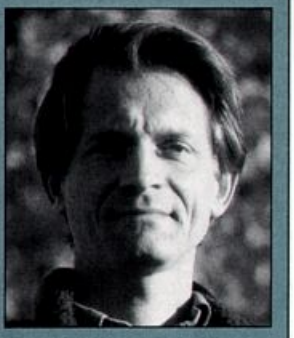
J. P. Myers

FACTS, INFERENCES AND SHAMELESS SPECULATIONS



Nowhere to Run; Nowhere to Hide

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We face the end of migrations in our lifetime. Not next year, not in the next 10 years, but in our lifetime. Migration, as we know it, will fade away, its threads unraveled, tattered and diminished beyond recognition.

Now I wouldn't want to exaggerate: Some American Robins will leave the suburbs of Cleveland each fall and then return in spring. Red-winged Blackbirds will migrate from grain-strewn feedlots in the southeast to municipal sewage marshes scattered throughout the midwest. Starlings, House Finches and Cattle Egrets may even develop new migratory behaviors, all the better to extend their recent population expansions. But the migration events that now occur across the hemisphere each fall and spring—hundreds of thousands of southbound shorebirds in the Bay of Fundy each August, one-half million Sandhill Cranes on the Platte River in March, spring warbler rains in coastal Texas, autumn warbler fallout on Point Reyes, a million Sooty Shearwaters offshore of Pismo Beach each August, to name only a few—these spectacles will become events of the past—avian buffalo reduced to ecosystem irrelevancies if not eliminated altogether.

Stark predictions. Depressing, and wrong, I hope. Some might even say ludicrous or at best a wild, Cassandraish exaggeration. But given what you and I are doing to the planet, this future is not all that unlikely.

Judge for yourself. Think about the combined effects of widespread habitat destruction, pervasive chemical contamination, and climate change. Not one by one, but their pooled, synergistic impact. Not a short-term view, blindered by our nervous system's insensitivity to long-term, gradual change. Step back. Extrapolate the trends. Consider their likely interactions. The future revealed is a landscape for migrants with nowhere to run, nowhere to hide, and the birds themselves diminished in their migratory capacity.

From habitat destruction we can expect the virtual disappearance of Central American tropical forests except for a few remnant, isolated patches. Species that depend upon these habitats will remain only as wisps of warbler and thrush on the North American landscape in spring migration. Decreases are already occurring. As the human population in Central America doubles—as it will over the next 30 years—the impacts on neotropical forest migrants will be devastating.

Similar predictions can be made for habitats key to other migration systems: James Bay under assault by HydroQuebec in its unquenchable drive for hydroelectric power; the Platte, while saved by the EPA's William Reilly last year from the water trolls in Denver, still has

Male Scarlet Tanager—a migratory species that may become scarce. Photograph/Rob Curtis.

enough diversion plans on the books to dry it out, even without global warming-induced droughts and water shortages.

And now, perhaps motivated by frustrating experiences in water traps on the golf course, the Vice President is leading a major assault on the nation's wetlands, making President Bush's commitment to "no net loss" read as hollow as his abandoned concern for global warming.

Chemical contamination has already brought a number of populations perilously close to extinction. Egg-shell thinning by organochlorine contamination is the most widely known example. But work around the Great Lakes shows this is just one of a host of impacts, and that the compounds that cause them are far from being under control. That work suggests that the impacts of chemical contamination are far more profound and egregious than any of us have ever expected—birth defects, reproductive incompetence, behavioral abnormalities. I will not be surprised to learn that these same compounds impair migratory abilities, particularly the accuracy of navigation, and that one of their larger impacts may be to render contaminated populations migrationally dysfunctional.

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Climate change will degrade every remaining patch of natural habitat as climatic conditions shift geographically. Forests that now stand will be replaced by tree and shrub species from further south, and the pace of change will be too fast for forests of one type to replace forests of another. The dominant picture will be forests dying and being replaced by weedy scrubs. Climate change will also eliminate many coastal marshes because of sea level rise. EPA projections anticipate as much as a 60% loss. Interior wetlands will also suffer if the predictions of increased drought and lowered soil moisture in the Central Flyway come true.

Yet another climate change impact is best understood by analogy. Imagine you were listening to an orchestra with two conductors playing Vivaldi, one conductor at adagio, the other allegro, with the string section following one and the horns another. *Spring* would become a ruinous cacophony, its musical threads unraveled. The same will happen as the earth warms: nature's two timing signals, day-length and temperature, will become uncoupled. Temperature will tell some plants and insects to start growing and reproducing, but day-length won't have shifted ahead. Thus, the timing of bird migration, largely controlled by day-length, especially for long-distance migrants, will be out of synch with flower blooming and insect emergence. This uncoupling may become quite extreme: the onset of the growing season is expected to advance as much as two months at 67° latitude.

What happens to Broad-tailed Hummingbird migration southward along the Rocky Mountains in August if Indian Paintbrush, upon which they now depend, stops blooming in July? Or to Red Knots in Delaware Bay if horseshoe crabs spawn in April instead of May? Or to eastern deciduous and boreal forest warblers if the caterpillars they now feed their young have pupated before the birds' northbound migration is complete?

As troubling as these possibilities are, climate change's largest impacts will likely be the unexpected. Consider, as one simple example, what has happened on the western shore of the Hudson Bay where Snow Geese stop in migration. Snow Geese

winter in Louisiana and breed in the eastern Canadian arctic. For the last several years, a weather anomaly has prevailed along the Hudson Bay: delayed spring snowmelt combined with an August drought. The late snow melt holds up goose migration, forcing the birds to remain at their stop-over far longer than normal. Held back, they overgraze the local grasses and sedges, and, in the process, uncover a layer of marine sands just beneath the thin tundra soil. Then as spring-melt water washes over the sands it picks up the salinity in the sands and carries it out over the nearby vegetation. Finally, the late summer drought prevents the vegetation from recovering. This combined effect of bird migration, weather anomalies and local geological conditions—ecological variables no one would have thought to combine in a single ecosystem model—are killing large, expanding areas of tundra vegetation. The changes in weather are almost certainly not the result of human-driven global warming. But they demonstrate clearly how small climatic changes can interact unexpectedly with other ecosystem variables.

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Why is anthropogenic global warming different from previous periods of climate change? After all, if anything is constant about climate in the geological past, it is that climate has changed. The difference now is that the episode into which we are now entering will occur at an unprecedented scale and rate. Changes in temperature that before might have been spread over centuries will now occur in decades. It is also different because humanity's other impacts are pummeling the planet simultaneously, diminishing the efficacy of organisms' usual responses to climatic variability—dispersal, migration, and evolutionary adaptation.

Collectively, habitat destruction, chemical contamination and climate change have us barreling along a highway toward a chasm of extinction the likes of which the world hasn't seen for 65 million years. Migration will be one of the victims.

–J. P. Myers is Director of the W. Alton Jones Foundation.