



**YELLOWSTONE TO YUKON**  
CONSERVATION INITIATIVE

**FOR IMMEDIATE RELEASE**

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**Large, connected landscapes offer solutions  
to climate change adaptation: new report**

*Canmore, AB.* The Yellowstone to Yukon (Y2Y) Conservation Initiative is applying the best approaches to prepare for adaptation by climate-stressed species in the region. So says a new report released today by the Initiative. With contributions from academics and experts in climate change and adaptation from both Canada and the United States, the report, *Moving toward climate change adaptation: the promise of the Yellowstone to Yukon Conservation Initiative for addressing the region's vulnerability to climate disruption*, reaffirms the urgency and importance of the continental-scale Y2Y initiative and its envisioned network of large protected areas, embedded in a matrix of sustainable land uses.

“The scale, intactness, and connectivity of the Yellowstone to Yukon region are essential for species to move in response to climate change”, notes the report’s lead author, Lisa Graumlich, Dean of the College of Environment at the University of Washington. “Arguably, no region in the world has as much potential to address the combined threats of habitat fragmentation and climate change as the Y2Y region,” she continues.

The report reviews the latest science tracking human-caused climate change in western North America and concludes that the Yellowstone to Yukon region is warming faster than the global average, experiencing phenomena such as rapidly melting glaciers, earlier spring run-offs, declining snowpacks and earlier bloom dates. All these factors could mean a northward shift of the ranges of many common wildlife species and the disappearance of others.

“Whether or not you believe in climate change, there’s no question that human activities throughout the 20<sup>th</sup> century have changed the character of the region between Yellowstone National Park and Yukon Territory,” says Rob Buffler, Executive Director of the Y2Y Initiative. “This report confirms that if we want the biodiversity of this region – the variety of wildlife, fish, plants and ecosystems – to survive through future changes, we must allow for adaptation to occur. Managing human land use so that plants and animals will be able to make such movements is a key strategy of the Yellowstone to Yukon Conservation Initiative,” he adds.

According to the report, the Y2Y Initiative’s network of over 135 government, academic, corporate, aboriginal, and private land partners, who share a common conservation vision, provides the necessary social capacity to create coordinated adaptation efforts and connect local efforts across the entire Y2Y landscape. “The Y2Y Initiative’s grand vision goes

beyond North America and could set the standard for climate adaptation initiatives in mountain regions around the globe” says the Preface to the report.

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Copies of the report *Moving Toward Climate Change Adaptation* can be downloaded at [www.y2y.net](http://www.y2y.net) and following the links to “Library” and “Reports”.

The report was co-authored by:

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- Dr. Lawrence S. Hamilton, International Union for the Conservation of Nature (IUCN), World Commission on Protected Areas;
- Dr. Lara Hansen, EcoAdapt;
- Dr. Richard Hebda, Royal British Columbia Museum;
- Dr. Erika L. Rowland, Wildlife Conservation Society;
- David Sheppard, Secretariat of the Pacific Regional Environment Programme;
- Dr. Gary Tabor, Center for Large Landscape Conservation;
- Dr. James W. Thorsell, IUCN; and
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and edited by Dr. Leslie Bienen.

**BACKGROUND (from the Report’s Executive Summary)**

The scenic wonder of the Y2Y region has served as an inspiration for much of the world’s national park and wilderness protected area movements. Notably, the Y2Y region contains the world’s first national park, Yellowstone, as well as the first national park in Canada, Banff. The Y2Y landscape is home to the first international peace park, Waterton-Glacier; one of the first natural World Heritage Sites, Nahanni National Park Reserve; and the first US National Forest, the Shoshone, in Wyoming. The gamut of over 700 protected areas in the region includes lands conserved under numerous federal, state, provincial, territorial, tribal, and local designations. In addition, the region contains a multitude of private land holdings protected through conservation easements and other stewardship efforts. While the Y2Y region is known mostly for its healthy assemblages of large terrestrial mammals such as bison and bears, the Y2Y geography also includes world-renowned alpine floral assemblages, continentally-important flyways, freshwater-fish communities, and thermal habitats.

Twentieth-century climate records from all parts of the Y2Y region reveal trends consistent with global changes. Mean annual temperatures have increased throughout the Y2Y region. From the early 1900s to the 20th century, from Montana north through British Columbia (BC) and into the Yukon Territory, temperatures have risen more than the global average

increase of 0.74°C. Changes in seasonal patterns of temperature and precipitation and the frequency of extreme events have also been observed. Most notably, winters throughout the region are warming faster than other seasons.

Major rapid changes in climatic conditions do not occur without consequences. The ecosystems of the Y2Y region, the processes that sustain them, and the organisms that rely on them, are beginning to respond to varying degrees. Climate change in the Y2Y region is already a reality, as is demonstrated by the nearly 25% loss in alpine glacier cover in the Canadian Rockies since the mid-1800s, much of which has occurred in recent decades. In some cases, the current extent of glacial retreat has not been observed in the past 3000 years or more. Extensive melting of the Athabasca Glacier, located in Banff National Park near the border between British Columbia and Alberta, has revealed wood that was snow-covered for 8000 years.

The combination of warmer winter and spring temperatures has resulted in decreased snow accumulation in many parts of the Y2Y region. Spring snowpack, as measured on April 1st of each year, has declined by 25% to nearly 50% on average over the past 50 years in parts of BC. Related to this, the timing of peak spring stream flow from snowmelt in mountain systems now occurs 20 or more days earlier.

Although average summer temperatures have increased less than average winter temperatures, the number of extremely hot summer days in some areas has risen over the past 100 years. Extreme heat events could push organisms (including humans) and ecosystem processes past the point where they can tolerate changes. In the mountains of western Montana, which includes parts of Yellowstone National Park and Waterton-Glacier International Peace Park, the average number of extremely hot days (>32.2°C/90°F) has increased threefold, from 5 days/year in the early 1900s to 15 days/year during the last two decades. Moreover, extremely hot days have begun to occur both earlier and later in the year compared to the timing of such events in the early 20th century. Continuing the observed 20th century trend, predictions are that the frequency of extreme heat days across Canada will escalate in step with future rises in annual temperature.

These projected changes in temperature and precipitation will influence other features of climate. Rapidly increasing temperatures, especially during the winter months, and decreasing precipitation as snow will continue to have a negative impact on annual snow depths throughout the Y2Y region. Decreases in winter snowpack are projected to be greatest at the southern end of the Y2Y region. In Montana, Idaho, and parts of BC, there could be as much as a 100% decrease in snow accumulation at the end of winter, a decline that has major implications for hydrological systems, aquatic biodiversity, water supply, and human endeavours.

Water is a key element that links the processes, places, and people of the region. Increasing temperatures, especially in summer, will lead to increased evaporation and declining water levels in water bodies and wetlands and cause direct impacts on dependant biota (both wildlife and human). Accelerated mountain stream run-off associated with early snow melt will likely lead to intensified spring flows followed by low summer water levels and increased summer water temperatures. These changes will affect fish populations, water supplies, the potential to generate electrical power, and recreation.

Climate scientists have made projections about range shifts of animals in response to changing climate conditions, both of individual species and of groups of species. One analysis encompassing all of North and South America predicts at least a 10% local loss of combined bird, mammal, and amphibian species, with much greater changes occurring in boreal and alpine tundra areas.

Wild species are not the only ones to experience the dramatic consequences of rapid climate change. People and communities also will need to make significant adjustments to altered environmental conditions. Climate change directly erodes natural capital, and thus the resource base for human enterprise. Not only will the natural resources on which people depend be directly impacted by a changed climate, our efforts to forestall or counteract the effects of climate change, e.g., by constructing more dams to hold back water flows, may also have further negative consequences for ecological systems. More frequent and intense wild fires and diminished stream flows, especially in late summer, with consequences for agricultural operations and tourism enterprises, are just some of the outcomes to which people and communities will need to adjust in the coming decades.

At the most general level, planning for biodiversity adaptation to climate change ideally should (1) occur at the scale of whole landscapes and regions, (2) address long time scales, and (3) involve diverse actors. Many papers recommend long-term regional perspectives and improved coordination among scientists, land managers, politicians, and conservation organizations. Regardless of whether models will be able to predict shifts accurately, there is strong support for protecting large areas and creating networks made up of small and large reserves embedded within a matrix of compatible land uses.

Maintaining or improving connectivity across landscapes is strongly recommended to enable adaptation to climate change. Land management practices that maintain the ability of species to move will have the additional benefit of reducing or avoiding impacts associated with habitat destruction and fragmentation. Readyng the landscape to promote biodiversity adaptation will also require new approaches that embrace social and cultural considerations. Most important is the need to increase regional institutional coordination of, and broad participation in, conservation planning.

The Y2Y region can serve as a model to teach us about resilience, and about enhancing adaptive management, in the face of climate change. Arguably, no region in the world has as much potential to address the combined threats of habitat fragmentation and climate change as the Y2Y region of the US and Canadian Rocky Mountains. In relatively unfragmented regions like Y2Y, retaining and maximizing general resilience has higher potential to succeed than in more degraded landscapes. The scale, intactness, and connectivity of the Y2Y region are essential for species to move in response to climate change. Topographic and physiographic diversity provide opportunities for species, ecosystems, and ecological processes to find new places on the landscape, perhaps only a few kilometers distant from current locations. Indeed, recent studies of plants ranging from family to sub-species scales point to high-relief mountain systems as centers for new biodiversity and preservation of ancient genetic diversity during climatic fluctuations.

The good news is that the Y2Y organization and its partners are making headway in protecting or re-establishing the critical landscape connections for the long term protection of grizzly bears and other species of animals, birds, fish and plants. Maintaining connectivity

at the continental scale, through the programs and activities of the Yellowstone to Yukon Conservation Initiative and many other actors, is the exact prescription for ensuring that biodiversity has the best chance of adapting to changing conditions.

The threatened consequences of climate change are potentially devastating for both humanity and the natural world on which we depend for our survival. Reducing greenhouse gases in the atmosphere and avoiding the most serious consequences of a warming planet must be the first and most urgent strategy. However, to the extent that some degree of change already is unavoidable, planning for adaptation is an essential and prudent approach.

Both the Y2Y region and the Yellowstone to Yukon Conservation Initiative are uniquely positioned to address the challenges of climate change for species survival—the Y2Y region because the landscape’s structural features provide some of the world’s best opportunities for climate change adaptation, and the Y2Y Initiative because it is a creative, dynamic partnership of highly diverse stakeholders with a common goal: to lead the way in climate adaptation readiness.

The Yellowstone to Yukon Conservation Initiative is poised to do much to help address the tsunami of challenges posed by climate change. By promoting the protection and expansion of core protected areas, by facilitating connectivity for multiple species across the landscape, and by promoting collaborations among organizations and agencies across multiple jurisdictions, the Y2Y Initiative already is affecting outcomes that will create the conditions necessary for species to adapt to shifting habitats. The Yellowstone to Yukon Conservation Initiative offers opportunities to build upon some of the most effective conservation work that is being done in the world, and to set a precedent for establishing climate-ready conservation practices on the ground.