Tourism and Outdoor Recreation

Background

Climate change will impact the viability of many tourism and outdoor recreation industries. For the United States as a whole, tourism is one of the nation's largest industries; tourism generated $2.1 trillion dollars in 2013, with $887.9 billion spent directly by domestic and international travelers that spurred an additional $1.2 trillion in other industries (U.S. Travel Association, 2013). And outdoor recreation generates $646 billion in consumer spending and 6.1 million direct jobs each year (Outdoor Industry Association). But changing weather patterns and more frequent and severe extreme weather events put tourism and outdoor activities such as hiking, camping, rafting, boating and skiing at risk. The loss of wildlife-related activities will also have an impact on the economy, as people spend billions of dollars every year on bird- and other wildlife-related recreation in the United States. For example, according to a survey by the U.S. Fish and Wildlife Service, Americans spend more than $3.5 billion yearly on birdseed, birdhouses, feeders, and baths, and an estimated 18 million adults take annual trips for the express purpose of watching birds. Birdwatchers alone spend an average of $100 million in each state, which in turn supports more than 200,000 jobs and generates more than $1 billion in state and federal tax revenues (Price & Glick, 2002).

Impacts and Solutions

Reduced snowpack: Increases in overall temperature and earlier advent of spring thaws are already impacting ski areas in the United States. Additionally, with half of the industries' profits coming from tourism the week following Christmas, one bad year of mid-winter snow could cause ski resorts to go under financially (Scott, Dawson, & Jones, 2007). Snowmaking and snow preservation is likely to be the sole adaptation option to keep ski resorts in business during the times when natural snow is unavailable, but this too is at risk due to climate change. Snowmaking is incredibly energy intensive, especially in marginal temperatures nearing 35°F (Efficiency Vermont). Additionally snowmaking requires more water at marginal temperatures at or above 35°F than it does below the marginal threshold.

> **Solutions:** While little can be done to cause more abundant quality natural snowfall, ski areas can take action to retain snow using snow breaks and fences, as well as improve snowmaking capabilities. Additionally, supporting and adding incentives for ski resorts to utilize more efficient equipment that operates well in optimal temperatures, will help ski resorts experience less revenue drop, and states will see less strain on energy and water resources and a healthier recreation economy (Energy & Resource Solutions, 2004).
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> **State and Local Examples:** Some states such as New York have been assisting ski areas by subsidizing their operations during the year as a way to buffer the resorts from financial hardships during a poor snow year. Other states such as Vermont have offered loans and other incentives for ski resorts in order to assist in purchasing efficient snowmaking and other operations equipment through Efficiency Vermont, an entity appointed under the Vermont Public Service Board (Efficiency Vermont).

Reduced wildlife viewing and bird watching: Vegetation shifts will cause what once were locally abundant species to become rarer. Nearly 60% of the 305 relatively widely distributed bird species found in North America in winter are already on the move, shifting their ranges northward by an

average of 35 miles (National Audubon Society). As climate change causes additional habitat loss, as well as other pressures intensify from human activities and invasive species, it is likely that certain species of birds and other wildlife could disappear altogether or at least move from what once was their native area.

Solutions: As temperatures warm and habitats disappear reducing outside stressors and conserving a broad spectrum of ecological settings will help birds and other species adapt to climate change. This can be done by conserving areas representing the full range of habitats as well as building and conserving corridors and transitional habitats between ecosystem types using land exchanges, conservation easements, leases and other approaches (Stien, Glick, Edelson, & Staudt, 2014). This will allow species to migrate to suitable habitats, and will increase the potential area into which stressed species can be transplanted if necessary.

Other solutions include encouraging the public to participate in bird and other wildlife counts and monitoring, as well as controlling feral cats and encouraging domestic cat owners to keep their cats indoors, as domestic cats kill over a billion wild birds a year. Institutions like the Cornell Lab of Ornithology and the Audubon Society have collaborated to hold events like the Great Backyard Bird Count. This event, typically held in the second week of February, asks the public to take 15 minutes to count the number and verity of birds in their area, and submit their findings through an online portal.

State and Local Examples: States can assist with programs to monitor bird and wildlife populations in their states through continued funding for research programs, as well as promoting bird and other wildlife count events. Additionally, states can support the health and safety of bird populations by adopting building measures that are bird safe, as in Minnesota and California. Minnesota's bird-safe building guidelines address eight major areas, including: pre-design site selection; schematic design; design development; construction documents; construction administration; construction; correction period; and ongoing occupancy. The guidelines specifically recommend such things as planning deterrent facades for areas that are bird attractants; reducing bird collision "traps"; monitoring of bird impacts during the building's first year; and incorporating Lights Out program concepts (Johns, 2013).

Loss of beaches and shorelines due to sea level rise and erosion: Higher sea levels and sea surface temperatures, along with increases in the frequency and severity of ocean storms are eroding beaches more quickly and severely than in the past (US Environmental Protection Agency, 2013). This will cause the loss of beaches and shorelines for tourism and recreation, as well as the loss of important wildlife habitat.

Solutions: Some of the impacts of sea level rise and increased erosion can be mitigated by implementing living shoreline programs that allow for the natural retreat of coastal ecosystems, as well as to allow coastlines to continue natural processes to replenish beaches. These programs include the removal, or the disincentivizing of rebuilding coastal armoring features, and planting native coastal vegetation above the high tide line.

State and Local Examples: Maryland and Virginia have both implemented living shoreline programs to assist their beaches with adapting to climate change. In Virginia, the Virginia Marine Resources Commission (VMRC) was directed by SB 964 in 2011 to develop and implement a general permit regulation that authorizes and encourages the use of living shorelines as the preferred alternative for stabilizing tidal shorelines. The Living Shorelines initiative is an effort aimed at decreasing shoreline hardening so as to allow wetlands to naturally migrate inland as sea levels rise. The initiative promotes the use of nonstructural or "hybrid" approaches to shoreline stabilization and can preserve, and in some cases expand, wetlands and natural shoreline features in the face of rising sea levels (Virginia Institute of Marine Science (VIMS)).

For sandy beaches one possible solution to problems of coastal erosion and sea level rise is to conserve and restore barrier island habitats. Barrier lands reduce the impact of ocean storms, and can also reduce the rate of sand erosion from inland beaches. Restoring coastal reefs as Florida has done can also reduce beach erosion. In many cases building large infrastructure projects such as jetties are not effective long-term solutions, and ecological systems to reduce erosion should be adopted when available (Coastal Planning & Engineering of North Carolina, Inc., 2013).

Loss of hunting opportunities: Climate change is already having significant impacts on fish and game animals and their habitats. Hunters and anglers are on the frontlines of climate change, as many sportsmen and women are already seeing the effects of climate change on their hunting and fishing opportunities, and are very concerned about what climate change means to the future of hunting sports. Large game ungulates such as elk and bighorn sheep, for example, appear to be less able to adjust to a changing climate than most other animals (McCain, CU-Boulder).

Solutions: Maintaining ecosystems capable of supporting fish and wildlife populations is critically important to ensuring that hunting areas and game species will be enjoyed for generations. By working to conserve critical feeding and breeding habitats, as well as reducing outside pressures from illegal hunting, pollution, and development, survival rates for game animals can be improved. In addition, monitoring wildlife populations is critical as climate changes can cause new disease outbreaks, increased competition from invasive species, and other unforeseen issues.

State and Local Examples: The California Department of Fish and Wildlife is working to ensure that many game and other species are able to thrive under changing climate conditions. One of the priorities of the California Department of Fish and Games Climate Science Program is to develop a collective vision for climate change adaptation planning across the state, focusing on biodiversity conservation (Georgetown Climate Center). The program also creates and maintains climate change partnerships through collaboration and coordination with national, regional, and local agencies and organizations - to prioritize research needs and ensure that the best available science is informing management actions (California Department of Fish and Wildlife).

Tools and Resources

Air Pollution, a Warming Climate, and the Troubled Future for America's Hunting and Fishing Heritage: report by the National Wildlife Federation. This report highlights a number of wildlife species important to hunters and anglers that are harmed by toxic air pollution and climate change. [Link]

Hunters and Anglers: Supporting Our Nation's Economy and Conservation: A short, two-page report from the Theodore Roosevelt Conservation Partnership about the economic impact of hunting and fishing in the United States. [Link]

Preparing for Climate Impacts: Lessons from the Front Lines: By the Georgetown Climate Center. This report details the trends in climate adaptation at the state and local level, and includes information about living shorelines. [Link]

Unity, Integration, and Action: DFG's Vision for Confronting Climate Change in California: This report from the California Department of Fish and Game Climate Science Program details the vision and objective of the Climate Science Program, and can be used for referencing for adapting the program for other states. The Climate Science Program was created in 2008 as part of the Climate Science and Renewable Energy Branch to help the Department address climate change in support of its mission. [Link]

Outdoor Recreation and the Economy: This 2012 report from the Outdoor Industry Association details the enormous economic impact of outdoor recreation in the United States. This follow-up and expansion to the 2006 economic impact report commissioned by OIA demonstrates that outdoor recreation is one of the biggest economic drivers in this country. [Link]

Bird-Friendly Building Designs: This reports from the American Bird Conservancy details different design elements that can be used to prevent harm to bird populations caused my collisions to buildings. [Link]

Impacts of Feral and Free-Ranging Cats on Bird Species of Conservation Concern: This report published in 2006 by the American Bird Conservancy details the impact of roaming and feral cat population on local bird populations. This report also have information about what states have done to help protect bird populations, with recommendations for resource managers and conservationists. [Link]