

# CONCLUSIONS AND RECOMMENDATIONS:

## The Effects of Climate Change on the Downhill Skiing and Recreational Fishing Economy in the Crown of the Continent



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January 2011

The climate in the Crown of the Continent is changing in a number of ways, including reduced snowpack, precipitation coming later in the fall and winter, more precipitation falling as rain instead of snow, earlier onset of peak spring runoff, increased frequency of winter and spring flood events, increased occurrence of summer droughts, and lower summer flows in rivers and streams. These trends are expected to become more significant in the future.

Climate change will directly impact the region's economy. The majority of jobs in the region, and nearly all the population and income growth over the past 30 years, are closely linked to the natural amenities and the natural resources of the Crown.

In this report, we looked at how climate change may affect two sectors of the Crown's economy—downhill skiing and recreational fishing. While these two industries are a small component of the overall regional economy, we selected them because they are “snowpack dependent” and because of their larger role as part of the quality of life of the region that attracts families and businesses to the Crown. We used quantitative techniques to document the geographic distribution and economic impacts of these sectors, and supplemented these with interviews with people closely involved in the skiing and fishing industries.

### The Land

Because of the Crown's relatively unfragmented landscapes, diverse climactic zones, variety of habitats, and linkages to other wild land areas, many scientists consider it a region that could adapt more successfully than others to the impacts of climate change. The Crown is therefore a natural laboratory for studying the effects of climate change.

From a scientific and management perspective, larger landscapes provide better possibilities for protection and restoration than smaller areas when the threats are as diverse and widespread as those predicted from climate change. The extensive public lands in the Crown provide large blocks of contiguous habitats that will facilitate the kinds of conservation and restoration activities that may be necessary to maintain these habitats in the face of climate change. In more highly fragmented and developed landscapes, where plant and wildlife movements are likely to be inhibited by dense human settlement and more discontinuous habitats, the Crown provides models of successful collaborations—such as the Blackfoot Challenge—among groups of people with a diverse set of perspectives and skills, who are tackling resource issues that cross ownership boundaries.

### The Economy

The overall economic context of the Crown is important background to this study because the region has undergone significant changes. The economy of the Montana portion of the Crown can be characterized as fast growing (although there are significant differences between counties), with the bulk of the jobs and income in three counties: Flathead, Missoula, and Lewis and Clark. Despite its rural feel, only a quarter of the population resides in a rural area.

In 2008, direct jobs in the region were distributed as follows: agriculture (2.7%); resource extraction (mining, oil, gas, forestry: 4%); services (67%), and government (15%). The remaining 11 percent consisted of non-forestry-related manufacturing and construction. In terms of personal income, 40 percent of all personal income in 2008 was from non-labor sources, including retirement and investment income. In addition, it is estimated that about one-third of all spending by tourists visiting Montana occurs in the Crown region.

As is the case in many areas in the West with vast expanses of open space and recreation opportunities (and with connections to the outside world via highways and regional airports), the makeup of the Crown's economy and much of the region's growth can be attributed to the in-migration of people—and their businesses—for quality of life reasons. This in-migration has contributed to the fact that in terms of population, job, and personal income growth, the region has outpaced the rest of the country, and it helps explain the relative prominence of service-based industries and non-labor sources of income.

Many Crown residents consider skiing and fishing—the two economic sectors this report focuses on—both central to their quality of life and to their decision to live in the region. The economic impact of these sectors thus extends beyond direct expenditures on items such as ski lift tickets and fishing gear to include their value as recreational and environmental amenities, and their ability to attract people and businesses to the Crown.

#### The Ski Industry and Climate Change

Until recently, four ski areas operated in the Montana portion of the Crown of the Continent; today only two major ski areas remain in operation, though one small one has reopened after closing in 2009. In the 2009-2010 season, expenditures by non-residents resulted in an estimated 288 jobs, \$24.6 million in economic output, and \$1.9 million in state and local taxes. When the expenditures of resident and non-resident skiers were combined, they resulted in an estimated 457 jobs, \$39.8 million in economic output, and \$3.1 million in state and local taxes.

Ski resorts in the Crown that attempt to adapt to rising temperatures and changing climate conditions will likely face higher operating costs. Some ski areas may be forced to “climb up the mountain” pushing into higher alpine environments in search of consistently suitable snow conditions. Because of the close relationship between snow conditions and skier days, most ski areas will have to expand artificial snow making, which may require purchasing new snow making technology and adding water infrastructure and storage facilities.

Resorts already are looking at ways to diversify their recreational offerings. Many resorts now offer mountain biking, mountaineering, hiking, and events in the summer, and activities requiring less snow—such as snowshoeing, cross country skiing, and terrain parks—in the winter.

Another important economic contribution of downhill skiing, which is difficult to quantify but widely supported by published literature, is that it is part of the overall “quality of life” package that attracts and retains people (and their businesses) to the Crown region.

If winter recreation is an important draw for people who choose to live and work in mountain communities, at least in part because of the skiing opportunities, then there could be a ripple effect through other sectors of the economy. The most obvious concern is that poorer ski conditions will negatively affect the real estate market. But the complex economic linkages that this report reveals

mean that fewer migrants, retirees, and second homebuyers—that is, less amenity migration—also will affect the finance, construction, retail, utility, transportation, and health care sectors.

### The Fishing Industry and Climate Change

From an economic perspective, the most valuable aspect of the fisheries in the Crown is the unique opportunity they offer, better than any others in the state, to catch native bull trout and cutthroat trout in pristine rivers and streams. These scenic and remote rivers draw anglers to the Crown and contribute to the wild character of the region that attracts and retains residents and businesses.

Expenditures by non-resident and resident anglers in the Crown region generated 457 jobs, \$38.2 million in economic output, and \$3.4 million in state and local taxes. Resident-spending on recreation, however, stimulates the majority (62%) of the economic output in the region, reinforcing an important point this report makes: recreation is a key reason why people live in the Crown region.

Restoring and maintaining the Crown's unique fish and pristine fishing experiences will be central to the future contributions of the fishing industry. The decline of bull and cutthroat trout in the Flathead drainage contributed to a significant decrease in fishing, and the emergent lake trout fishery on Flathead Lake did not make up for the lost angler days. The possibility of encountering a large bull trout remains a large part of the popularity of fishing on the Upper Blackfoot.

Climate change will lead to conditions that will affect the fishing industry, including: warmer water and increased drought; loss of habitat; displacement of native fish with non-native species; increased disease, and invasive and nuisance species; and more frequent disturbance events, including floods and wildfires. Restricted fishing seasons and seasonal closures; increased conflicts over water resources and new calls for dams and diversions; and extra costs associated with managing invasive species will likely result from changing climate conditions. All of these consequences may have negative effects on fishing guides, sporting goods stores, and other businesses catering to anglers.

Guides and shop owners are already adapting to some of these changes, recommending to their clients that they visit earlier in the year or in the fall to avoid low, warm waters during the summer. Some anglers are heading to smaller streams at higher elevations, or are fishing the larger tailwater rivers, like the Missouri and Kootenay that have consistently cooler waters through the summer months. Maintaining the integrity of headwaters habitat, riparian areas, and limiting diversions are critical to keeping cold water flowing for fish.

Land use change, dams and diversions, and mining activities already stress the health of rivers in the Crown. Climate change will place additional strain on rivers, making it all the more important to reduce impacts from commercial activities. Since protecting rivers from these activities has been more feasible for those that originate on public lands, like wilderness and national parks, the importance of these protected areas to increasing the chances of successful adaptation to climate change is clear. Collaborative efforts like the Blackfoot Challenge offer models for creating relationships and partnerships that can address landscape-scale impacts across large areas with multiple land-owners.

## Recommendations

A number of activities can increase the chances of adapting successfully to climate change:

### *Downhill Skiing:*

- Pursue energy efficiency and snowmaking capabilities that reduce longer-term operating costs and increase reliable snow coverage;
- Seek to increase advance bookings for non-peak weeks during the winter season, trading on unpredictable storms and shorter booking windows;
- Explore expanding into higher elevation terrain and slopes with a northern aspect that are better able to support snow coverage;
- Diversify winter recreation activities (e.g., sledding, skating, terrain parks) that are more concentrated and can be more easily sustained when snowpack is poor; and
- Grow summer recreation (e.g., mountain biking) and events (e.g., weddings) to boost off-season revenue.

### *Fishing:*

- Restore unique native bull trout and cutthroat trout fisheries by controlling lake trout in Flathead Lake and other non-native species throughout the Crown;
- Protect and restore the headwaters of the Crown's rivers and streams to maintain water quantity and temperature;
- Remove and prevent new dams and diversions to maintain migration routes for native fish (Wild and Scenic River designations can eliminate these threats on public lands);
- Reduce the impact of land use change on watersheds (residential development, oil and gas development, logging, and mining); and
- Increase collaborative efforts, such as the Blackfoot Challenge, to establish working relationships among diverse groups of people to improve river health.

Climate change already is affecting the Crown of the Continent and will have a larger impact in the future. Looking ahead, the economic well being of the Crown will be determined in large part by the ability of land managers, businesses, and residents to maintain or improve the unique experiences and resources of the Crown.

Fortunately, the Crown's size and the diversity of its public lands make the region more likely to mitigate and adapt to the effects of a changing climate. The challenge now is for scientists, land-managers, resource-users, and others to coordinate at the landscape-level to address the broad impacts of climate change.