

Is it too late to save the great migrations?

July 29 2008

Long gone are the days when hundreds of thousands of bison grazed the Great Plains, millions of passenger pigeons darkened the skies while migrating to and from their breeding grounds, and some 12.5 trillion Rocky Mountain locusts crowded an area exceeding the size of California. The subject of great migrations—lost and still to be saved—is explored in two new articles published online today in the open-access journal *PLoS Biology*.

In the first article, "Going, Going, Gone: Is Animal Migration Disappearing?" David S. Wilcove and Martin Wikelski describe the threats facing "one of nature's most visible and widespread phenomena," a behavior found in animals as diverse as whales and warblers, dragonflies and salamanders. Many of the most spectacular migrations have disappeared or experienced steep declines due to human behavior, the authors lament. With so much left to learn about the biological mechanisms underlying the world's migrations, Wilcove, author of "No Way Home: The Decline of the World's Great Animal Migrations," argues that conserving this spectacular phenomenon is critical to efforts to understand it.

What is being lost with the disappearance of these great migrations? We are left only to wonder what early explorers experienced as they watched "infinite multitudes" of birds soar overhead, but the authors make the case that even more important, we stand to lose the ecological properties and services associated with animals that migrate in huge numbers. "Protecting the abundance of migrants is the key to protecting the ecological importance of migration," they argue.

Consider that prior to European settlement, 160-226 million kilograms of salmon migrated each year up the rivers of Washington, Idaho, Oregon, and California. Today, after decades of dam construction, overfishing, water withdrawals for irrigation, logging, and streamside grazing by livestock, the total biomass of spawning salmon in the Pacific Northwest is now estimated to be only 12-14 million kilograms. How does this shortfall affect the ecology of the surrounding landscape? No one knows.

In the second article, "Protecting Migration Corridors: Challenges and Optimism for Mongolian Saiga," Joel Berger, Julie Young, and Kim Murray Berger highlight the challenges of protecting a population of migratory saiga—a critically endangered antelope—in western Mongolia. Saiga numbers have dropped more than 95%, from greater than 1,000,000 to less than 50,000 in the past 20 years, with just two subpopulations, totaling approximately 5,000 individuals.

To piece together the saiga's migratory route, the authors outfitted females with global positioning system collars. They identified three key bottlenecks along the migratory corridor, created by natural (e.g., a lake) and anthropogenic (e.g., a town) barriers. Berger et al. predict that the antelopes face an increasingly difficult and dangerous journey ahead, as the region's human population increases in size and affluence—leading to increased vehicle traffic—a trend that will surely place additional pressure on these endangered animals.

Efforts are under way to expand the boundaries of the Sharga Nature Reserve, where one of the subpopulations live, to protect the migratory corridor. The scientific community has an important role to play by providing data to identify potential threats, Berger et al. argue. "Ultimately, however, it is only through dialogue with vested interests that recommendations to reduce threats can be implemented. Protecting corridors will necessitate addressing difficult issues, but baseline data

provide opportunities to engage in these discussions before situations become dire."

Whether we can preserve the awe-inspiring beauty and wonder of great migrations ultimately depends on us, Wilcove and Wikelski argue. "If we are successful, it will be because governments and individuals have learned to act proactively and cooperatively to address environmental problems, and because we have created an international network of protected areas that is capable of sustaining much of the planet's natural diversity."

Citation: Wilcove DS, Wikelski M (2008) Going, going, gone: Is animal migration disappearing? PLoS Biol 6(7): e188.
doi:10.1371/journal.pbio.0060188 [biology.plosjournals.org/perls ...
journal.pbio.0060188](http://biology.plosjournals.org/perls...journal.pbio.0060188)

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