

## **An Ecological Stimulus**

Author: Small, Stacy L.

Source: BioScience, 59(4) : 278-279

Published By: American Institute of Biological Sciences

URL: <https://doi.org/10.1525/bio.2009.59.4.2>

---

BioOne Complete ([complete.BioOne.org](https://complete.BioOne.org)) is a full-text database of 200 subscribed and open-access titles in the biological, ecological, and environmental sciences published by nonprofit societies, associations, museums, institutions, and presses.

Your use of this PDF, the BioOne Complete website, and all posted and associated content indicates your acceptance of BioOne's Terms of Use, available at [www.bioone.org/terms-of-use](https://www.bioone.org/terms-of-use).

Usage of BioOne Complete content is strictly limited to personal, educational, and non - commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.

---

BioOne sees sustainable scholarly publishing as an inherently collaborative enterprise connecting authors, nonprofit publishers, academic institutions, research libraries, and research funders in the common goal of maximizing access to critical research.

# An Ecological Stimulus

STACY L. SMALL

**W**ashington, DC, is abuzz with economic stimulus. The American Recovery and Reinvestment Act of 2009 invests \$787 billion in the domestic US economy, giving priority to “shovel-ready” infrastructure projects, mostly in transportation and energy. Conventional definitions of infrastructure emphasize manufactured systems that route the flow of water, energy, traffic, and information. But federal infrastructure investment in today’s climate-change context ought to also emphasize restoration of resilient natural systems (wetlands, forests, and river floodplains, e.g.) that deliver valuable ecosystem services such as clean water and carbon sequestration, while buffering against storm surges, catastrophic floods, drought, wildfire, and biodiversity loss. Investment in a national green infrastructure initiative that restores functional ecosystems and mitigates for past infrastructure projects would combine the near-term economic benefits of job creation with longer-term economic and ecological benefits.

These are perilous times, but in the rush to fix damage done on Wall Street, there needn’t be a trade-off between the economy and the environment. Quick cash infusions to the financial industry have not delivered a new banking system. Cash infusions to the automobile industry may or may not result in a restructured, revitalized domestic manufacturing industry. When developing economic stimulus plans around infrastructure, the new administration should apply a systems perspective, seeking long-term return on investment, not just cosmetic repairs and short-term fixes. Achieving the long-term return may entail expanding the term “infrastructure” beyond poured concrete structures to include natural infrastructure that, when managed properly, sustains resilient fish and wildlife populations; yields food, fiber, and wood; and protects cities and

farmlands against the effects of climate change. For instance, floodplains and wetlands buffer against floods and storm surges by slowing erosion of coastlines and riverbanks and absorbing the volume and hydraulic impact of floodwaters. Simultaneously, these systems produce valuable or rare fish and wildlife resources that generate revenue through recreation or commercial harvest and add value in the agricultural economy through ecosystem services such as pollination and pest control.

A national green infrastructure initiative should cover activities like large-scale floodplain restoration and levee setbacks for nonstructural flood control; shoreline protection through coastal wetland restoration; coral reef and natural beach protection; small-dam removal where appropriate; implementation of prescribed fire plans; cleanup of abandoned mines; road maintenance on public lands to reduce erosion; public and private native landscaping projects; and restoration of riparian and freshwater wetland buffers on agricultural lands to capture sediment and nutrient runoff, slow erosion, retain groundwater, and ameliorate the effects of drought and higher temperatures on terrestrial and aquatic communities.

Some of these practices were included in the recent economic stimulus package, as a fraction of overall expenditures. Of the \$787 billion total, roughly \$1.5 billion is available for some form of habitat restoration or potentially beneficial land-management practices, depending on how agency managers choose to spend the funds. Additionally, an unspecified portion of \$4.4 billion and \$1.4 billion will go to the Army Corps of Engineers and the Bureau of Reclamation, respectively, for ecosystem restoration as well as for other water resource development projects that could be less beneficial to fish and wildlife. Another \$4 billion was

granted to the Environmental Protection Agency for the Clean Water State Revolving Funds; “not less than” \$600 million of those funds is designated for “green infrastructure” and environmentally innovative water projects. Also, \$27 billion for surface transportation programs is eligible for stormwater mitigation or remediation, although in the past, states have rarely seized similar opportunities.

A fully funded green infrastructure initiative that includes private lands would ensure that biodiversity protection is not marginalized in efforts to restore the economy, and would provide an opportunity to reframe biodiversity and ecosystem services as important economic drivers rather than burdensome or incidental costs. In October 2008, the Florida Fish and Wildlife Conservation Commission convened the first statewide summit on climate change and wildlife, bringing together representatives from agencies and nongovernmental organizations to engage in focused dialogue. The response of human and wildlife populations to the effects of climate change may be critical to sustaining Florida’s future economy, which derives significant income—estimated to be more than \$25 billion annually—from fish- and wildlife-related revenue. It became clear at the summit that managing across private and publicly owned landscapes will be necessary to avoid human-wildlife conflicts as ecological conditions change.

Proactive planning and management for the shifts in habitat and human and wildlife populations that will occur in response to climate change necessitate investment in both the public and private sectors; no longer can managers continue to operate in reactive mode and assume the increasingly expensive burden of climate change impacts. As a jobs

doi:10.1525/bio.2009.59.4.2

creation package, a green infrastructure initiative would support land-based projects that sustain local economies and create jobs that are hard to outsource. The National Wildlife Refuge Association estimated that 20,000 people could be put to work on shovel-ready habitat restoration jobs on refuges within 90 days of the recently signed funding package. Public lands projects like these typically also support private contractors and local economies. Additionally, these jobs numbers could be adjusted upward to include implementation of farm bill conservation programs on private lands.

In California's Central Valley, floodplain habitat restoration work by non-profit organizations and private consultants on public and private lands already employs skilled and manual labor in a broad array of disciplines, including the biological sciences, engineering, hydrology, horticulture, agricultural technology and farm labor, geography, landscape architecture, heavy equipment operation, recreation planning, wildlife management, graphic design, computer science, and accounting, and also provides a laboratory of academic research and educational opportunities. These interdisciplinary, land-based projects also secondarily support local service and supply-chain industries that sustain rural and small urban economies and create meaningful work across class and cultural boundaries. Finally, by attracting and retaining graduates of state school systems, large-scale ecosystem restoration projects can potentially counteract "brain drain" in rural agricultural communities, providing an excellent return on public education investment.

Within my own lifetime, I can think of a major missed opportunity for regional ecological stimulus. In the 1980s, the collapse of the steel industry in southwestern Pennsylvania, my native state,

left the Ohio River valley downstream from Pittsburgh both economically and environmentally devastated, with tens of thousands of manufacturing jobs lost.

Starting in the late 19th century, the Army Corps of Engineers had methodically drowned the Ohio River, which originates at Pittsburgh, by constructing a series of locks and dams along its mainstem and fully transforming this once vibrant river ecosystem into an industrial transportation corridor, enabling riverbank manufacturing development on a massive scale. In 2000, more than a decade after a major industrial decline had begun in the region, Congress authorized the Corps of Engineers to spend \$307 million for the Ohio River Ecosystem Restoration Program. However, the program was challenged and killed by environmental groups for not having a financially viable, comprehensive, ecosystem-based approach. The Ohio River Foundation reported, "What should have been yesterday's mitigation program is today's restoration program." In the wake of the program, a multiagency, nongovernmental collaborative—the Ohio River Basin Habitat Partnership—formed to examine ecosystem restoration options, this time with agency leadership from the US Fish and Wildlife Service.

The Ohio River valley of southwestern Pennsylvania is one regional example where swifter investment in transportation infrastructure mitigation, environmental remediation, and ecological restoration following industrial decline could have sustained local working-class communities: damaged ecosystems could have undergone repair, putting workers back to work and getting cash flowing into the regional economy during the transition from big steel production to new industries. Instead, families dispersed and local businesses folded so that, by

1990, a walk down Main Street in many of these manufacturing towns felt more like a desolate stroll through an industrial ghost town. Not coincidentally, this region became a focal point of political and media attention during the 2008 general election. In public speaking stops, President Obama has spoken of opportunities to transition the region's economy to alternative energy manufacturing—a good idea, but interim investment in the repair and revitalization of this badly damaged river system could have eased that transition over the past two decades, with long-term environmental benefits.

In these times of climate change and economic crises, we can't afford to repeat past mistakes by ignoring the forces and complexities of the natural world while devising short-term economic solutions. Pending another spurt of federal stimulus spending, it would be advisable for the conservation science community to put forth a continental-scale proposal for an ecological infrastructure initiative that cuts across urban and rural and public and private boundaries, with a cost-benefit analysis attached. While we invest in shovel-ready engineering projects today, we must also seek opportunities to build resilience into the natural infrastructure that protects society and preserves biodiversity for tomorrow.

### Acknowledgments

This article benefited from dialogue with Michael Bean, Rich Cogen, Paul Harrison, Eric Holst, Sara Hopper, Britt Lundgren, and Michael Replogle.

---

*Stacy L. Small (e-mail: [ssmall@edf.org](mailto:ssmall@edf.org)) is a conservation scientist in the Land, Water and Wildlife Program of the Environmental Defense Fund in Washington, DC.*