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PARKS AND WILDERNESS, THE FOUNDATION FOR CONSERVATION

Protected Areas in Chilean Patagonia

CARLOS CUEVAS

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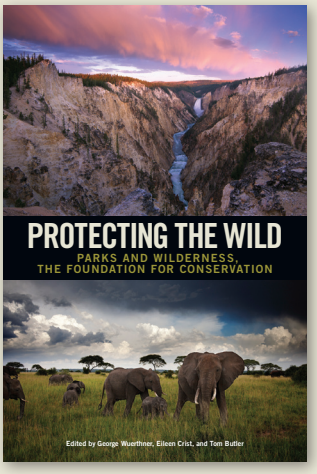

CARLOS CUEVAS, a forestry engineer and ecologist, is recognized for his key role toward establishing more than 2 million acres of private and public protected areas, terrestrial and marine, in Chilean Patagonia, equivalent to 3 percent of all protected lands and waters established in Chile since 1907. Working closely with Douglas and Kristine Tompkins for twenty years, Cuevas has assisted in the creation of the Tictoc-Melimoyu Marine Protected Area, Corcovado National Park, Yendegaia National Park, Pumalín Nature Sanctuary, and the Valle Chacabuco Park—the future Patagonia National Park.

WESTERN PATAGONIA IS A LAND of deep contrasts and impressive landscapes, extending 15 degrees of latitude, or roughly 1,000 miles, along the Pacific side of southernmost South America. The Antarctic continent is only 800 miles away from Cape Horn—Chilean Patagonia's southern tip. Covering 250,000 square kilometers, roughly one United Kingdom or three times the size of Austria, western Patagonia is home to less than 2 percent of Chile's current population. (In this essay the term "western Patagonia" refers to the present-day Chilean province of Palena and regions of Aysen and Magallanes.)

The dominant factor that shaped the landscape we see today is glacial action. Almost all the land was covered by ice 2–3 million years ago until just ten thousand years ago when the ice retreated, a very short time in the evolution of life on the planet. Two ice fields, the largest outside Antarctica and Greenland, are the last visible reminders of the glacial era. The most prominent sign of glaciers shaping the area, however, is the ubiquitous presence of coastal fjords, the retreating ice leaving behind not only peninsulas but some 10,000 islands as well. While the outer coast is about 1,000 miles long, the total coastline, factoring in all the islands and fjords, amounts to some 50,000 miles. Volcanic eruptions have shaped life in Patagonia—especially the resulting ash, a main component for soil origin and characteristics.

The abiotic and biotic characteristics of the ocean are conditioned by the South Pacific Gyre, flowing from west to east. Upon reaching the continent the current is divided between a segment flowing south around Cape Horn and another, the Humboldt Current, flowing north. Both cold water currents strongly influence the country's climate. The water flow and associated upwelling areas give rise to the most productive fisheries in the world. Yet the region's rich and complex marine ecosystems are poorly understood because research has focused on only a few species of commercial value; Patagonia's terrestrial ecosystems, with characteristics and dynamics found nowhere else on Earth, are better understood.

Population and land use

More than ten thousand years ago, humans arrived in western Patagonia; the Monte Verde archaeological site remains the oldest scientifically dated human habitation site in all of the Americas (14,800 years before present). The harsh climate and cold summers did not allow crops to reach maturity, so indigenous peoples were restricted to hunting, gathering, and fishing. Human numbers remained low and Patagonia still is the least inhabited part of the country. Until the early nineteenth century, five distinct native peoples populated western Patagonia. In the coast, the Chonos lived in the northern fjords, up to the Taitao peninsula; the Yamana or Yaghan lived south of Tierra del Fuego, to the southern tip of the continent, Cape Horn; between those groups, from the Taitao peninsula to the Strait of Magellan lived the Kaweshkar or Alacalufes. With little or no contact with the former, two groups of hunters lived in the grasslands east of the Andes, the Tehuelche on the mainland and the Ona or Selk'nam on the island of Tierra del Fuego. Their numbers likely never exceeded 10,000 people among all the groups.

The first European to reach Patagonia was Ferdinand Magellan, a Portuguese captain serving the Spanish crown, who entered the strait now bearing his name in 1520. Spanish colonists made an ill-fated attempt to settle the Strait of Magellan during the sixteenth century; the English corsair Thomas Cavendish rescued one survivor and bestowed the name "Port Famine" to the once-proud City of King Philip. This settlement was the first but not the last environmental blunder in Patagonia motivated by decisions made from afar and ignorant of local conditions. Few navigators reached Patagonian shores in the three centuries after discovery; the Spaniards established trade and supply lines through the Isthmus of Panama and tried to keep out competitors like the English or the Dutch who nevertheless came when Spain was at war with them in Europe. Francis Drake made the second passage of the strait, and the Dutch captains Willem Schouten and Isaac Le Maire discovered Cape Horn in 1616. More than a century later, in 1740, Admiral Lord Anson crossed through the Strait of Magellan en route to attack the Spanish forts in the Pacific. Massachusetts whalers and seal hunters came in numbers after American independence, to the point that Americans were generally known as "Bostoneses."

One distinguished visitor, Charles Darwin, spent over a year (1832) navigating Chilean Patagonia's stormy waters and carrying out research ashore as naturalist of HMS *Beagle*, charged with mapping the coast of the former Spanish colonies. Darwin noted the land's characteristics—glaciers flowing into the sea at the latitude of southern England, the mix of plant and animal species not found elsewhere, and the impact of volcanic activity. Darwin perceived very clearly that the limiting factor for agriculture and life in general was the very cold summers and not the average yearly temperatures; his observations

are still valid today. In the book written when he was not yet thirty years old, he made passing negative comments about the indigenous inhabitants, based on very superficial observations. Later in life a wiser Darwin changed his views after having access to data gathered by missionaries, such as a Selk'nam language dictionary with more than 30,000 terms showing the ability of the indigenous people of Patagonia to describe, understand, and adapt successfully to the harsh environment.

The permanent presence of a nonindigenous population dates only from the middle of the nineteenth century; this stemmed from government decision and not spontaneous movement by settlers seeking land to make a living. Chilean authorities established in 1842 a small garrison later turned into a penal colony. Punta Arenas ("Sandy Point" on the Royal Navy maps drawn by the HMS *Beagle* officers) languished for decades until steamships able to negotiate the narrows of the Strait of Magellan replaced the tall ships using the Cape Horn route. At that time the port revitalized, becoming a coaling and supply station and serving as a base for seal and whale hunters operating in South American and Antarctic waters.

Around 1880 the government brought sheep from the Falkland Islands and kick-started large-scale, wool-producing farms by selling and leasing extensive tracts of grasslands deemed "vacant"—ignoring the existence of indigenous peoples who lived there and hunted local wildlife. Near the Strait of Magellan, the operation succeeded financially but ruined indigenous communities; in the present-day Aysen Region further north, the "Magellanic model" of sheep grazing floundered due to lack of suitable grasslands. Since the beginning of the twentieth century, independent settlers occupied brush- and forestlands at the fringes of the Aysen concessions, where they intentionally set fires to easily open land for cattle ranching and sheep grazing. Forest fires damaged an estimated 10 million acres in Aysen and a lesser amount in Magallanes and Palena, but the forests are slowly recovering except where soil was lost completely due to erosion.

Indigenous peoples indeed had a certain degree of impact upon nature, but these effects were limited due to the human population's sparse numbers and modest technology. The second wave of inhabitants had more impact, but still within certain limits. At the present time, the natural and cultural heritage of western Patagonia is under a new kind of threat, stemming not from resource use by locals but from large-scale energy and fish farming investments by Chilean and international corporations.

Low-grade coal was known to exist since the nineteenth century and small mines operated irregularly depending on international prices. In the last twenty years two large coal-mining operations have been developed within a 100-mile radius of Punta Arenas, with an estimated 4 billion tons underground looming large as a potential threat. Drilling for oil was successful in 1945, production peaked in the 1980s and is declining, but the environmental consequences will remain for a long time. Further north in the Aysen Region there is no coal or oil, but salmon farming (salmon is a nonnative species) has surged (Chile is the world's second-largest exporter), reaching levels of density within pens and numbers of floating fish pens per coastal mile that would be unacceptable in other countries that have issued and enforce strict regulations for salmon aquaculture. Massive escape of these nonnative species is causing the degradation of native ecosystems while fishmeal that falls to the bottom through the pens has rendered lifeless large areas of the ocean.

While industrial salmon production is the major threat to Chile's coastal ecosystems, the potential for large-scale hydropower development of Patagonia's wild rivers presents the main conservation challenge on land. Plans for a series of huge dams proposed by private corporations for key Patagonian rivers were sidetracked in 2014 when the government withdrew one of the permits issued (to HydroAysen). Years of campaigning had rallied a majority of Chileans to strongly oppose such dam construction, but proponents are determined and have the right to reapply. Large dams have many negative effects, including the often-overlooked loss of landscape values, seismic risk, and loss of nutrient flow to the rich estuarine ecosystems. Moreover, the electricity that would be generated has no local benefit but is intended for sale to mines located 1,000–1,500 miles to the north, far from Patagonia. Dam construction, if permitted, will only increase an already quasi-monopolistic control by corporations of Chile's power generation; if halted, abundant wind and solar power near the mines (in fact the highest solar energy rate per square meter anywhere in the world) can serve local needs without power lines.

The controversy about the dams in Aysen and the social movement against the expansion of coal mining in Magallanes have started a discussion about what kind of future the local inhabitants want. Given the climatic and ecological constraints on traditional agriculture and the low population density, nature-based tourism is emerging as one of the few sustainable options, if adequately planned

and managed. Tourism might be a double-edged sword, but it is one of the few possible development options given the skills and financial possibilities of the locals. Western Patagonia, endowed with some of the most spectacular and dramatic landscapes in the world, provides tourism attractions of the highest level. In addition, roughly half of the land area is already conserved, legally declared as national parks, nature monuments, or national reserves, the oldest reserve dating from 1932 and the oldest park from 1945.

Natural heritage and conservation values

Although intuition might lead us to view the Arctic and the Antarctic as symmetric, as mirror images of one another, there are significant differences between Earth's far north and far south. The northern hemisphere is dominated by land while the southern hemisphere is predominantly water. Ecologically speaking, the difference is noteworthy: winds, ocean circulation patterns, heat transfer, ocean nutrient circulation, availability of space and connectivity for species evolution and migration differ greatly when comparing hemispheres. Additionally, New Zealand and Chile, the world's southernmost landmasses (excluding Antarctica) are part of the Pacific Ring of Fire, therefore volcanic activity is very high, strongly influencing soil conditions and the evolution of life-forms.

Two hundred million years ago, all of the planet's land was part of a single large continent, Pangaea. At that time this mega-continent started to break down, first dividing into northern and southern landmasses, and later continuing to break down as Australia, South America, Africa, and Antarctica drifted apart to become separate continents. Western Patagonia has been for millions of years at the "cutting edge" of the continent's drifting process, and the Andes Mountains have risen as the continent pushes against the oceanic plate. The Pacific Gyre brings cold Antarctic water toward the continent, creating a cooling effect; combined with predominantly westerly winds and the presence of the mountains, the conditions were set for extensive glaciation in Patagonia. Due to the common origin with other southern lands, local Patagonian flora is more closely related to New Zealand and Tasmania than to tropical America.

National parks and nature conservation

The oldest national park in western Patagonia is Cape Horn National Park at the southernmost tip of South America. Created in 1945 for its wilderness values and pristine character, Cape Horn is also a historic landmark. Not only did the captains and crews sailing past this promontory make the crossing between the two largest oceans of the planet, they achieved a special status because the journey was harsh and dangerous; dozens of ships sank trying to cross, and countless mariners perished in these waters.

Most of the land in Patagonia is government-owned, but the best agricultural or grazing land has long been in private ownership. The next step taken in protecting the outstanding natural heritage was establishing Lago Grey and Laguna San Rafael national parks in 1959. Years later, an enlarged Lago Grey became Torres del Paine National Park while Laguna San Rafael was the first "mega" protected area in Chile, with a size initially exceeding 1 million hectares (2.5 million acres) and now enlarged to 1.75 million hectares (4.3 million acres).

The late 1960s saw the largest increase in the number and total area of protected wildlands in Chile. Chile's then president Eduardo Frei Montalva demonstrated decisive conservation leadership during his term (1964–1970). No other president before or after has created more protected areas, in either number or total area conserved. Separated in time by more than sixty years, and governing in different cultural contexts, President Frei and U.S. President Theodore Roosevelt shared common traits: Both could be labeled as "Innovative Conservatives." Both came from tradition-oriented backgrounds, but neither was content administering "business as usual." Each felt the government should take action to further the public interest, and both used government powers to such effect. By the end of Frei's term roughly half of western Patagonia was within the boundaries of a national park or national reserve.

Progress in establishing protected areas by the Chilean government has been very irregular: sometimes fast, as was the case with president Frei, sometimes very slow, but never losing ground, showing at least some growth at the end of each president's term in office.

Since 1990, private landowners joined the protected areas movement, providing a welcome complement to government efforts, especially in places such as grasslands and other ecosystems not present or poorly represented in the older protected areas.

Categories of protected areas

Government-created protected areas covering terrestrial landscapes in Chile include national parks, nature monuments, and national reserves (formerly known as forest

reserves). Chile's national parks follow the same management principles as in the United States—large areas with limited evidence of human intrusion, open to visitors but managed to achieve protection of a region's natural heritage. Nature monuments are, in a sense, small-scale national parks managed for the protection of single elements with high conservation value, such as cave systems, marine birds' nesting sites, or salt lakes.

National reserves do not have a close equivalent in the United States, and America's national forests do not have an equivalent in Chile. People in the United States, Canada, and Europe are surprised by the fact that Chile's timber supply comes from fast-growing trees grown as a crop in abandoned agricultural land; native forests are dominated by a mixture of broad-leaved species, have slower growth rates, and grow in places with steeper slopes and poor access. Even if sustainability requirements are not added to the equation, all the above-mentioned factors turn logging native forests into a financially risky proposal. On the other hand, large areas deforested during the nineteenth century in central Chile in order to open lands for agriculture have thin soils, making them no longer profitable for agricultural use, and landowners either sell out to forest corporations or independently plant forest crops on the abandoned agricultural land. As a result, well over 90 percent of the timber consumed locally or exported comes from privately owned, planted forests, undercutting even more the financial prospects of timber production from native forests.

In Patagonia, as is the case in the rest of Chile, government-owned natural forests (which are fundamental for watershed protection and other ecosystem services) generally do not have commercially viable timber tracts, especially in Patagonia, where the topographic and climate conditions are extreme. Therefore, the U.S. National Forest concept (multiple-use management including timber extraction) does not apply in Chile. Thus, our national reserves fulfill a different role—they are not potential sources of timber but rather are sources of ecosystem services, protecting fragile ecosystems such as montane forests, wetlands, and alpine ecosystems. They also serve as interim protection until a precise allocation to a different category can be made.

In developing countries, many people, including influential politicians, hold development at all costs as a central tenet and perceive national parks and other strict land and ecosystem protection legal measures as hindering the desired development. National reserves may provide a lower level of legal protection, but by using such a designation some of the development boosters' resistance may be overcome. During President Frei's administration new protected areas were more or less evenly split between parks and reserves. Twenty years later a sizable amount of reserve land was upgraded to national park status and the resulting ratio was nearly two-thirds to one-third. The largest of the reserves, the 2.5-million-hectare Alacalufes National Reserve, however, was not reclassified on the grounds that, although fulfilling all the technical and scientific requisites to be a national park, it would result in the protected areas balance between parks and reserves reaching an 80:20 percent ratio, and that was not viable politically at the time.

The anti-conservation ideology, like the Spanish colonists of the sixteenth century, totally ignores the real characteristics, limitations, and also the opportunities for new ways of using a territory; but it is a powerful force and conservation advocates have to deal with it. Time and again the two views—toward landscape preservation or toward development—have clashed in Patagonia.

Present day

Western Patagonia, while comprising only one-third of Chile's continental territory, contains 80 percent of the nation's terrestrial protected areas; the figure is more impressive taking into account that approximately 20 percent of the country's land area (South American continent and adjacent islands) falls within the boundaries of national parks, nature monuments, national reserves, or private protected areas. Depending on who speaks, these figures are used for praising or criticizing conservation efforts and achievements. Critics always insist that there is too much territory "locked up" in national parks, and, even worse, now certain private owners are "locking" their resources instead of "developing" them; the critics see Patagonian biodiversity as "over-represented" in protected areas and believe that national park land should be declassified and opened to resource extraction.

Fortunately, in Chile, this anti-conservation view has never led to decreasing the area under protection, but it has hindered the establishment or enlargement of protected areas as well as government efforts in support of private conservation and especially public–private partnerships. Although the aim of the critics is not the improvement of conservation management, it is useful to take into account the implicit questions underlying their criticisms:

How much is enough? What level of ecosystem representation constitutes successful biodiversity conservation?

The key answer is that protected areas fulfill many objectives at once. In Patagonia, not enough time has passed since the glaciers retreated for new species to evolve, thus we still find a lower number of species as compared to the tropics, most of them pioneers able to exploit new opportunities. Although not a hot spot for tree species, this part of the world boasts a different kind of diversity. Here—in just one-tenth of 1 percent of the planet's land area—8 percent of the Earth's nonvascular plant species live, outnumbering the vascular species in the same area.

Within Patagonia's marine environment, protected areas are still few and small, covering as of January 2014 just some 100,000 hectares (247,000 acres) representing a fraction of 1 percent of the Patagonian territorial sea and none of the Exclusive Economic Zone. After a long struggle, two additional marine conservation units doubling the present area have been declared, a great achievement given the odds, but still painfully far from the minimum required to protect western Patagonia's marine heritage. Although the same categories used on land might be used in marine environments, the government has supported only the use of the Fisheries Law categories of marine park and marine reserve, as well as the "Multiple Use Coastal Marine Area," a management and enforcement agreement coordinating the actions of a number of government agencies with different mandates such as fisheries control, tourism, and navigation.

There is also a designated nature sanctuary in the Quitralco Fjord. Marine protected areas still do not have ranger stations or patrols as land areas have, and are not regularly monitored, but the establishment of marine protected areas is just starting in Chile and conditions should improve with time. Terrestrial areas started when the country did not have managerial experience or enough scientific expertise; in fact, the science of conservation biology did not exist. Present conditions are different and progress could be fast if the political will can be generated. The Patagonian fjords will certainly be at the center of developments regarding marine protected areas in the future.

Sometimes forgotten when forests get the limelight, Patagonian moorlands represent the third-largest wetland expanse in South America after the much better known Pantanal and Amazonian wetlands. These wetlands represent a huge carbon sink, in fact much larger than all of Chile's forest biomass combined; if disturbed or degraded they could become a huge source of greenhouse gases, therefore preservation measures are crucial.

In Patagonia, geology and the geological processes at work before our eyes are unique, including two large ice fields from which the glaciers issuing forth are the closest to the Equator that flow directly into the ocean.

Besides physical elements—flora, fauna, rocks, water or ice—in western Patagonia many relationships and associations contribute to the web of life. The intricate interactions between terrestrial and marine ecosystems—with a lengthy coastline, fjords, estuaries, ocean currents, upwellings, and tidal currents—are fragile and worth protecting. The natural fragmentation of ecosystems is the rule here; studying such processes can lead to greater biological understanding and possible ways to prevent extinctions elsewhere.

Although by area Chile is just the seventh-largest country in South America, some Patagonian protected areas are among the largest in the world. Bernardo O'Higgins National Park, with 3.5 million hectares (8.6 million acres), is larger than Belgium—or four times the size of Yellowstone. Next in land area is Alacalufes National Reserve with 2.3 million hectares (5.7 million acres), followed by Laguna San Rafael National Park (1.7 million hectares), Alberto de Agostini National Park (1.41million hectares), Guaytecas National Reserve (1.1 million hectares), and Katalalixar National Reserve at 674,500 hectares.

All these protected areas share a land boundary or are separated by only a fjord, strait, or bay. The areas stretch continuously along the fjord district, from latitude 42 to latitude 56 South, and have no roads or large, man-made structures; human presence is restricted to a few fishing villages in the vicinity (but outside park boundaries), a landing strip at Laguna San Rafael, and navigation aids for the ships passing through the fjords. The Madre de Dios islands, surrounded by Alacalufes, were left out in order to allow mining of high-quality lime deposits. The terrestrial component of western Patagonia's coastal zone is in fact a large wilderness, but, except for the small marine protected areas, fishing and aquaculture pens are allowed in the ocean. Captive fish breeding is prohibited if the adjoining land belongs to a national park; under this statute the most environmentally damaging activity is excluded from a large share of the coast.

In addition to the six large parks and reserves already mentioned, there are 25 public and a number of private protected areas in western Patagonia, some of them abutting one of six larger ones, most others not far from the core of protected land. The best known of the adjoining areas is Torres del Paine National Park, shar-

ing a boundary with Bernardo O'Higgins National Park along the southeastern edge of the Southern Patagonian Ice Field. Mention should be made also of Hornopirén, the northernmost of the Patagonian national parks; Cabo de Hornos, the southernmost and oldest of them; and Corcovado and Yendegaia national parks, the newest ones. Magallanes (the oldest national reserve) and Laguna Parrillar National Reserve provide watershed stabilization against landslides and drinking water for Punta Arenas, the largest city in Patagonia. Among the private conservation areas the largest are Pumalín, Patagonia Park, and Karukinka, but many others add to conservation efforts.

Private conservation in western Patagonia

Until 1990 the creation and management of protected areas was done exclusively by the national government (Chile is a unitary nation, meaning that although the national government is decentralized in 15 regions, there is no self-governing subnational level of government as found in federal nations). In recent decades a number of private conservation initiatives, large and small, have been undertaken in the region. They include profit-oriented businesses that include conservation as part of their business plan, farmers who want to preserve all or part of their properties, corporations that find themselves owning ecologically valuable pieces of native forests within landholdings used for commercial tree plantations, and plain examples of wildlands philanthropy—people who buy land in order to protect nature, without seeking financial gain.

In Chile, the private protected areas gained momentum at the height of a wave of privatization of public assets. Some people secretly and not so secretly hoped that the private sector would replace the government as the main conservation provider. A quarter of a century later, the hope has not materialized; there are solid reasons in economic theory for such an outcome. The products of conservation (scenic beauty, biodiversity, clean air and water) generally don't have market prices and there is no mechanism to charge those human "free riders" that refuse to pay voluntarily; on the other hand, conservation's direct costs (land acquisition and management, labor, infrastructure, energy, etc.) have a market price and there is no way to avoid paying it. The commitment to conservation demands an investment but cannot promise a specified financial return. In some instances it is possible to charge for the use of certain goods or services and achieve a margin of profit, but these cases are the exception and not the rule.

The six largest private protected areas in Chile, each covering more than 50,000 hectares (123,000 acres), are funded by interested sponsors because the revenues do not cover acquisition and development costs, and sometimes not even the operational costs. Two protected areas are financed by wealthy Chileans, two by U.S.-based nongovernmental organizations, and the balance by American philanthropists. Of the six, three are located in western Patagonia: Pumalín Park, Patagonia Park, and the Karukinka nature preserve.

Pumalín. Pumalín Park, encompassing roughly 290,000 hectares (716,000 acres), is located in Palena Province at the northern end of western Patagonia.The project was started by Douglas and Kristine Tompkins in 1990, who, through a charitable foundation, gradually bought private tracts of land as they came onto the market. Douglas Tompkins came to Chile for the first time in the 1960s as a downhill ski racer and later kept returning to enjoy nature-oriented sports while developing two successful business ventures in the United States. He later moved to South America and decided to devote himself to protecting the wildlife and beauty of Patagonia.

A century ago, the Chilean government gave away or sold at bargain prices most of the land in the province of Palena. The owners were expected to develop the land, cut or burn the forests, and start cattle ranches. The climate and soils were, in general, unsuitable for ranching and even less for crop agriculture. The inhabitants of the island of Chiloe, located some 40 miles west of Pumalín, had explored this coast since colonial times and did not find suitable places to make a living. This stretch of coast was spared the human-set fires that ravaged the forest near settlements located north and south of Pumalín Park.

Pumalín protects an important natural heritage, including 80,000 hectares of forest containing Chilean false larch (*Fitzroya cupressoides*), a species listed in CITES Appendix I. This represents about one-fifth of the world population of the species, which is endemic to a limited area in Chile and neighboring parts of Argentina.

Pumalín was formally declared a nature sanctuary by the government in 2005, providing a layer of official recognition to this exceptional private venture, widely acknowledged as the largest privately funded and managed nature preserve on Earth. The land is managed as a public access park, open for hiking, camping, and wilderness recreation, and has been offered as a donation to the government for the creation of a new national park. As of

this writing, the government has not yet accepted it for inclusion in Chile's national park system.

Patagonia Park. All over the world—in Chile, the United States, Argentina, Brazil, China—grasslands are among the least represented biomes in national parks and other types of protected areas, and for the same reason: Places suitable for grasslands typically support agriculture or livestock, and establishing protected areas means buying property, withdrawing grazing rights, and countering a perception that grazing is a benign land use with no real impact. Going against the three hurdles is no easy task for any government.

Grasslands cover roughly 12 percent of western Patagonia, but representation in the existing protected areas is very low, about one-tenth of 1 percent. Much sought after for sheep grazing, most grassland ecosystems were sold off by the government well before the creation of the first national parks. In Magallanes, the grasslands cover 3 million hectares (7.4 million acres) in one block broken only by the Strait of Magellan; in Aysen, the grassland area is much smaller, 370,000 hectares (914,000 acres) in the three valleys, where the region's three original private ranches, or *estancias,* were located.

By the beginning of this century, the Belgian owners of Estancia Valle Chacabuco, facing rising costs, declining soil fertility, and unstable commodity prices, started to look for a prospective buyer. Conservacion Patagonica, a nonprofit organization headed by Kristine McDivitt Tompkins, agreed to buy the economically troubled 78,000-hectare sheep farm in 2004. Conservacion Patagonica devised a project to create a future Patagonia National Park by combining the acquired private lands with two adjoining national reserves, Jeinimeni to the northeast and Lago Cochrane to the southwest. The new park, comprising roughly 263,000 hectares, will be a world-class protected area with the fullest array of fauna in all of Patagonia, majestic mountains, and easy visitor access from existing road networks in Chile and Argentina. The project is now concentrating efforts on eradicating introduced plant species, eliminating fences, and generally restoring the land to its former richness and diversity. Public access infrastructure is under construction, including park personnel housing, visitor center, trails, campgrounds, and other facilities. The project aims to be energy self-sufficient and all buildings will be low maintenance.

The Patagonia Park project's permanently employed workforce is already larger than the workforce employed by the former sheep farm. The park has the potential to become, within a few years, the economic driver of the Cochrane area, much as Torres del Paine National Park did for the province of Ultima Esperanza after land use there was converted from grazing to parklands.

The Chilean government has already accepted two recent land donations for new national parks, but the Patagonia Park project will likely remain for a while in the pipeline because there is still some restoration and construction work to be completed prior to the land's donation to the national park system. Meanwhile, work is progressing to create links with the local entrepreneurs who will benefit from the new service-oriented economy now emerging.

Karukinka. The private nature reserve Karukinka is a case study in land management serendipity and also a textbook example of late-twentieth-century Chilean decision makers' attitude toward a large tract of government-owned primary forest. At the end of the nineteenth century, the government of Chile sold or leased at very low prices the grass-covered northern part of the island of Tierra del Fuego. Nobody showed interest in the southern beech forests (*Nothofagus pumilio, N. betuloides,* and *N. antarctica*) in the central part of the island, so the government kept the lands that nobody wanted. It is interesting to note that in Chile, as in other parts of the world, those unwanted lands would later provide the backbone for the creation of national park systems.

Thirty years ago, in the late 1980s, decision makers were busy implementing an agenda known in Chile as neoliberal and in the United States as neoconservative, so they decided to sell half a million acres of gently rolling public domain land, half of it primary forest, at five dollars per acre to anyone interested in logging it. The military regime came to an end in 1990 and the newly elected government announced a change: The tracts that remained unsold would now go for ten dollars an acre. And with that, U.S.-based land developers investing a few million dollars got hold of the largest continuous expanse of Nothofagus forest in the world. They set up Forestal Trillium and started to plan a large-scale logging operation (which Chilean forest activists opposed vigorously), but—despite generous governmental assurances of subsidies for machinery and buildings—the projected bottom line always remained in the red and the operation never started. After the project went bankrupt, the investment bank Goldman Sachs ended up acquiring the Trillium assets while purchasing some distressed debt. The bank ulti-

mately donated the land in 2004 to the Wildlife Conservation Society (formerly New York Zoological Society), and the property, encompassing more than 275,000 hectares (680,000 acres), became one of the largest private nature reserves in South America.

Road to the future

After the creation of Hornopirén National Park in 1988, no new parks were established in Patagonia during the next seventeen years, although the process of parks declaration continued elsewhere in Chile. In 2005, in what was likely the largest donation of private lands for a national park anywhere in the world, Corcovado National Park was established with a core area of 80,000 hectares donated by the Conservation Land Trust (a foundation established by Douglas Tompkins) and American philanthropist Peter Buckley; their gift of private land was combined with roughly 200,000 hectares of previously unprotected public land. In early 2014, Yendegaia National Park in Tierra del Fuego was similarly established, with a core area donated by a foundation established by Douglas Tompkins (the lands originally acquired with the crucial help of Peter Buckley and Ernst Beyeler) plus the addition of a large tract of public land around the gift lands.

Besides the case of Patagonia Park, other exciting potential opportunities for private–public cooperation include Alacalufes National Reserve, the unit that thirty years ago could not be upgraded just to avoid increasing the total acreage of "hard" conservation, but which is now flanked by private land bought for that very purpose. Another area ideally fit for conservation is the land around the Melimoyu volcano, where there are three tracts of public land separated by private lands that are suitable only for protection.

In practical terms, the idea of substituting government conservation action with solely private action does not work. At the same time, since private conservation stakeholders are now active in Patagonia, the best option for the future is to join forces, combining what government and private sectors can each do best. Private entities have flexibility and can seize opportunities as they arise. The state can provide law enforcement capabilities, public policy harmonization, and steadier, if limited, funding. The end result, moving into the future, is a potentially world-leading system of protected areas that sustains western Patagonia's extraordinary beauty, favors distinctive biodiversity, and anchors a regional economy that sees wild nature as an asset to be treasured.