guide or are expressed in wilderness law will shape the degree to which we are inclined or allowed to intervene to manage the area. Other considerations may also come into play, including economic ones relating to the upfront costs of intervention relative to its possible long-term benefits, and the political climate for promoting wilderness conservation relative to alternate social and economic interests. In the following Parts, we examine how Australia, selected countries in Europe, and the United States have defined and implemented "wilderness" law, and their decisions regarding when to be pragmatic and when to be purists when managing wilderness.

III. WILDERNESS LAW: PAST AND PRESENT

Formal wilderness protection is largely the ambit of relatively prosperous Western nations.[36] We consider these particular jurisdictions because they offer the most longstanding and comprehensive examples of wilderness law. In this Part we consider how "wilderness" has been defined and regulated in legal frameworks in Australia, selected countries in Europe, and the United States.[37] We analyze the different ways that wilderness is described or characterized in legal and policy instruments and, where relevant, the ways in which the concept is implemented "on the ground," including through protected-area management plans. This analysis reveals important differences in the legal treatment of the concept of wilderness in different jurisdictions, with implications for both the persistence of wild places and the concept of wilderness in law, in the Anthropocene.

A. History of Wilderness Conservation

Wilderness has had a checkered history in human culture. In North America, previous generations of non-Indigenous settlers disdained wilderness as a forbidding place harboring dangerous beasts or

[36] *See* Jonathan H. Adler, *The Fable of Federal Environmental Regulation: Reconsidering the Federal Role in Environmental Protection*, 55 CASE W. RES. L. REV. 93, 99 (2004) (discussing how wealthier societies have greater means to address environmental problems). *See also* Riley E. Dunlap et al., *Of Global Concern: Results of the Health of the Planet Survey*, ENV'T: SCI. & POL'Y SUSTAINABLE DEV., Jan. 1993, at 7, 7 (discussing how affluent, industrialized nations place a greater emphasis on environmental quality).

[37] The Article's focus on legal frameworks in 'Global North' jurisdictions reflects where the authors live and work. It also provides an opportunity to compare legal frameworks that are somewhat similar in their development and operation, allowing us to identify important similarities and differences in how these laws may be deployed to conserve wilderness in the Anthropocene.

supernatural forces.[38] Subsequent generations denigrated wilderness as wasteland, better subdued by the axe or plough for productive use.[39] The same could be said for Europeans' colonization of Australia. The scars of forestry, dams and mines now blight many such areas.[40] Such exploitation sometimes coincided with the eviction of Indigenous peoples who had lived sustainably in these areas for millennia.[41] In Europe, due to intensive land cultivation, the building of road systems, and the channeling of rivers, large natural areas have become rare.[42] These nature-dominating attitudes started to wane in the nineteenth century, as wilderness areas became convenient cultural and aesthetic symbols of national identity for settler societies, aided by new artistic genres dedicated to evoking their sublime or scenic qualities.[43]

With the inauguration of national parks, beginning with Yellowstone National Park in the United States in 1872, a new type of legal regime was created—and emulated by other countries—that set aside territory without human settlement or other development pressures.[44] Legal initiatives in the late nineteenth century and the first half of the twentieth century for setting aside conservation lands were articulated through general nature conservation laws, under which protection was both tenuous, due to rival economic goals, and more limited in scope than the wilderness laws that followed.[45] As described below, in 1964, the

[38] Melanie Perrault, *American Wilderness and First Contact*, *in* AMERICAN WILDERNESS: A NEW HISTORY 15, 15, 18 (Michael Lewis ed., 2007).

[39] David Lowenthal, *Empires and Ecologies: Reflections on Environmental History*, *in* ECOLOGY AND EMPIRE: ENVIRONMENTAL HISTORY OF SETTLER SOCIETIES 229, 230, 233 (Tom Griffiths & Libby Robin eds., 1997).

[40] *See* Alistair J. Hobday & Jan McDonald, *Environmental Issues in Australia*, ANNUAL REV. ENV'T RESOURCES, Oct. 2014, at 1, 3 (describing how environmental quality has been significantly degraded since early European settlement).

[41] *See* Robert Poirier & David Ostergren, *Evicting People from Nature: Indigenous Land Rights and National Parks in Australia, Russia, and the United States*, 42 NAT. RESOURCES J. 331, 334–38 (2002) (exploring the history of exploitation of land from Indigenous peoples in Australia, Russia, and the United States and Indigenous views on land use in each of those countries). For a complete account of Aboriginal sustainability practices pre-European contact, see BRUCE PASCOE, DARK EMU: ABORIGINAL AUSTRALIA AND THE BIRTH OF AGRICULTURE (2018).

[42] Matthias Diemer et al., *Urban Wilderness in Central Europe: Rewilding at the Urban Fringe*, INT'L J. WILDERNESS, Dec. 2003, at 7, 8.

[43] *See generally* RODERICK NASH, WILDERNESS AND THE AMERICAN MIND 44, 69, 74 (2014) (discussing how wilderness was later "recognized as a cultural and moral resource and basis for national self-esteem"); Benjamin J. Richardson, *The Art of Environmental Law: Governing with Aesthetics* 35–36 (2019) (describing how artistic styles that developed during the Romantic movement rendered a more benign and habitable view of nature).

[44] Poirier & Ostergren, *supra* note 41, at 333–34.

[45] *See* Daniel Rohlf & Douglas L. Honnold, *Managing the Balances of Nature: The Legal Framework of Wilderness Management*, ECOLOGY L.Q. 249, 250 (1988) ("The regulations governing the use of primitive areas were not very protective of the wilderness qualities of those areas, however, nor were they strictly enforced."); Peter A. Appel, *Wilderness and the Courts*, STAN. ENV'T L.J. 62, 65, 71–72 (2010) (federal wilderness protections prior to the 1964 Wilderness Act were not "particularly strict or specific").

United States enacted the Wilderness Act,[46] the world's first legislation explicitly and exclusively devoted to protecting wilderness values.[47]

Outside of the United States, too, some early national parks prioritized visitors' experiences over nature conservation. For instance, during the early twentieth century, car rallies were allowed at Royal National Park, Australia's first such park.[48] Furthermore, the integrity of national parks was periodically compromised by alternate economic uses. For example, in 1950 some 1,500 hectares of old growth forest was excised from the Australian state of Tasmania's first national park, at Mount Field, in order to meet the resource needs of a nearby pulp mill producing newspaper.[49] Some advocates in Australia urged that national parks be managed according to principles more congruent with contemporary wilderness legislation, as discussed shortly, such as the pioneering conservationist Myles J. Dunphy. In the 1930s, Dunphy lobbied for conservation of "primitive areas . . . great portions of huge national parks wherein no roads may be constructed, no buildings erected, and no fences or other "improvements" are allowed."[50] Dunphy had some success, with designation of large wilderness areas for protection in the 1940s and 1950s through parks declared in the Blue Mountains and Snowy Mountains of New South Wales.[51]

In Europe, antecedents to wilderness law also took hold in the early twentieth century. Switzerland was a pioneer, with the establishment in 1914 of the Swiss National Park to safeguard 14,000 hectares where natural processes could flourish undisturbed except for scientific research.[52] Given the absence of "pristine wilderness" in Switzerland, as in most parts of Europe given many centuries of settlement, the Swiss approach emphasized restoring wilderness values through active human intervention rather than simply passively protecting them.[53] This policy

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[46] Wilderness Act, Pub. L. No. 88-577, 78 Stat. 890 (1964) (codified as amended at 16 U.S.C. §§ 1131–1136 (2018)).

[47] Gregory Dehler, *Wilderness Act*, BRITANNICA.COM, https://perma.cc/DA8Q-AKF2 (last visited Jan. 30, 2021); Nathalie Massip, *The 1964 Wilderness Act, From "Wilderness Idea" to Governmental Oversight and Protection of Wilderness*, MIRANDA 1, 6–7 (2020).

[48] *Car Racing in the Royal National Park, 1911*, SUTHERLAND SHIRE LIBR., https://perma.cc/7JAS-BDYS (last visited Feb. 16, 2021).

[49] *National Park and Florentine Valley Act 1950* (Tas) pts I–II, sch 1 (Austl.); *Newsprint Industry Concession*, MERCURY, Mar. 21, 1949, at 3.

[50] Barron Thurat, *Equilibrated Minds and Wilderness*, KATOOMBA DAILY, Aug. 24, 1934, at 5. Barron Thurat was a pseudonym occasionally used by Myles Dunphy. Myles Dunphy, *Some Thoughts of Barron Thurat*, COLONG FOUND. FOR WILDERNESS, https://perma.cc/T892-K3RY (last visited Mar. 2, 2021).

[51] Richard Gowers, *Dunphy, Myles Joseph (1891-1985)*, AUSTRALIAN DICTIONARY OF BIOGRAPHY, https://perma.cc/K2LV-2PXT (last visited Feb. 18, 2021); Graeme Worboys, *Celebrating Kosciuszko's 75th Anniversary*, NAT'L PARK ASS'N NSW, https://perma.cc/6FBC-7KL7 (last visited Feb. 18, 2021).

[52] *See* PATRICK KUPPER, CREATING WILDERNESS: A TRANSNATIONAL HISTORY OF THE SWISS NATIONAL PARK (Giselle Weiss trans., 2014); Parc Naziunal Svizzer, *1904-1914*, https://perma.cc/UP37-N4FD (last visited Feb. 18, 2021).

[53] Robert McMorran, *Creating Wilderness: A Transnational History of the Swiss National Park*, 38 MOUNTAIN RES. & DEV. 560, 560 (Nov. 2016) (book review).

eventually led to culling unsustainably high number of deer along with reintroducing missing indigenous species to re-establish ecological equilibrium.[54] Another pioneer was Russia, which in 1917 introduced under Tsar Nicholas II the *zapovednik*, or strict nature reserves, to control game hunting or ensure preservation of "virgin" natural areas without any human disturbances.[55] These reserves were expanded during the twentieth century in accord with the International Union for Conservation of Nature's (IUCN) highest protection category, 1a, "where human visitation, use and impacts are strictly controlled and limited".[56] As a special permit is usually obligatory to visit a *zapovednik*, few people other than scientists have had the opportunity to visit, although over the last two decades protection has become challenging due to budget cuts and tourism developments.[57]

Yet, like environmental law more generally in many countries before the 1960s, the notion of conserving areas of nature for their environmental values per se had limited traction in a world oriented to subjugating the natural world for human needs.[58] The corollary was the colonialist attitude that land occupied by Indigenous peoples was "terra nullius"—empty, without ownership —and thus freely available to more "civilized" nations to acquire and develop, as was the case in Australian colonial history.[59] It was when Western environmental philosophers such as John Muir, Aldo Leopold, and Elyne Mitchell advocated a shift in the human-nature relationship premised on the spiritual and aesthetic appreciation of untouched nature that the groundwork was laid for conserving wilderness for its own intrinsic values.[60] Along with improving scientific knowledge of the importance of relatively intact areas of the natural world to biological and ecological processes, these developments eventually spawned the creation of more comprehensive wilderness laws, as well as other environmental regulations, in many nations.[61]

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[54] *Id.*

[55] FELIKS R. SHTILMARK, HISTORY OF THE RUSSIAN ZAPOVEDNIKS, 1895–1995, at 26 (G.H. Harper transl., 2003).

[56] *Category 1a: Strict Nature Reserve*, INT'L UNION CONSERVATION NATURE, https://perma.cc/868F-6KBQ (last visited Feb. 18, 2021).

[57] Natalia Danilina et al., *Wilderness Protection in Russia*, *in* WILDERNESS PROTECTION IN EUROPE: THE ROLE OF INTERNATIONAL, EUROPEAN AND NATIONAL LAW, *supra* note 7, at 432, 453.

[58] Bastmeijer, *supra* note 7, at 3, 20.

[59] *See* MICHAEL CONNOR, THE INVENTION OF TERRA NULLIUS: HISTORICAL AND LEGAL FICTIONS ON THE FOUNDATION OF AUSTRALIA 10 (Macleay Press, 2005).

[60] *See generally* JOHN MUIR, OUR NATIONAL PARKS (1901); ALDO LEOPOLD, A SAND COUNTY ALMANAC (1949); ELYNE MITCHELL, SOIL AND CIVILIZATION (1946).

[61] Bastmeijer, *supra* note 7, at 3, 25–26.

B. Australian Wilderness Law

Australia has no national legal or policy mechanism that specifically provides for identifying, managing, or conserving wilderness.[62] Environmental law in Australia is primarily the legal domain of its six self-governing states and two territories rather than the national Australian government (the Commonwealth).[63] This stems from a constitutional arrangement that restricts Commonwealth law-making to matters of national responsibility—including, relevantly, laws that implement Australia's international obligations.[64] So, although the Commonwealth has enacted legislation for, among other things, identifying and conserving World Heritage areas and prohibiting international trade in endangered species, in the absence of international wilderness laws, there is no clear constitutional power for the Commonwealth to legislate.[65] The Commonwealth can, however, facilitate governance for matters that cross multiple jurisdictions, as is the case for detailed intergovernmental cooperation for managing the wild alpine parks that straddle New South Wales, Victoria, and the Australian Capital Territory.[66]

1. Categories of Wilderness Law

The concept of wilderness arises in Australian legal frameworks in three distinct ways. The first two relate to the designation of land as "wilderness" under statutory instruments, while the third relies on conservation agreements to conserve wilderness on private land. The first, and clearest, example of wilderness laws in Australia are wilderness-specific statutes, under which state governments may

62 Bruce Davis, *Wilderness Conservation in Australia: Eight Governments in Search of a Policy*, 29 NAT. RESOURCES J. 103, 107 (1989).

63 *Id.* at 106.

64 *See, e.g.*, *The Roles and Responsibilities of Federal, State and Local Governments*, PARLIAMENT OF N.S.W., https://perma.cc/9HSJ-84KP (last visited Feb. 19, 2021) (explaining "[t]he Federal or Commonwealth Government is responsible for the conduct of national affairs. Its areas of responsibility are stated in the Australian Constitution and include defence and foreign affairs; trade, commerce and currency; immigration; postal services, telecommunications and broadcasting; air travel; most social services and pensions[,]" and stating that the areas primarily controlled by the state is "health, education, environmental issues, industrial relations, etc."). *See also State and Territory Information*, AUSTRALIAN GOV'T, https://perma.cc/C4MB-GXTT (last visited Feb. 19, 2021) (listing the six states and two territories).

65 *See Infosheet 13 – The Constitution*, PARLIAMENT AUSTL., https://perma.cc/3JPY-R29B (last visited Feb. 19, 2021) (explaining that "states retain legislative powers over matters not specifically listed in the Constitution]" and omitting environmental matters as one of the explicit matters on which the Commonwealth can make laws).

66 *See* Australian Alps Liaison Comm., *Memorandum of Understanding in relation to the Co-operative Management of the Australian Alps National Parks*, AUSTRALIAN ALPS NAT'L PARKS, https://perma.cc/B5BN-H4ZV (last visited Feb. 19, 2021) (providing an example of collaboration between the Commonwealth, State, and Territory governments to protect an area of wilderness).

designate a protected area as a "Wilderness Area" and manage it according to specified principles, guidelines, or policies.[67]

Despite their wilderness-specific focus, these statutes provide little explicit guidance on the question: what is wilderness *for*? For example, the New South Wales Wilderness Act 1987 rather unhelpfully lists the objects of the Act as providing for "the permanent protection of wilderness areas . . . [and] the proper management of wilderness areas" as well as "to promote the education of the public in the appreciation, protection and management of wilderness."[68] These laws do, however, have a strong conservation-orientation, placing significant value on large areas of "untouched" nature, particularly areas that remain free from degradation by invasive species and human activities.[69]

In addition to its conservation focus, the New South Wales statute recognizes anthropocentric value in wilderness, requiring that wilderness areas be "capable of providing opportunities for solitude and appropriate self-reliant recreation."[70] Readers familiar with the federal wilderness statute in the United States (described in detail in Part III.C below), may observe similarities with that Act's emphasis on humans' ability to enjoy "outstanding opportunities for solitude. . . ."[71] In practice, the term solitude has been interpreted quite differently in Australia. The New South Wales Wilderness Assessment Guidelines define the term as follows:

> [Solitude] is a highly anthropocentric and subjective attribute that varies from person to person. . . . Any area that is capable of affording even the most basic feeling of solitude meets this requirement of the Act. . . . Wilderness assessments in [New South Wales] do not usually reject areas on the sole basis that solitary feelings may be disturbed (e.g. because of proximity to roads and other audible disturbances or views of disturbed landscapes).[72]

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67 *See Wilderness Protection Act 1992* (SA) pt 2 div 3 sub-div 12 para 2 (Austl.) (mandating "[t]he code must set out policies that should be implemented in the management of wilderness protection areas and zones . . ."). *See also Wilderness Act 1987* (NSW) pt 3 div 1 subdivs 8–9 (Austl.) (outlining how wilderness areas must be declared and managed).

68 *Wilderness Act 1987* (NSW) pt 1 s 3 (Austl.).

69 *See id.* at pt 2 s 6(1)(a) (explaining that an area of land "shall not be identified as wilderness" unless "the area is, together with its plant and animal communities, in a state that has not been substantially modified by humans and their works or is capable of being restored to such a state"). *See also Wilderness Protection Act 1992* (SA) pt 2 div 3 sub-div 12 para (2)(b) (Austl.) (stating that the wilderness code of management must include policies related to "the restoration of land and its ecosystems to their condition before European colonisation and the protection of land and its ecosystems from the effects of modern technology and exotic animals and plants and other exotic organisms").

70 *Wilderness Act 1987* (NSW) pt 2 s 6(1)(c) (Austl.).

71 Wilderness Act, 16 U.S.C. § 1132(c) (2018).

72 DEP'T OF ENV'T & CLIMATE CHANGE NSW, WILDERNESS ASSESSMENT GUIDELINES 11–12 (2008), https://perma.cc/D4SP-RZLP.

The very low standard applied to this Act's requirement for "opportunities for solitude" may reflect a pragmatic approach to designating wilderness in the state or perhaps a presumption that a potential wilderness area will not be rejected solely on the solitude criterion. Nevertheless, the different approach that New South Wales and the United States have taken in interpreting similar terminology is notable.

The second form of legal recognition for the concept of wilderness in Australia is similar. Some states provide protected area or conservation legislation for the declaration of defined segments of larger protected areas, explicitly described as "wilderness zones" or land subject to "wilderness overlays."[73] These statutory spatial tools affect the management objectives, activities, and permitting arrangements that apply within the defined wilderness zones or overlays—as distinct from the management arrangements that apply within the broader protected area.[74]

Perhaps unexpectedly, these general statutes provide clearer guidance about the purposes of wilderness areas or zones within their bounds than the wilderness-specific statutes. For example, protected area legislation in the state of Victoria specifies multiple objects for wilderness zones, including: protecting areas that remain undisturbed by the influences of European settlement; facilitating protection and evolution of the natural environment (including species and ecological, geological, and other forms of "scientific significance"); supporting use and enjoyment of wilderness areas and zones by the public; and furthering environmental research.[75]

Where a wilderness protected area or zone is created under statute, management principles are typically defined in statutory instruments such as codes or management plans. To illustrate, the primary legal tool for managing wilderness areas in South Australia is the *Wilderness Protection Areas and Zones: Code of Management* (SA Code).[76] The SA Code strongly emphasizes the conservation purposes of wilderness areas in that state, setting as its overarching objective: "[t]o maximi[z]e the naturalness and remoteness, i.e. the wilderness quality, of wilderness areas."[77] Additional objectives include protecting and, where practicable,

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73 *See, e.g.*, *National Parks Act 1975* (Vic) ch 5 (Austl.) (establishing specific areas as Wilderness zones). *See also* The State of Victoria Department of Environment, Land, Water and Planning, *Planning for Biodiversity Guidance*, at 13 (2017), https://perma.cc/Q93T-BB7T (discussing the "environmental significance overlay" which impacts wilderness by "identifying areas where development may be affected by environmental constraints and . . . ensur[ing] development is compatible with identified environmental values").

74 *See, e.g.*, *Wilderness Protection Areas*, GOV'T S. AUSTL.: DEP'T ENV'T & WATER, https://perma.cc/SYH4-XVQ7 (last visited Feb. 19, 2021) (distinguishing the Wilderness Protection Areas and Zones code of management, which "sets out statewide objectives, principles and policies for the management of wilderness" from management plans, which "set out management objectives and strategies for each wilderness protection area.").

75 *National Parks Act 1975* (Vic) pt I s 4(ab) (Austl.).

76 *South Australian Code of Management 1992* (SA) (Austl.) [hereinafter SA Code].

77 *Id.* at s 2.1; The Western Australian Policy Statement operates similarly. *Department of Conservation and Land Management Policy Statement No. 62* (WA) s 1 (Austl.).

enhancing wilderness quality; controlling and, where practicable, eradicating non-indigenous plants and animals; protecting various features including wildlife and ecological processes, geographical features, significant scientific, historical and Aboriginal cultural sites and providing for public use and enjoyment "where compatible with maximi[z]ing wilderness quality."[78]

A subset of this second form of legal recognition for wilderness occurs when a wilderness zone or overlay is allocated to an area in a statutory management plan, despite the absence of any wilderness provision in the primary legislation. For instance, no reference to wilderness occurs in any Tasmanian legislation, but the state is nevertheless home to the Tasmanian Wilderness World Heritage Area (TWWHA).[79] The statutory management plan for the TWWHA[80] creates a Wilderness Zone that emphasizes remoteness and the undisturbed or "natural" qualities of the landscapes of the TWWHA.[81] The Zone applies to the majority of the TWWHA area, and the management plan states that the Zone should be managed "in a manner that allows for natural processes to predominate."[82] The TWWHA is the only site inscribed on the World Heritage List to include "wilderness" in its title, although the concept of wilderness in relation to the TWWHA is the subject of ongoing controversy, particularly in regard to the place of Indigenous peoples in its contemporary use and management.[83]

The third and final form in which wilderness can be recognized in Australian law is in conservation agreements with private landholders. These agreements may include recognition of wilderness characteristics and require management actions to conserve or restore wilderness within the applicable area. Private agreements and conservation covenants with landholders are negotiated by landholders, often directly with government;[84] their terms are rarely made public;[85] and, consequently,

78 *SA Code* (SA) s 2.1(i–viii) (Austl.).

79 In Australia, World Heritage Areas (including the TWWHA) are declared and managed in accordance with the national *Environment Protection and Biodiversity Conservation Act 1999* and its regulations. *Tasmanian Wilderness World Heritage Area 2007*, at 5 (Cth) (Austl.).

80 The development of which is mandated under national legislation, though discretionary in Tasmanian legislation. *Executive Summary: TWWHA Management Plan 2016*, at 7 (Tas) (Austl.).

81 *Tasmanian Wilderness World Heritage Area Management Plan 2016* (Tas) 63–64 (Austl.) [hereinafter *TWWHA Management Plan 2016*].

82 *Id.*

83 *See* Emma Lee & Benjamin J. Richardson, *From Museum to Living Cultural Landscape: Governing Tasmania's Wilderness World Heritage*, 20 AUSTL. INDIGENOUS L. REV. 2017, at 78, 78–79 (discussing how Western perspectives of wilderness create difficulties when collaborating with Indigenous people in the TWWHA).

84 Or negotiated by landholders with environmental NGOs such as the Tasmanian Land Conservancy or with a statutory authority responsible for private protected areas, such as the state of Victoria's Trust for Nature.

85 *See, e.g.*, Mathew J. Hardy et al., *Exploring the Permanence of Conservation Covenants*, 10 CONSERVATION LETTERS 221, 223 (2017) (evaluating the difficulties in measuring the effectiveness of conservation covenants due to confidentiality requirements).

are difficult to analyze in a rigorous way. For these reasons, private protection of wilderness areas through such arrangements are not considered in further detail in this Article.[86]

2. Definitions of Wilderness

Australian statutory definitions of "wilderness" are usually quite circular, for example, defining a wilderness area as "lands . . . declared to be a wilderness area under this Act or the National Parks and Wildlife Act 1974."[87] While such definitions provide limited guidance about the status and role of the concept in Australian law, other consistent characteristics are more enlightening. Wilderness legislation often includes provisions that emphasize the importance of:

- permanent protected status;
- "proper" management, usually in accordance with an area-specific, statutorily-mandated management plan;[88]
- scale, requiring that wilderness areas be sufficiently large in size to support and sustain ecological processes;[89]
- excluding industrial, mechanical, and commercial activities;[90]
- stability and the importance of historical baselines; and
- in some jurisdictions, as places that provide opportunities for self-reliant recreation.[91]

The historical focus of wilderness laws—that is, their concern with preservation and maintenance of historical conditions—is demonstrated most clearly in provisions that require, for example, that wilderness areas

86 Although the discussion below, *infra* Part IV, about the implications of climate change for wilderness areas, the biodiversity that they support, and the opportunities to manage such areas in ways that support the adaptation of that biodiversity under rapid climatic change, apply equally to privately managed land that demonstrates wilderness characteristics.

87 *Wilderness Act 1987* (NSW) pt I s 2(1) (Austl.). *See, e.g.*, *Wilderness Protection Act 1992* (SA) pt I s 3(1) (Austl.) (defining wilderness as "land that meets the wildness criteria"); *National Parks Act 1975* (Vic) pt I s 3(1) (Austl.) (similarly provides that a "*wilderness zone* means land that, by reason of section 22(4A) or (5), is a wilderness zone for the purposes of this Act").

88 *See, e.g.*, *Wilderness Protection Act 1992* (SA), pt III div 3 s 32(b) (Austl.) (stating "operations must not be undertaken in relation to that [a wilderness protection] area or zone unless those operations are in accordance with the plan of management").

89 *See, e.g.*, *Wilderness Act 1987* (NSW) pt III s 6(1)(b) (Austl.) (requiring the area to be "of sufficient size to make its maintenance in such a state feasible").

90 *See, e.g.*, *Wilderness Protection Act 1992* (SA) pt III div 2 s 26(1) (Austl.) (prohibiting grazing, forms of production, and construction in wilderness protection areas and zones).

91 *See Wilderness Protection Act 1992* (SA) pt III div 2 s 12(2)(m) (Austl.); *Wilderness Act 1987* (NSW) pt II s 6(1)(c) (Austl.); *National Parks Act 1975* (Vic) pt III div 1A s 17A(3)(a) (Austl.).

not be "substantially modified by humans," or that they must be capable of being restored to that condition,[92] and requirements that wilderness areas not be affected (or only to a minor extent) by "modern technology" or exotic plants, animals or organisms.[93]

3. Conservation Management and Exceptions to the Non-intervention Principle

Various forms of active conservation management—beyond what might typically be considered compatible with wilderness characteristics such as pristine nature or "naturalness"—are also often permitted in Australian legal frameworks for wilderness. Examples of interventions currently supported by wilderness laws, policies, and management codes include restoring wilderness characteristics by removing built (European) infrastructure;[94] using mechanical and other forms of equipment to remove or reduce the impact of invasive alien species; and using machinery and introducing fire to enhance bushfire preparedness, the effectiveness of bushfire response and, where necessary, restoration of natural processes and native species after bushfires or other disturbances.[95] For example, the Western Australian Department for Environment and Water (as it then was) 2017–2018 *Annual Report* detailed prescribed burning, fire management, track and trail maintenance, mechanical hazard reduction in wilderness protection areas, feral goat and deer eradication, aerial and ground-based fox baiting, wildlife trapping, pitfall trapping, camera traps including baited camera traps, and drone flights for aerial population mapping of sea lions and island habitat.[96] In other words, it sometimes takes a fair bit of human intervention to sustain a "wilderness" in Australia.

Despite the emphasis in Australian wilderness laws on relatively untouched natural areas, wilderness laws also create certain specific exceptions to these requirements—some for conservation-specific purposes and others that are less easily reconciled with conservation goals. Legislation in each of the states of New South Wales, South Australia, and Western Australia empower governments to declare "buffer zones" on the boundaries of wilderness areas, where land that

92 *Wilderness Act 1987* (NSW) pt II s 6(1)(a) (Austl.).

93 *Wilderness Protection Act 1992* (SA) pt I s 3(2)(a) (Austl.); *Department of Conservation and Land Management, Policy Statement No. 62:* (WA) ss 4.6–4.8 (Austl.). But see *National Parks Act 1975* (Vic) pt I s 4(ab)(ii) (Austl.), which uniquely anticipates the need to provide for, among other things, the "*evolution of the natural environment*, including indigenous flora and fauna and features of ecological . . . significance" (emphasis added).

94 *National Parks Act 1975* (Vic) pt I s 4(ab)(i) (Austl.). *See also Wilderness Protection Act 1992* (SA) pt II div 3 s 12(2)(c) & (d) (Austl.) (Aboriginal cultural heritage is protected under Commonwealth and state legislation and wilderness management typically emphasizes its protection. For example, the wilderness management objectives of the SA Code include protecting sites of Aboriginal cultural heritage, and other sites of historical significance).

95 GOV'T OF S. AUSTL., DEP'T ENV'T & WATER, 2017–18 ANNUAL REPORT 8 (2018).

96 *Id.* at 8, 59–60.

would not otherwise meet the statutory or policy criteria to be defined as wilderness may nevertheless be declared to be wilderness if doing so would support the management of existing wilderness areas.[97] This provision helps to alleviate "edge effects" where extractive or other non-conservation managed land adjoining a wilderness area may undermine the health and resilience of the wilderness area.[98]

In addition to conservation-specific forms of active intervention, Australian wilderness laws create some further, unusual exceptions to purist, "hands off" approaches to managing wilderness. For example, in some rare cases, Australian legislation has protected some existing uses in newly designated wilderness areas, including uses that may be at odds with the designation of a new wilderness area on the basis that they were already taking place at the time of its designation.[99] Perhaps more significantly, for its apparent conflict with wilderness characteristics, South Australia's legislation prohibits mining in Wilderness Areas (i.e., protected areas that are wholly managed as wilderness) but allows mining in Wilderness Protection Zones, provided the activity abides by the South Australian Wilderness Code of Management.[100] The South Australian parks agency's 2017–2018 Annual Report noted that no wilderness protection zones have been declared in the state to date, so no mining operations were occurring that were subject to the relevant reporting obligations.[101] Nevertheless, statutory provision for such activities seems wholly inconsistent with the designation of an area as having wilderness qualities.

Another example of an exception to a purist, "hands off" approach to managing Australian wilderness can be found in the TWWHA Management Plan 2016. The Management Plan is implemented by a management committee with representatives of both state and Commonwealth governments—due to the Commonwealth's responsibility under the World Heritage Convention—along with a number of other non-government organizations and experts.[102] The Management Plan allows commercial operations within Wilderness Zones in the TWWHA, provided a proposed activity has all necessary permits and meets any

97 *E.g.*, *Wilderness Protection Act 1992* (SA) pt III div 1 s 22(5) (Austl.); BEN BOER & STEFAN GRUBER, LEGAL FRAMEWORK FOR PROTECTED AREAS: NEW SOUTH WALES (AUSTRALIA) 27 (2010), https://perma.cc/K5BD-QV7Z; Dep't of Conservation & Land Management, Policy Statement No. 62: (WA) ss 2 (Austl.), https://perma.cc/RAW2-92DD. *See also TWWHA Management Plan 2016*, *supra* note 81, at 63–64.

98 *E.g.*, William F. Laurence et al., *Averting Biodiversity Collapse in Tropical Forest Protected Areas*, 489 NATURE 290, 292 (2012) (finding that—at least for forest protected areas in the tropics—the management of adjoining land was *at least as significant* for biodiversity outcomes as the management of the protected area itself).

99 *Wilderness Act* 1987 (NSW) pt III div 1 s 8 (Austl.).

100 *Wilderness Protection Act 1992* (SA), ss 25-27 (Austl.) (particularly s 25(3) which allows mining under a proclamation by the Governor).

101 GOVERNMENT OF SOUTH AUSTRALIA, DEP'T ENV'T & WATER, 2018–19 ANNUAL REPORT 70 (2019).

102 *TWWHA Management Plan 2016*, *supra* note 81, at 24, 207.

other relevant statutory requirements.[103] Commercial activities may include guided bushwalks and inland and coastal fishing activities.[104] While none of the commercial activities listed in the TWWHA Management Plan could be considered equivalent to mining in their potential impact, providing for commercial activities in this way may nevertheless raise similar questions about the status and ongoing significance of the legal category of wilderness, when defined in its "purest" form.

Provision for commercial activities is particularly interesting in this case, because a primary purpose of the wilderness zone in the TWWHA is to protect "large expanses of remote and undisturbed landscape with high wilderness values," allowing "natural processes to predominate," including remnant Gondwanan and fragile alpine ecosystems and their component species.[105] While the wilderness zone is acknowledged as an area where "suitably experienced, equipped and motivated people can visit for recreation in a remote, wilderness environment," wilderness zone designations in the TWWHA emphasize the primacy of conserving remote nature along with Aboriginal cultural practices rather than predominantly for supporting human recreation.[106] The area's world heritage designation may have influenced the development of the TWWHA Management Plan in this respect, given the obligation on government and TWWHA managers to not only identify, protect, and conserve the area but also *present* its world heritage values to the world.[107]

C. United States Wilderness Law

1. Categories of Wilderness Law

Emerging after eight years of debate, 6,000 pages of testimony, and several titanic battles over relatively pristine areas slated for development, the Wilderness Act of 1964 defines and guides protection of "wilderness" areas in the United States.[108] The Act created a National Wilderness Preservation System that attaches a designation of "wilderness," with defined legal protections, on federal lands in the

103 *Id.* at 77–78; *Wilderness Act 1987* (NSW) p 1 div 1 ss 6, 9 (Austl.) (similarly anticipates commercial forms of self-reliant recreation in management principles set out in section 6).

104 *See, e.g.*, *TWWHA Management Plan 2016*, *supra* note 81, at 78; *Wilderness Act 1987* (NSW) pt 1 div 1 s 9 (Austl.).

105 *TWWHA Management Plan 2016*, *supra* note 81, at 63; *Wilderness Act 1987* (NSW) pt III div 1 s 9.

106 *See, e.g.*, *TWWHA Management Plan 2016*, *supra* note 81, at 63–64 (discussing the importance of preserving the cultural significance and remoteness of the area); *Wilderness Act 1987* (NSW) pt III div 1 s 9 (Austl.).

107 Convention Concerning the Protection of the World Cultural and Natural Heritage, Dec. 17, 1975, 1037 U.N.T.S. 151. *See TWWHA Management Plan 2016*, *supra* note 81, at 11–14.

108 Wilderness Act of 1964, 16 U.S.C. §§ 1131–1133 (2018).

National Park system, the National Forest system, the National Wildlife Refuge system, and lands owned by the federal Bureau of Land Management.[109] That is to say, Congress searches for and preserves "wilderness" on land previously set aside for other reasons.

The Wilderness Act has stood the test of time and has not been significantly amended since 1964.[110] Congress—and only Congress—may (and frequently does, even now)[111] add lands to the National Wilderness Preservation System. It is joked that "[p]rior to 1964, only God could make a wilderness. After 1964, only Congress could."[112] The system started with about 3.7 million hectares (9 million acres) in thirteen states and has grown to protect 45 million hectares (111 million acres) in 760 different areas in forty-four states.[113]

2. Definitions of Wilderness

The Act's definition of wilderness is clear and detailed, especially when compared to the approach found in some of the other jurisdictions profiled here. It defines "wilderness" as:

> an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain . . . an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.[114]

The Act also bans (except for prior private rights), commercial enterprises, permanent and temporary roads, and motor vehicles or aircraft.[115]

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109 *Id.*

110 *See* John D. Leshy, *Legal Wilderness: Its Past and Some Speculations on Its Future*, 44 ENV'T L. 549, 575 (2014) (explaining that, to the year of 2014, the Wilderness Act had not been significantly amended); KATIE HOOVER & SANDRA L. JOHNSON, CONG. RESEARCH SERV., R41610, WILDERNESS: ISSUES AND LEGISLATION (2018) (distinguishing between designations and amendments to the Wilderness Act).

111 In 2019, Congress added over half a million hectares of new wilderness. Juliet Eliperin & Dino Grandoni, *The Senate Just Passed the Decade's Biggest Public Lands Package. Here's What's in It.*, WASH. POST (Feb. 12, 2019), https://perma.cc/HJF3-FW63.

112 Marvin Henberg, *Wilderness, Myth, and American Character*, *in* THE GREAT NEW WILDERNESS DEBATE 500, 500 (J. Baird Callicott & Michael P. Nelson eds., 1998).

113 *See* Wilderness Connect, *Fast Facts*, U. MONT., https://perma.cc/T3RE-TQPA (last visited Feb. 19, 2021).

114 The Wilderness Act, 16 U.S.C. § 1131(c) (2018).

115 *Id.* § 1133(c).

Thus, while the Wilderness Act of 1964 recognizes that humans have, indeed shaped the landscape, it provides that wilderness should be managed so that it does not appear that there has been a human "imprint." Furthermore, size counts: small areas won't qualify.[116] And it's clear that the Act is designed for human desires, aesthetics, and recreation: for example, "wilderness" is protected primarily for our sake, not for its own sake.

3. Conservation Management, the Non-intervention Principle, and Its Exceptions

The Act is anthropocentric, designed primarily to preserve wilderness for particular kinds of human use.[117] Wilderness areas "shall be administered for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness . . . ."[118] But while the Act's default is to passively manage wildernesses "in their natural condition,"[119] it does permit for some exceptions: the President is authorized to allow water exploration, power projects, transmission lines, "and other facilities needed in the public interest, including . . . road construction and maintenance."[120] The Act also permits livestock grazing if rights were established prior to 1964—a concession that reflects a political comprise when the legislation was drafted.[121]

Conservationists who question the ontological reality of "wilderness"—does such an entity still exist or make legal sense if humans have impacted every millimeter of the planet?—must consider the political reality of environmental battles in the United States in the twenty-first century. The terms of the Act, as described above, are clear and offer the highest level of protection for any land designation in the United States.[122] Courts are far more likely to intervene to restrict agency decision-making and human ecosystem interventions pursuant to the Wilderness Act than under other federal land management or environmental statutes.[123] To avoid harming wilderness, U.S. courts have enforced strict requirements for protecting wilderness. A court upheld the U.S. Fish and Wildlife Service's denial of a permit for commercial boat tours in a wilderness area, which would have allowed picnicking, kite flying, and frisbee playing, and which the court sustained as

116 *Id.* § 1131(c).

117 *Id.* §§ 1131(a), 1131(c), 1133(d)(5) (prioritizing wilderness preservation for commercial, recreational, scientific, and other human uses).

118 *Id.* § 1131(a).

119 *Id.*

120 *Id.* § 1133(d)(4).

121 *Id.*

122 *See* Peter A. Appel, *Wilderness and the Courts*, 29 STAN. ENV'T L.J. 65, 67, 81 (2010) (analyzing the text of the Wilderness Act and case studies relying on the text).

123 For more examples from U.S. courts, see generally Elisabeth Long & Eric Biber, *The Wilderness Act and Climate Change Adaptation*, 44 ENV'T L. 623 (2014).

"incompatible with the wilderness character of the island."[124] Arguing that the Wilderness Act requires that maintaining the "primitive" character of a designated wilderness must be the foremost consideration, a court forbade the National Park Service from allowing commercial use of horses and mules in a wilderness area. A court noted that "the agency's primary responsibility is to protect the wilderness not cede to commercial needs" unless the agency has done a detailed analysis justifying the essential nature of the commercial enterprise.[125] Courts have also found that wilderness designation means members of an Indian tribe cannot use motorboats and all-terrain vehicles to reach desired hunting and fishing locales.[126]

Furthermore, both the clear language and purpose of the Wilderness Act forbid salmon stocking as part of a commercial enterprise because "statutory declarations show a mandate of preservation for wilderness and the essential need to keep commerce out of it."[127] In a long running battle, an appeals court found that renewing a permit for commercial oyster farming ran afoul of potential designation of the area as wilderness.[128] While finding that restoring native trout could potentially serve the purposes of the Wilderness Act, using rotenone to poison non-native fish is one step too far.[129] Similarly, while finding that intervening to conserve dwindling bighorn sheep met the object and purpose of the Wilderness Act, a court found that the Fish & Wildlife Service could find less wilderness-impairing solutions than building permanent watering tanks.[130] And reauthorizing grazing permits in designated wildernesses should only be allowed in "extraordinary circumstances."[131] So while we characterize the goal of U.S. wilderness preservation as "anthropocentric," the law circumscribes the kinds of uses and management it permits in service of a circumscribed subset of human experience the law prizes.

The seemingly clear mandates of the Wilderness Act become more opaque in an era when climate change and other forms of aggressive human intrusion on the wilderness character are intensifying. Managers now face conundrums on how to manage wilderness—or whether to manage at all—in an era when we are steering nature way off the course it might have taken if left unimpeded. If wilderness is land that "*generally appears to have been affected primarily by the forces of nature, with the*

124 McGrail & Rowley, Inc. v. Babbitt, 986 F. Supp. 1386, 1392 (S.D. Fla. 1997).

125 High Sierra Hikers Ass'n v. U.S. Dep't of Interior, 848 F. Supp. 2d 1036, 1047 (N.D. Cal. 2012).

126 United States v. Gotchnik, 222 F.3d 506, 510–11 (8th Cir. 2000).

127 Wilderness Soc'y v. U.S. Fish & Wildlife Serv., 353 F.3d 1051, 1061 (9th Cir. 2003).

128 Drakes Bay Oyster Co. v. Jewell, 747 F.3d 1073, 1088 (9th Cir. 2014).

129 Californians for Alternatives to Toxics v. U.S. Fish & Wildlife Serv., 814 F. Supp. 2d 992, 1024 (E.D. Cal. 2011).

130 Wilderness Watch v. U.S. Fish & Wildlife Serv., 629 F.3d 1024, 1037 (9th Cir. 2010).

131 Western Watersheds v. U.S. Forest Serv., No. C 08-1460 PJH., 2012 WL 1094356, at *13, *15 (N.D. Cal. Mar. 30, 2012).

imprint of man's work substantially unnoticeable,"[132] do we intervene as long as our interventions keep the land *appearing* to have been affected primarily by natural forces?

Wilderness managers must weigh what value visitors place in maximally functioning biotic systems: do managers (re)introduce top trophic level carnivores that may have been extirpated? As climate changes wreak havoc, do they assist with migration of species to landscapes preserved by "wilderness" designation? Our knowledge of ecosystems, particularly those changing chaotically, remains woefully incomplete. As Frank Egler, a federal Bureau of Land Management wilderness manager expressed it, "[e]cosystems are not only more complex than we think, they are more complex than we can think."[133] How to weigh the different values that the Wilderness Act protects, and how and when and whether to intervene to protect those values, when our knowledge of present and future environmental conditions is rudimentary remains an evolving enigma. Where future interpretations of the law head will depend on what we humans—for whom U.S. law has set aside the wilderness—prize and how effectively we learn lessons from past, present, and future interventions.

4. State Wilderness Laws

Unlike Australia, formal "wilderness" protection in the U.S. occurs primarily at the national level.[134] However, some states have decided that wilderness values should be legally preserved on a more local level.

For example, in 1974, the California Wilderness Act[135] established a California Wilderness Preservation System. The statute's goal is "to assure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas on state-owned lands within California, leaving no areas designated for preservation and protection in their natural condition."[136] The definition and character of "wilderness" in the Act closely parallels its federal forerunner, for example, "in contrast to those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain."[137] Multiple mountain, desert, and redwood forest parcels have been designated as wilderness under the system.[138]

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132 Wilderness Act, 16 U.S.C. § 1131(c) (2018).

133 Quoted in many sources, e.g., Christopher Solomon, *Rethinking the Wild*, N.Y. TIMES (July 5, 2014), https://perma.cc/3AMP-NGD2.

134 *See, e.g.*, 16 U.S.C. §§ 1131–1136.

135 CAL. PUB. RES. CODE §§ 5093.30–5093.40 (2019).

136 *Id.* § 5093.31.

137 *Id.* § 5093.33(c).

138 *Id.* § 5093.35; *California State Wildernesses*, CAL. DEP'T. PARKS & RECREATION, https://perma.cc/HZ3J-4N3K (last visited Feb. 19, 2021).

The California law permits some management to maintain or improve "the public purposes of recreational, scenic, scientific, educational, conservation, and historical use."[139] Commercial enterprises, permanent and temporary roads, and motor vehicles are banned unless those uses preceded the passage of the law, are necessary for emergencies, or are used to control fire, insects, or disease outbreaks.[140] Cattle grazing, if rights existed prior to the law's passage, may also continue.[141] That is to say, like the federal law on which it is modeled, the California Wilderness Act contemplates minimal—but still some—human intervention to maintain the characteristics that comprise its wilderness values.

The most recent survey of state-level wilderness counts seven states (California, Alaska, Maryland, Michigan, Missouri, New York, and Wisconsin) with legally designated wilderness programs whose areas bear some resemblance to the characteristics readers may ascribe to the term.[142] Forty-six percent of New York's magnificent, 6.1 million acre Adirondack Park (the largest park of any kind in the continental U.S.) is designated wilderness, with almost 10% comprising old growth forest.[143] Some lands described as "wilderness" do not quite live up to their designations. For example, the 11,500 acre "Disney Wilderness Reserve," restored from a derelict cattle ranch in Florida "stands as a testament . . . to Disney's love of nature,"[144] but Propst and Dawson opine that "the management and allowable types of use do not support wilderness character or experiences."[145]

Wilderness protection continues to be robust in the United States. While it is clear what activities are proscribed to maintain the qualities the Wilderness Act values, it is less clear how and when managers should proactively intervene to protect those values in the rapidly changing Anthropocene.

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139 CAL. PUB. RES. CODE § 5093.36(a).

140 *Id.* § 5093.36(b).

141 *Id.* § 5093.36(c)(4).

142 It is difficult to find a compendium of these resources; the authors of this Article contacted several experts and, largely, struck out. The most recent source is Blake M. Propst & Chad P. Dawson, *State Designated Wilderness in the United States: A National Review*, INTL. J. WILDERNESS, Apr. 2008, at 19. One of us (Takacs) is working on an updated survey. MIRANDA HOLETON & DAVID TAKACS, STATE WILDERNESS LAW IN THE UNITED STATES (forthcoming, 2021).

143 *Adirondack Wilderness*, ADIRONDACKS FOREVER WILD, https://perma.cc/LA6K-SEQA (last visited Feb. 19, 2021).

144 *The Disney Wilderness Reserve*, NATURE CONSERVANCY, https://perma.cc/2GX9-6QGL (last visited Feb. 19, 2021).

145 Propst & Dawson, *supra* note 142, at 19.

D. European Wilderness Law

1. Categories of Wilderness Law

Compared to Australia and the United States, very little law in Europe explicitly aims for wilderness protection. Only a few European countries have adopted explicit wilderness statutes: Finland,[146] Iceland,[147] and Norway.[148] A closer look, however, reveals that many legal instruments at various governance levels provide tools for protecting European wilderness without using the term "wilderness." One could take the view that this disqualifies the relevant protocols, EU directives, and laws as "wilderness law," but for Europe we have put the emphasis on whether the legal tools do (de facto), or could, protect areas that qualify as wilderness. We have also taken into account that some governments have adopted "explicit wilderness policy" to use such legal tools to protect wilderness, while the term "wilderness" itself is missing in the law.[149]

Below, four categories of "wilderness-relevant law" receive attention: European regional agreements, the European Union's (EU) Natura 2000-regime, domestic wilderness legislation, and other domestic nature conservation laws relevant for wilderness protection. European regional agreements, particularly the Carpathian Convention,[150] Alpine Convention,[151] and protocols under these conventions, contain wilderness-relevant provisions. For instance, the Protocol on Sustainable Forest Management under the Carpathian Convention obliges each Party to: "take measures in its national territory aimed at identifying and protecting natural, especially virgin forests of the Carpathians, by establishing Protected Areas in sufficient size and number . . . ."[152] It also requires parties to take specific measures for the preservation of virgin

146 62/1991 Ödemarkslag [Wilderness Act].

147 Lög um náttúruvernd [Nature Conservation Act], nr. 60/2013.

148 Lov om miljøvern på Svalbard (Svalbardmiljøloven) [Act on Protection of the Environment in Svalbard] 15 June 2001. nr. 71 §§ 1–3.

149 *See* Davis, *supra* note 62, at 106–07 and accompanying text (describing Australia's efforts to protect areas with traditional wilderness characteristics despite a lack of national policy aimed at wilderness preservation).

150 Framework Convention on the Protection and Sustainable Development of the Carpathians art. 7(5), May 22, 2003 (stating parties shall designate protected natural areas) [hereinafter The Carpathian Convention].

151 Convention on the Protection of the Alps art. 2, Nov. 7, 1991, 31 I.L.M. 767 (detailing the obligations of the parties to preserve the Alpine region) [hereinafter The Alpine Convention].

152 Protocol on Sustainable Forest Management to the Framework Convention on the Protection and Sustainable Development of the Carpathians art. 10(1), May 27, 2011. *See also* The Carpathian Convention, *supra* note 150, art. 7(5) (similarly stating the need for designating protected areas). For a detailed discussion, see Harald Egerer et al., *Wilderness Protection under the Carpathian Convention*, *in* WILDERNESS PROTECTION IN EUROPE: THE ROLE OF INTERNATIONAL, EUROPEAN AND NATIONAL LAW, *supra* note 7, at 222, 228–29 (explaining the history and implementation of the Carpathian Convention).

forests.[153] The Secretariat of the convention and the European Environmental Agency in June 2020 finalized an inventory of Carpathian virgin forests.[154] Similarly, the Mountain Forests Protocol to the Alpine Convention requires the Parties to "mark off natural forest reserves in a sufficient number and size, and . . . generally suspend[] any form of exploitation . . . ."[155] Why these protocols do not specifically refer to the concept of wilderness is uncertain but probably reflects the little attention that the concept of wilderness has received in international and European lawmaking more generally. Yet, several governments of the Carpathian and Alpine conventions have adopted policy to protect wilderness within their territories that fall within the geographical scope of application of these conventions. For instance, various large areas have received the status of "wilderness area" (category 1b) under the IUCN categorization of protected areas.[156]

The EU's Natura 2000-network[157] consists of important natural areas in the twenty-seven EU Member States, designated under the EU Birds Directive[158] and Habitats Directive.[159] It covers almost 1.4 million square kilometers of protected areas,[160] representing more than "18% of the EU's land area and more than 8% of its marine territory."[161] The core of the protection regime for these areas is posited in Article 6 of the Habitats Directive.[162] Compared to most international conventions, the Natura 2000–regime is a strict legal system with clear standards based on the precautionary principle for limiting human impacts on

153 Protocol on Sustainable Forest Management to the Framework Convention on the Protection and Sustainable Development of the Carpathians art. 10(1), May 27, 2011 [hereinafter Protocol on Sustainable Forest Management].

154 *Virgin Forest Inventory of the Carpathians*, EUR. ENV'T AGENCY & SECRETARIAT CARPATHIAN CONVENTION, https://perma.cc/MV7Z-TA8Z (last updated June 15, 2020).

155 Protocol for the Implementation of the Alpine Convention in the Field of Mountain Forests art. 10(1), Feb. 27, 1996. *See also* Volker Mauerhofer et al., *The Alpine Convention and Wilderness Protection*, *in* WILDERNESS PROTECTION IN EUROPE: THE ROLE OF INTERNATIONAL, EUROPEAN AND NATIONAL LAW, *supra* note 7, at 199, 205 (further detailing the Alpine Convention and its protocols).

156 Examples include IUCN category 1b areas in Slovakia that are situated within the Carpathian Mountains region and—for the Alps—Dürrenstein National Park and Hohe Tauern National Park in Austria. *See Slovakia*, PROTECTED PLANET, https://perma.cc/JXB6-HCST (last visited Feb. 19, 2021) (showing the IUCN 1b wilderness areas in Slovakia). *See also IUCN 1b Wilderness Celebration in Hohe Tauern National Park*, EUR. WILDERNESS SOC'Y, https://perma.cc/TQ6N-LZLF (last visited Feb. 19, 2021) (describing the two IUCN 1b wilderness areas in Austria).

157 For a more general introduction to the evolution of EU environmental law and its international relevance, see, e.g., Elisa Morgera, *An Introduction to European Environmental Law from an International Environmental Law Perspective*, 3–5, 13–16 (Univ. of Edinburgh Sch. of L. Working Paper Series, Paper No. 2010/37, 2010), https://perma.cc/6CBT-ASZ8.

158 Council Directive 2009/147/EC, 2009 O.J. (L 20) 7 [hereinafter Bird Directive].

159 Council Directive 92/43/EEC, 1992 O.J. (L 206) 7 [hereinafter Habitats Directive].

160 *Area of Natura 2000 Sites Designated Under the EU Habitats and Birds Directives*, EUR. ENV'T AGENCY, https://perma.cc/HHJ9-BMYZ (last updated June 22, 2020).

161 *Natura 2000*, EUR. COMM'N, https://perma.cc/69QM-4L9P (last visited Feb. 19, 2021).

162 Habitats Directive, *supra* note 159, art. 6.

biodiversity.[163] Under Article 6(3) competent authorities may only authorize a new plan or project within or outside a Natura 2000 site if "[i]n the light of the conclusions of the assessment of the implications for the site . . . [they] shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned."[164] The EU Court has explained that this is the case "where no reasonable scientific doubt remains as to the absence of such effects."[165] However, this strictness does not necessarily imply wilderness protection.[166] Natura 2000 sites are designated for specific species and habitat types (listed in Annex I of the Birds Directive[167] and Annexes I and II of the Habitats Directive[168]) and their conservation objectives must relate to these relatively specific natural values.[169] As the Article 6(3) assessment must be made in light of these objectives, and therefore be related to the characteristics that make the site suitable for the species and habitat types for which the site has been designated, wilderness protection is not the main aim. However, as explained by the European Commission[170] in 2013, Natura 2000 and wilderness protection can go hand-in-hand:

> [A] wilderness approach can be the most appropriate or even necessary management approach for those specific Natura 2000 sites hosting habitat types and species of Community interest whose maintenance or restoration to a favourable conservation status is dependent on some degree of wilderness qualities and natural processes. And there will be sites for which a wilderness approach can be useful but not necessarily the only way to

163 *Natura 2000*, EUR. LIME ASS'N, https://perma.cc/8LYG-W2A4 (last visited Feb. 19, 2021).

164 Habitats Directive, *supra* note 159, art. 6, para. 3. *See, e.g.*, Case C-127/02, Landelijke Vereniging tot Behoud van de Waddenzee v. Staatssecretaris van Landbouw, Natuurbeheer en Visserij (Nat'l Ass'n for the Conservation of the Wadden Sea v. State Sec'y for Agric.), 2004 E.C.R. I-7405, I-7469–71 (explaining the relationship between Article 6(2) and 6(3) of the Habitats Directive).

165 Nat'l Ass'n for the Conservation of the Wadden Sea, 2004 E.C.R. at I-7471.

166 *See* Kees Bastmeijer, *Natura 2000 and the Protection of Wilderness in Europe*, *in* WILDERNESS PROTECTION IN EUROPE: THE ROLE OF INTERNATIONAL, EUROPEAN, AND NATIONAL LAW, *supra* note 7, at 177, 189–93 (explaining that the degree of wilderness protection is driven by the conservation objectives of the site and thus highly dependent upon the importance of wilderness to the site's protected habitat and species).

167 Birds Directive, *supra* note 158, annex I.

168 Habitat Directive, *supra* note 159, annex I, annex II.

169 *See Commission Note on Setting Conservation Objectives of Natura 2000 Sites* (Nov. 23, 2012), https://perma.cc/V5UN-UC3R ("A conservation objective is the specification of the overall target for the species and/or habitat types for which a site is designated.").

170 The European Commission is the institution of the European Union that has the competence to develop and propose legislation to the EU Council and EU Parliament. *European Commission*, EUR. PARLIAMENT, https://perma.cc/U73M-FV3N (last visited Feb. 19, 2021). It is also the "watch dog" to ensure that the 27 EU Member States comply with EU law. *See id.* (explaining that the European Commission is responsible for the implementation of EU law). When the Commission believes that a Member State has breached EU law, the Commission may bring a case to the EU Court of Justice. *The Court of Justice of the European Union*, FED. MINISTRY LAB. & SOC. AFF. (Sept. 26, 2016), https://perma.cc/2HVM-8U5G.

> restore or maintain the species and habitats at a favourable conservation status.[171]

In national law, Iceland, Finland and Norway have adopted legislation that explicitly aims to protect wilderness. Iceland's Nature Conservation Act 2013 provides the instrument of designating "uninhabited wilderness."[172] No areas have yet been formally designated under this provision as of July 2020, but much work has been done to map wilderness in Iceland in support of possible future designations.[173] In Finland, as of early 2021, twelve wilderness reserves have been designated under the Finnish Wilderness Act of 1991,[174] athough the aim of the Act is cast broadly "to preserve their character, securing the Sámi culture, and developing a multi-purpose utilization of nature."[175] Consequently, "preserving a reserve's wild nature is balanced against the cultural and economic objectives for which the reserve has been established, particularly the interest of Sámi and other local people in using natural sources of livelihood."[176] This "multi-purpose approach" has resulted in international criticism from the perspective of wilderness protection as it results in allowance of activities that would be prohibited in wilderness areas elsewhere.[177] Kokko and Oksanen, however, state that this criticism may in part "result from an unduly limited acknowledgement of the fact that the people of different countries may have different perceptions of what 'wilderness' entails."[178] They also note that the legal statuses of the wilderness areas have been changed because "a significant amount of each wilderness reserve has become protected under Natura 2000" and that "Sámi cultural rights in wilderness areas still need further clarification."[179] According to IUCN's Protected Areas database, all twelve Finnish wilderness reserves have been shifted from

171 EUR. COMMISSION., GUIDELINES ON WILDERNESS IN NATURA 2000: MANAGEMENT OF TERRESTRIAL WILDERNESS AND WILD AREAS WITHIN THE NATURA 2000 NETWORK 6–7 (2013), https://perma.cc/VRL6-9BRW.

172 Nature Conservation Act, nr. 60/2013, art. 46 *translated in* Adalheidur Jóhannsdóttir, *Wilderness Protection in Iceland*, *in* WILDERNESS PROTECTION IN EUROPE: THE ROLE OF INTERNATIONAL, EUROPEAN, AND NATIONAL LAW, *supra* note 7, at 370.

173 Svar umhverfis- og auðlindaráðherra við fyrirspurn frá Guðmundi Andra Thorssyni um óbyggð víðerni og friðlýsingar [Answer by the Minister of the Environment and Natural Resources in response to an inquiry about uninhabited wilderness and protection], Parliamentary document 1807-873, 149th Legis. Assemb. 2018–2019, https://perma.cc/4J2C-FLKF.

174 Wilderness Act, 1991, § 3 (Act No. 62/1991) (Fin.).

175 *Id.* § 1. *See also* Kai Kokko & Markku Oksanen, *Wilderness Protection in Finland*, *in* WILDERNESS PROTECTION IN EUROPE: THE ROLE OF INTERNATIONAL, EUROPEAN, AND NATIONAL LAW, *supra* note 7, at 314, 319 (providing a translation of the Finnish Wilderness Act's broad purpose).

176 Kokko & Oksanen, *supra* note 175, at 314, 335.

177 *Id.* at 335–36.

178 *Id.* at 336.

179 *Id.*

IUCN's protected area management category VI ("protected area with sustainable use of natural resources") to category 1b ("wilderness").[180]

In Norway, wilderness protection is particularly strong in Svalbard. About 65% of this Arctic archipelago is a protected area under the Svalbard Environmental Protection Act 2001.[181] One of the fundamental principles of the Act is that "[t]here shall be protected areas in Svalbard that . . . contribute to the maintenance of wilderness and untouched nature."[182] Designated areas do not receive the title of "wilderness area," but the description of the purpose of National Parks and Nature Reserves clearly reflect the main qualities of wilderness.[183] Both categories aim "to maintain large, continuous and largely undisturbed areas of natural environment on land and in the sea with intact habitats, ecosystems, species, natural ecological processes, landscapes, cultural heritage, and cultural environments."[184]

The domestic laws of other European countries lack explicit references to "wilderness," though some provide legal tools to protect wilderness. In many countries, national parks systems contribute significantly to wilderness protection.[185] These parks generally represent large areas with relatively intact ecosystems, and many have enjoyed legal protection from large-scale human exploitation for many decades.[186] While national parks generally allow for various categories of human activities, they often include stricter protected zones, achieved through management plans or formally designated natural reserves.[187] An

180 *See* A.T. KUITERS ET AL., WILDERNESS REGISTER AND INDICATOR FOR EUROPE: FINAL REPORT 20 (2013), https://perma.cc/KA7M-55VH (noting Finland's early classification of protected areas as Category VI to allow for resource use as opposed to representing wilderness qualities); *Finland*, PROTECTED PLANET, https://perma.cc/K2A2-2GCC (last visited Jan. 28, 2021) (showing that Finland has now reclassified these areas as 1b).

181 *Svalbard and Jan Mayen*, PROTECTED PLANET, https://perma.cc/5K8C-4KT3. *See also* Svalbard Environmental Protection Act, Act No. 79/2001 (Nor.) (establishing continuous areas of wilderness in Svalbard to preserve its environment).

182 Svalbard Environmental Protection Act, Act No. 79/2001, art. 11 (Nor.).

183 *See id.* §§ 16–17 (allowing large or mainly untouched areas of natural habitat to be protected as National Parks if they are valuable for research or experiencing Svalbard's natural and cultural heritage, while defining Nature Reserves as areas of distinctive or vulnerable ecosystems, special types of habitat or geological formations, or special scientific interest that may receive absolute protection).

184 Forskrift om større naturvernområder og fuglereservater på Svalbard videreført fra 1973 av 04. april 2014, §§ 3, 14 *translated at Regulations relating to large nature conservation areas and bird reserves in Svalbard as established in 1973*, GOV'T. NOR. (Apr. 4, 2014), https://perma.cc/49LK-LECG.

185 *See* Kees Bastmeijer, *Conclusions*, *in* WILDERNESS PROTECTION IN EUROPE: THE ROLE OF INTERNATIONAL, EUROPEAN, AND NATIONAL LAW, *supra* note 7, at 539, 578–79 (2016) (explaining many countries' criteria for national parks and their connection with relatively high wilderness qualities).

186 *Id.* at 543–44, 578 (describing the establishment of national parks across Europe in the early twentieth century as motivated by the need to preserve large tracts of undisturbed nature).

187 *Id.* at 581 ("Zoning regimes often provide for the option (or requirement) to designate 'core zones' with high wilderness qualities that enjoy the highest level of protection against human disturbance.").

example is the designation of "strict nature reserves" within Estonia's national parks.[188] Here "[a]ll types of human activity is prohibited" except for supervision, rescue work, management, and monitoring.[189] In some countries, a national park has become the subject of a separate parliamentary statute. Of particular relevance from a wilderness perspective is the Icelandic Vatnajökull National Park Act of 2007[190] that aims to protect a relatively untouched part of Iceland's Central Highlands, covering 14% of Iceland.[191] The Act, in combination with the management plan for this park, provides "a relatively good level of wilderness protection, although negative impacts upon wilderness qualities may still be possible."[192] The area has the status of national park, and its nomination in 2018 for inclusion in the World Heritage List identified that "some 85% of the property is classified as wilderness."[193]

The extent to which the available legal tools for wilderness protection in Europe have been used in practice has not been adequately studied and depends heavily on conscious policy decisions by governments. While for several decades there has been a tendency to focus attention on protecting specific biodiversity values (species and habitat types) and sustainable use of natural resources, several governments have adopted clear wilderness policy targets. For instance, the German National Biodiversity Strategy (NBS) states: "[b]y the year 2020, Mother Nature is again able to develop according to her own laws throughout at least 2% of Germany's national territory."[194] The German Federal Agency for Nature Conservation explains that "[t]his target is primarily to be attained with the aid of large wilderness areas."[195] The strategy also stipulates the goal that "[b]y 2020, forests with natural forest development account for 5% of the wooded area."[196] Schumacher and others concluded in 2018 that "the NBS wilderness targets in principle are achievable even in a densely populated country like Germany" but also observed that "it is still a long

188 Looduskaitseseadus [Nature Conservation Act] 2004, ch. 4 § 29(1) (Est.) *translated at Nature Conservation Act*, RIIGI TEATAJA (Jan. 27, 2021) https://perma.cc/WQ82-UXUU.

189 *Id.* § 29(2)–(4).

190 LÖG um Vatnajökulsþjóðgarð [Vatnajökull National Park Act] 2007 nr. 60/2007 (Ice.) *translated at* Ministry for the Env't & Nat. Res., *Act on Vatnajökull National Park No. 60 /2007*, GOV'T ICE. (Nov. 16, 2018), https://perma.cc/L2XK-3GPX.

191 SNORRI BALDURSSON ET AL., NOMINATION OF VATNAJÖKULL NATIONAL PARK FOR INCLUSION IN THE WORLD HERITAGE LIST 12–13 (2018), https://perma.cc/JVH8-37D9.

192 Jóhannsdóttir, *supra* note 172, at 376.

193 BALDURSSON ET AL., *supra* note 191, at 13.

194 FEDERAL MINISTRY FOR THE ENVIRONMENT, NATURE, CONSERVATION, AND NUCLEAR SAFETY, GERMANY, NATIONAL STRATEGY ON BIOLOGICAL DIVERSITY 40 (2007) [hereinafter Germany's NBSAP].

195 *Wilderness Areas*, BUNDESAMT FUR NATURSCHUTZ, https://perma.cc/8PN8-2X2Y (last visited Feb. 2, 2021).

196 Germany's NBSAP, *supra* note 194, at 31.

way to achieve the wilderness targets," for instance, due to "conflicts between stakeholders."[197]

2. Definitions of Wilderness

In Europe, not all languages may have a word for "wilderness," and if they do, its meaning may differ according to culture and history.[198] The Finnish word for wilderness is *erämaa,* which refers to "an uninhabited area for hunting, fishing, berry-picking and, in some regions, burn-beating for cultivation," or in other words, "a place in which to acquire one's share of nature's bounty."[199] Particularly since wilderness protection received more political attention at the EU level in 2009, attempts were made to develop a wilderness definition for Europe.[200] In consultation with experts, the nongovernmental organization "Wild Europe" developed a definition in 2012–2013,[201] which was adopted by the European Commission as its working definition in the Natura 2000 wilderness guidelines of 2013:

> A wilderness is an area governed by natural processes. It is composed of native habitats and species, and large enough for the effective ecological functioning of natural processes. It is unmodified or only slightly modified and without intrusive or extractive human activity, settlements, infrastructure or visual disturbance.[202]

Several European countries have adopted this wilderness definition. The German government did so for implementation of its 2% policy objective.[203] The components of this definition also correspond with the components of the definition of "uninhabited wilderness" in Iceland's Nature Conservation Law 2013: "[l]arge land areas wherein human influences are minimal and where nature can evolve without the pressure from human activities."[204]

Thus, while definitions may vary, most include the "wilderness qualities" of "large size," "undevelopedness" (absence of permanent

197 H. Schumacher et al., *More Wilderness for Germany: Implementing an Important Objective of Germany's National Strategy on Biological Diversity*, 42 J. NATURE CONSERVATION 45, 51 (2018).

198 *See* Bastmeijer, *supra* note 185, at 540–42 (reviewing Europe's differing perceptions of wilderness both in terms of language and culture).

199 Kokko & Oksanen, *supra* note 175, at 314, 314–16.

200 Steve Carver, *Mapping Wilderness in Europe*, *in* WILDERNESS PROTECTION IN EUROPE: THE ROLE OF INTERNATIONAL, EUROPEAN, AND NATIONAL LAW, *supra* note 7, at 38, 43–44.

201 WILD EUROPE, A WORKING DEFINITION OF EUROPEAN WILDERNESS AREAS AND WILD AREAS 1–2 (2013), https://perma.cc/VH67-Y259.

202 EUR. COMMISSION, *supra* note 171, at 10.

203 Schumacher et al., *supra* note 197, at 47.

204 Nature Conservation Act, nr. 60/2013, art. 46 *translated in* Jóhannsdóttir, *supra* note 172, at 370.

human infrastructure, artefacts or disturbance),[205] and "naturalness" (free functioning native ecosystems).[206] In terms of naturalness, benchmarks such as virgin forests[207] appear to relate to "primary wilderness" (ecosystems unchanged by humankind),[208] yet most European definitions of wilderness accommodate re-wilding and the protection of "secondary wilderness."[209]

This larger flexibility in terms of wilderness definitions in Europe, compared to the United States and Australia, may be explained by the fact that, in Europe, little relatively untouched primary wilderness is left.[210] This has resulted in an approach in which the above wilderness definition is positioned within a broader "wilderness continuum." The European Commission has explained this as follows:

> In the European context, and the Natura 2000 network in particular, it is important to notice that there is a spectrum of more or less wild areas according to the intensity of human interference. In that sense, wilderness is a relative concept which can be measured along a 'continuum', with wilderness at one end and marginal used land at the other. Re-wilding is a process to move areas up towards a wilder state, where the final stage is wilderness.[211]

This approach of a wilderness continuum may still emphasize the importance of strict protection for the relatively untouched primary wildernesses, for example, the virgin forests in the Carpathian Mountains,[212] but at the same time it does not disqualify the value of the wilderness concept for the rest of Europe. It particularly suggests that wilderness can be recreated through re-wilding.

Finally, it should be noted that it is not always easy to distinguish components of a wilderness definitions from values of wilderness or aims of wilderness protection. For example, while the Icelandic definition focuses on large size, minimum human influence, and naturalness, the description of the aims of protection also include to "ensure that present

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205 MARTIN HAWES ET AL., REFINING THE DEFINITION OF WILDERNESS: SAFEGUARDING THE EXPERIENTIAL AND ECOLOGICAL VALUES OF REMOTE NATURAL LAND 8 (2018).

206 *Id.* at 4, 6, 8.

207 *See, e.g.*, Protocol on Sustainable Forest Management, *supra* note 153, art. 7 ("'Virgin forests' means natural forests which have not been influenced directly by human activities in their development.").

208 Gerd Lupp et al., *"Wilderness"—A Designation for Central European Landscapes?*, 28 LAND USE POL'Y 594, 597 (2011).

209 APPLIED URBAN ECOLOGY: A GLOBAL FRAMEWORK 83 (Matthias Richter & Ulrike Weiland eds., 2012) ("'[S]econdary wilderness' [is] vegetation that has arisen spontaneously on anthropogenic locations and which can develop unhindered."); EUR. COMMISSION, *supra* note 171, at 12 (describing Europe's broad definition of wilderness as categorized by the level of human interference).

210 *See* EUR. COMMISSION, *supra* note 171, at 12 (noting that Europe's fragmented 'wild areas' are better defined on a continuum).

211 *Id.*

212 *See supra* notes 153–156 and accompanying text (describing provisions that explicitly require strict protection for the Carpathian virgin forests).

and future generations can enjoy therein solitude and nature without disturbance from man-made infrastructure or traffic from motor vehicles."[213]

3. Conservation Management and Exceptions to the Non-intervention Principle

Although the foregoing examples provide good opportunities for wilderness protection, there are few guarantees. Because wilderness protection is not the primary aim of most of these regimes, the applicable rules leave much space for balancing interests and human interference. Under the EU Natura 2000–regime, the Court of Justice of the EU has allowed a road-upgrade project in Spanish Lynx habitat because more than 9 kilometers of fences and safe road crossings would sufficiently prevent road kills.[214] This illustrates that a regime that strongly focuses on the protection of specific species and habitat types may not ensure wilderness protection. Consequently, under these regimes the actual level of wilderness protection depends heavily on policy choices by governments.

Although the explicit wilderness legislation of Iceland and Svalbard prohibit most activities that affect wilderness qualities, exceptions apply.[215] The Icelandic Vatnajökull National Park Act of 2007 and the management plan for this park allow camping as well as for 4x4 driving on a limited number of roads, and permits may also be issued for UAV (drone) use.[216] In the protected areas of Svalbard "[s]hrimp trawling is permitted in waters where the depth is 100 m[eters] or more."[217] The "harvesting of marine mammals that do not show site fidelity" is also allowed "if this is governed by regulations adopted by the Ministry of Trade, Industry, and Fisheries."[218] The Governor of Svalbard may also issue a permit for exemptions to the prohibitions (e.g., some building works and off-road vehicles).[219] Due to the threefold purpose of Finland's Wilderness Act, it leaves much more space for human activities. The balancing of interests between wilderness protection, Sámi culture, and sustainable use has resulted in a regime that—through the management

213 Nature Conservation Act, nr. 60/2013, art. 46, *translated in* Jóhannsdóttir, *supra* note 172, at 370.

214 Case C-308/08, Comm'n. v. Spain, 2010 E.C.R. I-4281, I-4297–99.

215 For a detailed discussion, see NEUMANN, *supra* note 17, at 329–32 (noting exceptions for aircrafts depending on the use and for motor traffic depending on the snow coverage).

216 *Frequently Asked Questions*, VATNAJOKULL NAT'L PARK, https://perma.cc/96SH-EXRJ (last visited Feb. 19, 2021); *Permits*, VATNAJOKULL NAT'L PARK, https://perma.cc/QG7G-V3KY (last visited Feb. 19, 2021).

217 Forskrift om større naturvernområder og fuglereservater på Svalbard videreført fra 1973 av 04. Apr. 2014, §§ 6, 23 *translated at Regulations relating to large nature conservation areas and bird reserves in Svalbard as established in 1973*, GOV'T NOR. (Apr. 4, 2014), https://perma.cc/289X-SJBH.

218 *Id.* §§ 8, 25.

219 *Id.* §§ 11, 28.

plan or explicit permits—may allow for forestry, building projects, road constructing, and mining.[220]

Also, the European emphasis on "non-intervention management" in wilderness management seems problematic given that so much wilderness in Europe has been destroyed or modified that now can be reinstated only with some intervention. Examples include the removal of non-native species, reintroduction of certain species that are considered "missing links" in the ecosystem, enlargement of small wilderness areas, measures within areas to limit fragmentation (e.g., by the removal of roads), and measures to improve the connectivity between nature areas.[221] As in Australia and the United States, climate change may further increase the need in Europe to allow for exceptions to the purist "hands off" approach.[222]

E. Comparisons

Without direction from any international treaty, nations have embraced the idea of conserving wild areas, especially for aesthetic and recreational values, and where such areas lack alternate economic uses. The globalization of the ideal of wilderness conservation during the twentieth century entailed the transplantation of legal models and policies across countries, resulting in relatively high convergence in approach. Most often, this approach entails the national park or other type of formally designated conservation reserve on public land. The IUCN, established in 1948, has driven global standards for wilderness conservation from the mid-twentieth century.[223] Through its World Commission on Protected Areas (WCPA), the IUCN has prepared guidelines and best practices for the management of nature conservation, including wilderness areas.[224] Through its *Guidelines for Applying Protected Area Management Categories*, the IUCN harmonizes the concept of wilderness, to some extent, with the management aims of protected areas (not in a legal sense).[225] Furthermore, WCPA's Protected Areas Database shows which governments have made explicit decisions

220 Kokko & Oksanen, *supra* note 175, at 314, 326–27.

221 EUR. COMMISSION, *supra* note 171, at 35–36, 43–53.

222 *See generally* Alejandro E. Camacho, *Managing Ecosystem Effects in an Era of Rapid Climate Change*, *in* 1 ELGAR ENCYCLOPEDIA OF ENVIRONMENTAL LAW 555, 555–64 (Michael Faure ed., 2016) (noting that the legal framework governing wilderness management in the EU is not well suited for "maximizing ecological health in light of climate change").

223 *IUCN – A Brief History*, INT'L UNION CONSERVATION NATURE, https://perma.cc/8H7J-A7XH (last visited Feb. 19, 2021).

224 *World Commission on Protected Areas*, INT'L UNION CONSERVATION NATURE, https://perma.cc/XEV4-2V3U (last visited Feb. 19, 2021).

225 INT'L UNION FOR CONSERVATION OF NATURE, *supra* note 7, at 3–4, 14–16.

to manage areas as "wilderness" (category 1b), which may stimulate other governments to do the same.[226]

Conversely, some centrifugal forces in shaping wilderness law have been at work. In Australia and the United States, designation and management of wilderness areas and management sometimes has had to accommodate the legal interests of Indigenous peoples.[227] In Europe, this consideration has been applicable only in Scandinavia.[228] On the other hand, wilderness law in Europe has had to accommodate much higher levels of historical, intensive human settlement and development than in Australia or the United States, resulting in protected wilderness areas generally being smaller and more adulterated with human activity.[229] Wilderness law in Europe has also evolved under the aegis of EU standards and regulations, and yet while governments in Australia and the United States have enjoyed greater latitude to customize their own approach, both have also had to deal with the constraints of federalism, especially in Australia where wilderness law has been largely shaped at a subnational level by state governments.[230]

By creating temporal and spatial enclaves, wilderness protected areas have benefits and limitations. Territorial enclaves positively allow for precisely demarcated boundaries, sometimes supplemented with buffer zones, that can enable efficient and transparent application of legal controls (e.g., restrictions on allowable development with the mapped enclave).[231] Conversely, however, the enclave model assumes that wilderness sanctuaries can be set aside in designated spaces within which all conservation goals are met while freeing the remaining, and much

226 *Explore Protected Areas and OECMs*, PROTECTED PLANET, https://perma.cc/RPB6-KH8B (last visited Feb. 19, 20201) (using the "IUCN Category" filter to identify individual protected areas, countries, and regions with areas designated at "1b").

227 *See, e.g.*, SARAH A. CASSON ET AL., INT'L UNION FOR CONSERVATION OF NATURE, WILDERNESS PROTECTED AREAS: MANAGEMENT GUIDELINE FOR IUCN CATEGORY 1B PROTECTED AREAS 22, 69 (Craig Groves ed., 2017) (detailing Australia's management of Fish River Station, as advised by the Labarganyan, Wagiman, Malak Malak, and Kamu peoples, and the United States' management of the Arctic National Wildlife Refuge, the traditional land of the Inupiat and Gwich'in peoples, and the Kachina Wilderness Area, sacred wilderness to 13 Native American tribes).

228 *E.g.*, *id.* at 68 (noting Finland's Wilderness Act aims to protect Sámi culture and traditional subsistence uses of wilderness areas).

229 *See* Matthias Diemer et al., *Urban Wilderness in Central Europe*, INT. J. WILDERNESS, Dec. 2003, at 7, 7–9 (discussing how European landscapes underwent centuries of human habitation resulting in small wilderness areas that do not meet U.S. Wilderness Act or IUCN classification criteria).

230 *See generally* R. Daniel Kelemen, *Regulatory Federalism: EU Environmental Regulation in Comparative Perspective*, 20 J. PUB. POL'Y 133, 145–54 (2000) (detailing the implications of different countries' institutional structures on environmental policy and environmental enforcement).

231 *See* Dorothy Rotich, *Concept of Zoning Management in Protected Areas*, 2 J. ENV'T & EARTH SCI., 173, 173–75, 181–82 (explaining that clear demarcation allows for strict environmental protection and continued human activity, while buffer zones can help integrate biodiversity conservation with economic development at larger scales).

larger areas, for economic activity and settlement.[232] Yet, as the following Part of this Article examines more fully, "enclaves" may be insufficient to meet wilderness protection goals given that threats to them can emanate from exogenous sources often very distant from the wilderness area.[233] Enclaves may also be problematic as a temporal construct, seeking to protect a given set of constructed wilderness values at a moment in time without recognition of the historical condition of the wilderness area, such as its occupation by Indigenous people.[234] As the U.S. Parks Service has acknowledged in regard to Yellowstone, which set the model of the "wilderness" enclave, that it was: "for thousands of years . . . where [Indians] hunted, fished, gathered plants, quarried obsidian, and used the thermal waters for religious and medicinal purposes."[235] Moreover, this "freezing in time" of wilderness values may ignore future changes given the inherently dynamic nature of ecosystems even without accounting for additional anthropogenic impacts such as from global warming.

IV. WILDERNESS GOVERNANCE IN THE ANTHROPOCENE

A. Wilderness and the Anthropocene

The Anthropocene has been proposed as a new epoch in the Earth's history, in which geological, climatic and biospheric processes are being profoundly altered by humans.[236] The Anthropocene is characterized by

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[232] *See* Robert B. Keiter, *Toward a National Conservation Network Act: Transforming Landscape Conservation on the Public Lands Into Law*, 42 HARV. ENV'T L. REV. 61, 64–65 (2018) (noting that nature enclaves are designed to preserve specific areas or objects for the benefit of future generations).

[233] *See id.* at 90–93 (describing the failure of the enclave theory and presenting alternatives that better protect large areas from mounting human-driven pressures); *infra* notes 289–293 and accompanying text (including the increased connection of wilderness areas as a key adaptation strategy against climate change).

[234] *See* HAWES ET AL., *supra* note 205, at 13–14 ("[W]estern conceptions of wilderness tended to reflect a settler-colonial perspective that ignored or downplayed the deep interrelationships that existed between Indigenous people and 'wild' landscapes."). For more history on how "wilderness" may be constructed or construed from lands that have been managed and manipulated by indigenous occupants, see PASCOE, *supra* note 41 (discussing the contrast between infrastructure developed by indigenous communities and ideas of pre-colonial life); REBECCA SOLNIT, SAVAGE DREAMS (1994) (noting valuable land management techniques employed by indigenous communities that were vital to the health of the landscapes); MARK DAVID SPENCE, DISPOSSESSING THE WILDERNESS: INDIAN REMOVAL AND THE MAKING OF THE NATIONAL PARKS (1999) (discussing the creation of national parks and the subsequent removal of native inhabitants to prevent disruptions to the areas' "pristine" nature).

[235] Harlan Kredit, *Yellowstone: Historic Tribes*, U.S. NAT'L PARK SERV., https://perma.cc/2QTY-ATYP (last visited Feb. 19, 2021).

[236] *Working Group on the 'Anthropocene'*, SUBCOMMISSION ON QUATERNARY STRATIGRAPHY, https://perma.cc/K7UT-7TRT (last visited Feb. 19, 2021) (noting that the term 'Anthropocene' was initially coined by Paul Crutzen and Eugene Stoermer in 2000, and further analyzed by The Anthropocene Working Group, a part of a constituent body of the International Commission on Stratigraphy).

abrupt, rapid, and large-scale environmental change, with severe consequences for humans and non-human nature, including wilderness areas in both terrestrial and marine realms.[237] The implications of anthropogenic climate change for wilderness areas provide a particularly stark example of the challenges that the Anthropocene presents to the concept of wilderness in legal frameworks.

While recreational opportunities and other wilderness values will be affected by climate change, its implications are most complex and challenging for the biodiversity that wilderness areas contain, including native species, ecosystems and ecological functions. In fact, wilderness protection is fundamentally concerned with the presence and persistence of native biodiversity.[238] For example, laws that seek to protect the intrinsic value of wilderness places and their remoteness should protect the sum total of a host of biodiversity elements, including healthy and functioning ecosystems at landscape scales. Similarly, in laws that emphasize anthropocentric values such as human recreation and renewal, managers should protect the biodiversity that helps create that aesthetic and recreational experience, including their rich and unique assemblages of native species. Crucially, biodiversity conservation is also bolstered—far more strongly than previously thought—by protecting wilderness,[239] and wilderness laws provide a high standard of protection through the strict exclusion of human technology and other degrading activities.[240] In all, the effects of climate change on biodiversity will likely have significant and potentially cascading implications for the fate of wilderness areas more broadly.

Syntheses by the Intergovernmental Panel on Climate Change (IPCC)[241] and Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)[242] highlight many climatic changes with serious implications for biodiversity. These include changing rainfall patterns, warming and drying trends, ocean acidification, sea level rise, and more common and severe extreme events such as heatwaves (on land and in the ocean), wildfires, and floods.[243]

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237 *Id.*

238 Keiter, *supra* note 232, at 63–64.

239 *E.g.*, Moreno Di Marco et al., *Wilderness Areas Halve the Extinction Risk of Terrestrial Biodiversity*, 573 NATURE 582, 583, 585 (2019) (finding that wilderness areas are critical in reducing extinction risk of terrestrial biodiversity).

240 *See id.* at 582 ("Wilderness areas, in which industrial levels of human disturbance are absent or minimal, are the last stronghold of intact ecosystems.").

241 *See* C.B. Field et al., IPCC, *Summary for Policymakers*, *in* CLIMATE CHANGE 2014: IMPACTS, ADAPTATION AND VULNERABILITY, CONTRIBUTION OF WORKING GROUP II TO THE FIFTH ASSESSMENT REPORT OF THE IPCC 12 (2014) [hereinafter IPCC AR5 SPM] (projecting extensive biodiversity loss when global warming surpasses an additional 2°C).

242 *See* IPBES, SUMMARY FOR POLICYMAKERS OF THE IPBES GLOBAL ASSESSMENT REPORT ON BIODIVERSITY AND ECOSYSTEM SERVICES 13 (S. Díaz et al. eds., 2019) (citing the frequency and intensity of extreme weather events, fires, floods, and droughts as a driver of decreasing biodiversity).

243 IPCC AR5 SPM, *supra* note 241, at 21; IPBES, *supra* note 242, at 13.

Some climate breakdown will directly result in habitat and species losses, due to, for example, wildfires and sea level elevation (including inundation of coastal areas and low-lying islands).[244] Climate change will also have indirect effects on natural systems in areas designated or managed as wilderness.[245] The IPCC notes that many terrestrial, freshwater, and marine species have already "shifted their geographic ranges, seasonal activities, migration patterns, abundances, and species interactions in response to ongoing climate change."[246] Many more species' geographic distributions will shift or contract as their "climatic niche"—the temperature, rainfall and other habitat conditions that they rely on—shifts or disappears, including existing and new invasive species.[247] These effects of a rapidly changing climate are expected to drive a growing number of species to extinction and ecological communities to collapse over coming decades,[248] and species and ecosystems in designated wilderness areas will not be immune from these effects.

Recent research demonstrates that wilderness areas comprise the primary places left on the planet with mixes of species at "near-natural levels of abundance" and that support "ecological processes that sustain biodiversity over evolutionary timescales."[249] To the extent that wilderness areas are more likely to be healthy, diverse, and resilient, they may be better placed to withstand some of the more moderate impacts of

244 *Id.* at 25, 32.

245 *E.g.*, Sandra Zellmer, *Wilderness, Water, and Climate Change*, 42 ENV'T L. 313, 325–32 (2012) (discussing threats to wilderness areas from climate change, including changes to precipitation patterns, vegetation distribution, species migration and invasions, wind, and soil composition, temperature increases, diminished snowpack and earlier snowmelt, disease, pest infestation, fire, and species extinctions).

246 IPCC AR5 SPM, *supra* note 241, at 4.

247 *See* POTSDAM INST. FOR CLIMATE IMPACT RSCH. & CLIMATE ANALYTICS, TURN DOWN THE HEAT: WHY A 4°C WARMER WORLD MUST BE AVOIDED 49, 50 (2012) (describing projected shifts in species' distributions and ecological interactions, including the "spread and establishment of invasive species"); Chi Xu et al., *Future of the Human Climate Niche*, 117 PROC. NAT'L ACAD. SCI. 11350, 11350–51 (2020) (defining the human climate niche based on the mean annual temperature and the mean annual precipitation necessary for humans to thrive, projecting that a substantial part of humanity will be left outside of this niche absent climate mitigation or migration).

248 *E.g.*, Mark C. Urban, *Accelerating Extinction Risk from Climate Change*, 348 SCI. 571 (2015) (noting that, on the current trajectory, climate change threatens one in six species, "7.9% of species are predicted to become extinct from climate change," and global extinction risk is predicted to accelerate); Céline Bellard et al., *Impacts of Climate Change on the Future of Biodiversity*, 15 ECOL. LETT. 365, 371 (2012) (predicting that some areas will lose nearly all current species and that future rates of extinction will be higher than at any time "documented in the fossil record"); Chris D. Thomas et al., *Extinction Risk from Climate Change*, 427 NATURE 145, 147 (2004) ("Anthropogenic climate warming at least ranks alongside other recognized threats to global diversity . . . [and] is likely to be the greatest threat in many if not most regions.").

249 James E.M. Watson et al., *Protect the Last of the Wild*, 563 NATURE 27, 28 (2018) (defining wilderness as land or ocean areas "free of human pressures, with a contiguous area of more than 10,000 km^2").

climate change without experiencing severe ecological disruption, transformation, and loss.

However, climate change—even at the lower end of the scale of projected impacts—may nevertheless cause catastrophic biodiversity loss in wilderness areas, which are critical for conservation and planetary processes due to their scale, ecological integrity, and resilience.[250] Thus, even low levels of biodiversity loss in wilderness areas will likely include global losses of important reservoirs of genetic information, some of the last remaining reference points for restoration and rewilding, and habitat strongholds for many threatened species, ecological communities, and ecological processes.[251]

Wilderness areas also represent some of the most intact remnant habitat to which species can retreat and persist as the climate changes.[252] Harm to, or loss of, these "climate refugia" will contribute by orders of magnitude to the threat of biodiversity decline and species extinction in coming decades.[253]

Climate change will affect different wilderness areas differently. Disproportionately greater rates and scales of warming at the Earth's poles will increase snow and permafrost melt in the Arctic and in Antarctica.[254] Warming will radically alter the characteristics of those areas and will likely cause ecological change and loss earlier and at larger scales than in many other ecosystems.[255] Some places already under severe threat, such as the Amazon Rainforest or alpine glaciers, are also particularly vulnerable to climatic tipping points that may cause entire systems to collapse.[256] Species' habitats will deteriorate as food chains deteriorate, and species may also be imperiled due to increasing human activities as a result of improved accessibility of polar regions and higher chances of survival for non-native species.[257]

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250 *See* Di Marco et al., *supra* note 239, at 585 (highlighting wilderness areas' unique biological communities, intact ecosystems, and intrinsic conservation value).

251 *See* Watson et al., *supra* note 249, at 28 (describing the increasing importance of the Earth's remaining wilderness areas as buffers against climate change impacts); IPCC AR5 SPM, *supra* note 241, at 12 (projecting an increased number of ecosystems at risk of severe consequences with additional warming).

252 *See* Watson et al., *supra* note 249, at 28 ("Safeguarding intact ecosystems is also key to mitigating the effects of climate change, which are making the refuge function of wilderness areas especially important.").

253 *See* Toni Lynn Morelli & Connie Millar, *Climate Change Refugia*, U.S. DEP'T OF AGRIC.: CLIMATE CHANGE RESOURCE CTR., https://perma.cc/JCA4-GUTJ (last visited Feb. 19, 2021) ("Climate change refugia are 'areas that remain relatively buffered from contemporary climate change over time and enable persistence of valued . . . resources").

254 *See* IPCC AR5 SPM, *supra* note 241, at 4 ("Climate change is causing permafrost warming and thawing in high latitude regions.").

255 *See id.* at 80 (estimating that the physical, biological, and socioeconomic risks will have faster rates of change than social systems can adapt to in polar regions).

256 Will Steffen et al., *Trajectories of the Earth System in the Anthropocene*, 115 PNAS 8252, 8252–59 (2018).

257 *See* CONSERVATION OF ARCTIC FLORA & FAUNA, ARCTIC BIODIVERSITY ASSESSMENT: REPORT FOR POLICY MAKERS (2013) (describing the increased threat to the Arctic from invasive species introduced by human activity); *Information Paper submitted by the Scientific*

The scale, severity, and speed of climate change will almost certainly affect species, ecological functions, and aesthetic characteristics of even the most resilient wilderness areas. Consequently, urgent, rapid, and radically-upscaled efforts to reduce greenhouse gas emissions and to remove greenhouse gasses from the atmosphere are crucial for conserving wilderness areas (and the rich diversity of life everywhere else on the planet).[258] With some change already locked into the climate system, species, ecosystems and landscapes will also need to rapidly adapt their behaviors, distributions, interactions, and processes.[259]

The critical inquiry to pursue now is the implications of these environmental upheavals for wilderness governance and the relative merits of what we call purist versus pragmatist approaches to management of wilderness values.

B. The Case for Pragmatic Wilderness Management

Climate change constitutes an emerging threat in its own right but also exacerbates existing threats to species and ecosystems. The IPCC has emphasized that adding to the background threats of habitat destruction and degradation, and dissemination of invasive species, accelerating climate breakdown means that human intervention will have an important, and perhaps defining, role in facilitating adjustments in natural systems.[260] With some ecosystems on the verge of, or in a state of collapse,[261] many species and ecosystems are already close to the limits

Commission of Antarctic Research (SCAR) updating the Antarctic Climate Change and the Environment Report, at 6, IP 136 (May 31, 2019) (explaining that the future expansion of ice-free areas in the Antarctic will threaten the survival of less-competitive species and encourage the spread of invasive species). *See also* John Turner et al., SCAR, *Antarctic Climate Change and the Environment: An Update*, 50 POLAR REC. 237, 237–59 (2014) (publishing the most recent, comprehensive update to the ACCE Report). *See generally Meeting Documents and Archive*, SECRETARIAT ANTARCTIC TREATY, https://perma.cc/6K3X-CBTN (last visited Feb. 17, 2021) (providing access to SCAR's annual updates to the ACCE Report).

258 *See* E. JEAN BRENNAN, DEFS. OF WILDLIFE, REDUCING THE IMPACT OF GLOBAL WARMING ON WILDLIFE: THE SCIENCE, MANAGEMENT AND POLICY CHALLENGES AHEAD 4 (2008) (explaining the urgency "to reduce the primary cause of human-induced global warming: the greenhouse gases emitted when we burn fossil fuels" to mitigate climate change impacts on vulnerable wildlife).

259 *See id.* (explaining that immediate action to reduce greenhouse gases "will still be too late to prevent the extinction of some species," even so, "we can take many actions to help wildlife survive").

260 *See* John Agard et al., IPCC, *Annex II: Glossary*, *in* CLIMATE CHANGE 2014, *supra* note 241, at 1757–58, 1769 (defining adaptation as the process of adjustment to the effects of climate change, noting the need for human intervention to facilitate adjustment in natural systems, and defining mitigation as human intervention to reduce the cause of climate change).

261 *See* IPCC AR5 SPM, *supra* note 241 (explaining that some unique and threatened ecosystems are already at risk from climate change and will face severe consequences as warming increases); Ralph Mac Nally et al., *Collapse of an Avifauna: Climate Change Appears to Exacerbate Habitat Loss and Degradation*, 15 DIVERSITY & DISTRIBUTIONS 720, 725–27 (2009) (concluding that environmental changes caused by climate change, including

of their independent adaptive capacity.[262] The occasions and locations in which humans decide to intervene, either to prop up existing ecosystems or facilitate adaptation or transformation, will fundamentally influence the kinds of environments that persist as the climate changes.

The foregoing discussion makes clear that, for wilderness to persist, some active intervention will almost certainly be necessary (or continue to be necessary, given that many wilderness laws and policies already require active management to, for example, respond to threats such as invasive species).[263] Wilderness managers will need to act to protect important species and ecosystem processes from extinction or collapse and may need to intervene to restore ecological structure and function.

To date, emergency planning and response have not played a significant part in the development or implementation of wilderness laws. However, climate change is increasing the occurrence, severity, and scale of disasters such as wildfires, floods, and heatwaves.[264] Emergency planning for wilderness areas may include developing access roads into (or around the edges of) wilderness areas, including to provide fire breaks and fire-fighting routes, as well as facilitating emergency evacuations.[265] Scientists are also beginning to analyze emergency responses in natural areas, including for emergency wildlife evacuations[266] and in developing fire-fighting foams and gels that protect sensitive and high-value vegetation.[267] Emergency responses may also include assisted feeding for wildlife that survive forest fires or other major disturbances, as was implemented in southeastern Australia in January 2020 to safeguard endangered fauna that survived recent mega-bushfires.[268] Some of these measures may help sustain core ecological processes, but others may degrade wilderness through otherwise prohibited development.

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rainfall deficiency, increasing average temperatures, and reduced food availability, would make it hard for bird species to sustain their populations).

262 Tereza Jezkova & John J. Wiens, *Rates of Change in Climatic Niches in Plant and Animal Populations are Much Slower Than Projected Climate Change*, PROC. ROYAL SOC'Y B: BIOLOGICAL SCI., Oct. 2016, at 1, 7.

263 *See, e.g.*, Stuart Pimm et al., *How to Protect Half of Earth to Ensure it Protects Sufficient Biodiversity*, SCI. ADVANCES, Aug. 2018, at 1, 7 (arguing that governments will have to prioritize the protection of key habitats in addition to existing wildernesses, parks, and preserves to protect as many species at risk of extension as possible).

264 MCKINSEY Q., CONFRONTING CLIMATE RISK 1–4 (2020), https://perma.cc/V25P-NQRA.

265 *See, e.g.*, Erik D. Alnes, Fire Management Provisions in Federal Wilderness Law 62–64 (2017) (Professional Paper, University of Montana) (outlining the specific emergency situations in which the use of motor vehicles may be permitted in wilderness areas, per various federal agencies and laws).

266 CHRIS DICKMAN ET AL., AFTER THE CATASTROPHE: A BLUEPRINT FOR A CONSERVATION RESPONSE TO LARGE-SCALE ECOLOGICAL DISASTER 2 (2020).

267 *See, e.g.*, David R. Leach, Fire Suppressant Impacts on Flora of the Swan Coastal Plain, 1, 138–39 (2013) (unpublished PhD thesis, University of Western Australia) (advocating for the use of short-term gels and foams containing low nutrient content as opposed to long-term fire retardants due to the lower environmental impact on flora and human health).

268 *E.g.*, *Australia Bushfires: Carrots Dropped from Helicopters Feed Wallabies*, BBC NEWS (Jan. 13, 2020), https://perma.cc/MQ3L-TBHM.

Wilderness managers may also need to actively intervene to facilitate ecological restoration where natural regeneration cannot occur. For example, major wildfires can destroy natural, soil-based seed stocks, including as a result of a high-intensity burn or when a second wildfire razes an area before naturally regenerating vegetation has had time to produce seeds.[269] In such cases, adaptation-oriented intervention may require decision-makers to replant an area, or even to facilitate a transition from one ecosystem type to another.[270] Wilderness managers may need to introduce vegetation from outside a given wilderness area, in some instances, to supplement genetic diversity, maximize adaptive traits (for example, by planting heat or drought tolerant vegetation), and improve the likelihood that a wilderness area will be able to sustain ecosystem functions and processes as the climate changes.[271]

If wilderness managers or visitors characterize wilderness area by the existence of a particular species or ecological community, we may need active intervention to prevent the loss of that species or community as the climate changes. For example, warming and drying trends will affect long-lived tree species that do not have the capacity to adapt by independently redistributing upslope or poleward.[272] Where such species play a crucial role in an ecosystem or to human experiences of a wilderness area—especially in the United States where law emphasizes experiential values[273]—managers may be forced to decide whether to translocate the species (and protect the wilderness value) or maintain a purist approach and allow the species to decline or be lost. A more controversial question is whether wilderness managers could intervene to protect an ecological function that was historically provided by a native species that has become extinct—such as seed dispersal[274] or habitat

269 David M.J.S. Bowman et al., *Abrupt Fire Regime Change May Cause Landscape-Wide Loss of Mature Obligate Seeder Forests*, 20 GLOBAL CHANGE BIOLOGY 1008, 1014 (2014).

270 *See, e.g.*, *id*. at 1015 (suggesting carefully designed reseeding to reverse demographic collapse after fire).

271 *See generally* Jessica E. Halofsky et al., *Changing Wildfire, Changing Forests: The Effects of Climate Change on Fire Regimes and Vegetation in the Pacific Northwest, USA*, 16 FIRE ECOLOGY, art. no. 4, 2020, at 1, 1 (discussing a variety of approaches land and resource managers could take to improve forest resilience to fire, invasive insects, and drought).

272 *See* Christopher W. Woodall, *Study Suggests Tree Ranges are Already Shifting Due to Climate Change*, U.S. FOREST SERV. N. RES. STATION: RES. REV., Summer 2010, at 1, 3 (describing the decreased habitat area of some tree species in the U.S. as a result of climate change, noting the dependency of tree migration on transportation agents).

273 *See* Wilderness Act of 1964, 16 U.S.C. § 1131(a) (2018) ("[Wilderness areas] shall be administered for the use and enjoyment of the American people.").

274 *See, e.g.*, Philip J. Seddon, *From Reintroduction to Assisted Colonization: Moving Along the Conservation Translocation Spectrum*, 18 RESTORATION ECOLOGY 796, 799 (2010) (citing the use of Aldabran giant tortoises to restore seed dispersal functions previously performed by the now-extinct giant *Cylindraspis* tortoises).

creation by an ecosystem architect[275]—by introducing a surrogate non-native species as an "ecological replacement."[276]

Many wilderness laws and management instruments already support some forms of active intervention that can facilitate climate adaptation; although, we are not aware of controversial interventions such as ecological replacement currently being contemplated under the wilderness laws analyzed for this Article. For example, Australian laws permit some actions to eradicate invasive species, reduce hazards to prevent catastrophic wildfires,[277] and restore areas to a "natural" condition.[278] Similarly, in Europe, none of the three specific wilderness acts (in Iceland, Finland, or Norway) seem to strictly restrict human intervention, except perhaps the Svalbard Environmental Protection Act of 2001 in Norway, which seeks to maintain "large, continuous and *largely undisturbed* areas."[279] At least with the Finnish Wilderness Act of 1991, the opposite appears to be true as it provides for a "multi-purpose utilization of nature."[280] Even the stricter protection provided for Natura 2000 sites under, for example, the Habitats Directive, focuses on the integrity of the site and the objectives for its designation, rather than its untouched, pristine, or natural state, per se.[281]

However, as noted above, active forms of intervention—from the most controversial through to the relatively benign—are far less likely to

275 *See id.* at 800 ("[Restoration ecologists] need to consider the possibility of adopting an ecological engineering perspective to use conservation translocations . . . to contribute to the construction of new ecological communities.").

276 SPECIES SURVIVAL COMM'N, INT'L UNION FOR CONSERVATION OF NATURE, GUIDELINES FOR REINTRODUCTIONS AND OTHER CONSERVATION TRANSLOCATIONS 3 (2013) (defining "ecological replacement" as the release of species outside their indigenous range in order to re-establish an ecological function lost with the extinction of a native species).

277 *See, e.g.*, *State Planning Policy 3.7: Planning in Bushfire Prone Areas 2015* (WA) reg. 5.4 (Austl.) (aiming for an appropriate balance between bushfire risk management and biodiversity conservation values); *Wilderness Protection Areas and Zones: South Australian Code of Management 2004* (SA) reg 3.6 (Austl.) (allowing for the suppression of naturally caused fires when they pose a threat to human life, property, and habitats requiring protection while limiting fire suppression techniques to those with the least long-term impact on wilderness quality).

278 *See, e.g.*, *Wilderness Act, 1987* (NSW) pt 2 (Austl.) ("An area . . . shall not be identified as wilderness . . . unless the area is in a state that has not been substantially modified by humans or capable of being restored to such a state."); *Bushfire Management Act, 1954* (WA) pt 4 div 1 s 35A (Austl.) (allowing activities for the prevention, control, or extinguishment of bush fires, including aerial firefighting); DEP'T ENV'T & NATURAL RESOURCES, GOV'T OF S. AUSTRL., PEST MANAGEMENT: FERAL GOATS 4 (2011) (describing methods by which the government of South Australia culls feral goats in order to protect wilderness areas).

279 Forskrift om større naturvernområder og fuglereservater på Svalbard videreført fra 1973 av 04. Apr. 2014, §§ 3, 14 *translated at Regulations relating to large nature conservation areas and bird reserves in Svalbard as established in 1973*, GOV'T. NOR. (Apr. 4, 2014), https://perma.cc/D42B-7TP8 (emphasis added).

280 *See* Kokko & Oksanen, *supra* note 175, at 314, 319 (explaining that the wilderness areas were established to preserve the wilderness character, safeguard Sámi culture and livelihood, and to improve the multiple use of nature).

281 *See supra* note 162–171 and accompanying text (explaining that wilderness protection is not the main aim of Natura 200 sites).

be supported in wilderness areas in the United States. For example, the U.S. Forest Service's guidelines provide that active habitat management is only allowed when the "condition needing change is a result of abnormal human influence," "serious or lasting damage to wilderness values" will not result, and it is reasonably certain that the project will achieve "desired objectives."[282]

The fundamental question to answer is whether we can keep wilderness values if we do *not* intervene, particularly if part of the wilderness characteristics and values includes functioning, resilient ecosystems and their component species. Excluding high-intervention strategies such as species translocations to or from wilderness areas may undermine the persistence of these "wild" places in a rapidly changing world, and perhaps even hasten their loss. Yet, the high, upfront financial costs of some interventions to save wilderness for the long term may make it difficult to gain political support.

Climate change increasingly presents an existential threat to large parts of the Earth's biodiversity and its ecological processes. Moreover, this threat is anthropogenic. The scale of the threat is such that the "pristine" nature of wilderness areas already has changed, is certain to change further, and will likely be lost in some cases—even with active intervention. A desire to maintain an (inaccurate) distinction between humans and pristine and natural wilderness places does not justify inaction as functional ecological systems collapse and species extinctions rapidly accelerate. While we know tragically little about the conditions required to maintain ecological functions, if ecological loss in wilderness areas is inevitable without intervention, then learning on the job may be the best we can hope for.

Finally, an important qualification to the case for active intervention: We are not arguing for wholesale micro-management or domination of nature, nor for technological human engineering of wilderness areas. Rather, by taking a precautionary and adaptation-oriented approach, we suggest that a pragmatic approach could ensure that wilderness laws contribute a framework for guiding decision-makers about when and how to adopt active forms of management. This may include, for example, guidance about when species translocations might be supported into and out of wilderness areas, or about the use of "fuel reduction burning," in anticipation of climate-driven changes in wildfire regimes. Additional guidance for wilderness managers could include greater clarity on how restoration goals should be identified, pursued, and revised in wilderness areas in the context of climate change. A pragmatic and adaptation-oriented protection of wilderness in the Anthropocene must include active

[282] U.S. FOREST SERV., FOREST SERV. MANUAL § 2323.35a (2007). *See also* Lucy Lieberman et al., *Manipulating the Wild: A Survey of Restoration and Management Interventions in U.S. Wilderness*, 26 RESTORATION ECOLOGY 900, 900–08 (2018) (assessing the frequency and type of management interventions implemented in the National Wilderness Preservation System between 2011 and 2015).

and purposeful monitoring and reporting requirements to ensure that management lessons can be shared internationally.

C. The Case for Purism in Wilderness Management

From a purist wilderness perspective, the argument that we need human intervention to keep wilderness wild sounds odd. The premise of wilderness is that humans are not determining how nature should look or develop. Howard Zahniser, principal author of the U.S. Wilderness Act of 1964, stressed the need "to secure the preservation of some areas that are so managed as to be left unmanaged—areas that are undeveloped by man's mechanical tools and in every way unmodified by his civilization."[283]

This "non-intervention management" is generally viewed as a cardinal principle of wilderness preservation. It affirms respect for intrinsic values[284] of nature and particularly nature's autonomy: nature's independence of humankind[285] and its right "to express its own will."[286] "To protect wilderness is to allow the widest possible autonomy to nature; a place where otherness—wildness—has its highest and fullest expression."[287] This autonomy of nature, as well as a sense of human humility, has also constituted the main motivation for Zahniser choosing the word "untrammelled" when drafting the U.S. Wilderness Act:

> The idea within the word "Untrammeled," of [wilderness areas] not being subjected to human controls and manipulations that hamper the free play of natural forces is the distinctive one that seems to make this word the most suitable one for its purpose within the Wilderness Bill.[288]

These purist perspectives are clearly under pressure in the Anthropocene: Doug Scott writes that "wilderness areas are not islands inherently protected from all that goes on outside their . . . protected boundaries."[289] One might state that "non-intervention management" makes less sense

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283 Howard Zahniser, *The Need for Wilderness Areas*, LIVING WILDERNESS, Winter-Spring 1956–57, at 37, 37.

284 Janna Thompson, *The Moral Value of Wilderness*, CONVERSATION (Jan. 23, 2018), https://perma.cc/KU95-HRB2.

285 *See generally* RECOGNIZING THE AUTONOMY OF NATURE: THEORY AND PRACTICE (Thomas Heyd ed., 2005) (noting the special appeal of intrinsic values based on the autonomy of nature).

286 Douglas W. Scott, *"Untrammeled," "Wilderness Character," and the Challenges of Wilderness Preservation*, WILD EARTH, Fall/Winter 2001–2002, at 72, 75.

287 Paul M. Keeting, *Does the Idea of Wilderness Need a Defence?*, 17 ENV'T VALUES, 505, 516 (2008).

288 DOUG SCOTT, THE ENDURING WILDERNESS: PROTECTING OUR NATURAL HERITAGE THROUGH THE WILDERNESS ACT 2 (2004) (quoting a letter from Howard Zahnsier to C. Edwards Graves (April 25, 1959)). *See also* Scott, *supra* note 286, at 72 (highlighting the Act's use of the word "untrammeled" as submitting to the "forces of Nature" instead of preserving the present ecological condition or historical use of a sectioned area).

289 SCOTT, *supra* note 288, at 134.

in a time that humankind is, as a matter of fact, intervening in so many different ways: changing weather patterns, shifting seasons, disrupting food chains, bringing non-native species into wilderness area, sullying wilderness with plastics and persistent organic pollutants, etc.[290] It is also problematic in our era to speak of the need to emphasize the autonomy of nature. Through all such negative impacts, humankind has clearly not respected this autonomy, and the free will of nature to evolve has been considerably constrained.

Despite the dire implications of climate change for biodiversity, including within wilderness areas, legal and management tools already exist that could be implemented in ways sympathetic to the purist underpinnings of the wilderness ideal. Increasing the size and diversity of protected area networks, including by protecting the large areas of wilderness that currently fall outside of the protected area estate,[291] would help to bolster climate resilience and facilitate adaptation. Currently, environmental advocates, and global leaders (including U.S. President Joe Biden) have embraced a global campaign to give formal protection to 30% of the Earth's surface.[292] This could dramatically increase areas with formal wilderness designation and/or areas that include significant wilderness values. Similarly, ecological connectivity is widely recognized as a fundamental climate adaptation strategy for biodiversity, and improving connections between networks of wilderness protected areas and zones could create opportunities for species to redistribute into, and persist in, well-protected climate refugia within their boundaries.[293] None of these would interfere with the preference for non-intervention *within* protected wilderness zones.

Minimizing the impact of non-climatic threats—such as industrial development and habitat fragmentation—is another fundamental

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290 *See generally* IPCC, *Summary for Policymakers*, *in* CLIMATE CHANGE 2014: SYNTHESIS REPORT. CONTRIBUTION OF WORKING GROUPS I, II, AND III TO THE FIFTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE 5–7, 13 (2014) (describing humanity's contribution to global changes in extreme weather events and seasonal weather patterns, disruption of ecosystems and the resulting increased risk of extinction, and increased threat to food security).

291 *E.g.*, Rachel I. Leihy et al., *Antarctica's Wilderness Fails to Capture Continent's Biodiversity*, 583 NATURE 567, 567 (2020) (noting the importance of expanding "Antarctica's network of specially protected areas" to ensure more wilderness areas as "free from human interference").

292 E. Dinerstein et al., *A Global Deal for Nature: Guiding Principles, Milestones, and Targets*, 5(4) SCIENCEADVANCES (2019), https://perma.cc/WUZ6-TDX3; The White House, Executive Order on Tackling the Climate Crisis At Home and Abroad, § 216, "Conserving Our Nation's Lands and Waters" Jan. 27, 2021.

293 Nicole E. Heller & Erika S. Zavaleta, *Biodiversity Management in the Face of Climate Change: A Review of 22 Years of Recommendations*, 142 BIOLOGICAL CONSERVATION 14, 24 (2008). *See* Jonathan R. Mawdsley et al., *A Review of Climate-Change Adaptation Strategies for Wildlife Management and Biodiversity Conservation*, 23 CONSERVATION BIOLOGY 1080, 1082–83 (2009) (urging protection efforts to include movement corridors for terrestrial species and habitat islands that serve as steppingstones between larger reserves or as climate refugia).

strategy for enhancing adaptive capacity.[294] Again, existing legal provisions for wilderness protection and management, particularly where they exclude industrial uses and other developments, can improve climate adaptation for wilderness as well as conservation outcomes more generally, without coming into conflict with purist perspectives.

However, while today's purist perspectives may not constitute a convincing argument for a strict and full implementation of non-intervention management, existing deterioration of wilderness would not justify abandoning the concept of wilderness or wilderness protection. A parallel might be drawn with damage to cultural heritage: the fire in the Notre Dame in Paris on April 15, 2019, has certainly damaged the value of this cultural heritage[295] but does not mean we should not value the remaining parts of the iconic cathedral or refrain from restoring what we can of its original glory.

Nonetheless, governments and certain stakeholders sometimes cite the Anthropocene and its effect on wilderness to justify weakening wilderness protection. The Polish government argued that it needed to clear significant amounts of forest to mitigate climate change effects (specifically, fighting bark beetles) in the Polish Natura 2000 site Puszcza Białowieska.[296] As explained above, wilderness protection is not an explicit objective of the EU Natura 2000–regime; however, the regime may require strict protection of wilderness if this is important for protecting wilderness-dependent species and habitat types of EU importance.[297] According to the European Commission, this consideration applies to the Puszcza Białowieska Natura 2000 site because it is "one of the best preserved natural forests in Europe, characterized by large quantities of dead wood and old trees, in particular trees a century old or more."[298] The Commission also stated that this area represents "extremely well-preserved natural habitats,"[299] home to many threatened species.[300] In 2016, the Polish Minister for the Environment amended the management plan for Białowieska "in order to increase . . . the harvesting volume of the main forest products, resulting from pruning prior to felling and felling, from 63,471 [cubic meters] to 188,000 [cubic meters] and the envisaged area of afforestation and reforestation from 12.77 hectares to

294 HAWES ET AL., *supra* note 205, at 13, 42 (asserting the need to connect and buffer wilderness areas to reduce the negative impacts of habitat fragmentation, noting the importance to keep areas free from "roads, powerlines, buildings, and dams").

295 *Notre Dame Fire: Paris Cathedral Spire Collapses as Blaze Tears Through Landmark*, ABC, https://perma.cc/DLR5-RRCD (last updated Apr. 15, 2019).

296 For more background on the case, see Przemyslaw Tacik, *Poland's Defiance Against the CJEU in the* Puszcza Bialowieska *Case (C-441/17), in* THE EUROSCEPTIC CHALLENGE: NATIONAL IMPLEMENTATION AND INTERPRETATION OF EU LAW 67, 73–74 (Clara Rauchegger & Anna Wallerman eds., 2019) (describing Poland's continued logging despite CJEU's interim measure order).

297 *Supra* notes 169–171 and accompanying text.

298 Case C-441/17, Comm'n v. Poland, ECLI:EU:C:2018:255, ¶ 17 (Apr. 17, 2018).

299 *Id.*

300 *See id.* ¶ 18 (noting the presence of various beetles and birds protected under the Habitats Directive and Birds Directive).

28.63 hectares, in respect of the period 2012 to 2021."[301] As for the justification of this intensified human intervention, the Court's judgment explains:

> The justification for that request was 'the occurrence of serious damage within forest stands, as a result of the constant spread of the spruce [bark] beetle, resulting . . . in the need to increase logging . . . in order to maintain the forests in an appropriate state of health, to ensure the sustainability of the forest ecosystems and to halt the deterioration and undertake a process of regeneration of natural habitats.'[302]

The European Commission and the EU's Court of Justice disagreed with this reasoning. Felling ancient trees, removing dead wood, and other active management measures constitute a threat for the integrity and nature conservation objectives of the site and "cannot constitute measures ensuring the conservation of that site, for the purposes of Article 6(1) of the Habitats Directive."[303] The Court also rejected the argument that the felling is necessary to fight the spruce bark beetle, noting, "on the contrary, it is the removal of spruces and pines a century or more old colonised by the spruce bark beetle that was identified by the [management plan] as such a potential threat."[304]

This example shows that the Anthropocene may be used for unscrupulous purposes to weaken wilderness law and justify exploitation of wilderness areas. Such an approach will worsen environmental problems as it ignores the fact that wilderness areas play a vital role in mitigating various manifestations of the Anthropocene, particularly climate change and biodiversity loss. It is crucial to realize that, in practice, loopholes in strict nature protection law may be exploited to secure space for economic development. Therefore, it is important to stay close to purism, to keep wilderness law strict and to allow exceptions only if they are justified for protecting wilderness and its qualities and values. The difficult question is where to draw the line between situations where the rule of non-intervention can be maintained and where intervention is preferred.

V. CONCLUSIONS: INTERVENTION OR NON-INTERVENTION: WHERE TO DRAW THE LINE?

Some of the thorniest questions facing policy makers and hands-on wilderness managers include what to do about species and ecosystems in wilderness areas as the Anthropocene progresses and ecological change disrupts how ecosystems function and what species persist where. If the

301 *Id.* ¶ 28.

302 *Id.* ¶ 29 (quoting *Order of the Minister of Environment Approving the Annex to the Forest Management Plan for the Białowieska Forest Division* (Mar. 25, 2016) (Pol.)).

303 *Id.* ¶ 218.

304 *Id.* ¶ 220.

law, and the values underpinning the law, emphasize completeness of free-functioning ecosystems, then aggressive interventions such as controlling wildfires (including by introducing fire for hazard reduction in wilderness areas), eradicating invasive species, and reintroducing or translocating species as missing components of such ecosystems make sense.[305]

Degraded wilderness may be restored to reinstate whatever values the law prioritizes, although some results would likely only accrue over long timescales. Recovery may flow not only from the dynamic qualities of natural processes, such as ecological succession, but also from human intervention that facilitates such processes such as planting trees, culling invasive pests, or removing intrusive infrastructure (e.g., dams that impede freshwater flows and fish migrations).[306] If wilderness laws do continue to prioritize the absence of intentional human control, we should, at least, ensure that we closely observe how wilderness responds to change, and learn whatever lessons we can about how to manage the larger majority of the biosphere that remains under direct human control.[307]

The United Nations has declared 2021–2030 to be its Decade on Ecosystem Restoration, and although most of the planned initiatives will not in themselves reinstate wilderness, they could assist by mitigating or reversing environmental degradation that indirectly threatens it.[308] During the Anthropocene, rewilding is emerging as an important strategy.[309] In Europe, Australia, and the United States, biodiversity

305 For an exploration of different aggressive strategies for biodiversity conservation, see Phillipa McCormack & Jan McDonald, *Adaptation Strategies for Biodiversity Conservation: Has Australian Law Got What It Takes?*, 21 ENV'T & PLAN. L.J. 114 (2014) (analyzing a continuum of conservation strategies, from minimally interventionist to intensive conservation management, and highlighting the need to reorient current approaches to promote key adaptation strategies); David Takacs, *Aggressive Solutions to Disrupt Biodiversity Loss*, *in* Jessica Owley & Keith Hirokawa, *Environmental Law. Disrupted.*, 49 ENV'T L. REP. 10038, 10042 (2019) (promoting controversial legal paradigms, like CBDR and REDD+, to disrupt biodiversity loss and redefine aggressive conservation).

306 *See* Benjamin J. Richardson, *The Emerging Age of Ecological Restoration Law*, 25 REV. EUROPEAN, COMPAR. & INT'L ENV'T L. 277, 285 (2016) (reviewing the adequacy of ecological restoration law as compared to environmental restoration law).

307 For a full examination of the hands-off approach to management, see Peter Landres, *Let It Be: A Hands-Off Approach to Preserving Wildness in Protected Areas*, *in* BEYOND NATURALNESS: RETHINKING PARK AND WILDERNESS STEWARDSHIP IN AN ERA OF RAPID CHANGE 88–101 (David N. Cole & Laurie Yung eds., 2010) (noting the feasibility of this approach in some areas, but only when there is a full understanding of the resulting benefits and disadvantages).

308 *See generally Types of Ecosystem Restoration*, U.N. DECADE, https://perma.cc/3KPF-YBXG (last visited Feb. 19, 2021) (cataloguing the partnership between the UN and over 70 countries to engage in ecosystem restoration projects ranging from forest regeneration to peat marsh management, and even urban green scaping).

309 For more on "re-wilding," and who gets to decide on its application, see David Takacs, *Whose Voices Count in Biodiversity Conservation? Ecological Democracy in Biodiversity Offsetting, REDD+, and Rewilding*, 22 J. ENV'T POL'Y & PLAN. 43, 44, 47 (2019). *See also* Roger Kaye, *The Untrammeled Wild and Wilderness Character in the Anthropocene*, INT'L J. WILDERNESS, April 2018, at 8, 9–10 ("[M]ore wilderness will be needed to improve

managers are reintroducing species (especially charismatic, apex carnivores) into locales where they have been absent, to "help to bring back the Variety of Life, our Biodiversity, so that we can all be able to better enjoy it."[310] When does rewilding enhance wilderness values, and when does it violate the purist vision of ecosystems left to their own devices?

In *Wolf Recovery Foundation v. U.S. Forest Service*,[311] a U.S. federal court grapples with this question: In a legally designated wilderness, may the government fly helicopters to dart and collar grey wolves—which the same agency had previously reintroduced into the wilderness—to monitor and assess the success of the reintroduction?[312] We see pragmatic wilderness management here: For the triple purposes of aiding the endangered species, restoring full ecosystem function by reintroducing a top-level predator, and enriching the wilderness experience for human visitors, the Forest Service had already reintroduced the grey wolf into the wilderness.[313] But at some point, pragmatism ends, and purism begins. Pragmatic government agencies wanted to monitor the success of the program; purist environmental groups argued that was one pragmatic step too far.[314] The Wilderness Act, splitting the difference between purist and pragmatic approaches, contemplates some motorized vehicle use but only "as necessary to meet minimum requirements for the administration of this area."[315] As the court notes: "It would be a rare case where machinery as intrusive as a helicopter could pass the test of being 'necessary to meet minimum requirements for the administration of the area.'" However, this case may present that most rare of circumstances. Here, the helicopters collected data on wolves. The wolves were "released in the Frank Church Wilderness to restore the area's wilderness character."[316] As the case notes, "the Court is faced with a very unique circumstance here. It was man who wiped out the wolf from this area. Now man is attempting to restore the wilderness character of the area by returning the wolf."[317]

So, in the Anthropocene, as humans accelerate their impacts on the nonhuman world, does "wilderness" still belong as a distinctive legal concept? And if so, to what extent do we intervene to manage it for our

connectivity among existing reserves and to expand the benefits wilderness areas provide into the Anthropocene.").

310 REWILDING EUROPE, https://perma.cc/D8YE-HTVZ (last visited Feb. 19, 2021).

311 692 F. Supp. 2d. 1264 (D. Idaho 2010).

312 *Id.* at 1266.

313 *See generally* U.S. FISH & WILDLIFE, NORTHERN ROCKY MOUNTAIN WOLF RECOVERY PLAN, at v, 10 (1987) (explaining the objectives, purpose, and mechanisms for implementing the wolf recovery program in the Rocky mountain region).

314 *See* Ralph Maughan, *Wolves to be Tracked, Darted, and Collared*, WILDLIFE NEWS, https://perma.cc/FG3F-QECW (last visited Feb. 19, 2021) (examining environmentalists' outrage over the perceived blatant violation of the Wilderness Act and deep seeded mistrust of agency motives in using darts).

315 Wilderness Act of 1964, 16 U.S.C. § 1133(c) (2018).

316 *Wolf Recovery Found.*, 692 F. Supp. 2d. at 1268.

317 *Id.*

desires? What is wilderness for, anyway? If it is for maximally functioning ecosystems, then the purism route is the way to go when ecologists suggest the ecosystem already functions healthily. But paradoxically, for a wilderness to function like a wilderness, it might need apex carnivores, and that might mean major, disruptive interventions. Or if humans are the locus of wilderness law—if wilderness exists for our enjoyment of it and to see nature relatively untrammeled—then we also might need to actively restore the top-level carnivores that we would expect to see and that make for an ecosystem that functions as nature would intend without our intervention.

We assert that the law should continue to identify wilderness as a distinct category of protected area. In the Anthropocene, people will increasingly need relatively "untrammelled" nature for recreation, contemplation, and as a baseline of ecological function and species abundance. Furthermore, the intrinsic values of wilderness—wild areas and functioning ecosystems preserved for their own sakes—underpin the need for wilderness' continued protection. And pragmatically, as law has already prioritized these protected areas, environmentalists should not abandon an ontological category that has successfully kept some corners of the Earth relatively untouched.

But wilderness cannot be protected in isolation. We believe more attention should be paid to the interconnections between wilderness and non-wilderness areas. Management decisions must shift from treating wilderness as a discrete area, taking into account how pervasive and diffuse threats, from climate change to long-range pollutants, influence its values.[318] In other words, wilderness conservation should no longer be treated as a separate governance realm, but rather embedded in a broader agenda for managing the biosphere holistically.

Although "wilderness" is interconnected with the neighboring and distant biosphere, it still has special qualities that need special focus in the law. We may require more buffer areas designated around wilderness rather than abrupt transitions to incompatible land uses. Conservation may also require longer term, strategic planning that considers threats to a wilderness area over many decades, such as through scenario stress-testing (e.g., for climate change or invasive species) and then prescribing preventative measures to minimize such risks and impacts. Current wilderness law already allows for a variety of management practices along the purism to pragmatism spectrum. As considered earlier, legal instruments and management guidelines in Australia, the EU, and the United States describe wilderness as requiring active management in some very specific, usually extreme, circumstances (such as bushfire,

318 In keeping with developments in connectivity conservation scholarship, see Graeme L. Worboys, *The Connectivity Conservation Imperative*, *in* CONNECTIVITY CONSERVATION MANAGEMENT: A GLOBAL GUIDE 4–7 (Graeme L. Worboys et al. eds., 2010) (highlighting the value of integrated, holistic, and landscape-scale management in which wilderness areas would function as strictly protected 'core' components of a better-connected land management network across bioregions and continents).

vandalism, or removal of inappropriate non-Aboriginal structures).[319] But they otherwise prioritize a hands-off approach, based on the capacity of these large, relatively healthy ecosystems to sustain themselves.

Given the main strengths of wilderness law, and the wilderness literature, we recommend adhering as close to purism as possible but accepting some pragmatism in limited, well-defined exceptions to the rule of non-intervention. In the Anthropocene, the autonomy of nature will sometimes have to be compromised in order to restore wilderness qualities or to support wilderness areas in adapting to adverse change in order to maintain resilient and self-functioning ecosystem and associated biodiversity. However, to prevent authorities citing the Anthropocene as an excuse for weakening wilderness protections, these exceptions must be clearly justified by the protection of wilderness and its qualities and values, and not for extraneous reasons.

The scholarly literature emphasizes—and we affirm—that no "one size fits all" solution exists to help wilderness, and the human communities that prize it, adapt to the Anthropocene. In view of future uncertainties regarding environmental change and negative effects, the implementation of a diversity of management approaches appears sensible to spread the risk. This approach connects well with existing wilderness laws, which not only apply different definitions and objectives, but also leave space for implementing diverse management strategies in practice.

As the human population grows and expands ever more aggressively into nature's redoubts, and as climate change increasingly threatens human and nonhuman communities, the multiple values we imbue in wilderness will only grow in importance. COVID–19 corroborates this imperative; the pandemic finds its source in human transgressions into nature's domain, through habitat clearance and wildlife harvesting.[320] Protected wilderness comprises some of our most robust refugia for biodiversity and for maximum possibilities for biodiversity—and perhaps us—to survive the Anthropocene. Protected wildernesses provide our best baseline examples of how nature may survive and thrive if only we let it, and can teach us about how to manage the rest of the biosphere for sustainable human communities. We will, we hope, continue to cherish the opportunities to visit regions of the Earth that reveal what the planet may look like without the overweening impacts of human civilization. But it also paradoxically means intervening—perhaps with a fine scalpel, but intervening nonetheless—to ensure wildernesses and their special values persevere.

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319 *See supra* notes 44–47, 67, 94–95 and accompanying text.

320 For a recent, comprehensive review of pandemics and ecological conservation, see Andrew P. Dobson et al., *Ecology and Economics for Pandemic Prevention*, 369 SCI. 379 (2020) (describing how human proximity to animals, particularly through the illegal wildlife trade, have provided the vector for infectious disease crossover from animals to people).