

Transboundary cooperation to achieve wilderness protection and large landscape conservation



Figure 1. Compatible management of the Flathead River, pictured here in British Columbia, Canada, is critical to the long-term survival of Glacier National Park's native trout, many of which spawn upstream in Canada.

By Harvey Locke

THE IDEA THAT NATIONAL PARK MANAGERS SHOULD BE thinking across borders is not new, but the worldwide recognition of the need to do so at the landscape scale is. A combination of findings from the conservation science disciplines has identified coordinated planning and management actions across political borders as essential components of a landscape-scale approach to conservation. At the dawn of the 21st century, we have awakened to a new view in which large, natural resource-based national parks have become the indispensable centerpiece of a landscape-scale approach to conservation.

For park managers this recognition necessitates considering how a park's actions fit into a broader context, including the allocation of limited resources both within and outside park borders. An understanding of how large landscape conservation came to be the new imperative and what it means for the future of wild nature will help park managers to make better-informed decisions that lead to a more sustainable future for the national parks and the species and processes they protect.

The development of an idea

Every national park manager knows that Yellowstone, created by the Congress in 1872, was the world's first national park and that the idea quickly spread around the world, first to Australia, Canada, and South Africa and later to Europe, South America,

Asia, and other parts of Africa (Locke 2009). By 1900 these areas were essential to the preservation of large mammals and played a critical role in preventing their extinction around the world (Roosevelt 1994).

Sixty years after the creation of Yellowstone, the next great park innovation with a global impact was the Peace Park concept, which recognized that two parks in the Rocky Mountains, Waterton Lakes National Park of Alberta, Canada, and Glacier National Park in Montana, were part of the same landscape and should be managed cooperatively (fig. 1) (Konstant et al. 2005; Locke and McKinney *in press*). Culturally, there was also great symbolism in the name "peace park" and in the fact that in 1932 both Congress and the Canadian Parliament acted legislatively to create the world's first. The concept of peace parks has similarly spread around the globe, becoming an important part of both conservation and border conflict resolution, particularly among the countries in southern Africa (Ali 2007). Even without a formal peace park designation, the park-centered approach to shared stewardship across borders may serve to resolve tension and improve relationships, as is unfolding today along the U.S.-Mexico border. Recently the U.S. Department of the Interior National Park Service (NPS) has been working with Mexican counterparts to establish an "area of binational environmental interest" that includes reopening the Rio Grande crossing from Big Bend Na-

Abstract

Large intact wilderness areas remain the cornerstone of any conservation effort; however, they alone are insufficient to secure the perpetuation of the species and processes they are meant to protect. Scientific studies of species extinction patterns, natural processes, and climate change adaptation have established the need to move from managing at the park level to working across entire landscapes. This evolution in thinking is being embraced by park agencies around the world, but is one that requires park managers to approach conservation in new ways and to reassess traditional priorities with a landscape-scale perspective. National park wilderness is a key element in this new approach.

Key words

climate change impacts and adaptation, connectivity conservation, large landscape conservation, national parks, peace parks, transboundary conservation, wilderness, Yellowstone to Yukon

tional Park, Texas, to Boquillas del Carmen in Coahuila, Mexico (fig. 2; see also the Jarvis interview on pages 16–19).

As national park management thinking began to consider the areas around parks in the 1970s, transboundary conservation innovations such as the biosphere reserve and its cousin, the “greater ecosystem,” emerged, driven by both research and observation. Parks with straight-line boundaries were increasingly viewed as insufficient to protect species that moved in and out of them to reach their seasonal ranges. Waterton-Glacier and other parks became UNESCO biosphere reserves. The Greater Yellowstone Ecosystem would become a widely known example, and by 1991, the phrase “Greater Yellowstone Ecosystem” had become an important organizing principle (Keiter and Boyce 1991).

The role of science, keystone species, and ecological conditions

Advancements such as international peace parks and biosphere reserves further situated national parks within a larger landscape, but the scale remained regional, such as the Rocky Mountains surrounding Yellowstone National Park, instead of the Northern Rocky Mountains extending into Canada. By the 1980s the insufficiency of this approach was highlighted by the emerging fields of island biogeography and conservation biology. In a seminal paper, Newmark showed that even America’s largest national parks were islands of extinction that lost species over time and succumbed to the same ecological pressures that impact species on islands (1987). The solution proposed by conservation biologists was to take a larger perspective and to focus on much larger landscapes (Noss and Cooperrider 1994). Glacier National Park took an active interest in activities in Canada and talked of linkages north-



Figure 2. U.S. Secretary of the Interior Ken Salazar (left) and Mexican Secretary of Environment Juan Elvira Quesada sign the Rio Bravo–Big Bend agreement on 24 October 2011 establishing an “area of binational environmental interest.”

ward to Banff and Jasper National Parks. By the end of the 20th century, conservation agencies around the world were starting to shift their thinking from managing individual parks to parks as integral components of a landscape network (Parks Canada Agency 2000).

Of course, it is one thing to say that parks must be seen in a landscape context and another to know how to do that. Landscapes are inherently complex systems and large-scale approaches amplify this complexity. In an early approach, focal species were used as an organizing principle (Soule and Terborgh 1999). The Paseo Pantera Project, an idea of American ecologist Archie Carr III and Costa Rican Parks Service founder Mario Boza, considered the needs of cougars from Central America to Florida and called for linking up conservation reserves with movement corridors. Similarly, yet at an even larger scale, the Wildlands Project, an initiative of conservation biologists and activists, sought to consider the needs of a suite of species at the combined North and Central American scale (Soule and Terborgh 1999). Out of the same thinking, the Yellowstone-to-Yukon (Y2Y) Conservation Initiative emerged in 1993 (Locke 1994), seeking to link national parks and protected areas from Yellowstone National Park to the Yukon Territory to ensure the persistence of grizzly bears and the many species whose life needs would be met by landscapes maintained in a suitable condition (Locke 2006). Scientific studies increasingly took the perspective and supported the need for conservation of large mammals at the continental scale.

In the absence of keystone megafauna, other approaches to landscape-scale conservation have begun to unfold. In Australia a landscape connectivity approach has been developed that centers on ecological conditions (Mackey et al. 2010). Other efforts have also emerged, including the Great Eastern Ranges of Australia; the Terai Arc of India and Nepal; the Great Mountain Corridor in Spain, France, and Italy; and the Northern Appalachians of the United States and Canada (Worboys et al. 2010). Similar efforts in the marine realm can be seen in the large-scale approach to zoning the entire Great Barrier Reef of Australia. A global community of practice has emerged through the leadership of the Mountains Biome group of the International Union for the Conservation of Nature's (IUCN) World Commission on Protected Areas.

Large landscape conservation goes global

The Program of Work under the Convention of Biological Diversity, a 1992 treaty signed by 168 countries designed to prevent the loss of biodiversity around the world, recognizes the need for large landscape conservation (CBD 2005). At the ninth World Wilderness Congress (WILD 9), in Mérida, Mexico, senior representatives of five U.S. federal bureaus (National Park Service, USDA Forest Service, U.S. Fish and Wildlife Service, Bureau of Land Management, and USDA Office of Ecosystem Services and Markets), together with Parks Canada and the Mexican National Commission for Natural Protected Areas, signed a historical memorandum of understanding (MOU) on Cooperation for Wilderness Conservation (see Jarvis, pages 16–19). The initiative has moved ahead with support at the director level and the MOU was broadened in 2011 to include all protected areas.

A changing climate requires a landscape-scale response

The findings of conservation biology have required taking a large landscape conservation approach (Noss et al. *in press*), but it was the parallel emergence of the science behind climate change adaptation that solidified broad scientific consensus. Small-mammal studies in Yosemite National Park resurveying George Bird Grinnell's work nearly a century earlier record substantial movements of species due to changing climate (Moritz et al. 2008). Recent research shows species responding to climate change up to three times faster than previously known, shifting toward higher elevations at a median rate of 11.0 m (36.1 ft) per decade, and toward higher latitudes at a median rate of 16.9 km (10.5 mi) per decade (Chen et al. 2011). A comprehensive literature review found that connectivity was the single most frequently recommended method for allowing species to adapt to climate change (Heller and Za-

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valeta 2009). In another study the central role of core protected areas as anchors for any effort to adapt to climate change was highlighted (Hodgson et al. 2009). The authors stated four principles: (1) increasing protected areas, (2) maintaining and in some cases increasing environmental heterogeneity, (3) concentrating efforts in centers of endemism, and (4) reducing other pressures that are likely to be beneficial and robust, with or without climate change. This latter study of climate adaptation is important because it reminds us of the central role of national parks in any conservation strategy. Put another way, we need national parks *and* connectivity, and national parks should be managed to minimize human stressors, which can be accomplished by maximizing their wilderness character. It is important to remember that connectivity without robust core wilderness areas to connect to is like building a bridge to nowhere from nowhere.

A scientific consensus

By the beginning of the second decade of the 21st century, the need to move from the national park level to the whole landscape had become a wide consensus. This was succinctly stated in a 2011 editorial in the British scientific publication *Nature*, entitled "Think Big": the best approach for park managers to take in the face of climate change is to think beyond their park and "to ponder instead the larger landscape in which their parks sit. Scaling up is reassuring. At the park level, climate change may extirpate a species. At the landscape level, climate change merely moves it" (Nature 2011, p. 131). This editorial also recognizes the key symbolism of Yellowstone National Park and the shift in thinking to the Y2Y scale: "Yellowstone remains the archetype for the park as an island. . . . As corridor ecology has taken off as a scientific subfield, so have corridor and connectivity projects such as the Yellowstone to Yukon Conservation Initiative in North America."

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The complexities of working beyond boundaries

Study of the inherently complex mechanisms of how humans might organize themselves across international boundaries to accomplish large landscape conservation has become an area of academic interest (Chester 2006). In 2010 an international effort coordinated by the IUCN resulted in the creation of a volume of best connectivity conservation practices from around the world. In *Connectivity Conservation Management: A Global Guide* (Worboys et al. 2010) various case studies highlight the importance of a unified vision that guides all stakeholders, recognition that diverse stakeholders have diverse needs that should be accommodated as much as possible as long as the vision is achieved and that different kinds of land tenures require different conservation tools, and the importance of recognizing that such work is inherently long-term. In 2011 the Lincoln Institute on Land Policy issued a case study of North American efforts and considered their future (Levitt and Chester 2011) and is hoping to develop a North American community of large landscape conservation practice.

Taking on this complexity may seem daunting but it is essential to ensuring resilient ecosystems. The Intergovernmental Panel on Climate Change stated, “the resilience of many ecosystems is likely to be exceeded this century by an unprecedented combination of climate change, associated disturbances (e.g., flooding, drought, wildfire, insects, ocean acidification), and other global change drivers (e.g., land use change, pollution, overexploitation of resources)” (Parry et al. 2007, N 4.1 to 4.6). The best and most hopeful response park managers can use to address this profound challenge to ecosystems in the 21st century is to embrace and implement large landscape conservation.

A mandate to park managers

America’s Great Outdoors, the 2011 report to President Obama on U.S. federal lands, recognizes the importance of large landscape

conservation and instructs federal agencies to work together to achieve it. A natural evolution of America’s greatest idea, the national park, would require park managers and scientists to think about priorities at a larger scale and in new ways. In its August 2011 publication of *A Call to Action*, the National Park Service acknowledges the importance of large landscape conservation as essential to achieving its mission in the 21st century as follows: “To preserve America’s special places in the next century the NPS must manage the natural and cultural resources of the National Park System to increase resilience in the face of climate change and other stressors, cultivate excellence in science and scholarship as a foundation for park planning, policy, decision-making ... [and] collaborate with other land managers and partners to create, restore and maintain landscape scale connectivity.”

What does all this mean in an applied way for national park managers? New scales must be considered and new questions must be asked and answered: Is it more important to study a species’ behavior inside the park or to support research into the understanding of how the species navigates the whole landscape now and how it is likely to do so in the future? Is it more critical to acquire the last 100-year-old inholding inside a national park or to purchase private lands in key linkage areas outside the park so that park species can move securely in the future? Should we study the role of aquatic insects in feeding a park’s trout population or instead investigate how gravel bed river systems as a whole function in order to develop and implement regional conservation strategies that will help us adapt to climate change so we can maintain coldwater species like trout? Can park managers change their workweek to spend time with neighbors to promote a clear vision of large landscape conservation for their regions and help to create and enable coordinated conservation efforts across jurisdictions at scale? Can park managers identify culturally effective ways to communicate to park visitors and neighbors the critical role of national parks and wilderness as the centerpiece of large-scale integrated conservation efforts?

Large landscape conservation across boundaries requires collaborative conservation at the regional, national, and international levels. Not all of this is in the control of park managers. But one thing is: in this rapidly changing world, national park wilderness will remain the gold standard for all conservation actions and will be at the heart of the large landscape conservation efforts that have the best chance of success.

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