

International Wilderness in the Twenty-First Century: A Global Review

by Vance G. Martin, Alan Watson, Christopher A. Armatas, and Amy Lewis

Introduction	28
Forces of Change for Wilderness Protection in the Twenty-First Century	29
Wild Nature Re-Emerges in Europe	40
<i>European Wilderness Network</i>	41
The International Union for Conservation of Nature (IUCN)	43
Wilderness Protected Areas: Guidelines for Management of IUCN Category 1b Wilderness	44
International Institution Support for Wilderness	44
Different Types of Recognition and Protection of Wilderness: A Global Review	45
IUCN Protected Area Category 1b—Wilderness (An International Perspective)	45
Three Observed Classes of Wilderness Protection (An Intranational Perspective)	46
<i>Class I—Statutory (Legal) Protection of Wilderness</i>	46
<i>Class II—Administrative Zoning of Wilderness</i>	56
<i>Class III—Wilderness Protection Through Recognition in Conservation Programs</i>	60
Protection of Wilderness Values in Other Regions	61
<i>Latin America</i>	61
<i>Mexico</i>	61
<i>Brazil</i>	62
<i>China</i>	62
<i>Antarctica</i>	63
Other Initiatives to Protect Wilderness Values	63
<i>Protecting Biodiversity</i>	63
<i>Wildland Corridors</i>	64
<i>Transfrontier Conservation</i>	64
<i>Wild Rivers and Marine Wilderness</i>	65
<i>Rewilding</i>	66
<i>The World Wilderness Congress</i>	67
<i>International Journal of Wilderness</i>	67
Summary	68
Study Questions	68
Acknowledgments	68
Case Discussion: Canadian Wilderness—The Quetico Provincial Park	69
Case Discussion Questions	70
References	70

INTRODUCTION

Today it is recognized that wilderness has many dimensions, at once touching upon history, ecology, culture, mystery, risk, management, and personal experiences. The evolution of the wilderness concept, and how it is perceived, is influenced by diverse cultural perspectives, a continually expanding understanding of how humans are supported by nature, and existential threats to humanity, both socioeconomic (e.g., income inequality, access to nature and natural resources) and environmental (e.g., climate change, biodiversity loss). The primary purpose of this chapter is to review and summarize global contributions to the protection of wilderness land-and seascapes ("wild nature") thus illustrating how the many dimensions of wilderness are imagined and applied across institutions and cultures.

In our global review, wilderness is primarily conceptualized through the lens of the U.S. Wilderness Act of 1964, in large part because the idea outlined in the Act is reflected in a variety of intranational "wilderness" protection systems across various global contexts, and international adaptive applications. Indeed, the concept of "wilderness" lands and waters may be commonly considered as: "In contrast with those areas where man and his works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain" (U.S. Public Law 88-577). However, it is worth highlighting that this conceptualization of wilderness is both recent and not universally embraced. That is, the earliest human relationships with the natural world were so intimately entwined that the "idea of wilderness as a distinctive environment, let alone an area deserving special attention, was beyond comprehension" (Stankey 1989, 9). Numerous factors contributed to this. One view is that with the rise of monotheism and Judaism across the Middle East, people were increasingly viewed as separate from wild nature, which led, in part, to the creation of a wilderness idea where wastelands and evil forces impeded human progress and development (Nash 1982; Stankey 1989). Another view looks simply at the constantly improved and more efficient methods of human development that simply began to incentivize increased exploitation of natural resources. Consequently, these wilderness lands, from the perspective of the dominant cultural and political institutions (i.e., those formed and perpetuated by imperial concepts manifesting in multiple cultures throughout the world and carried forward by American settlers, for example), were seen as areas to be conquered, dominated, and exploited (Stankey 1989). These concepts were inextricably tied to widely embraced philosophies and movements such as the Doctrine of Discovery and Manifest Destiny and, eventually, the Industrial Revolution. As a result, over several hundred years, colonization and rapid development of significant portions of the Earth led to an efficient reduction in wilderness lands and waters. In response to the rapidly decreasing amount of wilderness and changing perspectives about the benefits of wild spaces, the U.S. Congress passed the Wilderness Act and the President signed it into effect in 1964.

From the passage of the Act to today, in America and across various global contexts, protection of wilderness largely serves as an antidote to the view that nature should be dominated and developed. However, to some, domination

over nature was never embraced in the first place, nor is it embraced today. For instance, while Indigenous cultures and perspectives are not monolithic, it is certainly true that nature reverence, philosophy, and practice among Indigenous cultures is a common core concept in the survival of their cultures. For example, Chief Luther Standing Bear of the Oglala Lakota (as quoted in McLuhan 1971, 45) famously commented in the nineteenth century on the difference between his culture and that of the European settlers who were replacing it: "We did not think of the great open plains, the beautiful rolling hills, and the winding streams with their tangled growth as 'wild.' Only to the white man was nature a 'wilderness' and only to him was the land 'infested' with 'wild' animals and 'savage' people. To us it was tame."

Further, the outcomes of protecting wilderness in a world where wild spaces are less accessible to an increasingly urban population and are in higher demand may be perceived as the creation of elite spaces for high-income people to recreate in, and as a global resource to absorb ecological crises created primarily by colonial ideals and forces. These two outcomes benefit a relatively small and homogenous group and appear inequitable to developing nations and Indigenous peoples. These perceptions have merit.

Wilderness protection per the U.S. Wilderness Act of 1964 provides benefits that may be widely recognized across cultures—even if the original motivations and meanings are not shared by all, and if the pressing need to preserve wilderness was driven by a Eurocentric domination of nature that manifested in colonialization and global capitalism. More generally, as global society pursues "sustainable development" (i.e., realization of a good life within planetary limits) (World Commission on Environment and Development 1987), and works to address social-ecological crises such as human rights for all, climate change, and widespread biodiversity loss, wilderness protection is one integral tool. For example, in the financial sector, there are wide-ranging discussions around innovative financial instruments such as debt-for-nature swaps, "green bonds," impact-oriented philanthropy, and elimination of perverse subsidies; all are directly related to protecting additional land and seas, with a focus on equitable compensation and distribution of benefits (European Commission 2018). In other words, the retention of wild nature can be a major source of income and economic progress, while also bolstering national heritage and health (Shah 2014).

As we review and summarize global contributions to the protection of wilderness land-and seascapes, with a focus on expansion since 2008, we recognize that the meaning of the word wilderness, and how it is regarded, differs around the world. One of the many objectives of this chapter is to introduce some of the challenges in understanding wilderness in the global context, as well as the importance of appreciating and working for it because of its key role in addressing many of the existential threats faced by our planet today.

For example, it is important to note that attitudes towards wilderness are not always positive and are often generic, as when some people use the term simply to refer to all natural areas that are undeveloped, sometimes with a connotation of the land being abandoned and in need of development. However, to many other people, a wilderness area means a place that you can go to and express identity, its protection shows responsibility to future populations and is a place of spiritual inspiration; a place that is protected so that it remains

ecologically whole. Nelson (1998) cited some thirty different reasons for wilderness conservation, including intrinsic value; for dependent indigenous cultures whose livelihood and cultural identity are inextricably linked to wildlands; for biodiversity protection, national identity, and ecotourism; and many more. Since 2015 there has been a new awareness of a broadened approach to sustainability, one that includes less-technological and more cost-efficient “nature-based” solutions (International Union for Conservation of Nature 2016). Protecting the remaining wilderness is beginning to be recognized as a key element of this new approach to sustainability, offering multiple benefits and being essential to simultaneously address both climate change and species extinction.

There is increasing acceptance of the term “wilderness area,” also, to mean those areas legislated or zoned for protection in their natural condition but often accommodating a wider spectrum of human activity than the U.S. definition might allow (Fig. 3.1). Additionally, an increasing number of areas have been protected in many countries without wilderness protection systems, but that meet international standards established by the International Union for Conservation of Nature (IUCN). Globalization of the wilderness concept and protection of areas in countries with rigorous protection systems have continued to evolve in both developed and developing nations. This evolution is driven, in part, by mutual learning through dialogue and proceedings of the World Wilderness Congresses (WWC), the *International Journal of Wilderness* (IJW), a growing network of wilderness training exchanges and a growing worldwide community of activists committed to protecting the wildest remaining places or restoring wilderness where it has disappeared. Further, new partnerships continue to expand support for wilderness science, to share information on methods and benefits of wilderness protection, and to carry out wilderness stewardship training.

In this chapter, by focusing on the expansion of the wilderness concept in global contexts, we aim to highlight the various ways that wilderness protection was achieved, as well as the nuance of what wilderness means as different cultures operationalize the concept. At the same time, we stress that wilderness and wild nature have never been more imperiled than they are today, and for this reason the need for better public

understanding, applied science, enhanced management, and political willpower has never been greater.

FORCES OF CHANGE FOR WILDERNESS PROTECTION IN THE TWENTY-FIRST CENTURY

There are wide ranging initiatives to both restore and protect wilderness across the globe. Specifically, the fifteenth meeting of the parties to the UN Convention on Biodiversity (CBD) (COP15) approved four “goals” and twenty-three specific “targets” for 2030, of which two targets are particularly relevant to our discussion:

Target 2 addresses restoration: “By 2030 . . . at least 30 percent of areas of degraded terrestrial, inland water, and coastal and marine ecosystems are under effective restoration, in order to enhance biodiversity and ecosystem functions and services, ecological integrity and connectivity.”

Target 3 addresses protected areas: “At least 30 percent of terrestrial, inland water, and coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem functions and services, are effectively conserved and managed through ecologically representative, well-connected and equitably governed systems of protected areas and other effective area-based conservation measures, recognizing indigenous and traditional territories.” Rights and full inclusion of Indigenous Peoples are especially emphasized. Though popularized as “30x30,” this protected area target still begs the question of how much is actually needed, which we address later in this chapter.

A prerequisite to realizing these targets is understanding how much wild nature exists on Earth. Numerous, ongoing efforts have tried to assess how much wilderness is left in the world, as the first step in deciding protection priorities. The answer often differs depending on the wilderness criteria used. There have been ongoing inventories since 1987, with estimates until recently of remaining terrestrial wilderness, as between 25 and 55 percent of our planet. The specific criteria vary in each inventory, so we encourage you to review each one. The first inventory—referred to by its authors as “reconnaissance-level” was pre-digital and, using Jet Navigation Charts and Operational Navigation Charts, produced in 1987 as part of the 4th World Wilderness Congress (WWC). It was undertaken by the Sierra Club, with participation by the United Nations Environment Program, the World Bank, and the World Resources Institute (McCloskey and Spalding 1988). This attempt took almost two years and was admittedly a crude but necessary first estimate, limited to areas 1 million acres (405,000 ha) or greater, and concluding that 33 percent of the world was still in wilderness condition.

Later, Hannah et al. (1994) produced a GIS-based map of human disturbance of natural ecosystems using a habitat index with three categories: undisturbed, partially disturbed, and human-dominated. Their analysis suggested that approximately 52 percent of the planet’s land was undisturbed.

The Wildlife Conservation Society’s assessment (Sanderson et al. 2002) used four criteria to assess wilderness: population density, land transformation, human access points, and electrical power infrastructure. These factors were combined



FIGURE 3.1 Around the globe many nations are following the American idea of maintaining certain lands in a wild state, as wilderness or in some protected area category appropriate to their culture. In Africa, wildlife, such as the elephant, are the international and enduring symbol of wildness and wilderness. These charismatic megafauna are part of the natural system and the history and culture that are Africa. Photo courtesy Ulf Doerner.

to generate a Human Influence Index rating, and the resulting map showed that 17 percent of the planet's land surface remained wild in 2002, though that assessment did not include Antarctica (Fig. 3.2).

Next, in 2003, Conservation International identified all areas over 2.47 million acres (1 million ha) having: at least 70 percent intact habitat, intact faunal assemblages of mammals, birds, and large predators, and a population density of fewer than five people per square kilometer (0.38 sq mi) (Mittermeier et al. 2003). Under these criteria, 38 to 46 percent of the planet was still wilderness.

Most recently, an international team of scientists mapped the world's remaining terrestrial wilderness and produced a similar map for intact ocean ecosystems (Watson et al. 2018). To map Earth's remaining terrestrial wilderness, instead of any universal definition of wilderness they used the best available data on eight indicators of human pressures at a resolution of 1 square kilometer (0.38 sq mi). These eight indicators were built environments, crop lands, pasture lands, population density, night-time lights, railways, major roadways, and navigable waterways (data from 2009). For mapping of intact ocean ecosystems, Watson et al. (2018) used 2013 data on fishing, industrial shipping and fertilizer run-off, along with sixteen other indicators. They identified wilderness land or ocean areas as those that were free of human pressures, with a contiguous area of more than 10,000 sq km (3,861 sq mi). They concluded that 77 percent of land (excluding Antarctica) and 87 percent of the ocean has been modified by the direct effects of human activities. They also concluded that more than 70 percent of the world's remaining terrestrial wilderness are contained in five countries (Russia, Canada, Australia, United States and Brazil—in descending order). These varying inventories use datasets that do not include relatively small areas of high biodiversity wilderness, often very important for protection and linking through natural corridors.



FIGURE 3.2 Wild weather and sudden flooding on rivers are major obstacles to New Zealand wilderness travel. Wilderness visitors are subject to the changes of nature, and travel schedules can be changed for days without warning. Photo courtesy Les Molloy.

Finally, and to add an extra layer of complexity, it is important to note that recognition or inventories of wilderness are most generally related to measuring human impact, and this should not be confused with “ecological intactness.” A very recent study focused purely on “faunal assemblages” as a criterion for intactness, and it concluded that only 2.9 percent of terrestrial areas remain intact as per these criteria (Plumptre et al. 2021). In this chapter we will report other efforts to measure and map wilderness in specific countries or continents (e.g., China and Europe). The “forces of change” summarized below can be seen as a response to the recognized threat to the declining amount of wilderness remaining in the world.

WILD NATURE RE-EMERGES IN EUROPE

Despite the remaining undeveloped, wild, and remote areas, in many countries there is no wilderness left to protect. In Switzerland, for example, wilderness has long since vanished, despite its rugged mountain landscapes. From border to border, this small nation has been transformed by human activity into a thoroughly modified landscape.

All over Europe, even the wildest places have been converted for agriculture and industry for thousands of years. Fisher et al. (2010) reported that no more than 1.5 percent of Europe can be classified as wilderness, which generally occurs in boreal zones, mountains, and rural areas. Most German national parks (the most strictly protected areas in Germany), for example, do not meet IUCN international criteria for even the national park category (World Commission on Protected Areas [WCPA] and IUCN Category 2). The first national park in Germany was established in 1969—the Bavarian Forest National Park, which receives about 1.5 million visitors annually (Brüggemann 1997). Logging and development for tourism access were among the initial plans for the park; however, conservation interests prevailed. Today, the principal objective of German park management is non-intervention in natural processes. This represents a change from the highly managed landscape and intensive forestry traditionally practiced in Germany and most of Europe. The name of this new management approach is translated as “let nature be.”

Křenova and Kiener (2012) gave an update on a wilderness experiment on the border of Germany and the Czech Republic. Two national parks, representing the two largest terrestrial Natura 2000 sites in both countries, Šumava National Park in the Czech Republic and the neighboring Bavarian Forest NP were described as Europe's Wild Heart for several years. The main goal of Europe's Wild Heart, which started in 2008, was to designate a transboundary wilderness area in the core zones of the two national parks. The project area was 13,060 ha and was intended to be the first and largest transboundary wilderness area in Central Europe. However, a bark beetle outbreak followed the Kyrill hurricane in 2008 and 2009 and escalated the discussion about appropriate forest management in Šumava National Park. Opponents of the national park principles of non-intervention and wilderness became more vocal. The situation escalated after the election in 2010 when the Green Party was replaced by conservatives (ODS, Civic Democratic Party) at the Czech Ministry of Environment. Clearcutting was started in some former non-intervention parts of Šumava National

Park, and hunting was again allowed in the core zone. Since then, both the management strategies and practical management measures in Šumava National Park and Bavarian Forest NP have become increasingly divergent. Currently, Europe's Wild Heart project is on hold in both countries.

There is, however, still another "wild heart" of Europe. The Carpathian Mountains extend from southern Poland southward almost to the Balkans, including a small area of Ukraine, but are largely contained within Romania. According to reports, there are a minimum of 864,838 acres (350,000 ha) of original forest, up to 400 years old, in a landscape mosaic that includes meadows lightly managed as hay fields for hundreds of years by subsistence farmers. The landscape is rich in biodiversity, and it features charismatic megafauna such as bears, wolves, lynx, and stags. Since 2001, the Romanian government has undergone a process of land restitution, giving national parks and forestry lands back to the families of their original owners (Rosu 2014). Despite prohibitions on logging, clearcuts are evident on many of the restituted parcels. Nonetheless, the Carpathian Mountains present a major opportunity for wilderness protection in Europe.

In southern Europe, land abandonment started early in the twenty-first century; the rural exodus was the result of several socioeconomic drivers, including declining ability to compete in the globalized food markets, lowering EU Common Agricultural Policy (CAP) subsidy, and tenure insecurity after the collapse of the socialist era in Eastern Europe. The amount of land taken out of production between 2002 and 2012 has been estimated at 114 million acres (46.1 mha or 461,000 sq km) of permanently fallowed farmland (Ustaoglu and Collier 2018).

Simultaneously, many wildlife species have made a return across Europe over the last four decades, highlighting the potential resilience of wildlife. The most recent study (Ledger et al. 2022) covers mammals such as the Eurasian beaver, gray seal, and European bison, which all show a strong comeback. It also includes birds such as the barnacle goose, griffon vulture, great white egret, Dalmatian pelican, and black stork which show the best comeback among some 25 species of birds which are also recovering. Factors such as increased enforced legal protection, the creation of corridors between protected areas, recovery of prey species, rewilding, reintroductions, and an ever-greater willingness and desire by Europeans to live alongside and enjoy the presence of wild animals have all contributed to this recovery.

Great Britain provides additional evidence of why the American model of wilderness preservation cannot be followed in many places, even if the culture would welcome islands of wildness in its midst. The British landscape has been settled continuously for more than 5,000 years with long-term impact on landscapes and biodiversity. British national parks serve primarily to preserve a rural lifestyle, complete with traditional agricultural practices. The British situation further demonstrates that, by the time old and intensely developed nations decide to establish a system of parks and reserves, there may be little alternative but to include substantial amounts of civilization. There is simply no opportunity to preserve an extensive wilderness system like that in North America or Australia.

Nevertheless, the quest for protection of the wildest areas in the UK continues. The wilderness concept emerged in the last 50 years in Europe, with a turning point perhaps

when the 3rd World Wilderness Congress convened in Scotland (1983), at which the Secretary of State for Scotland announced UK ratification of the World Heritage Convention, and numerous wilderness-specific NGOs were created. Until that point, the general opinion was that wilderness had disappeared in Europe during the centuries of intensive growth and development of human society. To the contrary, the presence and appreciation of wild nature is accelerating.

For example, areas within the Highlands of Scotland that appear inhospitable still generate feelings of wildness. However, many of these seemingly inhospitable areas were once inhabited, but were cleared of local people by the English in the early 1800s to establish sporting (hunting) estates and sheep grazing. These areas have often experienced declines in biodiversity, but many people nonetheless perceive them as wild. Restoration of the original forest cover would be needed to restore ecosystems. Thus, numerous "rewilding" projects are advancing throughout the UK, with perhaps one of the oldest and most respected being the Trees for Life project, started in the mid-1980s in the NW Highlands to restore the original Caledonian Forest (see www.treesforlife.org.uk). As of 2021, Trees for Life is an integral part of a larger program under Rewilding Europe, now called the "Afric Highlands," (McDonnell 2021) with an ambitious 30-year vision.

Europe's attention to wilderness is changing in several ways. Most recently this has been empowered by the European Parliament Resolution on Wilderness in Europe (European Parliament 2009). This sweeping resolution has many directives and calls for action by Member States, including: definition and mapping; enhanced protection; creation of wilderness zones within the European Union's Natura 2000 system of protected areas (the largest such network in the world); and sharing of best practices. It has also led to significantly enhanced NGO-driven initiatives such as that of Wild Europe and the criteria and standards for wilderness quality promoted by the European Wilderness Society.

European Wilderness Network

The European Wilderness Network (EWN) is an initiative of the European Wilderness Society (EWS), working in accord with the European Parliament Resolution on Wilderness in Europe (European Parliament 2009). EWS aims to strengthen the wilderness concept in Europe through creation of standard criteria for wilderness areas and providing NGO-based accreditation for those areas that qualify.

EWS has codified these standards under the European Wilderness Quality and Audit System (EWQAS), consisting of a hierarchy of nine principles, fifty-four criteria and more than 300 indicators. The structure of these standards is similar to other systems, such as that used by the Forest Stewardship Council and the Marine Stewardship Council. The European Wilderness Network currently includes forty-one areas across Europe, representing various biomes, including rivers, forests, coasts, and islands (Table 3.1).

There is potential to enlarge the EWN in the coming years, for example through many areas that are currently under a wilderness-focused restoration process. In this process, EWQAS provides an important, guiding protocol and framework for unified standards of quality across these new potential wilderness areas.

TABLE 3.1 European Wilderness Network Accredited Areas (Source: European Wilderness Society in 2022)

Name of Protected Area	Country	Total Area (ha)	Total Area (acres)
WILDERNESS			
1. Borjomi-Kharagauli	Georgia	50,325	124,356
2. Central Balkan	Bulgaria	20,019	49,469
3. Čepkeliai	Lithuania	13,004	32,134
4. Chornyy Dil	Ukraine	1,580	3,904
5. Darvaika	Ukraine	1,450	3,583
6. Fulufjället	Sweden	19,000	46,950
7. Gorgany	Ukraine	4,800	11,861
8. Hohe Tauern	Austria	6,728	16,625
9. Hoverla	Ukraine	4,477	11,063
10. Kalkalpen	Austria	13,034	32,208
11. Königsbrücker Heide	Germany	5,600	13,838
12. Küre	Turkey	26,162	64,648
13. Majella	Italy	25,895	63,988
14. Maramarosh	Ukraine	3,162	7,813
15. Oulanka	Finland	12,924	31,936
16. Paanajärvi	Russia	30,000	74,132
17. Peneda-Geres	Portugal	5,000	12,355
18. Podyjí	Czech Republic	254	628
19. Retezat	Romania	10,440	25,798
20. Rila	Bulgaria	16,222	40,085
21. Soomaa	Estonia	11,530	28,491
22. Teiču	Latvia	4,570	11,293
23. Uholka-Shyroky Luh	Ukraine	7,117	17,586
24. Zacharovanyy Kray	Ukraine	1,332	3,291
WILDCOAST			
25. Archipelago	Finland	10,600	26,193
26. Jasmund	Germany	806	1,992
WILDFOREST			
27. Hainich	Germany	1,570	3,880
28. Kalkalpen	Austria	5,251	12,976
29. Kuziy-Trybushany	Ukraine	5,251	12,976
30. Thayatal	Austria	250	618
31. Uholka-Shyroky Luh	Ukraine	7,117	17,586
32. Zacharovanyy Kray	Ukraine	1,258	3,109

(continued)

TABLE 3.1 European Wilderness Network Accredited Areas (Source: European Wilderness Society in 2022) (continued)

Name of Protected Area	Country	Total Area (ha)	Total Area (acres)
WILDISLAND			
33. Vilm	Germany	171	423
WILDRIVER			
		Total Length (km)	Total Length (miles)
34. Dyje	Czech Republic	2.7	1.7
35. Kitka	Finland	16	9.9
36. Mala Uholka	Ukraine	7	4.3
37. Olanga	Russia	36	22.4
38. Oulanka	Finland	26	16.2
39. Shyrokyi Luh	Ukraine	9	5.6
40. Thaya	Austria	2	1.2
41. Velyka Uholka	Ukraine	8	5.0

THE INTERNATIONAL UNION FOR CONSERVATION OF NATURE (IUCN)

The IUCN (once known for a short period as the World Conservation Union) was created in 1948 and as of 2022 has 1,700 members comprised of sovereign states, governmental agencies, and nongovernmental organizations (NGOs), and affiliates.

IUCN's purpose is to influence, encourage, and help societies throughout the world to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable. IUCN works with agencies in individual nations as well as various international bodies, such as the United Nations Environmental Program (UNEP), Food and Agricultural Organization (FAO), and United Nations Educational, Scientific & Cultural Organization (UNESCO).

The IUCN is administered through its secretariat in Switzerland, has numerous regional offices, and performs its conservation work primarily through seven commissions. The commission with the most relevance to wilderness is the World Commission on Protected Areas (WCPA), which undertakes a variety of responsibilities in aiding nations, particularly developing nations, in planning of protected areas. WCPA provides strategic advice to policy makers, guidance to protected area managers, and advice to the public, corporate donors, and governments on the value of protected areas, to increase investment.

Members and the Steering Committee of the WCPA support the compilation of global protected area data, and the following institutions or sources of information can provide a comprehensive, frequently updated, global view of protected nature. WCPA and its members co-founded the World Conservation Monitoring Centre (WCMC), administered by the United Nations Environment Programme (UNEP) and located in Cambridge (UK), which provides detailed computer-based analyses of the status of protected areas around the world through its World Database on Protected Areas that is updated monthly. More recently, WCPA launched the

Protected Planet website, which provides information on protected nature under eight themes: protected areas (the World Database on Protected Areas); management effectiveness; other effective conservation-based measures (OECMs); territories and areas conserved by Indigenous peoples and local communities (ICCAs); the IUCN Green List of Protected and Conserved Areas; connectivity; equitable governance, and marine protected areas. The WCPA also assists with the UN List of Protected Areas. Finally, the WCPA takes primary responsibility for organizing the World Parks Congress held about every ten years in various locations around the world.

Wilderness was not always recognized as a conservation category by the IUCN. Following a resolution adopted at the 3rd World Wilderness Congress in Scotland in 1983, a recommendation was passed at the IUCN General Assembly meeting in Madrid in 1984, requesting that a specific category—wilderness—be added to the IUCN protected area category list. This request assumed that formal international recognition of wilderness as a conservation category would lend important credibility to wilderness protection around the world. Wilderness was included as a Category 1 protected area when the revised IUCN conservation categories were finally approved in 1992. The six categories are presented under the Guidelines for Applying Protected Area Categories, in which Category 1 includes two types of protected areas: strict nature reserves, largely for science purposes only (Category 1a), and wilderness areas (Category 1b).

IUCN protected area management Category 1b areas are generally large-scale sites in which ecological processes can function with minimal human disturbance. These sites are defined as, "Protected areas that are usually large, unmodified or slightly modified areas, retaining their natural character and influence, without permanent or significant human habitation, which are protected and managed so as to preserve their natural condition" (Dudley 2013, 14).

In 2002, in a move to reinforce wilderness in the WCPA's Guidelines for Protected Areas, a temporary Wilderness Task Force (WTF) was officially established within the WCPA.

This Task Force was quickly elevated to a permanent Specialist Group (WSG) within WCPA, founded by the WILD Foundation, thus creating a permanent institutional voice for wilderness within the WCPA and the global environmental institution framework. The WSG initially led a series of workshops at the World Parks Congress in Durban, South Africa, in 2003; created a web portal for global wilderness professionals connected to IUCN; successfully maintained the integrity of Category 1b during the 2007–2008 process of revising the Guidelines for Protected Areas; and, in 2016, produced management criteria for the wilderness category (Casson et al. 2016).

WILDERNESS PROTECTED AREAS: GUIDELINES FOR MANAGEMENT OF IUCN CATEGORY 1B WILDERNESS

Casson et al. (2016) established the first, and to date, only global guidelines for understanding and managing formally designated wilderness areas. The Guidelines begin by acknowledging that the term “wilderness” is used in a variety of ways. It is a biological descriptor, referring to places that are mainly ecologically intact. It is a type of protected-area classification, referring to a category of protected areas that seeks to maintain wilderness quality over time, while still allowing for human uses that are compatible with those wilderness qualities. It is also used to describe an essential dimension of human culture, which is that humans, like all other species, originated in the wilderness: they evolved for millions of years in caves, trees, and open savannahs (Martin and Robles Gil 2009).

The Guidelines also address management principles; governance and authority; management tools and issues; and evaluating effectiveness. In addition, the Guidelines—produced by forty volunteer experts from around the world—emphasize that *wilderness areas do not exclude humans . . . they exclude certain human uses*. In addition, *the Guidelines emphasize that wilderness areas recognize, promote, and insist upon the inclusion of Indigenous Peoples and Local Communities (IPLC) as full partners (not just stakeholders) in wilderness designation and management as codified under the UN Declaration of the Rights of Indigenous Peoples (UNDRIP)*. Overall, the Guidelines present tools and techniques for wilderness management, while also providing insights into why and how wilderness areas are an important part of the international protected area estate. They increasingly serve as a priority solution to climate change, species extinction, and supporting/partnering with IPLC that live in or adjacent to the wilderness.

Further, and to amplify the above points about arguments used by opponents of wilderness, the authors of the Guidelines offer two specific wilderness critiques early on, of which wilderness advocates and managers need to be aware. They also provide information on how to respond when faced with these critiques. First, IPLC resist using the term “wilderness” because of the divide between their nature-based cultures and those of westernized, time-driven cultures, and because the concept of wilderness drives out Indigenous inhabitants. The Guidelines demonstrate that IPLC are not a holistic bloc, and there are clear examples in all regions of the world of use of the wilderness concept by IPLC. Second, the “neo-greens” argue against using the term “wilderness,” rejecting it as post-modern and deconstructionist because they believe “there

really is no such thing as wilderness.” This argument insists that wilderness ignores local people and that human impacts such as climate change and pollution are globally pervasive and therefore there are no “pristine” areas left on earth. Such an argument is unsupported by conservation science, and one also has simply to note that the word “pristine” is absent from formal definitions of wilderness, especially that of the IUCN.

Finally, the Guidelines also demonstrate that, in the absence of corruption and illegal uses, wilderness areas can support human-rights-based approaches to creating a world in which humans and nature coexist and are mutually reinforcing and reciprocal.

INTERNATIONAL INSTITUTION SUPPORT FOR WILDERNESS

In the U.S., wilderness is well defined in the Wilderness Act of 1964 and has a rich history of research and policy decisions to guide management by the four federal land management agencies (Forest Service, National Park Service, Bureau of Land Management, and the U.S. Fish & Wildlife Service). However, “wilderness” in the U.S. and internationally can also have a broader official definition. As noted earlier, the IUCN protected area Category 1b (wilderness area) is defined as “usually large unmodified or slightly modified areas, retaining their natural character and influence, without permanent or significant human habitation, protected and managed to preserve their natural condition.” Wild nature (or “wildlands”), while not being formally designated wilderness, is still supported by international institutions.

The World Bank conveyed international recognition for wilderness in a 1986 policy statement explaining how certain pristine areas yield more benefits to present and future generations if maintained in their natural state (Goodland 1987). To protect these long-term values, the World Bank announced that it would usually decline to finance development projects in such areas. If development in wildlands is to occur, careful justification is required and compensation (in the form of financing) to preserve an ecologically similar area or some other mitigating measure must be undertaken (World Bank 1986).

The establishment by the World Bank in 1990 of the Global Environmental Facility (prompted by the work of and a resolution approved at the 4th World Wilderness Congress) created one of the largest sources of intergovernmental funding to address biodiversity protection, often in wildlands and seas. Further progress is the trend among global financial experts and think tanks to monetize the values of ecosystem services provided by wild nature, and therefore determine the financial cost of their destruction (Johnson et al. 2021). When funding for such destruction is provided by governments, this genre of finance is now regarded as “perverse subsidies” (Myers 1998). Most recently, the UK government commissioned a two-year study specifically focused on the urgent need to change financial models to address the state of nature, with special interest in reallocating subsidies to instead protect nature see, for instance, (Sylvén and Martin 2020). The Dasgupta Review (Dasgupta 2021) directly addressed the futility and danger of measuring economic growth and prosperity without including the value and destruction of the essential natural processes produced by wild nature, upon which all life depends.

Given this progress, it is important to recognize that adherence to these new policies and trends in the mainstream financial sectors is, however, uneven and challenging. According to the Forest and Finance Policy Assessment (2022), which researched 200 financial institutions, since the Paris Agreement was signed in 2015, banks have provided USD 267 billion in credit (from 2016 to September 2022) to 300 forest-risk commodity companies operating in the world's three largest high-functioning, tropical forest regions: Southeast Asia, Central and West Africa, and parts of South America. Referring to destructive land-transformation projects, the report summarizes the situation as "the finance sector is pouring money in at an alarming rate."

General, international, natural-area designations exist and are widely used. While not based per se on designated wilderness, most of them interact by existing adjacent to or overlapping with wilderness. These types of designations exist as Conventions under the auspices of United Nations Educational, Scientific and Cultural Organization (UNESCO): Biosphere Reserves (multi-use sites including a core zone much akin to wilderness); Ramsar Sites (wetlands); and World Heritage Areas (specifically "natural" sites that have implications for wilderness) (Kormos et al. 2016). These areas are not under any formal legal statute, but they are rather prestigious global designations adopted by nations after strict review and approval by the relevant Convention's governing body. These designations, especially the Natural World Heritage one, can be used effectively in wilderness campaigns by helping build public understanding of their local and global importance (Fig. 3.3). Perhaps the most famous such matter is that of the South West Wilderness in Tasmania (declared a World Heritage Area in 1982), one of the largest temperate wilderness areas in the world and one of the very first wilderness campaigns that assumed global status when it was presented in plenary at the 2nd World Wilderness Congress in Australia, in 1980 (Brown 1982). The South West Wilderness has been



FIGURE 3.3 World heritage site status is given to areas possessing outstanding natural qualities, exceptional natural beauty, or threatened species of plants or animals. The Daintree area of northern Queensland, Australia, typifies a rain forest setting. Photo courtesy Ralph Lindsey.

an ongoing issue, and as recently as 2016 the Australian and Tasmanian governments tried to remove official status from this wilderness to allow logging. However, rejection of this action by the World Heritage Convention was a deciding factor in making the government abandon its plan (Glenday 2014).

In the United States, several biosphere reserves overlap with designated wilderness areas, such as the Noatak Wilderness in the Noatak National Preserve and the Aleutian Islands Wildernesses in Alaska, Everglades National Park Wilderness in Florida, and Three Sisters Wilderness in Oregon. The wilderness cores of these biosphere reserves provide a critical baseline for helping determine the extent of human influence on the surrounding biotic environment and are a source for understanding how natural processes can accommodate human impacts. As public awareness grows about the critical role wilderness plays in improving understanding of our environment, the security of such areas should increase.

DIFFERENT TYPES OF RECOGNITION AND PROTECTION OF WILDERNESS: A GLOBAL REVIEW

It is important to recognize some inherent confusion and overlap in the many ways that the term "wilderness" is used internationally. The status field in the World Database on Protected Areas (WDPA) provides information on whether a protected area has been established or designated, at the time the data were submitted. According to UNEP-WCMC (2017), designation means it is recognized or dedicated through legal means and implies a specific binding commitment to conservation in the long term. In this chapter we focus on some of those areas designated since 2008. Actual management plans were usually found for designated areas, but not all. While it is not entirely clear, the likely case is that many Category 1b areas are "recognized" as wilderness but are without a formal management plan. First, we consider an overview of Category 1b, and then look at another suggested type of general classification.

IUCN PROTECTED AREA CATEGORY 1B—WILDERNESS (AN INTERNATIONAL PERSPECTIVE)

Since 2008 and the most recent, former edition of this book, a total of 1,083 designated entries for Category 1b areas have been added to the WDPA (UCN and UNEP-WCMC 2022), with area, ownership, year designated, and type of protection indicated. There were also ten "established" (nine in Canada and one in Antigua and Barbuda). For the 1b areas added since 2008, there are eight administered by collaborative governments (all in Canada), one indicated to be in multiple ownership but federally or ministry controlled in Austria, 878 federal areas, twelve government-delegated areas, two Indigenous areas in Canada (Wehexlaxodiale Land Use Exclusion Zone through an Indigenous Land Use Plan, and Thaidene Nënë Territorial Protected Area designated in 2019 in the Northwest Territories with collaborative governance), one with individual landowners (Tierra Silvestre Canon del Diablo in Mexico), five in joint governance (Australia, Costa Rica, and Finland [Private Nature Reserve]), one local community in the Marshall Islands, six non-profits, three where

jurisdiction is not reported (in Brazil and the Dominican Republic), and 175 sub-national areas (states or provinces, mostly in Canada, but also in Australia and Malaysia). In the U.S., since 2008, there were 163 new designation entries (101 BLM, 34 FS, 5 NPS, and 23 FWS). The number of "new" Category 1b classifications is a topic deserving of additional study. We do not fully understand how many are simply additions to existing 1b areas, how many are re-classification of areas within other protection designations, who submits these areas for addition to the WDPA for each country, or whether there is consistency in reporting, the screening process, and the implications for management or future designations. But we do see a trend of recognizing the wilderness qualities of these places and growing designations across the world. We also do not know how much the IUCN Category 1b guidelines are in use to guide designation and protection of these areas.

Since 2008, many countries have reported new designations of protected areas meeting Category 1b criteria. These include Argentina, Australia, Austria, Burundi, Bosnia and Herzegovina, Brazil, Canada, China, Costa Rica, Denmark, Dominican Republic, Spain, Estonia, Finland, France, Haiti, Japan, Lebanon, Sri Lanka, Luxembourg, Mexico, Marshall Islands, Mongolia, Malaysia, Niger, Norway, Oman, Philippines, Poland, Portugal, Russia, Slovenia, Sweden, Tanzania, USA, and Uzbekistan. While many of these countries do not have official intranational systems of wilderness recognition, or official processes to designate areas (both of which do exist in several countries), they are protecting areas that they report do meet the criteria of IUCN Category 1b and their specific information have been added to the WDPA.

THREE OBSERVED CLASSES OF WILDERNESS PROTECTION (AN INTRANATIONAL PERSPECTIVE)

Following is a summary of some of the *de jure* (existing in law) and *de facto* (existing in fact) protection of wilderness areas and values in countries where such protection exists. A useful way to view this spectrum would be in three classes (as suggested by Martin 1994):

Class I wilderness includes statutory or legal protection of wilderness areas, usually with management plans. Eight nations including the United States have legislatively designated areas that protect wilderness attributes: Australia, Canada, Finland, South Africa, Sri Lanka, the Flathead Indian Reservation (a sovereign nation with the authority to self-govern within the United States), and Russia (technically, protected nature reserves with protection of wilderness attributes).

Class II wilderness includes recognition and protection of wilderness through administrative zoning as found in several countries, such as New Zealand, Zimbabwe, and Italy.

Class III wilderness includes wilderness recognition and protection in resource-management programs in which use of the concept *wilderness* is a key component in the overall conservation effort, such as in Namibia and the Philippines.

The following sections provide information obtained from some of the countries that demonstrate the characteristics of each class of the three classes listed above and some details about the history of their recognition system.

Class I—Statutory (Legal) Protection of Wilderness

Finland

Commercial forestry in large continuous areas of wildlands and the need to protect traditional means of livelihood in northern Finland stimulated a wilderness movement that began in the 1950s (Sippola 2000; Kajala 2008). Finland's Legislative Act on Wilderness Reserves, however, did not pass until 1991, providing statutory protection for about 3.75 million acres (1.5 million ha) in twelve units, about 5 percent of the area of Finland and all north of the Arctic Circle (Kajala 2008). No additional areas have been designated under this law.

The Finnish word that is translated as wilderness (*erämaa*) is defined culturally and historically different from wilderness in the English language. In Finland, some of the areas protected as wilderness have always been part of some people's everyday life for hunting and fishing (Saarinen 1998; Sippola 2000).

These areas in Finland were legislatively established to preserve their wilderness character, to protect the native Sami culture, maintain traditional subsistence uses of the areas, and enhance possibilities for multiple use of nature. All Finnish wilderness areas belong to IUCN protected area Category 1b: Wilderness. To be considered for inclusion, areas had to be a minimum of 37,000 acres (15,000 ha), over six miles across, and mostly roadless and uninhabited. The smallest Finnish wilderness area, Tsarmitunturi, is 37,000 acres (15,000 ha), and the largest, Kaldoaivi, is 726,500 acres (294,000 ha) (Kajala 2008). In addition, there are, in total, 334 Category 1b areas in Finland, with 112 designated since 2008. Of those designated since 2008, all are either in Private Nature Reserves or State Nature Reserves (either designated by Metsähallitus or Regional Environmental Centers).

Additional designation of wilderness lands under Finland's *Legislative Act on Wilderness Reserves* is not anticipated, although the Finnish wilderness legislation does state that if the national government acquires private inholdings within a designated wilderness reserve, that land area shall become part of the wilderness. In addition to national wilderness areas, Finnish Lapland has about 2.5 million acres (1 million ha) of protected natural areas that are valued for their wilderness character. Human activities are even more restricted in these areas than they are in wilderness areas, including within national parks, where a common management zone was once called a "wilderness zone," but recently this term has been changed to "remote zone." These are typically low-use recreation zones with little regulation in effect (Kajala 2008).

Protecting traditional relationships with nature and Indigenous Sami culture is an important aspect of wilderness in Finland (Pietikäinen 1995). Roads, mining, and large-scale tourism are forbidden, but small-scale forestry was allowed, with important restrictions, in some parts of five of the twelve wilderness units. However, Metsähallitus decided by the year 2003 that no forestry will be practiced in wilderness areas and before that, logging had only occurred in one wilderness area, Hammastunturi.

The wilderness areas are administered by Metsähallitus, which governs most state-owned lands. Recreation and tourism associated with the wilderness areas and national parks of northern Finland have become increasingly important. Saarinen (1998) found that the most important reasons

growing numbers of tourists visit some northern Finland sites include opportunities to see natural landscapes and wilderness and enjoy peace and quiet. Wilderness areas provide open, reservable and rentable huts, marked hiking trails, and snowmobile routes. However, to protect their pristine character, the largest parts of the wilderness areas do not have such facilities and services.

The Finnish people have protected many areas under a variety of designations, including wilderness (Table 3.2).

Australia

Having one of the lowest population densities of any settled country, Australia is also highly urbanized. Hence, a large part of the country is sparsely populated, although extensive areas show the influence of rangeland agriculture, logging and mining.

In 1944, the 3.2-million-acre (1.3-million-ha) Kosciuszko National Park in New South Wales was designated with the provision that up to 10 percent of the park be set aside as a primitive area. In 1962 this designation prevented the construction of hydroelectric power works in the higher elevations of the Snowy Mountains. From the late 1960s, wilderness issues were prominently featured in conservation campaigns opposing hydroelectric schemes in Western Tasmania and native forest logging in several states.

A series of inventories of Australia's wilderness resources began in the mid-1970s (Helman et al. 1976), covering parts of NSW, Queensland, Victoria, and Tasmania. Lesslie and Taylor (1985) developed a procedure to inventory wilderness quality as a continuum, characterized by remoteness and primitiveness. The survey was extended to nearly all of terrestrial Australia as the National Wilderness Inventory (NWI) (Lesslie and Maslen 1995). Little progress has been made since then, probably because the wilderness concept represented an ongoing constraint on development, was not acceptable to some sections of the Indigenous community, and there was a shift in emphasis to biodiversity conservation (Sawyer 2015). The NWI was not subsequently updated, and the

Commonwealth Wilderness Programme under which it operated finished in 1999. However, variants of the NWI method have been used to assess wilderness qualities in several other parts of the world (Hawes et al. 2018) and a revised version of the NWI was prepared and remains in use in Tasmania (Hawes et al. 2015).

Each of Australia's eight states and mainland territories holds principal authority over the management of its natural resources, including park and conservation management. Thus, the spread of the national parks idea and, later, that of wilderness was driven by regional rather than national issues and interests. In Australia today, two states, New South Wales and South Australia, have wilderness legislation. Most other states and territories have wilderness provisions within their general nature conservation legislation or within their parks and reserves legislation, although definitions of what constitutes wilderness varies.

Since the 1990s, the Australian federal government has taken a predominantly antipathetical approach to wilderness zoning on reserves partly or entirely under the control of its agencies. For example, the large wilderness zone in Kakadu National Park was removed, as was the marine wilderness zone of the northernmost part of the Great Barrier Reef, although both remain conservation reserves.

The *Environment Protection and Biodiversity Conservation Act 1999* is the main piece of national legislation that deals with environmental conservation, but it makes no mention of wilderness. Regulations under this Act include management provisions for IUCN Category 1b Wilderness, but in the absence of any such designated reserves under federal government control they remain unapplied. The World Heritage Properties Conservation Act 1983 recognizes Australia's international treaty obligations to protect World Heritage-listed areas, and federal guidelines recognize wilderness among the natural heritage values of World Heritage areas. However, the actual identification of wilderness is determined on a case-by-case basis in the reservation and planning processes conducted largely by the state governments.

Since much of Australia's unprotected wilderness is located on Aboriginal land, its protection depends on harmonizing non-Indigenous and Indigenous perspectives (Muir 2007). Some members of the Australian Indigenous community are supportive of the wilderness concept. Others are antagonistic, maintaining a contested view that wilderness implies a lack of past human activity and precludes traditional rights. The Malimup Communiqué (Commonwealth of Australia 1998) included principles for Indigenous use of wilderness but has not seen wilderness protection extended across northern Australia. Most Australian states are developing a co-management approach to protected area management.

The Collaborative Australian Protected Area Database [CAPAD] compiled by the Commonwealth of Australia (2021) (Table 3.3) indicates the country has 66 IUCN Category 1b protected areas, totalling 9.5 million acres (3.85 million ha), although categorization as 1b does not automatically confer protection of wilderness values. Twenty-five areas have been designated since 2008 (UCN and UNEP-WCMC 2022). However, Australia lacks a nationally consistent approach to assigning IUCN protected area categories, which are compiled by various state-based agencies. This information is then provided uncritically for the World Database on Protected Areas (WDPA). Hence, the information listed in the

TABLE 3.2 Protected Areas and Wilderness in Finland (Metsähallitus, Parks & Wildlife Finland, December 2022)

Protected Area	Number	Total Area (ha)	Total Area (acres)
National Parks	41	1,014,619	2,507,178
Strict Nature Reserves	19	153,998	380,537
Other Nature Reserves	1,186	921,897	2,278,057
Privately Owned Nature Reserves	13,142	407,624	1,007,260
Wilderness Areas	12	1,489,310	3,680,165

TABLE 3.3 IUCN Protected Area Category 1b Areas in Australia, by State and Territory (CAPAD 2021)

State or Territory	Areas with Category 1b Classification	Total Area (ha)	Total Area (acres)
Australian Capital Territory	1 wilderness zone	28,793	71,149
New South Wales	27 wilderness areas	1,762,383	4,354,937
Northern Territory	0	0	0
Queensland	1	4	10
South Australia	14 wilderness areas	1,850,067	4,571,608
Tasmania	5	4,884	12,069
Victoria	16 wilderness parks or zones	200,233	494,786
Western Australia	2 wilderness zones	1,281	3,165
Commonwealth of Australia	0	0	0

WDPA for Australia, historically and now, at least for Category 1b areas, gives a poor and inconsistent indication of the extent of protected wilderness in the country.

Despite high public support for protecting Australia's remaining wilderness (Fig. 3.4) (Hawes and Dixon 2021), the achievement of this continues to be hampered by limited political support, a lack of wilderness legislation at a national level, and a lack of current data on the extent and quality of the country's wilderness. Ongoing physical threats to wilderness include land clearance, logging, fracking, dam construction, and tourism development. Additionally, climate change poses a major threat to the ecological integrity and biodiversity of many wilderness areas.

Canada

A comprehensive appraisal of wilderness protection in Canada (Hummel 1989) called for a coordinated effort at provincial, territorial, and federal levels to secure legal protection of at least 12 percent of the nation's landscape by the turn of the

century. Canada now intends to protect 25 percent of the terrestrial environment by 2025 and 30 percent by 2030 (Environment and Climate Change Canada [ECCC] 2022). The protected areas will include national/provincial/territorial parks, Indigenous protected and conserved areas, national wildlife areas, migratory bird sanctuaries, and other effective area-based conservation measures. Canada is the second largest country in the world and as of 2021 had about 12.6 percent of its land and freshwater in protected areas (ECCC 2022).

Table 3.4 summarizes the areal extent of Canadian IUCN Category 1b Wilderness that is protected under national, provincial, territorial, and Indigenous designations. Table 3.5 represents knowledge about wilderness designation statuses published in 2008. These numbers are not directly comparable, but they do indicate accelerated interest in designation of areas (likely already protected at some level) protected for wilderness attributes, most beyond the intra-national wilderness designation system. Since 2008, WDPA entries suggest that 157 new areas have been designated in Category 1b in Canada, mostly at the provincial level, with a few in collaboration with non-profit organizations and two Indigenous community protected areas (UCN and UNEP-WCMC 2022).

In public opinion polls, Canadians have expressed strong support for the protection of wilderness lands (Rutledge and Vold 1995, Hummel 1989, Parks Canada Agency 2000). There was almost unanimous support for the government of Canada to take actions to protect wilderness, and 83 percent believed it was important for Canada to be seen as an international leader in protecting wilderness (Parks Canada Agency 2000). While wild landscapes remain vital, the protection of wilderness (without an integral human component) as a primary objective for protected areas has been eclipsed by objectives for biodiversity, climate change mitigation, and contributing to Indigenous Peoples conservation priorities (Maxwell et al. 2020, Fletcher et al. 2021, No'kmaq et al. 2021, Hebblewhite et al. 2022). Public support for protected areas remains strong (Fig. 3.5), as is the support for achieving Canada's protected areas targets (Wright et al. 2019).



FIGURE 3.4 The Valley of the Monoliths, part of the 70,000-acre (28,000-ha) wilderness located within the Budawang Range, in Morton National Park, New South Wales, Australia. Although recreational use is permitted here, overnight camping is prohibited because of the highly erodible terrain. Photo courtesy Rob Jung.

TABLE 3.4 IUCN Protected Area Category 1b (Wilderness) Areas in Canada (ECCC 2021)

Province/Territory	Authority	Total Area (ha)	Total Area (acres)
Alberta	Alberta	3,771,492	9,319,560
	Canadian Wildlife Service	10,798	26,682
	Parks Canada	1,784,900	4,410,584
British Columbia	British Columbia	3,624,801	8,957,078
	Parks Canada	261,400	645,933
Manitoba	Manitoba	3,438,513	8,496,753
New Brunswick	New Brunswick	17,570	43,416
	Parks Canada	18,400	45,467
Newfoundland & Labrador	Newfoundland & Labrador	398,268	984,142
Nova Scotia	Nova Scotia	424,664	1,049,368
Nunavut	Nunavut	3,494,459	8,634,996
	Canadian Wildlife Service	6,808,419	16,823,970
Northwest Territories	Northwest Territories	2,127,009	5,255,954
	Indigenous Protected & Conserved Area	2,183,988	5,396,752
	Canadian Wildlife Service	3,509,817	8,672,947
	Parks Canada	30,026,000	74,195,862
Ontario	Ontario	4,801,690	11,865,234
	Canadian Wildlife Service	21,277	52,577
	Parks Canada	217,308	536,980
Quebec	Quebec	781,374	1,930,817
Saskatchewan	Saskatchewan	2,054,220	5,076,088
Yukon	Yukon	520,320	1,285,739
	Parks Canada	325,900	805,316
Total		70,622,587	174,512,213

TABLE 3.5 Wilderness Lands by Province in Canada (McNamee 2008)

Province or Authority	Number of Units	Total Area (ha)	Total Area (acres)
British Columbia	1 Wilderness Area	19,000	46,930
Alberta	3 Wilderness Areas	100,800	248,976
Newfoundland/Labrador	2 Wilderness Areas	396,500	979,355
Ontario	9 Wilderness Parks	4,823,745	11,914,650
Nova Scotia	31 Wilderness Areas	285,000	703,950
Parks Canada	2 Wilderness Areas	85,000	209,950
Total	48 Wilderness Units	5,710,045	14,103,811



FIGURE 3.5 Much of Canada's far north holds outstanding opportunities for wilderness recreation. Here a kayaker enjoys the solitude and natural landscape of Pelly Bay. Photo courtesy Department of Economic Development and Tourism, Northwest Territories, Canada.

Indigenous Peoples are a growing force for establishing protected areas in Canada. Indigenous Protected and Conserved Areas (IPCA) are lands and waters where Indigenous Peoples have the primary role in identifying and designating their location and purpose. Some IPCAs are co-designated with federal, provincial, or territorial governments and legislation, while others are designated under Indigenous laws, governance, and knowledge systems. IPCA establishment, governance, and management objectives share three elements: being Indigenous-led, having a long-term commitment to conservation, and elevating of Indigenous rights and responsibilities (Indigenous Circle of Experts 2018). Inuvavik National Park (the majority of which is zoned as wilderness) was Canada's first IPCA and created through the Inuvialuit Final Agreement in 1984. Many IPCAs have been established through Indigenous land claim agreements, national park establishment processes, and in the past five years, five large IPCAs were established in the Northwest Territories, British Columbia, and Alberta.

Transboundary protection of wilderness areas is in place between provinces, provinces and territories, territories, and Canada and the U.S. Some examples include the protection of Manitoba-Ontario Interprovincial Wilderness Area, Tatshenshini-Alsek Provincial Park, Kluane National Park, and Glacier Bay and Wrangell-St. Elias National Park and Preserves; Torngat Mountains National Park, Kuururjuaq Quebec National Park, and Waterton-Glacier International Peace Park; and Inuvavik National Park, Vuntut National Park, and Arctic National Wildlife Area.

Seven of the ten Canadian provinces have legislation to designate wilderness protected areas and/or to support wilderness management zones within protected areas: Alberta, British Columbia, Manitoba, Newfoundland and Labrador, Nova Scotia, Ontario, and Saskatchewan. The three territories, Quebec, and New Brunswick do not have wilderness legislation, but each has IUCN Category 1b areas identified (Table 3.4).

At the federal level, the Canada's National Parks Act was amended in 1988 to include provision for wilderness designation (McNamee 2008). In 2000, Parks Canada declared its first wilderness areas in Banff, Jasper, Kootenay, and Yoho (McNamee 2008) using the National Parks Wilderness Area Declaration Regulation. As of 2022, eight national parks have legislated wilderness areas. In addition, through each

national park management plan a large proportion of land and water are zoned wilderness. Some migratory bird sanctuaries and national wildlife areas have been identified as Category 1b Wilderness by the Canadian Wildlife Service because they are large unmodified areas that retain their natural character, lack permanent habitation, and are managed to preserve their natural condition, but the legislation for these protected areas does not identify wilderness as a management objective.

Currently Alberta manages wilderness areas established under three legislations: the Willmore Wilderness Park Act (1962), the Provincial Parks Act (1964), and the Wilderness Areas, Ecological Reserves, Natural Areas and Heritage Rangelands Act (2000). Historically, other legislation was used: the Wilderness Provincial Park Act (1959), Forest Reserves Act (1961), Public Lands Act (1965), and Wilderness Areas Act (1971).

British Columbia now establishes wilderness parks/areas through the Protected Areas of British Columbia Act (2022). This Act consolidates legislation still used for designating and managing protected areas: the Parks Act and Ecological Reserve Act. British Columbia has been a leader by establishing large, protected areas since the early 1900s, with logging, mining, and hydro dams considered threats to wild spaces. Public opinion has supported protecting large wilderness areas as a top priority for the province.

In Manitoba, the Provincial Parks Act (1993) includes the designation of a wilderness park with the purpose of preserving representative areas of a natural region and provides for a wilderness land use category within the management plan for any type of park.

Newfoundland and Labrador created its Wilderness and Ecological Reserves Act in 1980 that has an emphasis on ensuring that traditional relationships (hunting, trapping, fishing, and recreational travel) with the land are supported (McNamee 2008).

In Nova Scotia, the Wilderness Areas Protection Act of 1998 provided immediate protection of almost 5 percent of the province's total land base (McNamee 2008). This legislation is unique in a province that is 70 percent privately owned.

Ontario passed a Wilderness Areas Act in 1959 (McNamee 2008). In 1978, the Ontario government recognized wilderness parks as one of six official categories of Ontario provincial parks, and in 2006, a new Provincial Parks and Conservation Reserves Act repealed the old Wilderness Areas Act and made wilderness parks an official category in the province's protected areas system.

In Saskatchewan, the Parks Act (1986) includes a category for the designation of wilderness parks that are to be used primarily for preserving large remote natural landscapes and for low intensity, non-mechanized recreation. The Saskatchewan Protected and Conserved Areas Roadmap (2020) describes the overall goal of conserving and protecting 12 percent of land and water but does not include a specific goal for wilderness.

South Africa

The modern concept of wilderness was introduced to South Africa (SA) through a group of rangers working in remote conserved areas in KwaZulu-Natal during the 1950s. The

manner in which they lived and worked had a deep effect on their worldview and this common perception created enduring bonds. It is noteworthy that these bonds sometimes circumvented the legally enforced racial segregation that had plagued the country. One ranger, Jim Feely, circulated an article from the American Wilderness Society, "11 Fundamentals of the Wilderness Concept" (Trippensee 1948). These concepts had a profound effect on fellow ranger Ian Player who, against considerable political opposition, initiated two innovations (Draper 1998).

To firstly prepare himself, Player contacted Howard Zahniser of The Wilderness Society (U.S.)—the unassuming, modest "architect" of the U.S. Wilderness Act—and "Zahnie" mailed him transcripts of the U.S. Senate hearings on the proposed legislation for wilderness. Player read these transcripts around the campfire while on patrol in the iMfolozi, and con-signed to memory all the arguments used against wilderness so that he could be prepared for the policy struggle he knew would come in his own country as the wilderness concept advanced (Martin 1983).

Then came the innovations. Under the rationale that the value of wildness would not be appreciated while it remained unknown, Player initiated multiple-day hikes for the public where participants would live simply: camping under the stars or a basic canvas, and traversing the wilderness on trails made by rhinoceros and hippopotamus. Such trips commonly terminated with a group meeting (*indaba* in Zulu; Mutwa 1999) with participants articulating appreciation of the intrinsic and societal values of these "wild places" and their personal experiences while there. Player's Zulu elder and mentor/colleague/friend, Magqubu Ntombela (Fig. 3.6) suggested that a larger *indaba* should be held to expand this understanding, leading directly to what Player then named the first World Wilderness Congress (in Johannesburg, 1977).

The second innovation entailed establishing portions of two conservation areas as wilderness, a designation never before formally used in South Africa or anywhere else in Africa. These areas have been expanded and continue to this day as the iMfolozi and the Tswati Wilderness Areas (see Table 3.6). Determined to expand wilderness awareness, Player formed the *Wilderness Leadership School*, prioritising selected participants from all walks of life, races, and social levels to promote advocacy for environmental care and wilderness awareness. The symbol of this organisation, selected by Ntombela, was the trifoliate coral tree leaf (signifying the interconnectedness of humanity, spirit, and nature) later adopted by the sister organizations—the WILD Foundation, Wilderness Foundation UK, and the Wilderness Foundation Africa. The advocacy by these groups and the *Wilderness Action Group*, increased the number of SA wilderness areas. Table 3.6 below shows the extent and nature of wilderness areas in SA.

Independent of this introduction of wilderness, the forester Danie Ackerman (then the director) and W.R. "Bill" Bainbridge (then a planner) of the national Forestry Department led the way in amending the 1971 Forest Act to protect forest wilderness, with successive amendments retaining this within the National Forest Act No. 84 of 1998. Interestingly, this Act does not define wilderness, relying, rather, on either common usage of the term or subsequent legal definitions appearing



FIGURE 3.6 Dr. Ian Player, noted South African and international wilderness advocate, and his friend, Magqubu Ntombela, famous game guard and Zulu tribal chief. Player was instrumental in establishing part of the Umfolozi Game Reserve as wilderness in 1958 and in founding the Wilderness Leadership School (WLS), a nonprofit group dedicated to introducing leaders, especially young people, to wilderness. Photo courtesy Ian Player.

elsewhere in SA law. Bainbridge was primarily instrumental in protecting huge swathes of the Drakensberg mountains as catchment areas. Later much of this was formally designated as wilderness.

The legal definition of wilderness occurred with the National Environmental Management: Protected Areas Act No. 57 of 2003 (NEMPAA), which denotes their intrinsically wild character, devoid of roads or human habitation. It limits access to unmechanised means and prioritises biodiversity and ecosystem services including opportunities for solitude (Bainbridge and Lax 2008). It describes how state, communal, or private wilderness can be designated directly or zoned within management plans approved by the government minister. To ensure its efficacy, zoned wilderness must have two inherent requisites: (1) the management plan must be current and (2) the management system must withstand scientific rigour. In other words, the process of zoning wilderness must be consultatively lawful and adhere to a defensible peer-reviewed methodology (Cryer 2009).

Commitment to wilderness protection is varied: the increased number of wilderness areas shows promise, but both the preference for zoning wilderness rather than officially designating it, and the tendency for the areas to be smaller in extent, indicates less or diluted commitment to the wilderness concept. SA's environmental policy, especially since the late 1990's, focuses more on social benefit. This, and increasing law-enforcement needs, result in core conservation (including wilderness) being de-prioritized. The mixed enthusiasm is rooted in the historic perception of wilderness as a post-colonial romantic relic (Zealand 2007), resulting in the concept narrowly surviving SA's democratic transition in the 1990s. Early drafts of NEMPAA excluded wilderness as a protected area category. Instead, it was retrofitted into subsequent drafts as an attribute to be applied to protected areas. The survival of the wilderness concept in SA in the face of

TABLE 3.6 Properties of Wilderness Areas in South Africa (Source: Paul Cryer, South Africa)

Name	Reserve/Park or Area in Which It Is Embedded	Management Authority	Total Area (ha)	Total Area (acres)
Kruger National Park Wilderness Complex (15)	Kruger National Park	South African National Parks	814,999	2,013,906
Richtersveld Wilderness Complex (2)	Richtersveld National Park	South African National Parks	67,777	167,481
Wolkberg Wilderness Area	Wolksberg Nature Reserve	Department of Environment, Forestry & Fisheries	22,000	54,363
Imfolozi Wilderness Area	Hluhluwe-iMfolozi Park	Ezemvelo KZN Wildlife	31,711	78,360
Tewati Wilderness Area	Isimangaliso	Greater St Lucia Wetland Park Authority	42,486	104,985
Ithala Wilderness Area	IGRithala Game Reserve	Ezemvelo KZN Wildlife	6,338	15,662
uKhahlamba Drakensberg Wilderness Complex (4)	uKhahlamba Drakensberg Park	Ezemvelo KZN Wildlife	157,421	388,996
Ntendeka Wilderness Area	Ngome State Forest	Department of Environment, Forestry & Fisheries	5,250	12,973
Groot Swartberg Wilderness Complex (2)	Swartberg Complex	Western Cape Nature Conservation Board	32,437	80,154
East Swartberg Wilderness Complex (2)	Swartberg Complex	Western Cape Nature Conservation Board	16,382	40,481
Kammanassie Wilderness Area	Swartberg Complex	Western Cape Nature Conservation Board	8,136	20,104
Rooiolfantskloof Wilderness Area	Swartberg Complex	Western Cape Nature Conservation Board	5,550	13,714
Paardenberg Wilderness Area	Swartberg Complex	Western Cape Nature Conservation Board	1,522	3,761
Rooiberg Wilderness Area	Swartberg Complex	Western Cape Nature Conservation Board	12,844	31,738
Cederberg Wilderness Complex (3)	Cederberg Complex	Western Cape Nature Conservation Board	49,773	122,992
Groot Winterhoek Wilderness Area	Groot Winterhoek Complex	Western Cape Nature Conservation Board	22,251	54,983
Boosmanbos Wilderness Area	Langeberg Complex	Western Cape Nature Conservation Board	14,000	34,595
Marloth Nature Reserve Wilderness Area	Langeberg Complex	Western Cape Nature Conservation Board	5,821	14,384
Padderberg Nature Reserve Wilderness Area	Langeberg Complex	Western Cape Nature Conservation Board	560	1,384
Kogelberg Wilderness Area	Kogelberg Nature Reserve	Western Cape Nature Conservation Board	12,858	31,773
Fonteinjtiesberg Wilderness Area	Fonteinjtiesberg Nature Reserve	Western Cape Nature Conservation Board	2,522	6,232

(continued)

TABLE 3.6 Properties of Wilderness Areas in South Africa (Source: Paul Cryer, South Africa) (*continued*)

Name	Reserve/Park or Area in Which It Is Embedded	Management Authority	Total Area (ha)	Total Area (acres)
Anysberg Wilderness Complex (2)	Anysberg Nature Reserve	Western Cape Nature Conservation Board	18,621	46,013
De Hoop Wilderness Area	De Hoop Nature Reserve Complex	Western Cape Nature Conservation Board	1,519	3,754
Pilanesberg Wilderness Area	Pilanesberg National Park	Department of Environment, Forestry & Fisheries	11,000	27,182
Baviaanskloof Wilderness Complex (3)	Baviaanskloof World Heritage Site	Eastern Cape Parks & Tourism	84,117	207,858
Total			1,447,895	3,577,828

criticisms (including its exclusion of human habitation) rests with two trends in global and local environmental thinking:

- The acknowledgement of sacred sites to Indigenous/local peoples has increased significance in SA, with many protected areas (and embedded wilderness areas) now being owned by local communities through the land restitution process, which reversed the loss of tenure during apartheid. The idea that certain sacred sites could be protected within a wilderness designation offers new opportunities (Wild and McLeod 2008). The overlap between sacred sites and areas of remote wildness is well understood and could further justify limited access to the community that holds the area as sacred. Such thinking may help convert local critics of wilderness into ardent advocates (Beltrán 2000).
- Within an accentuated awareness of planetary boundaries, averting a biodiversity crisis involves revaluing the complexity inherent in large intact ecosystems. This long-known value of wilderness may induce invigorated support within the country's protected area network.

As a result, current SA wilderness designation prioritizes ecological and Indigenous knowledge systems over simple recreation (a word sometimes associated in SA with elitism) (Fig. 3.7). Even to fatigued urbanites, the value of wilderness is then perceived as benefitting the human spirit rather than just providing fun. This offers challenges in that wilderness management methodologies and language remain structured around recreation. Broader acceptance of wilderness in SA is dependent on incorporating within wilderness management practice this linguistic and conceptual evolution of a society vastly changed since the election of President Mandela in 1994.

Sri Lanka

Sri Lanka is the only South or East Asian country with Class I (legally designated) wilderness. Sri Lanka's 1988 Natural Heritage Wilderness Act provides for the conservation and protection of unique ecosystems, genetic resources, and outstanding natural features by regulating the entry to, and residence within, these areas and the use of their natural resources by local communities. Natural heritage wilderness

is created by order of the minister of Lands and Development, but only after consulting the ministers of the Environment, Wildlife Conservation, Fisheries, Agriculture, Cultural Affairs, and Indigenous Medicine. The recommendation must then be approved by the president and confirmed by Parliament. Management of protected areas falls under the Forest Department and Department of Wildlife Conservation.

Two main rationales form the historical basis for the Act. First is the historical need to protect wild landscapes for watershed values; this practice originated with the ancient kings to protect status as an agricultural power some 800 years ago. Singhalese kings declared specific areas as *thahansi kale*, or forbidden forests. These were typically dense, evergreen tropical forests with rivers and streams. Between 1600 and 1800, colonial rulers destroyed much of these areas for tropical hardwood exports. The few that remain, such as the Sinharaja Rainforest, Peak Wilderness, and Horton Plains, are dramatically reduced in size and now protected under the 1998 Natural Heritage Wilderness Act.

The second rationale for the Act is cultural and religious. Buddhist thought and practice has influenced ideas of nature and conservation for more than 2,300 years. Thus, modern Sri Lanka is steeped in the tenets of compassion, protection, and sanctuary for all life. One ancient teaching explained that humanity and all living beings were equal: "Oh great King, the birds of the air and the animals have an equal right to live in this land as thou, the land belongs to the people and all living beings and thou art only the guardian of it." The concept of sanctuary for animals dates back more than 800 years. However, conservation historians remind us that Sri Lanka's several modern protected areas (e.g., Yala, Horton Plains) were originally established by colonial administrators to protect "game" for sportsmen to kill.

Today Sri Lanka's large network of protected areas covers a diverse range of habitats and covers a significant portion of the island. These areas protect a wide variety of terrestrial, aquatic, and marine species and contribute to the thriving ecotourism industry. In fact, Sri Lanka serves as a case study illustrating how long-held cultural beliefs about nature and humans can demonstrate the wide variety of ecological, social, and economic benefits that arise from protecting nature.

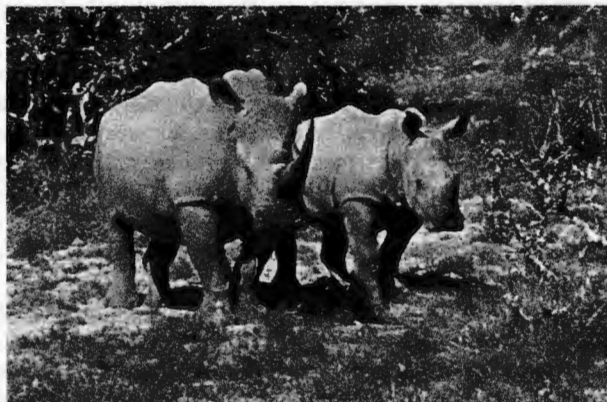


FIGURE 3.7 Wilderness in Africa includes some charismatic megafauna—elephant, lion, and rhinoceros—that are considered icons of wilderness. Photos courtesy Ulf Doerner.

Flathead Indian Nation (Confederated Salish and Kootenai Tribes of Montana, U.S.)

There is a link between Indigenous people and nature that is not described or acknowledged in the U.S. Wilderness Act. The Wilderness Act suggests that these protected areas should be “untrammeled,” or unmanipulated, unfettered, when in fact it is common knowledge that, for most areas in North America, Indigenous people have intervened, with respect, for generations. The Mission Mountains Tribal Wilderness in Montana, though not part of the National Wilderness Preservation System, was designated to protect many of these same values but also extended to protect important cultural meanings assigned to this wild landscape. The meanings that members of the Confederated Salish and Kootenai

Tribes of Montana attach to their (formally designated under Tribal law) Mission Mountains Tribal Wilderness were found to include: (1) protecting nature and culture; (2) functional, emotional, and symbolic attachments; (3) wildlife and watershed protection; and (4) access, beauty, privacy, and recreation (Watson et al. 2011a). Protecting the relationship between Indigenous people and relatively intact, complex systems, which we commonly refer to as wilderness in North America, can be an important contributor to sustainability of the landscape and cultural heritage (Watson et al. 2011a).

The Confederated Salish and Kootenai Tribes live on 1.2 million acres (518,000 ha) in northern Montana, United States, and are a quasi-autonomous jurisdiction under tribal governance. The Mission Mountain Tribal Wilderness Area on the Flathead Indian Reservation in northwest Montana is the only wilderness protected under tribal law found on the more than 300 federally recognized Indian reservations in the United States, and only one of three Category 1b areas designated in the world in the WDPA (UCN and UNEP-WCMC 2022) protected by an Indigenous community.

The Confederated Salish and Kootenai Tribes are the descendants of Salish, Pend d'Oreille, and Kootenai Indians who traditionally occupied a 20-million-acre (8.3-million-ha) area stretching from central Montana to eastern Washington and north into Canada. After the Hellgate Treaty of 1855, most of these ancestral lands were ceded to the U.S. government, with 1.2 million acres (518,000 ha) remaining and now known as the Flathead Indian Reservation (McDonald 1995).

Starting in 1936, there were several attempts to protect the Mission Mountain Range, which is central to the Indians' physical and spiritual geography, but the main effort to protect it came in the mid-1970s in response to a proposal by the Bureau of Indian Affairs to log the mountains. Three greatly respected grandmothers (yayas) raised the initial protest and led the way for other community leaders to organize a “Save the Mission Mountains Committee.” About this time, Thurman Trosper (a tribal member, retired U.S. Forest Service and National Park Service employee, and past president of The Wilderness Society) returned home to the Flathead Reservation and proposed the idea of a tribal wilderness. Following extended community action, the Tribal Council in 1982 approved Tribal Ordinance 79A and the Mission Mountains Tribal Wilderness management plan, designating 92,000 acres (38,333 ha) as wilderness. It was the first time that an Indian tribe had taken action to designate wilderness on its own land and to establish policy direction and provide personnel for its protection and management. CSKT Tribal Ordinance 79A states that “Wilderness . . . is the essence of traditional religion and has served Indian people of these Tribes as a place to hunt, as a place to gather medicinal herbs and roots, as a vision seeking ground, as a sanctuary, and in countless ways for thousands of years” (CSKT 2005).

Salish Elder Clarence Woodcock (CSKT 2005) described these mountains as lands where the people walked and lived. They are important to elders and for the perpetuation of Indian culture because of stories created and told there. A significant difference between the Tribal Ordinance and the federal Wilderness Act, however, is that Ordinance 79A states unambiguously that a primary purpose of the Mission Mountains Tribal Wilderness is the preservation of Tribal culture, and it acknowledges the importance of wilderness to the perpetuation of traditional Indian religion.

Further management plans ensued for protecting grizzly habitat and for fire management, and a Wilderness Buffer Zone of 23,000 acres (9,600 ha) was later established. The importance of the Mission Mountain Wilderness Buffer Zone (a policy or designation not applied to federal Wilderness in the U.S.) to achieving Wilderness protection purposes has been highlighted in recent research, particularly its role in restoration of fire in the larger ecosystem through buffering the non-wilderness from the wilderness (Watson et al. 2013, Watson et al. 2009).

There are also important differences between managing wilderness on the Flathead Nation and managing federal lands under the U.S. Wilderness Act. The needs and values of tribal members take precedence over those of nontribal members resident on the reservation or visiting. Research by Watson et al. (2011a) demonstrates that protecting this tribal wilderness showcases the wisdom of tribal communities in safeguarding their cultural landscape. This protection extends to off-site benefits such as water resources, wildlife habitats, aesthetic values, and other essential resources.

Russia

Although a concept exists in the Russian language that is analogous to wilderness—*dikaya mestnost* (wild place)—a different word is used for some of Russia's wildest protected places: *zapovedniks*—literally “forbidden areas” (Table 3.7). The Soviet Union established these areas, withdrawn from economic use, to preserve representative natural ecosystems and typical and rare landscapes; to protect gene pools for wildlife; and for research and educational purposes (Pryde 1987).

The first *zapovednik*, Barguzin *Zapovednik*, was established as a wildlife preserve to protect a sable population by a regional government in 1916 (Ostergren and Shvarts 2000). In the 1920s, the Ilmen'ski *Zapovednik* was established to protect its unique geological and mineralogical features, making it the first area in the world protected primarily for scientific purposes (Weiner 1988a). The number of areas expanded until 1951, when 128 areas totaled more than 31 million acres (12 million ha). Then, in 1951, about seven-eighths of

the reserves were abruptly eliminated, and it was further reduced by one-third in 1961 (Weiner 1988b). Since 1961, the number of *zapovedniks* has slowly rebuilt and in 2022 there are 1,019 areas totaling more than 84 million acres (34.5 million ha) (Table 3.8).

Despite the privatization of industries and homes following the fall of the Soviet Union in 1991, the vast majority of land has remained under federal control. Total public control creates, in theory, a promising political framework for all kinds of conservation, including that of protected areas. Within the Russian Federation there are also 64 national parks, 60 national nature refuges, and 17 national nature monuments (Table 3.8).

There are important differences between the Russian *zapovednik* and Class 1b Wilderness: absence of parliamentary or other public legislative control; lack of consistent, enforced management plans; some use of motorized vehicles and, originally, the lack of people as part of the environment. However, there is enough regard for maintaining “wild” values present in the Russian *zapovedniks* that they are included here as legally protected wild places.

Despite the original dominant role of nature protection in *zapovedniks*, their value for human uses has also become acknowledged. In the 1960s and 1970s, growing pressures on several nature reserves forced authorities to consider that the areas may have demand for recreation. The recreational demands contributed in part to the creation of several Soviet National Parks in the 1970s. Some parklands were zoned to include wilderness conditions (e.g., natural conditions, access by foot or horse only, no permanent structures), but unlike *zapovedniks* the parks also include economic zones for tourism infrastructure and may have had limited logging.

Probably the most significant post-Soviet event for protected areas was the passage of an “organic act” for all agencies in 1995 and the establishment of the Department of *Zapovednik* Management within the State Committee of Environmental Protection. Historically, *zapovedniks* were protected by various administrative authorities, even at local and provincial levels. This legislation in 1995 (which emphasized biodiversity protection and long-term ecological monitoring) provided a new sense of direction and legal strength to

TABLE 3.7 Types of Protected Areas in Russia (Ministry of Natural Resources of Russia 2021)

Type of PA (Russian and English)	Meaning	IUCN Equivalent	IUCN Category
Заповедник sounds: <i>zapovednik</i>	strictly protected preserve of federal (national) level only	National Nature Reserve or <i>Zapovednik</i>	1a
Национальный парк sounds: <i>natsionalny park</i>	national park, sometimes closer to U.S. National Forest of recreational areas; federal level only	National Park	2 (but some parks closer to 6 because of natural resources used)
Заказник sounds: <i>zakaznik</i>	nature refuge or sanctuary mostly for ecosystem/species protection and management; can be of federal, regional, municipal or local level	(National) Nature Refuge or (National) Nature Sanctuary	4
Памятник природы sounds: <i>pam'yatnik prirody</i>	nature monument—“the least important” PA with quite “soft” regime usually; can be of federal, regional, municipal or local level	(National) Nature Monument	3

TABLE 3.8 Protected Areas (PA) System in Russia (2020) (Ministry of Natural Resources of Russia 2021)

Category of Protected Area	Federal (National) Level		Regional Level		Municipal and Local PAs	
	Number of PAs	Total Area (million ha)	Number of PAs	Total area (million ha)	Number of PAs	Total Area (million ha)
National Nature Reserves (Zapovedniks)	109	34.5	na	na	na	na
National Parks	64	26.9	na	na	na	na
Nature Park	na	na	106	-	-	-
Nature Refuges	60	13.6	2,422	55.9	-	-
Nature Monuments	17	0.024	7,390	-	-	-
Dendrological parks and Botanic gardens	46	0.005	27	0.002	-	-
others	-	-	494	-	-	-
Total:	296	75	10,439	117.7	1,090	47.5

na = not applicable

- = no data

protect these critical areas in Russia. In addition to clarifying responsibilities and strengthening law enforcement authority, the 1995 law expanded the purpose of zapovedniks to include conservation training for professionals, participation in regional environmental impact assessments, and, very controversially, environmental education that may include ecotourism. After eighty years of traditional exclusion, it became legal to bring people into the territory of zapovedniks for purposes other than ecological research (Ostergren 2001).

Discussions about the possibility or necessity of tourism in the zapovedniks went on for many years, with some managers supporting this idea, while some believed that it could destroy wildlife. In 2011, amendments were adopted to the basic law on protected areas, where the development of tourism has become one of the main tasks of the zapovedniks. In fact, tourism has already become established in and around some particularly attractive protected areas, and since 2011 has become legal.

The impetus behind this change in the law is the popularization of nature conservation in Russia, the extensive system of protected areas, and the formation of very positive public attitudes and support for nature conservation associated with the Protected Areas system. However, this decision was not followed by specific policies and direction, leading many managers to begin to develop recreation services with some impact on natural resources, which caused conflicts with nature conservation interests and the loss of value for some territories. In Russia, there is the need to develop ecological tourism in zapovedniks and use it as a tool for nature conservation, without negative impact to the natural resources of protected areas.

According to Watson et al. (2018), Russia contains more remaining “wilderness” than any other country. Because Russia covers eleven time zones and a wide array of ecosystems

(e.g., tundra, taiga, bogs, deciduous forest, steppe, mountains, deserts), there is potential for additional protection of wild lands. Endangered wildlife species are most frequently located in these “wilderness” places, but inadequate funding and staffing, coupled with pressures from competing economic interests (e.g., poaching, food gathering), are continuing problems.

Interestingly, the twelve Russian protected areas listed in the WDPA as Category 1b: Wilderness (six since 2008), are not in the strict nature reserves (zapovednik). Eight are in national parks and the other four are located in State Natural Zakaznik areas (UCN and UNEP-WCMC 2022).

Class II—Administrative Zoning of Wilderness

Some nations protect wilderness by administrative zoning. This protection is not as secure as Class I because administrative rules and regulations are easier to change than statutory protection.

New Zealand

New Zealand protects a wilderness system through administrative designation or zoning under provisions provided in its Reserve Act of 1977, the National Parks Act of 1980, and the Conservation Act of 1987 (Cessford and Dingwall 1997; Somers 2008). Physical conditions, cultural values, and vigorous wilderness advocacy combine to make New Zealand's wilderness have extremely high standards, supported by strict management guidelines.

In 2023, there were eleven designated wilderness areas and two recommended wilderness proposals that totaled around 1.80 million acres (732,000 ha) in New Zealand (Table 3.9).

TABLE 3.9 Wilderness Areas in New Zealand in 2022 (Cessford 2008 and Barnett et al. 2015)

Wilderness Areas	Total Area (ha)	Total Area (acres)	Gazetted (Legislated)
Raukumara	40,000	99,000	1988. Forested highlands, Raukumara Conservation Park.
Ruakituri	24,000	59,500	2006. Remote forested highlands, Te Urewera
Te Tatau-Pounamu	6,500	13,529	1962. Forested subalpine landscapes, Tongariro N.P.
Hauhungatahi	8,500	20,999	1966. Forested subalpine landscapes, Tongariro N.P.
Tasman	87,000	215,000	1988. Forested highlands, Kahurangi N.P.
Paparoa	31,000	76,500	2002. Forested highlands/mountains, Paparoa N.P.
Adams	47,000	116,000	2002. Mountains & valleys, Southern Alps
Hooker-Landsborough*	41,000	101,000	1990. Mountain/valleys, Southern Alps, by Mt Cook N.P.
Olivine*	83,000	205,000	1997. Mountains, valleys, and glaciers, Mt Aspiring N.P.
Pembroke*	18,000	44,500	1974. Forested/alpine mountain lands, Fiordland N.P.
Glaisnock*	125,000	309,000	1974. Forested/alpine mountain lands, Fiordland N.P.
Gazetted Area Subtotal	511,000	1,263,000	1.9 percent of New Zealand land
Proposed Wilderness	ha	acres	Area Proposals
South-West/Cameron*	182,000	450,000	Lowland forest and lakes, Fiordland N.P.
Pegasus	40,000	99,000	Lowland Stewart Island forests/coast, Rakiura N.P.
Proposed Subtotal	222,000	549,000	0.8 percent of New Zealand land area
Wilderness Area Total	733,000	1,811,000	2.7 percent of New Zealand land area

These designated and proposed wilderness areas total about 3 percent of New Zealand's land area. These New Zealand "wildernesses" reflect standards of physical and social conditions that are among the most rigorous in the world and exceed the Category 1b criteria specified by IUCN (1998) for the most protected class of wilderness areas, because IUCN criteria make more allowance for minor human modification and habitation. Indeed, over 30 percent of New Zealand's total area is protected natural public conservation land, with over 20,288,760 acres (8,2000,000 ha) managed by the Department of Conservation for biodiversity conservation and wilderness-type values (Fig. 3.8). This is one of the highest proportions of protected areas of any country in the world (Green and Paine 1997; IUCN 1998). Most of these lands are remote and natural, with high wilderness quality by any standards.

Further, possibly 25 percent of New Zealand's conservation lands outside the designated wilderness areas might



FIGURE 3.8 Most high alpine areas have significant wilderness values in New Zealand and internationally. Some have access by aircraft, the only major intrusion, other than people, to otherwise pristine places. Photo courtesy Gordon Cessford.

qualify as the most remote kind of wilderness under IUCN criteria. But these lands also have a legislative basis for conservation management in New Zealand, and potential pressures on them for development and recreational use are not great. Eighty-five percent of New Zealand's 5 million residents are urbanized coastal dwellers, most concentrated in the upper half of the North Island. Very few live in remote areas and, unlike most other countries of the world, very few have any occupancy options in lands that are managed as protected natural areas.

New Zealand created one of the world's first national parks in 1894 when the volcanoes and lava fields of the central North Island became Tongariro National Park. These lands had been given to the nation in 1887 by its Indigenous Maori guardians, who wanted these sacred mountains enshrined in public protected-area status (Cessford and Reedy 2000).

The arrival of humans introduced new ecological impacts against which the native biota had few natural defenses. In less than one thousand years, it is estimated that humans and their accompanying animals removed 70 percent of the forest cover and drove 32 percent of the Indigenous terrestrial bird species to extinction. Moreover, around a thousand species of Indigenous plants and animals are now threatened, including thirty-seven of the fifty remaining native terrestrial bird species. Thus, retaining biological uniqueness by maintaining natural biodiversity is a high priority for the management of New Zealand's conservation lands.

Wilderness has a very specific meaning in New Zealand conservation management, relating most often to specifically designated "Wilderness Areas" and based most often on recreational experience criteria. Most wilderness advocacy from the earliest days to today has been generated by the Federated Mountain Clubs of New Zealand (FMC), although the earliest concepts were heavily influenced by those developing in the United States (Barnett et al. 2015). In 1939, Lance McCaskill, a prominent conservationist, visited the United States and met Aldo Leopold and, through his influence, introduced the concept of wilderness into New Zealand National Park circles (Cumberland 1981). In 1949, the American conservationist Olaus Murie visited New Zealand and supported the idea of introducing wilderness protection provisions into the pending 1952 national park legislation. This legislation outlined a procedure whereby distinct areas of wilderness could be established in national park settings, and that such areas should be kept and maintained in a state of nature, without any buildings, roads, or tracks, and only foot access permitted.

Although there was general agreement about what wilderness was, there was no consensus or management philosophy. Because the mechanisms for wilderness protection were spread across three different statutes, three different governmental agencies, and two governmental ministries, it was difficult to promote the assessment and protection of wilderness. In 1976, public conservation groups, led by the FMC, began to consider options for wilderness protection (Molloy 1983). Working with three government management agencies, the FMC helped produce a Joint Wilderness Policy in 1980 that outlined the legislative status of wilderness in New Zealand, discussed social and physical criteria for such areas, proposed common definitions with which each agency would work, and identified general guidelines for establishing and managing wilderness.



FIGURE 3.9 Wilderness users need the highest levels of fitness, outdoor skills, and self-sufficiency to access and explore New Zealand's wilderness. Photo courtesy Gordon Cessford.

Following an FMC-sponsored conference on wilderness, in late 1981, the minister of Lands and Forests appointed a Wilderness Advisory Group (WAG) to advise on appropriate policies and action. The WAG reached a consensus based on the earlier Joint Wilderness Policy and provided a succinct statement of objectives for wilderness protection and criteria for wilderness areas, though allowing for flexibility in designation and management. Wilderness would be large enough to take at least two days' foot travel to traverse, have clearly defined topographic boundaries, be adequately buffered from human influences, and have no developments such as huts, tracks (trails), bridges, signs, or mechanized access. The WAG developed specific recommendations for designating ten areas, totaling more than 1.2 million acres (500,000 ha) (Molloy 1983).

Progress has been gradual since the initial provisions for zoning wilderness in the 1952 National Parks Act, followed by the 1977 Reserves Act, a new National Parks Act in 1980, and a new Conservation Act in 1987. In each of these statutes, the purpose of wilderness areas can be summarized as the preservation of a natural state, primarily for wilderness experiences (Fig. 3.9). More specifically, the Conservation Act of 1987 lists provisions that must apply to any wilderness area: its indigenous natural resources shall be preserved; no building, machinery, or apparatus shall be erected or maintained in it; no livestock, vehicles, or aircraft shall be allowed to be taken into or used in it; and no roads, tracks, or trails shall be constructed in it (Molloy 1997; Cessford and Reedy 2000).

Today there are few recreation-based threats to the integrity of New Zealand's currently designated wilderness. In 2023, relevant issues facing wilderness area expansion and management can be summarized as:

- The depletion of Indigenous species and habitat by introduced animals and plants remains the greatest overriding threat to conservation values. Most effort from the Department of Conservation remains focused on this issue through pest and weed control and species/habitat restoration.
- Well established legislative provisions continue to minimize any potential for compromises to designated wilderness areas from mechanized access or recreational infrastructure developments. Given this limited demand pressure and priorities to address other conservation pressures there is only

low-level advocacy for extended or new wilderness area designations.

- Maori associations with their traditional lands, values for natural areas, and customary uses of resources are now being more formally recognized.

The most significant recognition of Maori status specifically relating to a designated wilderness area has been the Te Urewera Act 2014 (<https://www.environmentguide.org.nz/regional/te-urewera-act/>). Under this legislation the “Te Urewera” area (incorporating the “Raukīturi Wilderness Area”) ceased to be a government national park and was vested in itself as its own unique legal private entity. It is co-governed by a board led by the Tūhoe people and comprised of a mix of government and majority-Tūhoe appointed representatives. Building a new direction from its National Parks Act (1980) and Conservation Act (1987) precursors, the Te Urewera Act’s purpose is to:

- strengthen and maintain the connection between Tūhoe and Te Urewera;
- preserve as far as possible the natural features and beauty of Te Urewera, the integrity of its Indigenous ecological systems and biodiversity, and its historical and cultural heritage; and
- provide for Te Urewera as a place for public use and enjoyment, for recreation, learning, and spiritual reflection, and as an inspiration for all.

The formal “wilderness area” classification of Ruakituri was maintained by the 2014 Act and to date it appears to have remained as protected as it ever was. As stated by an FMC representative (Stewart 2015): “The significance of having our home-grown recreational concept of ‘wilderness areas’ accepted as part of a new, indigenous way of recognizing and managing our interactions with a significant natural area should not be underestimated. The Te Urewera Act may prove to be a one-off, but equally it may prove to be the harbinger of a new way of exercising guardianship of natural lands, of which wilderness is now an accepted part.” Ongoing communication and consultation with local communities, recreational groups, and other stakeholders will be critical for Te Urewera’s evolution, as apparent from current controversies over its recreational access provisions and facility infrastructure plans, although to date these do not appear to affect the designated wilderness area.

Zimbabwe

Zimbabwe is the first developing country to have proclaimed a wilderness area (Martin 1990). The Mavuradonna Wilderness Area was designated in Zimbabwe early in 1989 by tribal authority of the Mzaribani District Council on their own communal lands. This designation was made in conjunction with national policy direction under Zimbabwe’s Communal Areas Management Programme for Indigenous Resources (CAMPFIRE), which develops economic, educational, and cultural linkages between natural-resource management and tribal authorities. The minister of State for Tourism officially opened the area, furthering national recognition of the wilderness concept and this area’s designation.

The Mavuradonna Wilderness Area is approximately 192 square miles (500 sq km) in the escarpment of the Zambezi Valley; one road bisects the area. The area is used for a

combination of wilderness “trails” (hiking), sport hunting (primarily bow hunting), and wildlife cropping, with a primary purpose of generating economic benefit for local villagers and farmers. The area produces income each year under the proposed uses, derived mostly from wildlife harvesting. As a result of the initial wilderness proclamation, other areas in Zimbabwe were under consideration for wilderness designation by other tribal authorities. Subsequent political turmoil in Zimbabwe has complicated this.

There has been continuing resistance from some sectors against designating wilderness in developing nations, based primarily on the argument that the wilderness concept is too elitist, exclusionary, and recreation-oriented to be of value in developing countries where higher-priority issues are about food, education, rising population, and poverty. Therefore, the Mavuradonna Wilderness Area signals a shift in attitude within a developing nation toward accepting the wilderness concept; the wilderness designation is linked to rural development with the management emphasis being on economic sustainability of the local people, and it is an example of a designation that is relative to the culture in which it exists (Martin 1990).

The Mavuradonna Wilderness Area was established with little or no public agitation. Anglo-oriented conservationists introduced the concept to the tribal authority, and it was welcomed with little resistance or controversy. Zimbabwe’s adoption of the wilderness concept could mean that the concept is further evolving to include and incorporate the needs of more traditional and diverse people, thereby becoming more relevant to developing nations. However, no additional areas have been protected as wilderness in Zimbabwe and the WDPA only lists one area, preceding the Mavuradonna Wilderness Area in its existence, on the Chirinda State Forest (UCN and UNEP-WCMC 2022).

Tanzania

More than one-third of Tanzania is protected as national parks, game reserves, forest reserves, and other types of protected areas. Wilderness zoning in national parks is an important part of a tourism strategy in the country to promote low-impact, sustainable tourism development. Most of Tanzania’s national parks have wilderness zones. Tanzania’s largest national park, Serengeti National Park, has more than 1.28 million acres (517,000 ha) zoned as wilderness. This park’s management plan suggests that promoting tourism for the wilderness zone is crucial to achieving the range of park conservation objectives (Kormos and Martin 2008). The WDPA indicates that Tanzania has eight total Category 1b areas designated for protection, two of them since 2008 (both in 2019 and all eight are on National Forest Reserves) (UCN and UNEP-WCMC 2022).

Italy

In Italy, a small but determined effort by the Wilderness Associazione Italiana per la Wilderness (AIW), founded by Franco Zunino—who was inspired by the Wilderness Society (U.S.) and by participating in the 3rd World Wilderness Congress (1983)—ultimately pioneered a new type of wilderness designation by private landowners and public authorities in the 1980s (Zunino 2007). The very first sector of Italian wilderness area, the Fosso del Capanno Wilderness Area,

was established in 1988 through a management agreement with a private foundation and was 283 acres (118 ha) in size (later expanded to 1,877 acres or 750 ha). The largest wilderness is the Ausoni Wilderness Area, at 10,338 acres (4,230 ha). Most areas are now protected by municipalities, regional forestry authorities, or private landowners. Only one designation is by a national park authority. By the end of 2022, AIW reported that there were eighty wilderness areas covering 144,536 acres (58,491 ha) in twelve regions of Italy and twenty-five provinces. More wilderness designations are expected. The term *wilderness area* (first used in Italy, and the first official use in Europe) is now in common use in Italy, as much a new linguistic innovation as it is a new land-use and planning category in that country.

Although not as secure as the type of protection provided by national legislation, the creative approach in Italy demonstrates the important growth of the wilderness concept internationally, and that it can be a useful and politically viable concept even in highly developed European countries. An anomaly worth noting is that there are no officially designated IUCN Protected Area Category 1b areas in Italy (UCN and UNEP-WCMC 2022).

Japan

The Nature Conservation Law of 1972 provides the foundation for establishing wilderness areas and nature conservation areas in Japan (Caouette 2008). The Ministry of Environment in consultation with government land management agencies can declare both types of areas. Currently, there are five designated wilderness areas that protect 2,280 acres (5,631 ha) of national forestland. They are intended to be free from human activities and to protect ecosystems that remain in their original condition. These wilderness areas typically allow only research and science activities that require specific permits. While some of these areas are adjacent to national parks, they are not components of larger protected areas or systems, as seen in many countries. All eight Category 1b areas in Japan are federally designated, all since 2008. Four are offshore (UCN and UNEP-WCMC 2022).

Class III—Wilderness Protection Through Recognition in Conservation Programs

The Class III type protection for wilderness occurs where wilderness is “recognized” as a distinct component of resource-management programs and a larger conservation effort.

Namibia

Namibia is an arid country on the southwest coast of southern Africa. A high proportion of the country is desert or semi-desert, and it includes the great Namib Desert. The country is 40 percent formally protected under various categories, is the only country in the world whose entire coastline is under protected status, and has numerous, large, protected areas including the world-famous Etosha Pan and the Skeleton Coast National Parks. Though Namibia does not have any legally designated wilderness, most of these extensive protected areas contain within their borders some of the best-preserved de facto wilderness zones on the subcontinent (Cooper 2001).

Namibia has important areas of privately owned land that are either partly or completely managed as natural areas for

wildlife production, or as private reserves and game farms. The natural communities in these areas are largely intact, and a full range of large and small wildlife species are present. Many valuable conservation projects, such as the Cheetha Conservation Fund, which owns and manages almost 250,000 acres (98,000 ha) for wildland value, take place on these privately owned areas and make important contributions to the economy through various forms of tourism, including photography, local education, and hunting (Barnes 1998).

One of the most important developments in Africa in recent years is the establishment of community-owned and managed nature conservancies in Namibia, all located on and operated by local tribes and communities. Pioneered largely by the NGO Integrated Rural Development and Nature Conservation (IRDNC), these lands are not necessarily categorized as wilderness. In IUCN terms, they may fall under a different category that directly addresses landscapes stewarded by Indigenous Peoples and Local Communities, but for all intents and purposes, they contain and are managed to maintain significant wilderness values. Some 20 percent of Namibia's lands are gazetted as community conservancies (half of the nation's total), affecting 8 percent of the nation's population. Namibia is the only country in Africa where all populations of wildlife are regarded as increasing, some dramatically, yielding considerable protein and tourism revenue directly to communities (IRDNC 2019). Important to note is that despite the progress in wilderness protection mentioned here, no Category 1b sites have been formally registered in Namibia (UCN and UNEP-WCMC 2022).

Philippines

In the Philippines, wilderness is recognized under a national legislative Act as a type of land classification, but it does not seem to be singled out for special management. The Philippine National Integrated Protected Areas System Act of 1992 established a national system of 200 potential areas (Pollisco and Meniado 1997). The intent is to maintain essential ecological processes and life-support systems, to protect genetic diversity, to ensure sustainable use of resources, and to maintain natural conditions. The act establishes protection of these places as national parks, game refuges, bird sanctuaries, wilderness areas, watershed areas, mangrove reserves, and virgin forests. Eight proposed areas in six regions were targeted for immediate inventory and intense public participation in planning, funded by a grant from the European Union (Rambaldi 1997).

In northeastern Luzon, the Palanan Wilderness Area is a relatively new example of Class III wilderness, in which use of the term is descriptive rather than part of a formal land-use management plan. It deserves note for several reasons. Originally designated a wilderness area, the Palanan rainforest was proclaimed a national park in 1997 and later renamed the Northern Sierra Madre Natural Park. It encompasses the towns of Divilacan, Dinapigue, Palanan, Maconacon, San Mariano, Ilagan, San Pablo, Cabagan, Santa Maria, and Tumauini. It is one of the most important and largest tracts of tropical rain forest in the Philippines (494,000 acres or 200,000 ha). It has also been home to the Agta forest people for more than 2,500 years. In 2003, this area was combined with the neighboring Peñablanca Protected Landscape and Seascape, increasing the size to closer to 300,000 ha and

nearly 72,000 ha of marine areas. Like many of the protected wilderness areas discussed in this chapter, it is also the result of citizen action by a local NGO, the Northern Sierra Madre Wilderness Foundation. Conservation International, the U.S.-based NGO, is very active working with and supporting the local NGO and other private groups in a community-based natural-resource management plan including traditional people's rights, conservation enterprise, sustainable use, and scientific research. In the Philippines there are also five Category 1b areas, with three designated before 2008 and two since 2008, and all are under federal protection. One of the areas designated since 2008 is within a marine resource reserve and one is terrestrial. The Palanan Wilderness Area is not listed in the WDPa (UCN and UNEP-WCMC 2022).

PROTECTION OF WILDERNESS VALUES IN OTHER REGIONS

The nations discussed above, along with the United States, are primarily the only ones in which wilderness protection has achieved some type of formal status within the country. However, wilderness values are recognized more broadly, sometimes with formal protection in other regions as well. The distinction here is subtle; formal, explicit wilderness protection is still relatively limited around the world, but the use of Category 1b designation is growing rapidly. Further, if we broaden our perspective to embrace programs designed to protect wilderness values, albeit without the explicit labeling of areas as wilderness, we find additional important activity. The reasons for not labeling such areas as wilderness vary widely; in some places, wilderness is simply not a part of the language. Elsewhere, there is the belief that other designations, such as national parks or nature reserves, adequately protect wilderness values.

The distinguishing qualities of wilderness, as used in this book, includes areas where natural ecological processes operate generally free of human influence and can provide experiences with opportunities for solitude and primitive recreation. In most of the countries just reviewed, this general concept of wilderness prevails. But programs in many other countries protect natural conditions and processes and also the solitude and primitive recreation opportunities associated with wilderness (Fig. 3.10).



FIGURE 3.10 Trekking in the Annapurna Sanctuary near Pokhara, Nepal, provides the opportunity to see the interaction of mountain communities with wilderness environments. Photo courtesy Chad P. Dawson.

Latin America

The wilderness concept has generally not been adopted by Latin American land management agencies and institutions. As of 2008, no protected areas meeting the IUCN protected areas Category 1b definition or the protection criteria of the three classes of wilderness defined in this chapter exist in the region. Nevertheless, even though wilderness policy frameworks are scarce south of the U.S.-Mexican border, wilderness as a place persists, often in wild abundance, due to over a century of initiatives led by Latin American conservationists. The first national park in Latin America, Nahuel Huapi National Park (made possible by a land trust by Argentine scientist and explorer Francisco Moreno) was proposed in 1903 and achieved formal designation in 1922 (Scarzanella 2002), initiating a decades long movement to preserve the ecological qualities of this ecologically mega-diverse continent.

Two of the largest marine protected areas in the world are in Chile: the Rapa Nui Marine and Coastal Protected Area (~579,000 square km) and the Nazca-Desventuradas National Park (~300,000 square km). To the northeast of Chile, Brazil's vast and diverse ecology is home to the world's largest terrestrial protected areas, and not just in the Amazon. The Cerrado Biosphere Reserve, which lies almost entirely in Brazil but extends across the frontier to Paraguay and Bolivia, encompasses approximately 297,000 square kilometers of subtropical woodland and grassland. Chile, which has successfully protected 42 percent of its marine waters and 21 percent of its land, has expanded its National System of Protected Areas by more than 36,000 square kilometers since 2017, in no small part due to the support and generosity of Kris and Doug Tompkins of Tompkins Conservation. In 2021, two of those national parks joined the IUCN's Green List for Protected and Conserved Areas, which recognizes places that are managed to a high global standard (Germani and Sepúlveda 2021). Indeed, some of the most globally significant and intact wilderness remains in Latin America, including the Amazon rainforest and the Patagonian steppes and austral forests, despite the intensification threats posed by the expansion of agricultural lands and myriad political, economic, and geographic challenges to the enforcement of existing laws.

While formal government protection of wilderness is rare in Latin America, wilderness values are evident in other conservation strategies and actions carried out by government officials, private actors, and Indigenous leaders (Wakild 2014).

Mexico

Although Latin American countries currently do not officially register wilderness areas, since 2008, a few areas (for example in Argentina in 2018 and 2019, Brazil in 2017, and Mexico in 2009) have been registered as protected among IUCN Category 1b areas and listed in the WDPa (UCN and UNEP-WCMC 2022).

Agreement on the first designated wilderness area in Latin America, and the only Category 1b area listed for Mexico, was announced at the 8th World Wilderness Congress (in Alaska in 2005). The Tierra Silvestre Cañón del Diablo (El Diablo Wilderness Area) is listed in the WDPa at 224 square km (86.5 sq mi) (UCN and UNEP-WCMC 2022). El Diablo Wilderness Area is within the El Carmen area in the State of Chihuahua, 75,000 privately owned acres (30,500 ha), and

the core of a large transfrontier area between Mexico and Texas. As a result of subsequent activities at the 9th World Wilderness Congress in Mexico (2009), by 2011 this larger, transfrontier area was formally recognized by the U.S. and Mexico governments under the Cooperative Action for Conservation in the Big Bend/Rio Bravo Region (USDI 2011). This 10-million-acre (4-million-ha) mosaic of protected areas (private and public), ranches, and *ejidos* (communal areas) reflects the vision of the Mexican conservation photographer Patricio Robles Gil and his organization, Agrupación Sierra Madre, and others working on the U.S. side of the border. The management, rehabilitation, and wildlife reintroduction work in the core area of the complex, including the El Diablo Wilderness Area, is funded and on land owned by CEMEX, a large international corporation. El Carmen is one of the fabled sky islands of the Chihuahuan and Sonoran Deserts of northern Mexico and is an international biodiversity hotspot. Numerous NGOs and experts on both sides of the border continue to work on a vision of a U.S./Mexico International Park in this region.

Brazil

Unrelenting threats, from national politics to the climate emergency, have not deterred Brazilian advocates and their international partners from efforts to protect the Amazon, which remains one of Earth's largest, most intact wildernesses, the size of Mexico, Mongolia, Peru, and Egypt combined. Mapping and administering such a vast and often impenetrable area (over 7 million square kilometers) are not without their challenges.

Though not recognized as "wilderness" officially, since 1965 Brazil has sought to keep the Amazon intact through the Forest Code, a law requiring landowners in the Amazon to maintain 80 percent of their properties under native vegetation. Stringent in spirit, this policy has proven difficult to enforce in the context of a social-ecological system characterized by remote, nearly impenetrable terrain and a powerfully entrenched political resistance.

Increasingly, Indigenous communities are leading regional efforts, working in concert with international partners, to maintain wilderness values at a landscape level. One little known, but potentially consequential, initiative in the Western Amazon could result in the use of corridors to interconnect three pristine Indigenous reserves in the heart of the rainforest. Known as the "umbilical cord," this area would encompass over 10,000 square kilometers, providing ecological and cultural protections for surrounding traditional communities, including one of the world's highest concentrations of uncontacted people (Lewis 2023).

China

China is Asia's largest single country (considering that Russia spans both Europe and Asia) and the fourth largest in the world, with a terrestrial area of 9.6 million sq km (3.7 million sq mi), and is also the world's most populous country, with 1.4 billion people. Despite its high population and long history of occupation, China is also one of the "mega-wild" countries in the world (Watson et al. 2018). China, however, is also facing potential loss of wild areas due to rapid changes in land use and land cover (Cao et al. 2022a; Cao

et al. 2022b). In addition, China's national policy of "ecivilization" (or promoting ecological progress—生态文明) is a national strategy to change land development patterns, promote resource conservation and utilization, protect natural ecosystems and the environment, and improve quality of life, creating new opportunities to consider the role of wilderness protection in this national strategy (Li 2017).

Since 2008 and the emergence of wilderness as a topic in China, Tin and Yang (2016) explored past Chinese reference to what we call wilderness. Tin and Yang (2016) described recent past use of the term 荒野 (huang ye) as the most common term adopted for wilderness in Chinese (Mandarin), though they questioned the accuracy of the meaning of the translation. They explained that 荒 (huang) commonly refers to uncultivated, unattended, uncivilized, or wild places (it can actually be used as an adjective or a noun), and 野 (ye) can be translated either as an adjective as "wild" or as a noun meaning "open country." Explaining 荒野 (huang ye) as a combination of adjectives and nouns helps to clarify some of the confusion it has caused and underscores the need for better translations of these terms. Since this translation into Chinese had mostly referred to an inhospitable place, a place without desirable features, it was not fully capturing the positive reasons a wilderness area, defined by IUCN Protected Area Category 1b, would be protected. In subsequent presentations and discussions in the international community (for example at the Global Land Project Third Open Science Meeting on October 24–26, 2016, in Beijing), they suggested using the term 荒(huang)野(ye)区(qu)——保持着原荒和野性的地区 (areas maintaining their original wildness and wild nature), which offers a more precise meaning of wilderness area, not just a vague reference to wilderness. They found this term already in use in academia in China. It offered a more complex but clarifying connotation by transforming both 荒 (huang) and 野 (ye) into adjectives. The overall reference now focuses on an area (a noun), providing an opportunity to introduce a new term for a previously undefined area of interest within environmental protection circles in China.

Wilderness-related policy, technical, and science papers related to China have been appearing more in national and international journals, such as the Chinese Journal of Landscape Architecture (Cao et al. 2017; Martin 2017; Watson and Carver 2017), the International Journal of Wilderness (Cao et al. 2018), and others. The rapidly rising popularity of the wilderness concept is also evident in academic exploration of the term "urban wilderness" in China (Martin and Hill 2021). There is also an effort to keep this popularity in perspective because of the inherent confusion and misappropriation in referring to wilderness within urban areas, although some wilderness areas around the world do exist in close proximity to urban areas.

One wilderness area mapping exercise in China (Cao et al. 2019) identified over 86,000 wilderness areas (or patches) with a total area of just over 4 million sq km, (1.5 million sq mi) covering 42 percent of China's terrestrial area. These wilderness areas were identified using the following three criteria: areas that contain only natural land cover, areas that are roadless, and areas that are free from permanent human settlements. In addition, extra-large wilderness areas are found within the provinces of Xinjiang, Tibet, Qinghai, and Inner Mongolia. Large wilderness areas are mainly distributed in western China, while medium, small, and extra-small wilderness areas are

distributed throughout most of the provinces. Crucially, these areas can still be found in the densely populated and developed east of China. Landscapes in east and west China are significantly different, including the fact that the degree of human influence and landscape fragmentation in the west of China is far lower than that in the east (Cao et al. 2020).

The WDPA (UCN and UNEP-WCMC 2022) indicates the first designation and protection of IUCN Category 1b (wilderness areas) in China in 2018. All three areas listed are contained within Ramsar sites: Gansu Yanchiwan Wetlands in the Yanchiwan National Nature Reserve on the northern edge of the Tibetan plateau, Hubei Wang Lake in the Wang Lake Wetland Natural Reserve in the catchment of the Fu river, and the Heilongjiang Youhao Wetlands in the Youhao National Nature Reserve on the slopes of the Lesser Khingan mountains in north-east China (UCN and UNEP-WCMC 2022).

Antarctica

The earth's largest remaining wild area, Antarctica, is a world of superlatives—the coldest, iciest, windiest, and most remote of the world's continents, girded by the stormiest ocean. Equivalent in size to the combined area of the United States and Mexico, it expands in size each winter when the surrounding seas turn to ice.

Antarctica is vital for understanding our planet. Its ancient rocks, once at the core of the Gondwana supercontinent, hold the key to unlocking the earth's geological history. The vast Antarctic ice sheet, on average 6,560 feet (2,000 m) thick, is a window for observing changes in global climates over tens of thousands of years. The ice is a storehouse for 90 percent of the earth's freshwater resources—enough to raise the global sea level by many meters, if all of it were to melt. In this era of global warming, dramatic changes to the ice cap are already being observed. The continent and surrounding seas are a vital influence on the well-being of human life on the earth through the ways they regulate the global atmosphere and the oceans, thus affecting patterns of global weather and ocean circulation.

Antarctica remains mostly untrammelled wilderness—but it is not pristine. Soon after its discovery, human exploitation targeted the marine resources and in just a few decades of the nineteenth century, Antarctica's fur seals and whales were brought to the brink of extinction (though have now mostly recovered). Since the late 1960s, new fisheries commenced in the Southern Ocean for the massive numbers of surface-living krill (*Euphausia superba*), and for rock cod and ice fish, and the fisheries experienced classic boom-and-bust episodes when harvest levels were neither ecologically nor economically sustainable. A significant accomplishment in the Antarctic oceans region in recent years—requiring years of consensus-building among twenty-six nations—is the establishment of the Ross Sea Marine Protected Area. At 600,000 sq miles (1.6 million sq km) immediately adjacent to Antarctica and protected from commercial fishing for an initial thirty-five years, this MPA with its commercial “no-take” policy may well cause this area to be regarded as the world's largest so-called “marine wilderness” (Brooks et al. 2021).

On land, steadily expanding national research programs have established dozens of scientific stations, composed of buildings, stores, airstrips, and increased ship and air traffic

to sustain thousands of scientists and support staff in Antarctica each year. A growing tourist industry brings many more thousands of people each year into Antarctica. Although Antarctic scientific and tourist activities generally exhibit a high level of environmental awareness, instances of pollution of land, sea, and air from fires, fuel spills, waste dumping, shipwrecks, and aircraft crashes occasionally damage the environment. Pollutants such as DDT, polychlorinated biphenyls (PCBs), and other compounds originating from distant industrialized regions are also found. Of even greater concern is the impact of “greenhouse” gases on global warming that are very rapidly increasing melting of Antarctic glaciers and ice.

Considered together, these impacts and growing risks of significant environmental damage highlight the value of stewardship of the Antarctic region. The initial Antarctic Treaty (1961) set the stage for the 1991 Environmental Protocol to the Antarctic Treaty (Madrid Protocol) that laid out a farsighted and comprehensive program for protecting and managing the Antarctic environment, and in which the word “wilderness” appears many times, but the treaty doesn't specify how to protect these areas. The Treaty declares Antarctica a natural reserve devoted to peace and science, creates the world's largest de-militarized zone, bans mineral extraction, and presents ambitious mandates requiring all treaty parties and private individuals to minimize their impact on Antarctica.

The Madrid Protocol provides for designating special protection for areas acknowledged to have significant natural, historic, scientific, or landscape values, and areas where multiple uses might cause undesirable environmental impact or disruption among conflicting activities. Management plans are required for most protected areas established over natural sites, such as breeding colonies of seabirds and seals, and historic sites, including stations from the heroic era of Antarctic exploration (Dingwall 1997).

The Antarctic Treaty has proven effective, practical, and responsive to changing global problems and circumstances. In agreeing to the Environmental Protocol, the treaty governments have signaled a strong commitment to protection and sustainable management of Antarctica's resources. But challenges lie ahead with the increasing human presence, growing demands for the use of its resources, and global climate change.

OTHER INITIATIVES TO PROTECT WILDERNESS VALUES

In addition to international definitions, the archival of designation data, and efforts by individual countries to inventory and initiate protection of wilderness character, there are several initiatives that have led to a better understanding of the importance of wilderness. These initiatives have introduced a wider range of definitions and protection methods, and other influences to increase both wilderness recognition and stewardship.

Protecting Biodiversity

Determining How Much Wild Nature Needs to be Protected

Efforts to protect biodiversity directly support wildland conservation and wilderness because it is most often in wild areas that diversity flourishes and species evolve as naturally

as possible. Recognizing this, the Convention on Biological Diversity (CBD) was signed at the Earth Summit in Rio de Janeiro, Brazil, in 1992, and it is the world's premier treaty addressing biodiversity loss, with its three mutually reinforcing objectives: conservation, sustainable use, and equitable sharing of benefits from biodiversity (Faries and Cervigni 1998). The Global Environmental Facility (GEF) of the World Bank is the financial mechanism of the Convention on Biological Diversity and provides assistance to developing countries that are parties to the Convention. The protection of entire biomes preserves the biodiversity of species needed to maintain the productive capacities of ecosystems. Protected areas provide nesting, calving, spawning sites, and habitat for plant and animal species that local people rely on for food, medicine, or for sale to acquire income.

In 2023, the CBD is expected to have concluded its (pandemic-delayed) 10-year program that was agreed upon in Aichi, Japan, in 2010. This global framework has twenty-one targets and ten milestones for 2030, on the way to "living in harmony with nature by 2050" (CBD 2022). An element of these targets deals specifically with the amount of nature needed to protect in order to sustain life on Earth. The "Aichi Targets" called for the protection of 17 percent of land and 10 percent of oceans as milestones towards to-be-determined, increased targets. These 2010 targets were not quite realized, yet the call increases for more ambitious targets. As conservation science and remote sensing rapidly increased in accuracy in the past fifteen years, it is evident that minimum-effective sizes of intact ecosystems—functioning wildlands and seas—are necessary to support all life on Earth. Various NGO-driven processes emerged to drive this debate. The first process, called Nature Needs Half, was launched on the global scene at the 9th World Wilderness Congress (Mexico, 2009) and was developed by the WILD Foundation (Locke 2018). Later, the important Half Earth Project (Wilson 2016) was launched by the E.O. Wilson Biodiversity Foundation. Furthermore, the IUCN's Resolution 125, which set area-based conservation targets based on evidence of what nature and people need to thrive, was adopted at the (pandemic-delayed) World Conservation Congress in 2022. This resolution approves the science recognizing that protecting approximately half of intact nature is required to secure essential ecological services and also, of course, with full, prior, and informed consent of IPLC and recognition of Indigenous rights (WCC 2020).

The Role of Indigenous Peoples in Protecting Biodiversity

The critical and inherent role of Indigenous Peoples (and other Local Communities) in protecting what is essentially their own lands and seas was long ignored. As this continues to change and a new conservation paradigm emerges, it is important for the non-Indigenous protected area manager or policymaker to understand that IPLC are not a homogenous bloc. Though there are matters somewhat similar to them all—especially the nature-based culture of Indigenous societies—they are comprised of many societies and attitudes. Differences in policies and actions abound as one would expect in any grouping of humans and societies. However, most important is the certainty that they are key partners in the fate of the planet's biodiversity and remaining wildlands and seas.

Of the world's remaining high biodiversity areas most are in high-functioning wildlands, some scientists claim that 80 percent is under the direct stewardship of Indigenous Peoples (Raygorodetsky 2018). One example is the Xingu Indigenous Reserve in the central Amazon that is 25 million acres (10 million ha) of virtually intact tropical rainforest under the stewardship of the Kayapo people, the largest Indigenous Reserve in the world. How protection of these areas must be approached has begun to dramatically change. In contrast to the former, neocolonial approach of expropriating native lands to become new protected areas, much positive progress has been made since 2009 under the United Nations Declaration of the Rights of Indigenous Peoples (UNDRIP), which calls for "free, prior, and informed consent" when considering actions that affect the cultures and homelands of Indigenous Peoples (Cambou 2019). Examples are beginning to emerge in Central and South America, South and Southeast Asia, Australia, and parts of Africa where Indigenous Peoples' rights are recognized, and their well-being integrated into plans for sustainable wildland management. As is emphasized in the Guidelines for Category 1b Wilderness, recognizing their role as partners (not just another stakeholder) in protecting wildlands and biodiversity, and helping them protect their cultures and lifeways, also protects the wilderness. Progress is being made in this regard but much more is needed.

Wildland Corridors

Conservation biology is concerned with joining protected wild areas and low-impact areas, such as national forests or private forests and ranchlands, to create wildland habitat corridors to ensure migration of wildlife, enhanced biological intactness, and sustainable ecosystem functioning. One of the earliest and ongoing models, started in 1993, is Yellowstone to Yukon (Y2Y), a joint Canadian-U.S. network (www.y2y.net) of more than 800 organizations, institutions, foundations, and conservation-minded individuals who have recognized the value of working together to restore and maintain an unprotected area of the corridor between Yellowstone (in northwestern Wyoming) and the Yukon (northwestern Canada and northeastern Alaska) region. Y2Y opens new possibilities for ensuring the continued presence of North American wildlife and wildlands. In the wake of Y2Y came similar initiatives, many of them inspired or managed by The Wildlands Project (www.twp.org), such as Heart of the West, Southern Rockies, and Northern Sierra Madre in North America, and other initiatives on every continent. Recognizing the critical importance of corridors, the World Commission on Protected Areas, IUCN, established the Connectivity Conservation Specialist group.

Transfrontier Conservation

Some mega-wildland corridors are *transfrontier*, that is, crossing national political boundaries to embrace entire ecosystems. This is not a new concept, and the first such area was established in 1932 between Glacier National Park (Montana, U.S.) and Waterton National Park (Alberta, Canada). A 2005 survey reported in *Transboundary Conservation* (Mittermeier et al. 2005) indicates that there are 188 Internationally Adjoining Protected Areas (IAPA) or complexes involving 818 protected areas in 112 countries and

representing approximately 17 percent of the global extent of high-biodiversity wilderness areas. Nearly half of the total land area of IAPAs is located in North America, followed by Africa. The Russian Federation has the greatest number of IAPAs (twenty-one), followed by China (fourteen) and Canada (twelve). Countries contributing the most area to the overall IAPAs are Greenland, the U.S., and Venezuela.

IAPAs, or transfrontier protected areas, involve important issues in political and land management cooperation, which is a challenging task even across a friendly border such as that between the U.S. and Canada with the Boundary Waters Canoe Area and Canada's Quetico Provincial Wilderness Park, or (as mentioned earlier in this chapter) between Mexico and the U.S. in the Big Bend/Rio Bravo region—North America's largest and most diverse desert ecosystem.

Elsewhere in the world, such tough issues may take years to resolve, if they are resolved at all. The Peace Parks Foundation (www.peaceparks.org), based in South Africa, has popularized this concept and is working to establish a network of "peace parks" throughout Southern Africa. Their work is extensive, large-landscape focused, and involves all levels of authority and responsibility from local communities to heads-of-state. Peace Parks areas exemplify what the world could be like with concern for wild nature at the center of human dialogue.

Wild Rivers and Marine Wilderness

At the 6th World Wilderness Congress in Bangalore, India, in 1998, Michael McCloskey presented the results of his most recent international survey, "Wild Rivers of the World" (McCloskey, Michael 2001). In his second reconnaissance-level global survey, McCloskey studied all rivers at least 50 kilometers long (31 miles). They earned the "wild" distinction if they were free of dams and their effects and had a pollution-free watershed, with no roads along the banks. Rivers that ran through lightly developed territory (small, scattered settlements), though not moderately or heavily developed, were also included. McCloskey's study identified 6,000 river segments in the world that appeared wild under these criteria. Added together, these segments amounted to 484,250 miles (781,051 km), averaging 81 miles (130 km) each segment. This amounts to 19.6 percent of all rivers studied, mostly found in developing nations.

North America had the highest percentage of wild rivers—37.9 percent—most of which were in the sub-Arctic and Arctic north above 53 degrees north latitude. South America still had 26.1 percent of its rivers wild, mostly in the Amazon Basin. Three other regions were below average: Eurasia with 17 percent, mostly in eastern Siberia; Australia and Oceania with 10.6 percent; and, surprisingly, Africa with the lowest percentage (7.6). Nearly 60 percent of remaining wild rivers are in just two countries, Russia and Canada. Another 20 percent are in the United States (mostly in Alaska), Brazil, and China.

There are evolving efforts to apply the wilderness concept to water and marine areas. Initially, this was done by incorporating portions of aquatic areas in wilderness designations with surrounding terrestrial areas, the Boundary Waters Canoe Area Wilderness in the United States being the best example. Internationally, an important example of this is the wilderness zone in Lake St. Lucia located in KwaZulu-Natal in South Africa. A low fence in the lake marks areas for

nonmotorized use. There is also a terrestrial wilderness zone on the eastern shore between the lake and the Indian Ocean, which was the focus of one of the most dramatic conservation struggles in Africa during most of the 1990s. Conservation NGOs were pitted against the world's largest mining company, Rio Tinto Zinc, and eventually were successful when President Mandela's government proclaimed the Greater St. Lucia Wetland Park in 1998, which was declared South Africa's first World Heritage Site in 2000.

At the 8th World Wilderness Congress in Alaska in 2005, Mike Smith presented a new inventory of freshwater wilderness that extended the earlier McCloskey (2001) analysis to include lakes and wetlands, as well as streams, and identified large areas of the world where surface waters were most likely to remain in natural condition. This study found important areas of freshwater wilderness only at the northern extremities of the continents and in a few small watersheds of South America. The loss of wild water in much of the tropics is associated with the fact that rivers have often served as avenues for human penetration of tropical forests (Sanderson et al. 2002). Although Amazonia and the Congo Basin are considered terrestrial wildernesses (Mittermeier et al. 2003), they are impacted by river channel fragmentation and human management of flow regimes, which affect large areas within catchments. Southeast Asia, which has some of the world's highest levels of freshwater biodiversity, has long been impacted by agriculture and high human population density. It is now subject to high regulation of water flows at all scales. In the Northern Hemisphere, population density and agriculture eliminate wild waters at midlatitudes. Regulation of water flow extends human impacts to even higher latitudes, leaving only a few northward-flowing watersheds with large-scale wilderness conditions. These studies show that wild freshwater is the rarest form of wilderness and is the form that is disappearing most rapidly.

Carver (2018) suggested that protecting the wilderness qualities of river catchments is the key to protecting the wildness of rivers. Carver (2018) attempted a global assessment of wild rivers based upon connectivity between land and rivers and how much human activity within catchments (including settlement and transportation infrastructure) and modification via human land use (agriculture, forestry, etc.) affects that connectivity. Using purely global datasets, Carver (2018) mapped the hydrological functioning of watersheds, those that are providing natural water flows. There are many limitations associated with global datasets according to Carver (2018), including coarse resolution, generalization, variable accuracy, and consistency across regions and national boundaries, plus they were contending with fixed and arbitrarily defined catchment boundaries. Despite these limitations and suggestions to undertake more national, regional, and local assessments with more precise and varied sources, they concluded that many of the wildest rivers of the world fall mainly into permafrost or desert environments. As such, Carver (2018) clarifies that these rivers are likely to be ephemeral and only flow when fed either from seasonal ice/snowmelt or high magnitude/low frequency flash flood events in desert areas. Mid-latitude rivers in temperate or moist tropical regions are not well represented in the top 10 percent of wildest rivers at a global scale, the exception being those within the intact tropical rain forest areas of northern Amazonia and the larger rivers draining northern Australia.

There has also been movement toward recognition of oceanic or marine wilderness. The 2nd World Wilderness Congress, in Australia, featured discussion of a proposed wilderness zone in the Great Barrier Reef Marine Park. The Australian Park Authority designated zones in the Capricornia section for wilderness-type use and later degazetted them. Although small in terms of the overall size of the park, it should be emphasized that, in terrestrial terms, the zones are extensive (Kelleher 1982). The U.S. National Oceanic and Atmospheric Administration announced inquiry into the feasibility of oceanic wilderness (Foster and Lemay 1988) at the 4th World Wilderness Congress.

At the 6th World Wilderness Congress, Maxine McCloskey added considerably to the concept of marine wilderness with an innovative, global survey of potential wilderness areas on the high seas (McCloskey, Maxine 2001). One of former president Clinton's executive orders (May 2000) established a new Marine Protected Area in the northwestern Hawaiian Islands. One of its original intentions was to institute "no take" management, a widely accepted criterion for marine wilderness. In 2006, former president Bush signed a proclamation that created the Northwestern Hawaiian Islands Marine National Monument (renamed the Papahānaumokuākea Marine National Monument in March 2007). This national monument placed nearly 140,000 square miles (362,600 sq km) of the northwestern Hawaiian Islands under the highest form of marine environmental protection. The national monument will preserve access for Native Hawaiian cultural activities, provide for carefully regulated educational and scientific activities, enhance visitation in a special area around Midway Island, prohibit unauthorized access to the monument, phase out commercial fishing over a five-year period, and ban other types of resource extraction and dumping of waste. This marine national monument is the largest single area dedicated to conservation in the history of the United States, and the largest protected marine area in the world. It is more than one hundred times larger than Yosemite National Park. In the U.S., there are forty Category 1b areas that are classified as marine, including eleven predominantly or totally marine and twenty-nine mixed terrestrial and coastal marine (UCN and UNEP-WCMC 2022). Of the forty, one is BLM, two are NPS, and the rest are US-FWS. Eight Category 1b areas have been designated since 2008 (all are FWS, with none designated since 2010).

Rewilding

While it can be a crucial consideration in the feasibility of wilderness designation and protection strategies, rewilding is also a concept being applied well beyond the boundaries of wilderness today (Lorimer et al. 2015) to promote restoration of free-willed nature across the landscape. Rewilding has been receiving increasing worldwide attention, with particular focus in Europe and North America. In North America the original reason to use rewilding methods was to link lands in the National Wilderness Preservation System to larger landscapes (Hintz 2007). In Europe, it has been applied in a broader way, often in countries without established wilderness systems but where land abandonment is increasingly common (Corlett 2016). Lorimer et al. (2015) summarized that these efforts serve to maintain or increase biodiversity, while reducing the impact of present and past

human interventions through the restoration of both species and ecological processes.

The concept of trophic levels has emerged as a central organizing theme for a great deal of rewilding research and projects because protecting the benefits of intact trophic cascades—relating to food and feeding (trophic) and enhancing the number of opportunities for animals, plants and other creatures to feed on each other (cascading)—is important in understanding natural systems (Monbiot 2014; Svenning et al. 2015). Wilderness areas, with free-willed ecosystems, are an important way to recapture these benefits. The emotional human aspects of freedom, self-will, and wildness are important goals of rewilding. Greater awareness of the importance of social and cultural factors in conservation have contributed to the popularity of rewilding (Corlett 2016). Monbiot (2014), in describing the emotional attraction and motivation of feral environments, suggests that his primary excitement about rewilding is not to protect natural processes, but to witness these processes in a self-willed environment (or simply know they exist in some places). Excitement about reconnecting landscapes, seascapes, rivers, and humans to free-willed nature is central to wilderness conservation through rewilding.

Soule and Noss (1998) emphasized the 3 Cs of rewilding in North America: core areas, corridors, and carnivores. The "3 Cs" was subsequently elaborated on by adding more "Cs": climate, compassion, and coexistence, according to Johns (2019). In Europe, there was realization that protection of special sites alone would not secure conservation goals, so more focus on connectivity through ecological corridors, core wild areas, restoration, and buffer zones emerged (Hobbs 2002; Jones-Walters 2007). A major aspect of European efforts in rewilding has been an emphasis on naturalistic grazing and effects on biodiversity (Regos et al. 2016). While predators have yet to be restored in large numbers there, focus has been more on the role of large herbivores in opening up forest canopy into more park-like settings. Rewilding is a popular concept in Europe, particularly in areas of rural depopulation and land abandonment (Lorimer et al. 2015; Regos et al. 2016; Corlett 2016) and a recent subject of the IUCN's Commission on Ecosystem Management (CEM) to propose guiding principles for rewilding, which clarified that rewilding exists on a continuum of scale, connectivity, and level of human influence and aims to restore ecosystem structure and functions to achieve self-sustaining autonomous nature (Carver et al. 2021).

Rewilding, however, does not have a single, simple definition. Similar to wilderness and wildness, it is defined differently in different cultural and geographical contexts. Jørgensen (2015) details multiple rewilding definitions as: (1) cores, corridors, carnivores; (2) Pleistocene megafauna replacement; (3) island taxon replacement; (4) landscape through species reintroduction; (5) productive land abandonment; and (6) releasing captive-bred animals into the wild. Jørgensen (2015) amusingly (but realistically) adds another use of the term by suggesting that rewilding has also been adopted by activists as a rallying "plastic" word. This plasticity might be celebrated by some as giving license to activate the emotional aspect of returning control to nature. Like the term wilderness, the plastic uses of rewilding illustrate the cultural attraction to wild nature, to nostalgic feelings, and the sense of loss created by the arrival and domination by humans in

the Anthropocene era. Lorimer et al. (2015) emphasized that rewilding can be an approach that seeks to maintain or increase biodiversity and reduce or reverse past and present human impacts by restoring more functional ecosystems. Incorporating cultural landscape considerations into rewilding decisions, however, is also an important criterion. The level of human intervention (trammeling) during ecological restoration, required to achieve some prescribed set of conditions or biological components is often controversial, but the end-point goal of freedom or self-will of a fully cascading trophic system is the ultimate goal. The costs in terms of level of intervention during ecological restoration to get to this ultimate goal remain a topic of great debate.

Restoration, by itself, can have the primary goal of better ecosystem functioning to produce human benefits of water, food production, etc. Just one major, positive demonstration of this is the 4-million-acre (1.6 million ha) Loess Plateau Watershed Rehabilitation Project in central China, guided by John D. Liu and summarized for the World Bank by Chen et al. (2004). But, beyond restoration, there is rewilding, with a primary goal of restoring self-sustaining and autonomous nature, often involving ecological restoration as a prerequisite step. The global importance of restoration and rewilding is evidenced by the United Nations' Decade on Ecosystem Restoration (DECADE; <https://www.decadeonrestoration.org/>), generally spanning 2021 to 2030. This initiative draws together global principles, on-the-ground projects, "community toolkits," and more.

The World Wilderness Congress

The World Wilderness Congress (WWC), a project of The WILD Foundation and associates (www.wild.org), has met on ten occasions (1977, South Africa; 1980, Australia; 1983, Scotland; 1987, the United States; 1993, Norway; 1998, India; 2001, South Africa; 2005, Alaska; 2009, Mexico; and 2013, Spain) to explore management, cultural, and scientific elements of wilderness protection (Martin 2001). The 11th World Wilderness Congress was planned for Jaipur, India, in March 2020, and was canceled just two weeks before convening due to the Covid-19 pandemic. Discussions are underway for the 12th World Wilderness Congress. The WWC has provided a continuing international forum for expanding the wilderness concept, and its plenary and technical symposia proceedings document important international perspectives and information on wilderness values, opportunities, management, science, and cultural issues. The WWC has also been adamant, since its inception, that Indigenous and traditional communities must be involved as full partners, not stakeholders, in international wildlands conservation.

The World Wilderness Congress has been a focal point for the worldwide evolution of wilderness definition and legislation. Each of the ten World Wilderness Congresses has worked toward a definition of wilderness and wilderness management guidelines acceptable to the world community, with each proceedings recording new perspectives. Ultimately a resolution and proposed definition from the 4th World Wilderness Congress (Martin 1988) was submitted and adopted by the IUCN Commission on National Parks and Protected Areas—now called the World Commission on Protected Areas, discussed earlier. The IUCN protected area

classification (Category 1b) definition for wilderness was subsequently updated to "A large area of unmodified or slightly modified land, and/or sea, retaining its natural character and influence, without permanent or significant habitation, which is protected and managed so as to preserve its natural condition" (Kormos et al. 2008, 22).

There is a distinct difference between this evolving international definition and that contained in the 1964 U.S. Wilderness Act, "Where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain." In developing countries, many wildland areas are either occupied by Indigenous people or are under pressure from subsistence farmers, people who engage in shifting cultivation, grazing, or other extractive and potentially damaging practices.

The World Wilderness Congress is very different from most conferences. Each new congress is conceived and implemented in and with a different country, and on a few occasions, it returns years later to a country to reconvene and update. Practical conservation and wilderness objectives are established, and a structure and process implemented to achieve them. The WWC has an impressive list of these accomplishments, some of which have been mentioned elsewhere in this chapter, such as helping initiate the Global Environmental Facility, establishing the International League of Conservation Photographers, initiating the Native Lands and Wilderness Council, pioneering the marine wilderness concept, establishing wilderness on private lands, creating the first World Wilderness Inventory, creating the first inventory of freshwater wilderness; designating the first wilderness area in Latin America (Mexico); helping launch a significant new focus on Rewilding Europe, and others.

Even though the 11th World Wilderness Congress was canceled, planning had proceeded to the point that practical outcomes were still accomplished, such as the Global Charter for Rewilding the Earth (Rewilding Charter Working Group 2020), out of which emerged, within a few months, the Global Rewilding Alliance (www.globalrewilding.earth).

The Aldo Leopold Wilderness Research Institute collaborated with several U.S. federal agencies and international cooperators to produce technical proceedings from the 6th World Wilderness Congress in India (Watson et al. 1998) and (Watson et al. 2000), the 7th WWC in South Africa (Watson and Sproull 2003), the 8th WWC in Alaska (Watson et al. 2007), the 9th WWC in Mexico (Watson et al. 2011b) and the 10th WWC in Spain (Watson et al. 2015) and are available online (<https://leopold.wilderness.net/>).

International Journal of Wilderness

Another initiative of The WILD Foundation and several academic, NGO, and government collaborators, in close partnership with the WWCs, is the International Journal of Wilderness (IJW). Launched in 1995, the IJW is sponsored by a combination of federal agencies, universities, and non-governmental organizations (four of them in countries other than the United States). The IJW features articles on wilderness protection, allocation and designation, science, management, and uses worldwide. It services a professional network of wilderness professionals, managers, scientists, and advocates, and is another reflection of the international growth and acceptance

of wilderness. As a forum for scientific and professional articles, opinions, and discussion about wilderness around the world, *IJW* is published in three issues per year (www.ijw.org) and includes peer-reviewed professional and science research articles as well as opinion and feature articles about wilderness designation, stewardship, and management concepts and issues. Some examples of wilderness-related special issues in recent years include a focus on wilderness in specific countries; achieving wilderness fire restoration; wild river inventories, science, and protection; long trail designation and protection across boundaries; the 50th anniversary of the Wilderness Act; and wilderness ecosystem services. In 2017, the journal initiated online-only publication. The website (www.ijw.org) provides access to past volumes that you can read online and are available to download PDF (from 1995 through the past year's volume).

SUMMARY

The idea of protecting wilderness character on a large scale began in the United States, but it has gained recognition and support around the world, both through official efforts to designate wilderness areas in some countries and through the designation of individual areas that meet IUCN Protected Area Category 1b in many more. In 1989, there were forty-four areas registered as wilderness within the IUCN system, (Eidsvik 1989) and by 2016 there were 2,992 marine and terrestrial wilderness areas registered with the IUCN as solely Category 1b sites (UCN & UNEP-WCMC, 2016). The American notions about wilderness are an influence, but not a determinant, on how other nations approach the idea. Differences of geography, culture, and economics alter the specific ways in which other countries approach designating and managing wilderness.

This chapter describes countries where wilderness is protected by law (Class I), as an administrative zone in a park or other protected area (Class II), or as part of another conservation program designation (Class III). The concept of wilderness varies around the globe in its approach to designation and protection criteria, ecological protection, and Indigenous populations, which are major issues regarding wilderness in the U.S., Australia, South America, the Philippines, and Finland. These are all issues that individual countries must confront and resolve considering their own social, economic, and cultural circumstances. In developing countries, the need for resolving wilderness and wildland protection with economic and rural development needs is a primary consideration.

International interest in wilderness has grown and continues to grow. Global progress has been made institutionally through the recognition of wilderness by the IUCN as a formal, distinct category of protected areas (Category 1b) and guidelines have been distributed that can guide designation and protection. Numerous countries around the world have begun to consider how wilderness might fit into their conservation management systems and have even initiated large-scale assessments of wilderness potential. Even in some countries where long-term occupancy and development have greatly modified the landscape, the possibility of restoring wilderness and natural conditions is being discussed. The wilderness idea reflects an increasing understanding that wilderness settings are a repository of a country's natural heritage and a symbol of

STUDY QUESTIONS

1. What role do you believe wilderness protection efforts in the United States played internationally in protecting wilderness?
2. What are some differences between wilderness protection in the United States and in other countries?
3. Identify and discuss some of the factors that account for differences in progress in wilderness preservation between the United States and Europe.
4. Identify some of the important relationships between wilderness and other international conservation designations.
5. As population increases throughout the world, do pressures for development in lesser-developed countries lead to undesirable changes in ecological conditions? What strategies and actions will be necessary to improve prospects for wilderness and wildland protection in developing nations?
6. Why was there interest in inventorying the freshwater and marine waters of the world for natural and wild conditions? What is the value of protecting some of these areas?
7. Explain the distinctions between Class I, Class II, and Class III wilderness designations presented in this chapter. What nations have Class I wilderness? How are they different in their mechanisms for protection?
8. How are Russian zapovedniks similar to wilderness in the United States? How are they different?
9. What are transfrontier conservation areas?
10. Where would you look to find information on IUCN Protected Area Category 1b Wilderness designations in the country where you live?

that country's international responsibility to protect the environment and care about quality of life for future populations.

ACKNOWLEDGMENTS

This chapter was updated for the fifth edition by Vance Martin, founder/past president of The WILD Foundation; Alan Watson, formerly of the Aldo Leopold Wilderness Research Institute, USDA Forest Service, Rocky Mountain Research Station; Christopher Armatas of the Aldo Leopold Wilderness Research Institute; and Amy Lewis, CEO of the WILD Foundation. Their work updates and expands on Martin and Watson's coauthorship of the fourth and third editions, building on the second edition by George Stankey, Vance Martin, and Roderick Nash and the first edition by Roderick Nash.

The coauthors wish to thank Cyril Kormos, CEO of Wild-Heritage (and former vice president for policy at The WILD Foundation) for his previous contributions to the section on international wilderness law and policy. We also wish to thank our many colleagues for their reviews and contributions to this and earlier editions, but the interpretation, conclusions, errors, and omissions are the responsibility of the authors. We thank Bill Bainbridge, consultant (retired), Natal Parks Board, South Africa; Hugh Barr, past president, Federated Mountain Clubs of New Zealand; Ralf Buckley,

Griffith University, Australia; Julie Cajune of the Confederated Salish and Kootenai Tribes; Cao Yue, National Tsinghua University in China; Gordon Cessford, formerly Department of Conservation, New Zealand; Paul Cryer, Applied Ecology Unit, African Conservation Trust; Paul Dingwall, formerly Department of Conservation, New Zealand; Grant Dixon, independent researcher, Australia; Brian Dych, BC Parks, Victoria, British Columbia, Canada; Tom Elliot, Parks Canada, White Horse, Yukon, Canada; Harold Eidsvik (retired), Parks Canada; Martin Hawes, independent researcher, Australia; Peter Helman, private consultant, Sydney, Australia; Steve Hollenhorst, University of Idaho; Evelyn Hurwich, The Antarctica Society, U.S.; Ian Lockwood, Overseas School of Colombo, Pelawatte, Sri Lanka; Alec Marr and Julie McGiness, The Wilderness Society, Australia; Metsähallitus, formerly Finnish Forest and Park Service, Finland; Brad Mills, Land Conservation Council of Victoria, British Columbia, Canada; Pers Nilsens, Parks Canada, Ottawa; Dave Ostergren, Northern Arizona University; Vicki Sahanatien, PhD, Bella Coola, British Columbia; George Wallace, International School for Forestry and Natural Resources, Colorado State University, Fort Collins; and Mikhail Yablokov, formerly Russian Ministry of the Environment and Natural Resources.

The findings and conclusions in this publication are those of the authors and should not be construed to represent any official U.S. Department of Agriculture or U.S. Government determination or policy.

CASE DISCUSSION: CANADIAN WILDERNESS—THE QUETICO PROVINCIAL PARK

The Quetico Provincial Park (QPP) in northwestern Ontario, Canada has a Wilderness Zone occupying 90 percent of QPP's approximately 1.18 million acres (471,878 hectares). The southern boundary is shared with the Boundary Waters Canoe Area Wilderness in the Superior National Forest in the state of Minnesota (U.S.). The QPP was created in 1913 and classified as a wilderness park in 1977, and it has remained remote with difficult access except for two access roads. Canoeists who enter the area to enjoy the more than six hundred lakes and waterways must access the QPP by obtaining a permit via one of six ranger stations that serve more than twenty access points.

Historically, the area was used by Native peoples and later as a travel route for European explorers, fur trappers, and traders. In 1996, the Canadian federal and provincial governments designated the QPP as part of Boundary Waters—Voyageur Waterway and Canadian Heritage River. This designation was a historic and cultural tribute to the voyageurs who paddled these waters as fur traders.

The QPP is in an ecological transition zone between the plains to the west, the boreal forest to the north, and the mixed hardwood and softwood forests to the south. Fire has been a historic natural influence throughout the area. Logging and some mining activities have impacted the forests but were prohibited by 1971. In 1979, all motorized vehicles including motorboats were banned, except for an agreement with part of the Lac La Croix First Nation, which were allowed to

operate motorized guideboats with less than a 10-horsepower motor until the year 2015.

The QPP is representative of the wilderness values most often reported by Canadians in justifying their support of wilderness protection: a bequest to future generations and protection from the advancement of civilization. The QPP is one of the first protected areas in the province of Ontario and the second largest such area. International recognition of the importance of protecting this area was noted by the IUCN, which classified the QPP as a Category 2 protected area—a national park designated for ecosystem protection and recreation use.

Recreational opportunities for remote and primitive canoe camping abound, with more than 2,000 unimproved campsites spread over the lakes of the QPP. There is also one campground with 107 sites that is accessible by vehicle at the Dawson Trailhead. The interior recreational use is restricted to daily quotas and regulated by personnel at the ranger stations through a permit process, with group size limits and the prohibition of motorized and mechanized equipment and of nonburnable, disposable food and beverage containers. The interior has both day use and overnight visitors, with an annual average of 125,000 visitors and 122,000 camper nights.

The initial QPP master plan was approved in 1977 and then revised in 1982, 1988, and 1995. In 2007–2008, when the fourth edition of this textbook was published, the QPP was engaged in a review of its management plan. Revision of that plan concluded in 2018 (Quetico Provincial Park 2018). Some of the major issues they were addressing in 2008 included:

1. Zoning (e.g., creation of nature reserve zones, new access zones).
2. Policies for resource stewardship, operations, and development for:
 - a. Natural resources, including fisheries management, wildlife management, fire management, and vegetation management.
 - b. Cultural resources—First Nation values (e.g., spiritual sites, pictographs) and historical sites (e.g., Cabin 16, King's Point).
 - c. Operations—natural heritage education (e.g., interpretation, information services); research (e.g., wildlife, natural fire, fisheries); recreation management (e.g., carrying capacity and quotas, new recreation activities, and winter uses); Atikokan-Quetico Tourism recommendations; tourism services (e.g., outfitting); and marketing (e.g., partnerships, relationship with Atikokan, Lac La Croix, Thunder Bay).
 - d. Development—economic development (e.g., Lac La Croix and Atikokan); new access points (e.g., locations, facility requirements); roads (e.g., Batchewaung Lake); and other (e.g., backcountry hiking/skiing trails).
3. Implementation priorities for stewardship, operations, and development policies.
4. Social and economic impact analysis (e.g., job creation, infrastructure).
5. Management planning discussions will recognize existing Aboriginal uses and the aspirations of the Lac La Croix First Nation to achieve economic and employment opportunities associated with the park.

CASE DISCUSSION QUESTIONS

1. The complexities of the issues that were addressed were a challenge to the planning team. What types of representation should there be on the planning team in view of the various constituents and disciplines affected and the considerations being reviewed? Does that change when you think about the mission of the QPP?
2. When you read over the list of considerations the planning team had to address, does it seem as if the definition of wilderness should factor into what was considered further and what was dropped? Do you think the definition of wilderness at that time was based on what was currently allowed or prohibited in the QPP? Would each of the five issue categories above, being considered under the QPP plan revision, have negatively impacted or positively supported that definition of wilderness?
3. Some people argue that Canada has such vast wildlands and waterways in the northern area of the nation that parks in the south like QPP should be declassified as wilderness and further developed. How would you argue for maintaining strong protection of wilderness values in QPP? What could international recognition, such as the IUCN Category 1b, do to support your argument?
4. The role of Indigenous people in the history and current management plan for this area is extensive. Is that historic role evident in the QPP plan?

Please see QPP (2018) for the way these discussion questions were addressed by the planning team.

REFERENCES

- Bainbridge, W. R.; Lax, I. 2008. South Africa. In: Kormos, Cyril, ed. *A Handbook on International Wilderness Law and Policy*. Golden, CO: Fulcrum, pp. 241–267.
- Barnes, J. I. 1998. Economic value of wilderness in Namibia. *International Journal of Wilderness*. 4(1): 33–38.
- Barnett, S.; Stewart, J.; Wilson, P. 2015. Wilderness Areas, Then and Now. FMC Bulletin. 200: 18–22. Official quarterly of the Federated Mountain Clubs of New Zealand.
- Beltrán, Javier, ed. 2000. Indigenous and Traditional Peoples and Protected Areas: Principles, Guidelines and Case Studies. IUCN, Gland, Switzerland and Cambridge, UK and WWF International, Gland, Switzerland. xi + 133p. [Pre-publication]
- Brown, B. 1982. The use and misuse of wilderness in SW Tasmania. In: Martin, Vance G., ed. *Proceedings of the 2nd WWC*. Fulcrum Publishing, pp. 81–86.
- Brooks C.; Bloom, E.; Kavanagh, A.; Nocito, E.; Watters, G.; Weller, J. 2021. The Ross Sea, Antarctica: A highly protected marine protected area in international waters. *Marine Policy*. 134: 104795.
- Brüggemann, Jens. 1997. National parks and protected areas management in Costa Rica and Germany: A comparative analysis. In: Ghimire, Krishna B.; Pimbert, Michael D., eds. *Social Change and Conservation: Environmental Politics and Impacts of National Parks and Protected Areas*. London: Earthscan, pp. 71–96.
- Cambou, Dorothée. 2019. The UNDRIP and the legal significance of the right of indigenous peoples to self-determination: A human rights approach with a multidimensional perspective. *The International Journal of Human Rights*, 23(1–2): 34–50.
- Cao, Yue; Long, Ying; Yang, Rui. 2017. Research on the identification and spatial distribution of wilderness areas at the national scale in Mainland China [J]. *Chinese Landscape Architecture*. 6: 26–33. [In Chinese; English translation available at <https://ijw.org/2018-mapping-wilderness-in-mainland-china/>]
- Cao, Yue; Yang, Rui; Ying, Long; Carver, Steve. 2018. A preliminary study on mapping wilderness in Mainland China. *International Journal of Wilderness*. 24(2): 104–116.
- Cao, Yue; Carver, Steve; Yang, Rui. 2019. Mapping wilderness in China: Comparing and integrating Boolean and WLC approaches. *Landscape and Urban Planning*, 192: 103636.
- Cao, Yue; Yang, Rui; Carver, Steve. 2020. Linking wilderness mapping and connectivity modelling: A methodological framework for wildland network planning. *Biological Conservation*. 251: 108679.
- Cao, Yue; Tseng, Tz-Hsuan; Wang, Fangyi; Jacobson, Andrew; Yu, Le; Zhao, Jianqiao; Carver, Steve; Locke, Harvey; Zhao, Zhicong; Yang, Rui. 2022a. Potential wilderness loss could undermine the post-2020 global biodiversity framework. *Biological Conservation*. 275: 109753.
- . 2022b. Identifying ecosystem service value and potential loss of wilderness areas in China to support post-2020 global biodiversity conservation. *Science of the Total Environment*. 846: 157348.
- Caouette, B. 2008. Japan. In: Kormos, Cyril, ed. *A Handbook on International Wilderness Law and Policy*. Golden, CO: Fulcrum, pp. 171–181.
- Carver, Steve. 2018. The river wild: Towards a global assessment of wild rivers. *International Journal of Wilderness*. 24(1).
- Carver, Steve; Convery, Ian; Hawkins, Sally; Beyers, Rene; Eagle, Adam; Kun, Zoltan; Van Maanen, Erwin, et al. 2021 Guiding principles for rewilding. *Conservation Biology*.
- Casson, Sarah A.; Martin, Vance G.; Watson, Alan; Stringer, Angie; Kormos, Cyril F.; Locke, Harvey; Ghosh, Sonali, et al. 2016. Wilderness protected areas: Management guidelines for IUCN Category 1b protected areas. Gland, Switzerland: IUCN. x + 92p. <https://portals.iucn.org/library/sites/library/files/documents/PAG-025.pdf>; accessed December 6, 2022.
- Convention on Biological Diversity. 2022. Open-ended working group on the post-2020 global biodiversity framework. *Third Meeting (Part II)*. Geneva, Switzerland; March 14–29, 2022. <https://www.cbd.int/article/draft-1-global-biodiversity-framework>; accessed December 6, 2022.
- Cessford, Gordan R.; Dingwall, Paul R. 1997. Wilderness and recreation in New Zealand. *International Journal of Wilderness*. 3(4): 39–43.
- Cessford, Gordan R.; Reedy, Murray C. 2000. Wilderness status and associated management issues in New Zealand. In: Watson, Alan E.; Aplet, Greg H.; Hendee, John C., comps. *Personal, Societal, and Ecological Values of Wilderness: 6th World Wilderness Congress Proceedings on Research, Management and Allocation*, Vol. II; October 24–29, 1998; Bangalore, India. RMRS-P-14. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, pp. 185–192.
- Cessford, Gordan R. 2008. Personal communication with Vance Martin.
- Chen, S.; Wang Y., et al. 2004. Loess Plateau Watershed Rehabilitation Project. Scaling Up Poverty Reduction: A Global Learning Process and Conference Shanghai; May 25–27, 2004. https://web.worldbank.org/archive/website00819C/WEB/PDF/CHINA_LO.PDF.
- Commonwealth of Australia. 2021. Collaborative Australian Protected Areas Database (CAPAD). 2020.
- Commonwealth of Australia. 1998. The Malimup Communiqué. Native title and protected areas project. <https://indig-enviro.asn.au/Support21.htm>; accessed January 18, 2023.
- Cooper, T. 2001. Wilderness in Namibia. In: Martin, Vance, ed. *Wilderness and Humanity: The Global Issue. Proceedings of the 6th World Wilderness Congress*; October 24–29, 1998; Bangalore, India. Golden, CO: Fulcrum, pp. 128–133.
- Corlett, R. T. 2016. Restoration, reintroduction, and rewilding in a changing world. *Trends in Ecology & Evolution*. 31(6): 452–462.

- Cryer, P. B. 2009. *The implementation of an environmental monitoring and management system in the wilderness area of the Hluhluwe-Imfolozi Park*. Thesis. Centre for Environment, Agriculture and Development, School of Applied Environmental Sciences, University of KwaZulu-Natal.
- Confederated Salish and Kootenai Tribes (CSKT). 2005. Mission mountains tribal wilderness. A case study. *Native Lands and Wilderness Council*. <https://wild.org/wp-content/uploads/2010/02/Mission-Mountains-Tribal-Wilderness.pdf>; accessed May 8, 2023.
- Cumberland, Kenneth B. 1981. *Landmarks*. Surry Hills, New South Wales, Australia: Reader's Digest Proprietary.
- Dasgupta, Partha. 2021. The economics of biodiversity: The Dasgupta review. London: HM Treasury. <http://www.gov.uk/official-documents>.
- Dingwall, Paul. 1997. Environmental management for Antarctic wilderness. *International Journal of Wilderness*. 3(3): 22–26.
- Draper, M. 1998. Zen and the art of Garden Province maintenance: The soft intimacy of hard men in the wilderness of KwaZulu-Natal, South Africa, 1952–1997. *Journal of Southern African Studies*. 24(4): n.p.
- Dudley, N., ed. 2013. *Guidelines for Applying Protected Area Management Categories*. IUCN, Gland, Switzerland.
- Eidsvik, H. K. 1989. The Status of Wilderness: An International Overview. *Natural Resources Journal* 29: 57–82.
- Environment and Climate Change Canada (ECCC). 2021. Canadian Protected and Conserved Areas Database. <https://www.canada.ca/en/environment-climate-change/services/national-wildlife-areas/protected-conserved-areas-database.html>.
- . 2022. Canadian Environmental Sustainability Indicators: Canada's conserved areas. Consulted on January 4, 2023. www.canada.ca/en/environment-climate-change/services/environmental-indicators/conserved-areas.html.
- Environment Guide. 2014. "Te Urewera Act." <https://www.environment-guide.org.nz/regional/te-urewera-act/>.
- European Commission. 2018. Innovative financial instruments. https://ec.europa.eu/info/business-economy-euro/growth-and-investment/financing-investment/innovative-financial-instruments_en; accessed December 12, 2022.
- European Parliament. 2009. European Parliament resolution of 3 February 2009 on wilderness in Europe. https://www.europarl.europa.eu/doceo/document/TA-6-2009-0034_EN.html; accessed December 6, 2022.
- European Wilderness Society. 2022. European wilderness quality standard and audit system: The need for a European wilderness quality standard. <https://wilderness-society.org/european-wilderness-definition/european-wilderness-quality-standard-audit-system/>; accessed December 6, 2022.
- Faries, W.; Cervigni, R. 1998. Achieving sustainable conservation: The global environment facility. *International Journal of Wilderness*. 4(2): 32–33.
- Fisher, M.; Carver, S.; Kun, Z.; McMorran, R.; Arrell, K.; Mitchell, G. 2010. Review of status and conservation of wild land in Europe. Project commissioned by the Scottish Government. Final Report, Tender Ref: CR/2009/31, Project No: WRI/001/09. On file at The Wildland Research Institute, The University of Leeds, Leeds, UK.
- Fletcher, Michael-Shawn; Hamilton, Rebecca; Dressler, Wolfram; Palmer, Lisa. 2021. Indigenous knowledge and the shackles of wilderness. *PNAS* 118(40): e2022218118.
- Forest and Finance Policy Assessment. 2022. Is your money destroying rainforests or violating rights? <https://forestsandfinance.org/wp-content/uploads/2022/10/FF2022-policy-briefer.pdf>.
- Foster, N.; Lemay, M. H. 1988. Ocean wilderness—Myth, challenge or opportunity? In: Martin, Vance G., ed. *For the Conservation of the Earth. Proceedings of the 4th World Wilderness Congress*; September 11–18, 1987; Denver and Estes Park, CO. Golden, CO: Fulcrum, pp. 171–174.
- Germani, F. S.; Sepúlveda, M. 2021. Chile adopts international certification standards for management of protected areas: Inclusion of national parks on IUCN Green List would recognize country's work on conservation. Pew Charitable Trust. Retrieved May 2, 2023.
- Glenday, J. 2014. Federal Government will respect UN committee's Tasmanian forest ruling. ABC. Australian Broadcasting Corporation. June 24, 2014, archived from the original on September 1, 2014. Retrieved December 11, 2014. <https://www.abc.net.au/>; accessed December 12, 2022.
- Goodland, R. J. A. 1987. The World Bank's wildlands policy: A major new means of financing conservation? *Conservation Biology*. 1(3): 210–213.
- Green, M. J. B.; Paine, J. 1997. State of the world's protected areas at the end of the twentieth century. Paper presented at the *IUCN World Commission on Protected Areas Symposium on Protected Areas in the 21st Century: From Islands to Networks*; November 24–29, 1997; Albany, Australia. Cambridge, England: IUCN Publications Services Unit. www.iucn.org.
- Hannah, L.; Lohse, D.; Hutchinson, C.; Carr, J. L.; Lankerani, A. 1994. A preliminary inventory of human disturbance of world ecosystems. *Ambio*. 23: 246–250.
- Hawes, Martin; Dixon, Grant; Ling, Roger. 2015. Assessing wilderness values—The Tasmanian Wilderness World Heritage Area, Australia. *International Journal of Wilderness* (21): 3.
- Hawes, Martin; Dixon, Grant; Bell, Chris. 2018. Refining the definition of wilderness: Safeguarding the experiential and ecological values of remote natural land. Bob Brown Foundation, Hobart.
- Hawes Martin; Dixon, Grant. 2021. What do we mean when we talk about wilderness? *Wild*. 18 (Spring 2021).
- Hebblewhite, Mark; Hilty, Jodi A.; Williams, Sara; Locke, Harvey; Chester, Charles; Johns, David; Kehm, Gregory; Francis, Wendy L. 2022. Can a large-landscape conservation vision contribute to achieving biodiversity targets? *Conservation Science and Practice*. 4: e588.
- Helman, P. M.; Jones, A. D.; Pigram, J. J.; Smith, J. M. B. 1976. *Wilderness in Australia: Eastern New South Wales and Southeastern Queensland*. Armidale, Australia: University of New England, Department of Geography.
- Hintz, John. 2007. Some political problems for rewilding nature. *Ethics, Place and Environment*. 10(2): 177–216.
- Hobbs, Richard, J. 2002. Habitat networks and biological conservation. In: Gutzwiller, K. J., ed. *Applying Landscape Ecology in Biological Conservation*. New York: Springer, pp. 150–170.
- Hummel, Monte. 1989. *Endangered Spaces: The Future for Canada's Wilderness*. Toronto, Ontario, Canada: Key Porter Books.
- Indigenous Circle of Experts. 2018. We Rise Together. Achieving pathway to Canada Target 1 through the creation of Indigenous Protected and Conserved Areas in the spirit and practice of reconciliation. Integrated Rural Development and Nature Conservation (IRDNC).
2019. IRDNC Strategy 2019–2024. <https://www.irdnc.org.au/pdf/IRDNC-Strategy-2019%E2%80%932024.pdf>; accessed December 12, 2022.
- International Union for Conservation of Nature (IUCN). 1998. 1997 *United Nations List of Protected Areas*. Cambridge, England. www.iucn.org.
- . 2016. IUCN Members' Assembly. Resolution 6.069: Defining Nature-Based Solutions, WCC.2016-Res-069. Gland, Switzerland.
- Johns, David. 2019. History of rewilding: Ideas and practice. In: Petorelli, N.; Durant, S.; du Toit, J., eds. *Rewilding*. Cambridge University Press, pp. 12–33.
- Johnson, J. A.; Ruta, G.; Baldos, U.; Cervigni, R.; Chonabayashi, S.; Corong, E.; Gavryliuk, O.; Gerber, J.; Hertel, T.; Nootenboom, C.; Polasky, S. 2021. The economic case for nature: A global earth-economy model to assess development policy pathways. Washington, DC: World Bank. <https://openknowledge.worldbank.org/handle/10986/35882>.
- Jones-Walters, Lawrence. 2007. Pan-European ecological networks. *Journal of Nature Conservation* 15: 262–264.
- Jørgensen, Dolly. 2015. Rethinking rewilding. *Geoforum*. 65: 482–488.
- Kajala, L. 2008. Finland. In: Kormos, Cyril, ed. *A Handbook on International Wilderness Law and Policy*. Golden, CO: Fulcrum, pp. 143–155.

- Kelleher, Graeme. 1982. Management of the Great Barrier Reef. In: Martin, Vance, ed. *Wilderness*. Moray, Scotland: The Findhorn Press, pp. 136–141.
- Kormos, C. F.; Bertzy, B.; Jaeger, T.; Shi, Y.; Badman, T.; Hilty, J.A.; Mackey, B.G.; Mittermeier, R.A.; Locke, H.; Osipova, E.; Watson, J. E. M. 2016. A wilderness approach under the World Heritage Convention. *Conservation Letters: Policy Perspectives*. 9(3): 228–235.
- Kormos, C. F., ed. 2008. *A Handbook on International Wilderness Law and Policy*. Golden, CO: Fulcrum.
- Kormos, C. F.; Martin, V.G. 2008. Southern and Eastern Africa. In: Kormos, Cyril, ed. *A Handbook on International Wilderness Law and Policy*. Golden, CO: Fulcrum, pp. 313–317.
- Křenová, Z.; Kiener, H. 2012. Europe's wild heart—Still beating? Experiences from a new transboundary wilderness area in the middle of the old continent. *European Journal of Environmental Sciences*, Vol. 2, No. 2, pp. 115–124.
- Ledger, Sophie. E. H.; Rutherford, Claire A.; Benham, Charlotte; Burfield, Ian J.; Deinet, Stefanie; Eaton, Mark; Freeman, Robin; Gray, Claudia; Herrando, S.; Puleston, H.; Scott-Gatty, K.; Staneva, A.; McRae, L. 2022. Wildlife comeback in Europe: Opportunities and challenges for species recovery. Final report to Rewilding Europe by the Zoological Society of London, BirdLife International and the European Bird Census Council. London, UK: ZSL.
- Lesslie, R. G.; Taylor, S. G. 1985. The wilderness continuum concept and its implications for Australian wilderness preservation policy. *Biological Conservation*. 32(4): 309–333.
- Lesslie, R. G.; Maslen, M. 1995. *National Wilderness Inventory: Handbook of Principles, Procedures and Usage*, 2nd ed. Canberra: Australian Heritage Commission.
- Lewis, A. 2023. Personal conversation with Chief Tashka Yawanawá.
- Li, P. 2017. Proposing a National Protected River System in China: Ecological civilization. *International Journal of Wilderness*. 23(2): 64–70.
- Locke, Harvey. 2018. The international movement to protect half the world: Origins, scientific foundations, and policy implications. *Elsevier: Reference Module in Earth Systems and Environmental Sciences*.
- Lorimer, Jamie; Sandom, Chris; Jepson, Paul; Doughty, Chris; Barua, Maan; Kirby, Keith J. 2015. Rewilding: Science, practice, and politics. *Annual Review of Environment and Resources*. 40: 39–62.
- Martin, Vance G. 1983. Personal conversation with Ian Player.
- , ed. 1988. Resolution of the Congress. In: *For the Conservation of the Earth: Proceedings of the 4th World Wilderness Congress*; September 11–18, 1987; Denver and Estes Park, CO. Golden, CO: Fulcrum.
- , 1990. International wilderness: Adapting to developing nations. In: Lime, David, ed. *Managing America's Enduring Wilderness Resource*. Conference proceedings; September 11–17, 1989; St. Paul: University of Minnesota Extension Service, pp. 252–266.
- , 1994. Wilderness designation as a global trend. In: Martin, Vance; Tyler, N., ed. *Arctic Wilderness: Proceedings of the 5th World Wilderness Congress*; September 1993. Tromsø, Norway. Golden, CO: Fulcrum, pp. 8–19.
- , 2001. The World Wilderness Congress. *International Journal of Wilderness*. 7(1): 4–9.
- , 2017. Wilderness—International Perspectives and the China Opportunity. *Chinese Landscape Architecture*. 33(258): pp 5–9. [Abstract in English.]
- Martin, Vance G.; Robles Gil, P. 2009. Wilderness. Collection Voces de la Tierra Sierra Madre. Sierra Madre, 123 p.
- Martin, Vance G.; Hill, Melanie. 2021. Urban wildness—A more correct term than “urban wilderness” *Landscape Architecture Frontiers*. 9(1): 80–90.
- Maxwell, S. L.; Cazalis, V.; Dudley, N.; Hoffmann, M.; Rodrigues, A. S. L.; Stolton, S.; Visconti, P.; Woodley, S.; Kingston, N.; Lewis, E.; Maron, M.; Strassburg, B. B. N.; Wenger, A.; Jonas, H. D.; Venter, O.; Watson, J. E. M. 2020. Area-based conservation in the twenty-first century. *Nature*. 586(7828): 217–227.
- McCloskey, J. M.; Spalding, H. 1988. A reconnaissance-level inventory of the wilderness remaining in the world. In: Martin, Vance G., ed. *For the Conservation of the Earth: Proceedings of the 4th*. Golden, CO: Fulcrum.
- McCloskey, Michael. 2001. Wild rivers of the world. In: Martin, Vance, ed. *Wilderness and Humanity: The Global Issue. Proceedings of the 6th World Wilderness Congress*; October 24–29, 1998; Bangalore, India. Golden, CO: Fulcrum, pp. 20–25.
- McCloskey, Maxine. 2001. The high seas: Is there room for wilderness? In: Martin, Vance; Sarathy, M. A. Partha, eds. *Wilderness and Humanity: The Global Issue. Proceedings of the 6th World Wilderness Congress*; October 24–29, 1998; Bangalore, India. Golden, CO: Fulcrum, pp. 193–197.
- McDonald, T. 1995. Mission Mountains Tribal Wilderness Area of the Flathead Indian Reservation. *International Journal of Wilderness*. 1(1): 20–21.
- McDonnell, A. 2021. Affric Highlands, Scotland: Scotland's wild east-west corridor. <https://rewildingeurope.com/landscapes/affric-highlands/>; accessed December 6, 2022.
- McLuhan, T. C., ed. 1971. *Touch the Earth: A Self-Portrait of Indian Existence*. New York: Outerbridge and Dienstfrey.
- McNamee, K. 2008. Canada. In: Kormos, Cyril, ed. *A Handbook on International Wilderness Law and Policy*. Golden, CO: Fulcrum, pp. 91–117.
- Mittermeier, R. A.; Kormos, C. F.; Mittermeier, C. G.; Robles Gil, P.; Sandwith, T.; Besançon, C. 2005. *Transboundary Conservation: A New Vision for Protected Areas*. CEMEX-Agrupación Sierra Madre-Conservation International, Mexico. 372p.
- Mittermeier, R. A.; Mittermeier, C. G.; Gil, P. R.; Pilgrim, J. 2003. *Wilderness: Earth's Last Wild Places*. Conservation International and University of Chicago Press.
- Molloy, L. F. 1983. Wilderness recreation—the New Zealand experience. In: Molloy, L. F., ed. *Wilderness Recreation in New Zealand: Proceedings of the FMC 50th Jubilee Conference on Wilderness*; August 22–24, 1981; Lake Rotoiti, Nelson Lakes National Park, New Zealand. Wellington, New Zealand: Federated Mountain Clubs of New Zealand, pp. 4–19.
- , 1997. Wilderness in New Zealand: A policy looking for someone to implement it. *International Journal of Wilderness*. 3(2): 11–45.
- Monbiot, G. 2014. *Feral: Rewilding the land, the sea and human life*. Chicago: The University of Chicago Press.
- Muir, K. 2007. Action toward wilderness protection in Australia. In: Watson, Alan; Sproull, Janet; Dean, Liese, comps. *Science and Stewardship to Protect and Sustain Wilderness Values: Eighth World Wilderness Congress Symposium*; September 30–October 6, 2005; Anchorage, AK. Proceedings RMRS-P-49. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.
- Mutwa, C. Vusamazulu. 1999. *Indaba, My Children*. First American ed. New York: Grove Press, now Grove Atlantic.
- Myers, Norman. 1998. Lifting the veil on perverse subsidies. *Nature*. 392: 327–328.
- Nash, R. 1982. *Wilderness and the American Mind*. New Haven, Connecticut: Yale University Press.
- Nelson, Michael P. 1998. An amalgamation of wilderness preservation arguments. In: Callicott, J. B.; Nelson, M. P., eds. *The Great New Wilderness Debate*. Athens: University of Georgia Press, pp. 154–200.
- No'kmaq, M.; Marshall A.; Beazley K. F.; Hum, J.; Joudry, S.; Papadopoulos, A.; Pictou, S.; Rabesca, J.; Young, L.; Zurba, M. 2021. “Awakening the sleeping giant”: Re-Indigenization principles for transforming biodiversity conservation in Canada and beyond. *FACETS*. 6: 839–869.
- Ostergren, D. M.; Shvarts, E. 2000. Russian zapovedniki in 1998: Recent progress and new challenges for Russia's strict nature preserves. In: Watson, A. E.; Aplet, G. H.; Hendee, J. C., comps. *Personal, Societal, and Ecological Values of Wilderness: 6th World Wilderness Congress proceedings on research, management, and allocation*; Vol. 2; October 24–29, 1998; Bangalore, India. RMRS-P-14. Ogden, UT: United States Department of Agriculture, Forest Service, Rocky Mountain Research Station, pp. 209–213.

- Ostergren, D. M. 2001. An organic act after a century of protection: The context, content and implications of the 1995 Russian Federation law on specially protected natural areas. *Natural Resources Journal*. 41(1): 125–152.
- Parks Canada Agency. 2000. Unimpaired for future generations? Protecting ecological integrity with Canada's National Parks. Vol. I. "A call to action." Report of the Panel on the Ecological Integrity of Canada's National Parks. Ottawa, Ontario: National Parks Canada.
- Pietikäinen, S. 1995. Finland's wilderness act—a Scandinavian model. In: Martin, Vance; Tyler, N., eds. *Arctic Wilderness: Proceedings of the 5th World Wilderness Congress*; September 1993; Tromsø, Norway. Golden, CO: Fulcrum, pp. 181–186.
- Plumptre, A.; Baisero, D.; Belote, R. T.; Vázquez-Domínguez, E.; Faurby, S.; Jędrzejewske, W.; Kiara, H.; Kühl, H.; Benítez-López, A.; Luna-Aranguré, C.; Voigt, M.; Wich, S.; Wint, W.; Gallego-Zamorano, J.; Boyd, C. 2021. Where might we find ecologically intact communities? *Frontiers in Forests and Global Change*. (4): 626635.
- Polisio, W. S.; Meniado, A. P. 1997. Implementation of the National Integrated Protected Areas System Act. *Sylvatrop*. 7(1–2): 2–6.
- Pryde, P. R. 1987. The distribution of endangered fauna in the USSR. *Biological Conservation*. 42(1): 19–37.
- Quetico Provincial Park. 2018. Quetico Gwetamung Management Plan. <https://files.ontario.ca/quetico-gwetamung-park-management-plan-2018.pdf>; accessed December 12, 2022.
- Rambaldi, G. 1997. RRA as a tool in integrating people's participation in protected areas management in the Philippines. *Sylvatrop*. 7(1–2): 28–39.
- Raygorodetsky, G. 2018. Indigenous Peoples defend Earth's biodiversity: But they're in danger. *National Geographic*. November 16, 2018. <https://www.nationalgeographic.com/environment/article/can-indigenous-land-stewardship-protect-biodiversity->
- Regos, A.; Domínguez, J.; Gil-Tena, A.; Brotons, L.; Ninyerola, M.; Pons, X. 2016. Rural abandoned landscapes and bird assemblages: winners and losers in the rewilding of a marginal mountain area (NW Spain). *Regional Environmental Change*. 16: 199–211.
- Rewilding Charter Working Group. 2020. Global charter for rewilding the Earth. *The Ecological Citizen*. 4(A): 6–21.
- Rosu, Alexandru-Cristian. 2014. Property restitution in Romania. *Global Economic Observer; Bucharest*. 2(2): 37–41.
- Rutledge, R.; Vold, T. 1995. Canada's wilderness. *International Journal of Wilderness*. 1(2): 8–13.
- Saarienen, J. 1998. Wilderness, tourism development, and sustainability: Wilderness attitudes and place ethics. In: Watson, A. E.; Aplet, G. H.; Hendee, J. C., comps. *Personal, Societal, and Ecological Values of Wilderness: Proceedings of the 6th World Wilderness Congress proceedings on research, management, and allocation*, Vol. I; October 24–29, 1998; Bangalore, India. Proc. RMRS-P-4. Ogden, UT: USDA, Forest Service, Rocky Mt. Research Station, pp. 29–36.
- Sanderson, Eric W.; Jaiteh, Malanding; Levy, Marc A.; Redford, Kent H.; Wannebo, Antoinette V.; Woolmer, Gillian. 2002. The human footprint and the last of the wild. *Bioscience*. 52 (10): 891–904.
- Sawyer, N. 2015. Wilderness quality mapping—The Australian experience. In: Watson, A.; Carver, S.; Křenová, Z.; McBride, B., comps. *Science and Stewardship to Protect and Sustain Wilderness Values: 10th World Wilderness Congress Symposium*; October 4–10, 2013; Salamanca, Spain. Proc. RMRS-P-74. Fort Collins, CO: USDA, Forest Service, Rocky Mt. Research Station, pp. 100–108.
- Scarzanella, Eugenia. 2002. Las bellezas naturales y la nación: Los parques nacionales en Argentina en la primera mitad del siglo XX. [Natural beauties and the nation: National parks in Argentina in the first half of the 20th century.] *Revista Europea de Estudios Latinoamericanos y del Caribe*. 73: 5–21. <https://www.jstor.org/stable/25675985>.
- Shah, Anup. 2014. Nature and animal conservation. *Global Issues: Social, Political, Economic and Environmental Issues That Affect Us All*. January 9, 2014. <https://www.globalissues.org/article/177/nature-and-animal-conservation>; accessed December 6, 2022.
- Sippola, A-L. 2000. Biodiversity in Finnish wilderness areas: Aspects on preserving species and habitats. In: Watson, A. E.; Aplet, G. H.; Hendee, J. C., comps. *Personal, Societal, and Ecological Values of Wilderness: Proceedings of the 6th World Wilderness Congress proceedings on research, management, and allocation*, Vol. II; October 24–29, 1998; Bangalore, India. Proc. RMRS-P-14. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, pp. 48–56.
- Somers, J. 2008. New Zealand. In: Kormos, Cyril, ed. *A Handbook on International Wilderness Law and Policy*. Golden, CO: Fulcrum, pp. 193–213.
- Soulé, M. E.; Noss, R. 1998. Rewilding and biodiversity: Complementary goals for continental conservation. *Wild Earth*. 8(3): 18–28.
- Stankey, G. H. 1989. Beyond the campfire's light: Historical roots of the wilderness concept. *Natural Resources Journal*. 29: 9.
- Stewart, P. 2015. The possibilities of North Island Wilderness. *FMC Bulletin*. 200: 26–29. Official quarterly of the Federated Mountain Clubs of New Zealand.
- Svenning, Jens-Christian; Pedersen, Pil B.; Donlan, C. Josh; Ejrnaes, R.; Faurby, S.; Galetti, M.; Hansen, D. M.; Sandel, B.; Sandom, C. J.; Terborgh, J. W.; Vera, F. W. M. 2015. Science for a wilder Anthropocene: Synthesis and future directions for trophic rewilding research. *Proceedings of the National Academy of Sciences of the United States of America*. 12: 1–7.
- Sylvén, M., Wagner, K., & Martin, V.G. 2020. *The Story of Our Future: The Survival Revolution: The WILD11 Jaipur Declaration*. The WILD Foundation. www.wild.org/wilderness-specialist-group; www.wild11.org/outcomes; accessed December 12, 2022.
- Tin, T.; Yang, R. 2016. Tracing the contours of wilderness in the Chinese mind. *International Journal of Wilderness*. 22(2): 35–40.
- Trippensee, R. E. 1948. *Wildlife Management: Upland Game and General Principles*. New York: McGraw-Hill.
- UCN and UNEP-WCMC. 2016. The World Database on Protected Areas (WDPA). <http://www.protectedplanet.net>; accessed January 10, 2023.
- UCN and UNEP-WCMC. 2022. The World Database on Protected Areas (WDPA). <http://protectedplanet.net>; accessed September 2022.
- UNEP-WCMC. 2017. World Database on Protected Areas User Manual 1.5. http://wcmc.io/WDPA_Manual.
- U.S. Public Law 88–577. The Wilderness Act of September 3, 1964. 78 Stat. 890.
- U.S. Department of the Interior. 2011. U.S., Mexico Announce Binational Cooperative Conservation Action Plan: Salazar, Elvira Under-score Commitment to Protecting and Preserving the Big Bend/Rio Bravo Region.
- Ustaoglu, E.; Collier, M. J. 2018. Farmland abandonment in Europe: An overview of drivers consequences and assessment of the sustainability implications. *Environmental Reviews*. 26(4).
- Wakild, E. 2014. Acts of courage, acts of culture: The Wilderness Act in Latin America. *Environmental History*. 19(4): 728–734.
- Watson, A. E.; Aplet, G. H.; Hendee, J. C., comps. 1998. *Personal, Societal, and Ecological Values of Wilderness: 6th World Wilderness Congress Proceedings on Research, Management, and Allocation*, Vol. I; 1997; October; Bangalore, India. Proc. RMRS-P-4. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 158 p. <https://winapps.umn.edu/winapps/media2/leopold/pubs/342.pdf>; accessed December 29, 2022.
- Watson, A. E.; Aplet, G. H.; Hendee, J. C., comps. 2000. *Personal, Societal, and Ecological Values of Wilderness: 6th World Wilderness Congress Proceedings on Research, Management, and Allocation*, Vol. II; October 24–29, 1998; Bangalore, India. Proc. RMRS-P-14. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 248 p. <https://winapps.umn.edu/winapps/media2/leopold/pubs/375.pdf>; accessed December 29, 2022.
- Watson, A. E.; Carver, S.; Křenová, Z.; McBride, B., comps. 2015. *Science and Stewardship to Protect and Sustain Wilderness Values: 10th World Wilderness Congress Symposium*; October 4–10, 2013; Salamanca, Spain. Proceedings RMRS-P-74. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 208 p. <https://winapps.umn.edu/winapps/media2/leopold/pubs/846.pdf>; accessed December 29, 2022.

- Watson, A.; Matt, R.; Knotek, K.; Williams, D.; Yung, L. 2011a. Traditional wisdom: Protecting relationships with wilderness as a cultural landscape. *Ecology and Society*. 16(1): 36. <http://www.ecologyandsociety.org/vol16/iss1/art36/>.
- Watson, A.; Murrieta-Saldivar, J.; McBride, B., comps. 2011b. *Science and Stewardship to Protect and Sustain Wilderness Values: 9th World Wilderness Congress Symposium*; November 6–13, 2009; Meridá, Yucatán, Mexico. Proceedings RMRS-P-64. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 225 p. <https://winapps.umn.edu/winapps/media2/leopold/pubs/740.pdf>; accessed December 29, 2022.
- Watson, A.; Carver, S.; Matt, R.; Waters, T.; Gunderson, K.; Davis, B. 2013. Place mapping to protect cultural landscapes on tribal lands. In: Stewart, W.; Williams, D.; Kruger, L., eds. *Place-Based Conservation*. Springer, Dordrecht.
- Watson, A.; Matt, R.; Waters, T.; Gunderson, K.; Carver, S.; Davis, B. 2009. Mapping tradeoffs in values at risk: at the interface between wilderness and non-wilderness lands. In: González-Cabán, Armando, ed. *Proceedings of the 3rd International Symposium on Fire Economics, Planning, and Policy: Common Problems and Approaches*. PSW-GTR-227. Albany, CA: USDA Forest Service, Pacific Southwest Research Station, pp. 375–387.
- Watson, A.E.; Carver, S. 2017. Wilderness, rewilding and free-willed ecosystems: Evolving concepts in stewardship of IUCN protected category 1b areas. *Chinese Landscape Architecture*. 33(258): 34–38. [In Chinese. English translation available at <https://winapps.umn.edu/winapps/media2/leopold/pubs/923.pdf>.]
- Watson, A.; Sproull, J., comps. 2003. *Science and Stewardship to Protect and Sustain Wilderness Values: 7th World Wilderness Congress Symposium*; November 2–8, 2001; Port Elizabeth, South Africa. Proc. RMRS-P-27. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 272 p. <https://winapps.umn.edu/winapps/media2/leopold/pubs/487.pdf>; accessed 29 December 2022.
- Watson, A.; Sproull, J.; Dean, L., comps. 2007. *Science and Stewardship to Protect and Sustain Wilderness Values: 8th World Wilderness Congress Symposium*; September 30–October 6, 2005; Anchorage, AK. Proceedings RMRS-P-49. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 581 p. <https://winapps.umn.edu/winapps/media2/leopold/pubs/623.pdf>; accessed 29 December 2022.
- Watson, J. E.; Venter, O.; Lee, J.; Jones, K. R.; Robinson, J. G.; Possingham, H. P.; & Allan, J. R. 2018. Protect the last of the wild. *Nature*. 563(7729): 27.
- WCC. 2020. WCC-2020-Res-125-EN. Setting area-based conservation targets based on evidence of what nature and people need to thrive. https://portals.iucn.org/library/sites/library/files/resrecfiles/WCC_2020_RES_125_EN.pdf. A; accessed December 12, 2022.
- Weiner, D. R. 1988a. *Models of Nature: Ecology, Conservation, and Cultural Revolution in Soviet Russia*. Bloomington: Indiana University Press.
- . 1988b. The changing face of Soviet conservation. In: Worster, Donald, ed. *The Ends of the Earth: Perspectives on Modern Environmental History*. Cambridge, England: Cambridge University Press, pp. 252–273.
- Wild, R.; McLeod, C., eds. 2008. *Sacred Natural Sites: Guidelines for Protected Area Managers*. Gland, Switzerland: IUCN.
- Wilson, E. O. 2016. *Half-Earth: Our Planet's Fight for Life*. Liveright/W.W. Norton.
- World Bank. 1986. The World Bank's Operational Policy on Wildlands: Their Protection and Management in Economic Development.
- World Commission on Environment and Development (WCED). 1987. *Our Common Future*. New York: Oxford University Press.
- Wright, P.A.; Moghimehfar, F.; Woodley, A. 2019. Canadians' perspectives on how much space nature needs. *FACETS*. 4: 91–104.
- Zealand, Clark T. W. 2007. Decolonizing Experience: An ecophenomenological investigation of the lived-experience of the Appalachian Trail thru-hikers. Thesis. University of Waterloo, Ontario, Canada. <http://hdl.handle.net/10012/3036>.
- Zunino, F. 2007. A perspective on wilderness in Europe. *International Journal of Wilderness*. 13(3): 40–43.