



BORDER FLOWS: A Century of the Canadian-American Water Relationship
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PART THREE

*Challenging the Border:
Ecological Agents of Change*

Border Ecologies in Boundary Waters

JAMES W. FELDMAN

Borders mean different things in different places. Along the line that divides the United States from Mexico, the border brings to mind armed patrols, tunnels and fences, illegal immigration, and one of the thorniest modern political issues. In the Quetico-Superior country—a 199-mile/320-kilometre stretch between the state of Minnesota and the province of Ontario, the border means something else entirely: old-growth forests, world-class fishing, and the northern lights; voyageurs and portages rather than coyotes and maquiladoras. While there are three formal border crossings and customs stations along the line that divides the Boundary Waters Canoe Area Wilderness (also known as the BWCA, a unit of the United States Forest Service) in Minnesota from Quetico Provincial Park in Ontario, in most places one could simply walk—or paddle—across the border. This region of pristine lakes and boreal forests contains a hydrological boundary as well as an international one: the Laurentian Divide. Water north of the divide flows into the Arctic Ocean; water to the south flows to the Atlantic. At one point, the international border and the hydrological border overlap: the Height-of-Land portage, where modern-day canoe travellers carry their gear eighty rods (1,320 feet/402 metres) between North and South Lakes, straddling the border as they go. The occasional small metal obelisk marks the location of the international border, while a weather-beaten sign denotes the hydrological one.

There is not, however, much of an ecological border here. The BWCA includes 1,086,953 acres, while the Quetico contains 1,180,000 acres. The two parks together create one of the largest protected areas in the eastern half of North America. Both parks rest on top of the basalts and granites of the Canadian Shield—some of the oldest exposed rock formations in the world, created in the heart of the Earth 2.7 billion years ago. The rocky shorelines and sharp cliffs created by the ancient bedrock frame a landscape of dense boreal forest and deep, cold lakes. The northern boreal forests, containing a community of pine, fir, aspen, maple, and spruce, provide a home for a rich diversity of wildlife. Both parks include some of the most significant remnant stands of old growth in the Great Lakes Basin. The BWCA provided the last shelter in the continental United States for grey wolves, although that population has now recovered and spread to other Great Lakes states. The water quality along the border is so high that many wilderness visitors to the BWCA and Quetico take their drinking water straight from the lakes, without boiling or filtering—a rarity in North America and a sign of the ecological health of the region.

Elemental ecological forces such as wind, fire, and water pay no heed to the international border, of course. Neither do more anthropogenic (though still ecological) agents such as mercury or invasive species. And yet the way that Canadians and Americans manage these ecological forces must acknowledge the border. One contiguous ecosystem in two countries: the perfect place to consider how ecological agents blur the lines on the map and how the lines on the map often shape the environment—creating unique border ecologies in the process. The two chapters in this section reveal these complicated dynamics and border ecologies.

While the Quetico and the Boundary Waters together protect over two million acres of a remarkably healthy and wild ecosystem, the human construct of the border still makes a significant difference. Patterns of visitor use and impact in the two parks reveal the ecological and social impact of the border. Over a quarter million people visit the BWCA each year, making it the most heavily visited wilderness area in the United States. To manage the large number of visitors, regulations require that campers stay in designated campsites, each one findable on a map and equipped with a fire grate and a primitive fibreglass latrine. Evidence of past use at these sites is often quite extensive—log seating areas around the fire grate, clearly defined tent pads, limited supplies of firewood, occasional trash in

the fire pits. Across the border, however, the Quetico receives one-tenth of the annual visitation of the Boundary Waters. Wilderness travellers find their own spots to spend the night and may camp anywhere they choose. Signs of visitor use are still present—the same places still get used—but the impact of this use is far lighter than that south of the border.

The heavier use in the Boundary Waters has both social and ecological consequences. In short, the two places simply *feel* different. Activists, scholars, and wilderness travellers have long struggled to define the “wilderness experience”: an alchemy of isolation, natural beauty, antimodernity, and ecological health. The BWCA is simply more crowded. A 2012 study of visitor use patterns found that travellers encountered an average of 8.6 other groups per day, up from 4.1 and 4.2 in 1969 and 1991, respectively. Trail crews maintain the portages—the trails between lakes—regularly in the BWCA; portages in the Quetico are notoriously overgrown, hard to find, and harder to cross. Most visitors perceive crowding as a serious social threat to wilderness values. The ecological impacts of high visitor use in wilderness areas include vegetation trampling, the creation of pathways for invasive species, and wildlife disturbance, among other issues. In the BWCA, scholars have demonstrated a clear link between portage travel and the spread of invasive species. Species of concern include plants (such as purple loosestrife, oxeye daisy, and hawkweed) and animals (such as earthworms and gypsy moths). Visitors carry seeds and insects in their footwear and equipment, and the trampling along trails alters soil characteristics and damages native species, creating the conditions for exotic species to gain a foothold in a region otherwise known for its ecological health. The worms and insects, in particular, have the capacity to move beyond the portage trails and dramatically alter forest composition.¹

The differences between the BWCA and the Quetico derive from modern management decisions, but also from different histories of use and industry. For nearly 150 years, the Boundary Waters area has been more accessible and more influenced by industrial development. Rich deposits of iron drew Euro-American settlers to northeastern Minnesota as early as the 1870s. The town of Ely, Minnesota—the closest town to the BWCA—grew into a rough-and-tumble mining town in the early twentieth century. Intensive logging began in the area in the 1880s, as well, and continued through the mid-twentieth century. The creation of Superior National Forest brought federal administration to the area. The U.S. Forest Service

designated parts of the forest as a roadless area in 1926—among the earliest American steps toward wilderness management and a recognition of the region’s growing recreational appeal. Although the Quetico had a similar history of logging, it is much farther away from urban population centres and has never had the same kind of recreational or industrial pressures. The first road into the Quetico region was not built until 1954. The differential patterns of visitor use on opposite sides of the border today have a deep historical precedent.²

In other ways, the human construct of the international border barely matters. Consider, for example, the “Boundary Waters–Canadian Derecho” of 1999—also called the “Boundary Waters Blowdown.” On July 4, a ferociously powerful windstorm gathered over the North American Great Plains and began moving east. The term “derecho,” derived from the Spanish word for straight, indicates straight-line winds as opposed to rotational ones. When the storm reached the boundary waters, winds blasting at over one hundred miles per hour ripped through both the BWCA and the Quetico, flattening trees over 500,000 acres in Minnesota and 288,000 acres in Ontario—an area more than five times greater than that affected by the eruption of Mount St. Helens in 1980. The derecho knocked down tens of millions of trees across both sides of the border, with some areas losing virtually every single tree. Bluffs and high areas were particularly hard hit; the more wind-resistant stands along the shores of the region’s larger lakes fared slightly better. The derecho paid no attention to the international border. Indeed, after leaving canoe country, the storm proceeded through Ontario and Quebec before turning south toward Maine and northern New England.³

The forest fires that followed the blowdown disregarded the border, as well. The dead and drying trees in the area altered fire behaviour and fire management planning. Fire suppression throughout the 1900s elevated fuel loads on the forest floor; the trees felled by the blowdown added to the problem, elevating the risk of particularly hot fires that could potentially damage the region’s thin topsoil and retard forest regeneration. For the first time ever in designated wilderness areas, American authorities conducted prescribed burns to help mitigate the risk of major conflagrations. Fires of historic proportions have burned on both sides of the border in the years since the 1999 derecho. The two largest fires in the region since 1918 both burned in the blowdown area: the Ham Lake Fire of 2007, which

straddled the border and burned 76,000 acres, and the Pagami Creek Fire of 2011, which burned over 100,000 acres inside the BWCA.⁴

Management response to the fires in the blowdown, however, has had to acknowledge the border. Management authorities in Minnesota and Ontario use a series of compacts and international agreements to coordinate fire management. The Great Lakes Forest Fire Compact includes the fire management agencies of Wisconsin, Michigan, Minnesota, Ontario, and Manitoba. The compact allows the agencies to coordinate planning, share personnel and equipment, and respond effectively to cross-border fires. Other agreements detail procedures for border crossings during fire emergencies and the management of air space over the border. A separate border agreement between Minnesota, Ontario, and several American federal agencies creates a “common border”—an area ten miles on either side of the border—in which air and ground resources can be shared. The necessities of fire management make the border into an instrument of cooperation rather than division. Following an ecological lead, fire management authorities acknowledge the border by blurring it.⁵

All of these issues—border ecologies, invasive species, blowdowns, fire management—take on new meaning in light of the threats and challenges posed by climate change. The Quetico-Superior country lies close to another border: the boundary between the conifer-dominated boreal biome to the north and the deciduous forest biome to the south. Scholars forecasting the ecological impact of climate change have speculated that plant communities will shift radically in response to changing rainfall and temperature patterns. This might be particularly true for the Quetico-Superior region, where, some scholars have noted, the vegetation “is particularly sensitive to climate change, with little inertia.”⁶ This might mean a shift to a grassland/savannah ecosystem or temperate hardwood forest and an end to the ecological conditions that currently define the region. Climate change raises all sorts of complicated questions about causality, turning upside down long-held notions of just what kinds of ecological change are “natural” and which are anthropogenic. Might the 1999 derecho, for example, have had its origins in new weather patterns influenced by rising levels of carbon dioxide in the atmosphere? Border ecologies—changing ecosystems and changing social systems embedded within each other, all buffeted by a changing climate—provide the context for the two chapters in this section.

The environmental historian Joseph Taylor powerfully explores these contested border ecologies in his chapter, “Lines That Don’t Divide: Telling Tales about Animals, Chemicals, and People in the Salish Sea.” He traces the emergence of a new biocultural region—the Salish Sea—located in the coastal networks and ecosystems between British Columbia and Washington. Chemicals flowing into the water on both sides of the border have altered natural and human communities, in the process creating a place with new social and ecological characteristics. The tendency of mercury, PCBs, and other persistent organic pollutants to bioaccumulate has reshaped the bodies of both fish and human residents of the region. Cultural practices and social divides have pushed the hazards associated with these pollutants toward some groups and away from others, in ways that often follow preexisting sociopolitical lines. Taylor reveals the “contingent significance of borders”—the borders between countries, between social groups, and between humans and nature.

In “Resiliency and Collapse: Lake Trout, Sea Lamprey, and Fisheries Management in Lake Superior,” the environmental historian Nancy Langston explores the complexities of a single case study in border ecology: the collapse and recovery of the Lake Superior lake trout fishery. For years, fisheries managers have blamed the invasive sea lamprey for the collapse of the fishery. The lamprey made an easy target; the voracious and invasive parasite travelled up the St. Lawrence River, latched onto the sides of juvenile and adult trout, and sucked out their insides. And yet, Langston shows, the story was never this simple. Lake trout proved remarkably resilient for nearly 150 years, weathering “multiple stressors at multiple scales”: changing land-use patterns (deforestation and agricultural development); intensifying pressure from a commercial fishery that grew more mechanized and market-based; paper mills that treated Lake Superior as a dumping ground for industrial byproducts. Determining the cause of the lake trout collapse means reconciling all of these factors, none of which remained constant. The border confounded many of these variables as well, precluding an effective management response. Regulations on fishing and chemical dumping varied from state to state and country to country; so did the intensity of logging and land-use change. It is the special task of environmental historians, Langston suggests, to piece together these constantly changing variables into a plausible narrative, one that explains why trout “were resilient for so long—until suddenly they weren’t.”

The environmental historian Paul Sutter recently challenged the field to explore more deeply the implications and origins of what he labels “hybridity”: the recognition of the complex interconnections between nature and culture that shape the material world. The exploration of this concept has come to define the modern field of environmental history. Borders of all kinds—be they ecological, political, social, international—provide perfect places to study the past and future of hybrid landscapes. If, as Sutter suggests, “all environments are hybrid,” then border environments are especially so.⁷ Both Taylor and Langston add to our understanding of hybridity along the border—Taylor by documenting the creation of a new and hybrid space from several different pasts and environments, and Langston by exploring the many different social and ecological causes necessary to understand a single episode of the environmental past. Taylor and Langston together demonstrate that the most consistent variable in border ecologies is change itself. Ecosystems shift and move in response to both natural and anthropocentric forces; the human systems built upon and embedded within those ecosystems struggle to catch up. The borders themselves serve as agents of division in some times and places, and agents of cooperation in others. In all cases, the *meaning* of the border—and of border ecologies—constantly evolves.

Notes

- 1 Robert G. Dvorak et al., *The Boundary Waters Canoe Area Wilderness: Examining Changes in Use, Users, and Management Challenges*, Research Paper No. RMRS-RP-91 (Fort Collins, CO: U.S. Dept. of Agriculture, Forest Service, Rocky Mountain Research Station, 2012), 9; “Threats to Wilderness from Overuse,” *Wilderness.net*, University of Montana, accessed September 15, 2014, <http://www.wilderness.net/nwps/threatsOveruse>; Sara Jo M. Dickens, Fritz Gerhardt, and Sharon K. Collinge, “Recreational Portage Trails as Corridors Facilitating Non-Native Plant Invasions of the Boundary Waters Canoe Area Wilderness (USA),” *Conservation Biology* 19, no. 5 (2005): 1653–57; Lee E. Frelich and Peter B. Reich, “Wilderness Conservation in an Era of Global Warming and Invasive Species: A Case Study from Minnesota’s Boundary Waters Canoe Area Wilderness,” *Natural Areas Journal* 29, no. 4 (2009): 385–93.
- 2 Benjamin Heber Johnson, “Conservation, Subsistence, and Class at the Birth of Superior National Forest,” *Environmental History* 4, no. 1 (1999): 80–99; Gerald Killan, *Protected Places: A History of Ontario’s Provincial Parks System* (Toronto: Dundurn / Ontario Ministry of

- Natural Resources, 1993); R. Newell Searle, *Saving Quetico-Superior: A Land Set Apart* (St. Paul: Minnesota Historical Society Press, 1977).
- 3 Christine Mlot, "The Perfect Windstorm Study: What Happens when Millions of Trees Fall Down in a Forest Wilderness?" *BioScience* 53, no. 7 (2003): 624–29; "July 4–5, 1999 Derecho: The Boundary Waters–Canadian Derecho," accessed April 4, 2016, <http://www.spc.noaa.gov/misc/AbtDerechos/casepages/jul4-51999page.htm>.
 - 4 Bryan Hansel, "Fire Management in the Boundary Waters Canoe Area Wilderness after the Pagami Creek Fire," *Paddling Light*, September 19, 2011, <http://www.paddlinglight.com/articles/fire-management-in-the-boundary-waters-canoe-area-wilderness-the-pagami-creek-fire>.
 - 5 The Great Lakes Forest Fire Compact website can be found at <http://www.glffc.com>. See also Minnesota Incident Command System, "Northeastern Minnesota Aviation In-Briefing," January 15, 2010, <http://mnics.org/wp-content/uploads/2012/04/NE-Minnesota-Aviation-Inbriefing-1-15-10.pdf>.
 - 6 Frelich and Reich, "Wilderness Conservation," 387.
 - 7 Paul S. Sutter, "The World with Us: The State of American Environmental History," *Journal of American History* 100, no. 1 (2013): 96.