

# Transboundary Environments

## A North American Greenprint

**Next steps in developing adaptive  
capacity for transboundary  
conservation under climate change**



**Report from the Strategy Forum:  
Transboundary Environments and Adaptation to Climate Change  
Wild9 Congress Mérida, Yucatán, Mexico**

**Report by Laura López-Hoffman, Barbara Morehouse and Lisa J. Graumlich**



[udallcenter.arizona.edu/booksandmore](http://udallcenter.arizona.edu/booksandmore)

Strategy forum sponsored by Aldo Leopold Wilderness Research Institute, U.S. Forest Service

# A North American Greenprint

## Next Steps in Developing Adaptive Capacity for Transboundary Conservation under Climate Change

Report from the

### **Strategy Forum on Transboundary Environments and Adaptation to Climate Change**

convened at

WILD9 (9th World Wilderness Conference), Mérida, Yucatán, Mexico, November 12, 2009

Prepared by Laura López-Hoffman,<sup>1</sup> Barbara Morehouse,<sup>2</sup> and Lisa J. Graumlich<sup>3</sup>

Supported by a grant from the

U.S. Forest Service Aldo Leopold Wilderness Research Institute

March 2011

---

<sup>1</sup> Assistant Professor, School of Natural Resources and the Environment, and Assistant Research Professor of Environmental Policy, Udall Center for Studies in Public Policy, University of Arizona

<sup>2</sup> Deputy Director for Research, Institute of the Environment, University of Arizona

<sup>3</sup> Dean, College of the Environment, University of Washington

## **Introduction**

Wherever political boundaries traverse ecosystems, the conservation of biodiversity and management of ecosystems is more complex and difficult. In areas with such borders, the flow of information tends to be slower, administrative regimes are more fractured, decisions are more delayed—often executed with little or no coherence—and responsibilities, masked. Furthermore, as a changing climate alters species distributions and ecosystem processes—for example, those that straddle the U.S.–Mexico and U.S.–Canada borders in North America—the inherent difficulties of transboundary conservation and management also are likely to limit the adaptability of human and natural systems to such changes.

The 9th World Wilderness Conference, WILD9, held in November 2009 in Mérida, Yucatán, Mexico, provided a unique opportunity in which to explore the implications of climate change in shared environments of North America, as well as in other parts of the world. With funding from the U.S. Forest Service Aldo Leopold Wilderness Research Institute, organizers from the University of Arizona and elsewhere convened a workshop, “Strategy Forum on Transboundary Environments and Adaptation to Climate Change,” to assess the state of North American transboundary conservation efforts and to identify critical needs for building transboundary initiatives that are adaptive to a changing climate.

The purpose of the workshop was to develop a brief list of specific, targeted, and prioritized actions that could be undertaken in the ensuing three-to-five years to strengthen transboundary conservation programs, policies, and institutions in North America. This report summarizes the discussion and conclusions from that gathering.

## **Workshop organization, methods, and objectives**

To prepare for the workshop, the organizers interviewed by phone 14 individuals representing relevant government agencies, non-governmental organizations (NGOs), and academic institutions active in conservation across the U.S.–Canada and U.S.–Mexico borders. The respondents were asked for their thoughts about the current state of transboundary conservation in North America. The information gathered from the interviews was used to formulate the questions posed at the workshop (strategy forum) convened in association with WILD9.

Some 40 persons participated in the workshop; most were from Canada, the United States, and Mexico; three participants were from African nations, and two from the Czech Republic. Most of the participants were representatives from NGOs, academia, and government agencies. In addition, there were two landowners (one from each side of the U.S.-Mexico border).

To develop a critical assessment of the current state of transboundary conservation, the facilitators asked the participants to identify the following:

- the major ecological impacts likely to arise from climate change,
- the most critical impediments to transboundary conservation,
- the consequences of “business-as-usual” management practices, and
- what is working well in transboundary conservation management.

The participants suggested actions that, if undertaken, might strengthen transboundary conservation efforts. And, through a nominal group process, the participants developed a series of specific, targeted priority actions that should be taken within the next three to five years.

In both the interviews and workshop, the participants’ assessments of climate change impacts, barriers to developing adaptive capacity across borders, and the consequence of “business-as-usual” management practices, mirror the growing body of knowledge on these issues (e.g. Chester 2006; Graumlich and Bienen 2010; López-Hoffman et al. 2009). While this report briefly describes these matters, the focus is on what is working well in transboundary conservation, with a list of prioritized, target actions.

## **Critical assessment of the state of transboundary conservation**

### *Ecological consequences of climate change in transboundary environments*

Regarding the ecological consequences of climate change for transboundary conservation efforts, the workshop participants identified three main areas of concern—water, disturbance regimes, and species ranges and habitat—and made the following observations:

Water. Conflicts over the sharing of transboundary water are likely to increase, in particular those arising from institutionally imposed water limits forcing greater efficiency. Given that in many regions, and particularly along the U.S.-Mexico border,

natural systems subsist on “incidental” return flows and waste water from agriculture and urban areas, the increased pressure to use this water more efficiently will necessitate the need to acquire dedicated water rights for ecosystems. This will be particularly felt in transboundary areas such as the Colorado River delta, located in Mexico, which relies on return flows from the United States.

Disturbance regimes. Changes in disturbance regimes, including increases in extreme weather-related events and changes in fire regimes, might cause significant changes in the landscape, such as widespread forest-to-grassland conversion across the region from the Canadian Shield to the Sky Islands of northwestern Mexico and southwestern United States, and with possible climate related increases in tree mortality due to pests and pathogens, such as pine beetles in Canadian forests.

Species ranges and habitat. As the natural boundaries of species and their resource habitats shift, the ranges of species may no longer coincide with the distribution of the species’ resources. As changes occur in the distribution of natural migratory corridors, including the reduction in corridors that link key habitats, it is likely that so too will change migratory patterns and dispersal routes. This will create two challenges as species ranges shift across borders and administrative jurisdictions: (1) optimal ranges that were previously situated in protected areas may no longer be so secured, and (2) new migratory corridors may need to be established—or managers might need to manually assist certain species with migration. Assisted migration across international borders would be complicated and would require a high degree of cross-border collaboration. Also, recently established security infrastructure along the U.S.–Mexico border could act as a barrier to species migration.

### *Barriers to transboundary collaboration under a changing climate*

According to the workshop participants, the barriers to transboundary conservation include:

Differences in language and culture. In the past, language often was a barrier to cross-border conservation. Many U.S. agency staff lacked sufficient ability to communicate in French or Spanish to build collaborations with counterparts in eastern Canada or Mexico, respectively. More recently, in some areas the language has lessened; in other areas, though, the problem remains.

Differences in levels of funding. Differences in available resources are significant barriers to cross-border collaboration, in particular the lack of parity of funding and resources for transboundary projects. This makes it particularly difficult to sustain long-term initiatives. Of particular concern is the access to funding and capacity to manage funding of Mexican, community-based, conservation organizations. Some funders, for example, are interested in supporting projects with transboundary implications, but are unwilling to fund projects and research in Mexico.

Differences in decision-making centralization and in land tenure. The three North American nations differ significantly in terms the centralization of governmental decision-making about natural resources and their management. For example, in Mexico, until the 1990s, water management was tightly controlled by the central government. In the United States, however, water management regimes vary from state to state. There are also significant differences in land tenure regimes. In Canada, the provincial governments manage large tracts of land, while in the United States much public land is managed by federal agencies such as the U.S. Forest Service. To complicate matters further, land tenure in Mexico differs from that in the United States and Canada, as lands in Mexico can be communal, known as *ejidos*, as well as public and privately held.

Insufficiently empowered agency personnel. In all three countries, agency personnel are not sufficiently empowered to work across the border, given the tradition of transboundary environmental governance that exists at the federal level. For example, many agency personnel are not made aware of MOUs and other arrangements that could be used to support transboundary research. Further, U.S. agency travel policies impede regularized transboundary working relationships: travel permit processing takes six weeks to two months (with anecdotal evidence of delays of up to a six months), day trips have been reduced, and approval for travel to conferences outside the United States has become more difficult.

Security concerns. The emphasis of the U.S. federal government on building border security infrastructure and patrolling the border is shifting agency attention and resources and public attention from cross-border collaborations for environmental protection and biodiversity conservation.

Lack of harmonized priorities and policies. One of the greatest challenges to cross-border collaboration is when land management priorities and policies are not harmonized across the border. For example, buffel grass (*Cenchrus ciliaris*) is a species native to Africa and that is invading and transforming the Sonoran Desert of the U.S.

southwest and northwest Mexico. In the United States, land managers battle to rid the landscape of the grass, while Mexico, the ministry of agriculture promote planting the grass for livestock forage.

### *Consequences of “business as usual”*

Under a changing climate, the “business-as-usual” approaches to transboundary conservation will lead to ecosystem degradation and loss of biodiversity, both adjacent to international boundaries and across shared ecoregions. The short term consequences of business as usual—i.e. the failure to form “truly” collaborative transboundary institutions—will yield a paucity of information and a lack of integrated data about impacts, leading to poor forecasts of climate change impacts and to uncoordinated ecosystem and species management.

### *What is working well*

What is working well in North American transboundary conservation is large-scale, landscape conservation across borders catalyzed by civil society—particularly NGOs, but also academia. Over the last 10–15 years, NGOs have been building a history of working together across the Canada–U.S. and Mexico–U.S. borders, while building trust between the public agencies and the private sector. Because NGOs are subject to less restrictions and are more flexible than government agencies, they can work where agencies are often hobbled, carving out agreements, tackling contentious issues, and sharing and disseminating data.

In addition, NGOs are often much more skilled than government agencies in public outreach, such as building public support for conservation and helping citizens see how large-scale efforts can be furthered by small, local actions. While examples of NGOs transboundary conservation efforts abound from both borders, we highlight here an example from each region: the Yellowstone to Yukon Conservation Initiative (Y2Y) and the Colorado River Joint Cooperative Process.

Yellowstone to Yukon Conservation Initiative. The Yellowstone to Yukon Conservation Initiative, more commonly known as Y2Y (see <http://www.y2y.net>), is a binational Canada–US NGO that seeks to maintain connectivity between montane ecosystems from Yellowstone National Park to the Yukon (see Chester 2006, 134-216). The Y2Y region spans five U.S. states, four Canadian provinces and territories, as well as the

jurisdictions of more than 30 Native nations and numerous federal and state or provincial land management agencies. Based on an in-depth study of climate change vulnerabilities in the region, Y2Y is engaging in extensive collaborations with landowners and managers in both countries to craft strategies for maintaining wildlife corridors and connectivity under a changing climate.

Colorado River Joint Cooperative Process. The Colorado River Joint Cooperative Process is an effort of the Mexican and U.S. sections of the International Boundary and Water Commission (IBWC) to expedite discussions over the Colorado River (Drusina and Salmon 2010). Based on a long-term and collaborative relationship (see Laird-Benner and Ingram 2011), a group of U.S. and Mexican NGOs and academics—led by ProNatura, the Sonoran Institute, and the Environmental Defense Fund—was able to convince the IBWC to consider habitat protection and restoration in the Colorado River delta. In 2010, this resulted in a new Minute (No. 316) to the 1944 Water Treaty that calls for the two countries and the NGO coalition, each, to contribute 12.3 Mm<sup>3</sup> of water to a critical wetland in the delta, the Cienega de Santa Clara. Furthermore, due to the trust built by the NGOs, the U.S. water agencies agreed in the Minute to allow Mexico and the NGOs to share their water conveyance system.

## **Moving forward**

### *What we need: A new North American greenprint*

The highest priority recommendation from the workshop discussion was the urgent need to develop an overarching vision—a greenprint—for managing transboundary conservation and adaptation to climate change in North America. Under this greenprint, conservation institutions, policies, and practices would be harmonized between the countries, and truly collaborative, transboundary action would be taken to adapt to climate change.

Many of the participants felt that the greenprint would eventually need to be codified by a new tri-national treaty or agreement, similar to the North American Agreement on Environmental Cooperation of 1994, outlining the responsibilities of the United States, Mexico, and Canada to work together to adapt to climate change in North America. Given the success of civil society in catalyzing transboundary conservation, individuals from NGOs and academia should take the lead in drafting the greenprint.



Recognizing the difficulty in establishing new formal international agreements, a two part process is recommended to develop such a greenprint involving: (1) strategic coordinated actions to demonstrate the ability of NGOs and academia to foster transboundary adaptive capacity, and (2) NGOs and academia taking the lead in assessing the capacity of current transboundary institutions to adapt to climate change, suggesting ways of incorporating climate change adaptation into existing institutions, and indicating what types of transboundary institutions might be necessary in the future.

### *Part 1: Priority actions*

The workshop participants identified five types of actions that could be taken during the next three-to-five years to strengthen cross-border capacity for adapting to climate change and lay the groundwork for developing the public will for a new North American greenprint:

Corridor pilot projects. The creation of additional transboundary corridor projects, such as the Y2Y effort, should be initiated under the tripartite Merida Agreement. Such projects would include assessment and management plans for transboundary species and habitats, and could be used to prove the efficacy of cross border collaborations involving two countries, multiple jurisdictions and government agencies, and civil society.

Strategic education programs. Non-governmental organizations and academia should work with K-12 (primary and secondary) educators to disseminate and implement educational materials and programs to teach students about climate change impacts on wildlife and ecosystems, and options for adapting to these changes.

Youth ambassador corps. A coalition of NGOs working on transboundary conservation issues should sponsor a youth ambassador corps to inform decision-makers about the transboundary consequences of climate change.

Citizen-science network. A North American network of citizen scientists, similar to the National Phenology Network in the United States, should be created to monitor transboundary species and environments. In addition to providing useful scientific information, a citizen-science network would increase awareness of the need for broader cross-border strategies for adapting to climate change.

Standardized research and data. As NGOs and academia continue researching and monitoring transboundary environments and climate change impacts, research efforts, including data collection and analysis, should be streamlined and harmonized. Furthermore, mapping efforts, climate projections, and impact assessments should be integrated across borders and across NGOs, academia and agencies. This is critical to develop coordinated transboundary strategies for managing and creating awareness about transboundary impacts.

### *Part 2: Institutional analyses*

A key part of the workshop participants' strategy for developing a new North American greenprint is to undertake a critical assessment of current transboundary conservation institutions, such as treaties, agreements, and formal, government sponsored organizations, such as the Commission on Environmental Cooperation (CEC) created in 1994 by the environmental side agreement to NAFTA. Such an assessment would consider the adaptive capacity and areas of focus of current institutions, and then identify gaps between them where new governance strategies and/or institutions might be necessary. Armed with this knowledge, the NGOs and academic partners could begin to work with stakeholders to reorient existing institutions and create new structures as necessary.

The workshop participants identified two critical institutional structures that should be created:

An environmental grantmaking organization for transboundary collaborations. More binational and multinational funding sources should be created, including an entity similar to the Environmental Grantmaking Association, to target transboundary collaborations. Structural changes should be made within federal agencies and private foundations to allow funds to be used for projects across borders that impact the environment of the home country (which would be particularly useful for conserving habitat for migratory species throughout their ranges).

A Transboundary Environmental Impact Assessment. In the environmental side agreement to NAFTA, the newly formed Commission on Environmental Cooperation was charged with developing a trilateral mechanism to assess the potential for transboundary environmental impacts. The CEC, with an expert group from the United States, Mexico, and Canada, developed the concept of the Transboundary Environmental Impact Assessment (TEIA) to provide decision-makers in one country with timely

information on the possible transboundary environmental consequences of projects in another country. The goal of TEIA was not oblige one country to halt a project that might negatively impact the people or environment of another country. It merely provided a way for potentially affected people and governments to participate in a neighboring country's planning process on the project. Despite their commitment to do so, the three North American nations have not adopted the TEIA mechanism.

## References

Chester, C. 2006. *Conservation across borders: Biodiversity in an Interdependent World*. Island Press, Washington, D. C.

Drusina, E., and R. Salmon. 2010. "IBWC's Colorado River Joint Cooperative Process." Presentation to the Border Governors' Binational Desalination Conference, San Diego, Calif., May 26, 2010. See <http://www.watereducation.org/userfiles/EdwardDrusina.pdf>.

Graumlich, L.J., and L. Bienen. 2010. *Moving Toward Climate Change Adaptation: The Promise of the Yellowstone to Yukon Conservation Initiative for Addressing the Region's Vulnerability*. Yellowstone to Yukon Conservation Initiative. Canmore, Alberta, Canada.

Laird-Benner, W. (G.), and H. Ingram. 2011. Sonoran Desert Network Weavers: Surprising Environmental Successes on the U.S./Mexico Border. *Environment* (Jan./Feb.).

López-Hoffman L., E. McGovern, R.G. Varady, and K.W. Flessa, eds. 2009. *Conservation of Shared Environments: Learning from the United States and Mexico*. 320 pages. First volume in a new series, *Edge: Environmental Science, Law & Policy*. M Miller, B Morehouse & J Overpeck (series eds). University of Arizona Press, Tucson.