After Chile’s fires, reforest private land

Large-scale wildfires have recently swept through 475,000 hectares of central Chile (1), displacing thousands of households. The affected region is located in a globally threatened biodiversity hotspot (2, 3). The suspected causes of the wildfires were a combination of human activities, record high temperatures, and an extended drought, attributed to anthropogenic climate change (4). The current forest management system of monoculture plantations, which have replaced native forest with fast-growing exotic tree plantations that facilitate fire propagation, also exacerbated the fires (5).

The protected areas in the region represent only 4% of Chile’s Mediterranean habitat and are largely biased toward high-elevation areas of the Andean range, leaving endangered and critical ecosystems unrepresented (3). In the aftermath of the fires, the government plans to restore the Mediterranean landscape with native forest on public land. However, almost all of the native forest affected by the fires is on private land (1). A strong institutional response should be implemented to facilitate the restoration of native forest—not exotic monocultures—on private land through government compensation to landowners for their foregone business opportunities.

The conservation network should also be expanded to private land to respond to climate change, and the recent fires highlight the urgent need for a robust landscape-scale institutional response to reduce the risk posed to people, ecosystem services, and biodiversity in Mediterranean native forest. Potentially trigger social costs that outweigh the opportunity costs to local stakeholders. Instruments such as ecological fiscal transfers, which redistribute tax revenues to localities to address ecological challenges (6), or payments for ecosystem services (7) should be implemented to facilitate conservation. Central Chile is particularly sensitive to climate change, and the recent fires highlight the urgent need for such a robust landscape-scale institutional response to reduce the risk posed to people, ecosystem services, and biodiversity in Mediterranean native forest.

OUTSIDE THE TOWER

March for Science: Share your sign

The March for Science will take place on 22 April, and AAAS (the publisher of Science) will be there! In preparation, we asked scientists what they plan to write on the signs they will carry as they march. We offer some of their ideas below. Do you have a sign suggestion to add? Post it on Twitter with the hashtag #ScienceSigns.

The new $E = mc^2$

Lora Winslow, Climate Change, USA

I came, I saw, I concurred.
Evidence breeds consensus.
Sean Tobias May, Transgenics and Bioinformatics, UK

Science pays in many ways.
Ian C. McKay, Immunology, UK

Evidence-based science for evidence-based legislation
Terry McCallum, Organic Photochemistry, Canada

Public health:
For liberty, for justice, for all
Eric J. Daza, Biostatistics and Public Health, USA

Maria Jose Martinez-Harms, Duan Biggs, Hugh P. Possingham

1 Australian Research Council Centre of Excellence for Environmental Decisions, The University of Queensland, Brisbane, QLD 4072, Australia. 2 Centre for Biodiversity and Conservation Science, The University of Queensland, Brisbane, QLD 4072, Australia. 3 National Environmental Science Programme Threatened Species Recovery Hub, The University of Queensland, Brisbane, QLD 4072, Australia. 4 Department of Conservation Ecology and Entomology, Stellenbosch University, Matieland, South Africa. 5 The Nature of Queensland, Brisbane, QLD 4072, Australia.

10.1126/science.aan3787

Fund American science, or we’ll make other countries great.
Ethan M. Gutmach, Neuroscience, USA

Defunding science defunds our future.
Dan Gutierrez, Physics, USA

Unlike science, tweets aren’t peer-reviewed!
Emily Adkins, Chemical Engineering, USA

Fund basic science! Exploration saves lives.
Sharon M. Homer-Drummond, Biology, Ecology, Environmental Science, USA

Published by AAAS
Europe’s insufficient pollutant remediation

Of all the banned persistent organic pollutants listed under the Stockholm Convention (1), the polychlorinated biphenyls (PCBs) pose the greatest difficulty in remediation because of their relative abundance, toxicity, and environmental persistence, even relative to other organochlorines (2,3). Many contracting parties of the Stockholm Convention are not adequately reporting progress on PCB elimination (3). Currently, the various bans on PCB manufacture and use are insufficient, on their own, to fully protect human health or to conserve wildlife. As an initial step, countries need to make a greater effort to comply with the terms of the Stockholm Convention, particularly in Europe. Europe produced between 299,000 and 585,000 tons of PCBs, but many EU member states are not assessing or decontaminating PCB-contaminated materials, sites, or waste stockpiles sufficiently (3). Only Norway, Sweden, and Switzerland in Europe have established procedures for secure disposal or destruction of highly contaminated PCB in joint sealants (3).

The United States produced the most PCBs globally (between 476,000 and 648,000 tons in total) and has signed but not ratified the Stockholm Convention (3). Nonetheless, the United States has been relatively proactive in terms of PCB mitigation nationally and at state level, including numerous U.S. Environmental Protection Agency (EPA) Superfund sites—areas polluted with high levels of PCBs and other hazardous substances, which the EPA is actively working to decontaminate (2). Perhaps as a direct result, PCB levels in the United States have slowly declined in humans and other biota such as fish for many years now, and overall PCB mitigation is generally considered to be successful (4). Given that the aggressive PCB risk assessment and decontamination adopted in the United States has produced sustained and ongoing declines in PCBs in humans and wildlife over several decades (4), we should advocate a similar approach as a matter of urgency, particularly in Europe.

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Science 356 (6334), 147-148.
DOI: 10.1126/science.aan0701