



Article scientifique

Article

2009

Submitted version

Open Access

This is an author manuscript pre-peer-reviewing (submitted version) of the original publication. The layout of the published version may differ .

Why do we fly? Ecologists' sins of emission

Fox, Helen E; Kareiva, Peter; Silliman, Brian; Hitt, Jessica; Lytle, David A; Halpern, Benjamin S;
Hawkes, Christine V; Lawler, Joshua; Neel, Maile; Olden, Julian D; Schlaepfer, Martin; Smith, Katherine;
Tallis, Heather

How to cite

FOX, Helen E et al. Why do we fly? Ecologists' sins of emission. In: Frontiers in Ecology and the Environment, 2009, vol. 7, n° 6, p. 294–296. doi: 10.1890/09.WB.019

This publication URL: <https://archive-ouverte.unige.ch/unige:110794>

Publication DOI: [10.1890/09.WB.019](https://doi.org/10.1890/09.WB.019)

Why fly? Institutional changes to reduce high-flying conservationists' footprints

Helen E. Fox¹, Peter Kareiva², Brian Silliman³, Jessica Hitt⁴, David Lytle⁵, Benjamin S. Halpern⁶, Christine V. Hawkes⁷, Joshua Lawler⁸, Maile Neel⁹, Julian D. Olden¹⁰, Martin A. Schlaepfer¹¹, Katherine Smith¹², Heather Tallis¹³

¹ Conservation Science Program, World Wildlife Fund – US, 1250 24th Street, NW, Washington, DC 20037-1132 USA. Email: Helen.Fox@wwfus.org

² The Nature Conservancy, 4722 Latona Ave NE, Seattle, WA 98105

³ Department of Biology, University of Florida, Gainesville, FL 32612

⁴ EcoAdapt, Washington, DC 20037

⁵ Department of Zoology, Oregon State University, Corvallis, OR 97331

⁶ National Center for Ecological Analysis and Synthesis, 735 State St., Santa Barbara, CA 93101, USA

⁷ Section of Integrative Biology, University of Texas at Austin, Austin, TX 78712

⁸ College of Forest Resources, University of Washington, Seattle, 98195

⁹ Department of Plant Science and Landscape Architecture and Department of Entomology, University of Maryland, College Park, MD 20742

¹⁰ School of Aquatic and Fishery Sciences, University of Washington, Seattle WA 98195

¹¹ State University of New York, College of Environmental Science and Forestry, Syracuse NY 13210

¹² Brown University, Department of Ecology and Evolutionary Biology, 80 Waterman St Box G-W Providence, RI 02912

¹³ The Natural Capital Project, Woods Institute for the Environment, Stanford University, 371 Serra Mall, Stanford, CA 94305

We write to address an increasingly unsustainable paradox: a hallmark of modern science is frequent air travel, yet the realities of global climate change will force us to find creative and constructive ways to reduce our carbon emissions (Gremillet 2008; IPCC et al. 1999; Pacala & Socolow 2004). The unease about frequent flying should be particularly acute for the community of ecologists and conservation scientists—a group of scientists who commonly speak out against emissions, yet by virtue of their own behavior have individual carbon footprints that likely exceed the per capita footprints of most Americans. There is no large survey of carbon footprints for scientists or conservationists, so we each completed a carbon calculator (<http://www.climatecrisis.net/takeaction/carboncalculator/>)¹ for 2007 and documented our “sins of emission” (Fig. 1). We thirteen conservation scientists span a wide range of jobs (academic and NGO) and career stages (junior to senior scientists), and although not a random sample we are fairly representative of the conservation field. The results give pause: the emissions from our flights account for an astonishing two-thirds of our carbon footprint. Thus, in spite of considerable lower-carbon lifestyle choices (eg diet, driving a hybrid car, home energy conservation) that made our non-flying carbon footprint 16% smaller than the average American’s, our total emissions are double that of the American average and more than ten-times the global average (Fig. 1)¹. The mismatch between individual behavior and conservation platitudes has already been noted (eg Bearzi 2009) and can cause considerable embarrassment for the conservation community (Dowie 2008).

The question for scientists who believe emissions must be reduced is whether we can achieve those reductions while remaining globally engaged in our professions. To address this question, we first asked: “Why do we fly?” Collectively, our flights fell into five broad categories. Networking (conferences and external meetings) and research were by far our largest reasons for flying, followed by personal, management (eg internal organizational meetings, grant review panels, etc.), and fundraising (Fig. 1). These categories are likely to apply to all scientists globally, albeit in varying proportions depending on the field. Not surprisingly, no two scientists are the same and there will not be a one-size-fits-all solution to reducing individual carbon footprints. However, flying in our professional lives occurs for well-justified and poorly-justified reasons (Table 1). While an organization or individual can reduce the amount of travel without needing such labels, we propose general solutions that institutions and individuals can take to reduce air travel through better discipline and priorities (Table 1). Any categorization such as ours has shades of gray, will likely differ among sectors, and may change depending on factors such as career stage. But because air travel is the greatest single source of carbon emissions for many scientists, individual and institutional reductions in air travel will have immediate and significant impacts.

The largest reduction could be achieved if individuals and institutions hold fewer meetings. As is already happening with many businesses, the scientific sector should further invest in and demand increased video conferencing to reduce in-person meetings. Moreover, tools to facilitate coordinating conferences temporally and geographically to minimize travel already exist in simplified form (eg www.meetomatic.com, www.doodle.com), and could be enhanced (eg Primerano et al. 2008). Research trips can be reduced by establishing collaborations and empowering others to assist in research, lead on subprojects, and send data digitally. For flights that cannot be eliminated, carbon offsets are an option.

While these changes are relatively simple, they have enormous potential to reduce carbon emissions in the scientific community. If the 10-12,000 scientists in the Ecological Society of America (http://www.esa.org/member_services/) or the Society for Conservation Biology (<https://www.conbio.org/join/>) collectively reduced their travel by 30%, it could result in reductions of $\sim 42,000 \text{ t C yr}^{-1}$ (assuming their footprints are comparable to ours). This is the equivalent of taking ~ 7300 cars off the road for a year (<http://www.epa.gov/solar/energy-resources/calculator.html>) or eliminating 172 Boeing 747 US-Europe transatlantic flights .

Institutional changes to reduce flying are beginning. For example, The Nature Conservancy reduced trustee meetings from annual to biannual and reduced science leadership meetings from three to one per year. These changes have not compromised either activity. Similarly, the World Wildlife Fund has pledged a 10% reduction in flights; we urge others to do the same and more. Because the environmental impact of flying is very large, small changes in how we conduct our private and professional lives that lead to fewer flights will significantly reduce carbon emissions.

Acknowledgements: We thank S.Rizk of the Global Footprint Network for assistance with data sources, as well as the following individuals for information and discussions: L. Burke, T. Damassa, and S. Putt del Pino (WRI), G. Baldwin, K. Chatterjee, E. Dinerstein, P. Lockley, and T. Ricketts (WWF), B. Hemmings (T&E), and R. Robison (NIH). We are grateful to The Nature Conservancy for providing funding for us to initiate this project.

References

- Bearzi, G. 2009. When Swordfish Conservation Biologists Eat Swordfish. *Conservation Biology* **23**:1-2.
- Dowie, M. September 29, 2008. The wrong path to conservation. *The Nation*. (<http://www.thenation.com/doc/20080929/dowie>).
- Gremillet, D. 2008. Paradox of flying to meetings to protect the environment. *Nature* **455**:1175.
- IPCC, J. Penner, D. Lister, D. Griggs, D. Dokken, and M. McFarland 1999. *Aviation and the Global Atmosphere*. Cambridge University Press.
- Pacala, S., and R. Socolow. 2004. Stabilization Wedges: Solving the Climate Problem for the Next 50 Years with Current Technologies. *Science* **305**:968-972.
- Primerano, F., M. Taylor, L. Pitaksringkarn, and P. Tisato. 2008. Defining and understanding trip chaining behaviour. *Transportation* **35**:55-72.
- Putt del Pino, S., R. Levinson, and J. Larsen 2006. *Hot climate, cool commerce: a service sector guide to greenhouse gas management*. World Resources Institute, Washington, DC. (<http://www.wri.org/publication/hot-climate-cool-commerce>)

Table 1. Our assessment of (A) well-justified and (B) poorly-justified reasons to fly along with suggestions for how institutions can institute policies to reduce travel for these reasons.

A Well-justified reasons to fly	
To network with a large group of professional colleagues in a limited area and time period, thus eliminating the need for multiple trips to see individual colleagues. To develop a relationship for fundraising or professional partnership. To build a sense of team, with new collaborators or colleagues. To work closely together over an extended time period. To conduct field research that cannot be done any other way.	
B Poorly-justified reasons to fly	Institutional solutions
To ensure you actually do the work involved in the project or give it your full attention. To ensure you are in the loop and do not miss out on any key discussions or subtexts, or to ensure that your ideas will be given as much weight as others with competing ideas who have shown up in person. To meet with a group you know well (including flying as part of a large group of your internal colleagues). To symbolize that the topic is important.	Enforce deadlines, encourage reasonable work commitments and better self-discipline. Require participation in video conferencing to “level the playing field.” Establish clear and disciplined decision-making processes (consensus, vote, senior manager/leader under advice of group) so that the role of personal interactions is minimized. Meet less frequently and work as “virtual teams.” Provide online forums for important discussions and improve other forms of communications such as electronic newsletters. Do not require symbolism to establish importance, but rather have clear priority system that highlights importance

Figure Legend

Figure 1. Estimated average annual per capita carbon footprint from transportation and home energy use for a sample of conservationists¹, Americans¹, and global citizens². The conservationists’ flights have been further subdivided by category. Variance is large (SD=6.6 t C year⁻¹) due to differences in proximity of family, specific demands of our jobs, and personal choices.

¹<http://www.climatecrisis.net/takeaction/carboncalculator/howitwascalculated.html>

Per capita air travel emission factors were based on Department for Environment, Food and Rural Affairs (Defra; <http://www.defra.gov.uk/environment/business/envrp/conversion-factors.htm>) and the WRI Greenhouse Gas Protocol Calculation Tool for CO₂ emissions from transport or mobile sources (available from <http://www.ghgprotocol.org/calculation-tools/service-sector>). Factors assume average occupancy in airplanes (Putt del Pino et al. 2006) and average seating configuration (2008 Guidelines to Defra’s GHG Conversion Factors:

Methodology Paper for Transport Emission Factors, available from <http://www.defra.gov.uk/environment/business/envrp/pdf/passenger-transport.pdf>). Proportion of Americans' carbon from air travel from Federal Aviation Administration Office of Environment and Energy. 2005. Aviation & Emissions: A Primer, p. 10. (http://www.faa.gov/regulations_policies/policy_guidance/envir_policy/media/aeprimer.pdf). All websites viewed 6 March 2009.

²Data from the International Energy Agency (<http://wds.iea.org/WDS/Common/Login/login.aspx>) provided by S. Risk, Global Footprint Network.

