



Environment Institute
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New Zealand



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BREAKING THE BARRIERS

INNOVATING TO IMPROVE ECOLOGICAL OUTCOMES
ON TRANSPORT AND OTHER LINEAR INFRASTRUCTURE
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IMAGE CREDIT: ROB APPLEBY, WILDSPY/GRIFFITH UNIVERSITY



KEYNOTE ABSTRACT

Ghost Roads and the Destruction of Tropical Forests – With Lessons for the Developed World

Roads, railways, transmission lines and other linear infrastructure are expanding globally at the fastest pace in human history. The torrent of new linear infrastructure is most intense in biodiversity-rich tropical nations where it can promote forest loss and fragmentation, wildfires, illicit land invasions, and other environmental and societal impacts. Many roads are being constructed illegally or informally and do not appear on any existing roadmap; the toll of such ‘ghost roads’ on ecosystems is poorly understood. My colleagues and I used ~7,000 hours of effort by trained volunteers to map roads across the tropical Asia-Pacific region, sampling more than 1.4 million km² of land area. We detected a total of 1.37 million km of roads in our study area—from 3.0 to 6.6 times more roads than were recorded in the same plots using leading global-road datasets. Across our study area, road building almost always preceded local forest loss, and road density was by far the strongest predictor of forest loss out of 38 potential biophysical and socioeconomic drivers. Further studies in the Amazon and Congo Basins corroborate the importance of rapidly proliferating illicit roads in driving forest loss. Collectively, these findings reveal unbridled, unmapped, understudied ghost roads are among the gravest of all direct threats to tropical forests and their imperiled biodiversity.

The results of our global studies are also relevant for planning, designing and managing roads and other linear infrastructure in Australia and New Zealand. Landscape-scale planning—including integrating with bio-regional planning—of linear infrastructure networks is critical, including robust impact assessment and effective project minimisation and mitigation. The promotion of new or expanded linear infrastructure in optimal areas, and the permanent protection of ‘road-free’ areas, are both fundamental to sustainable development, both here in Australasia and abroad.

SPEAKER BIOGRAPHY

William Laurance is a Distinguished Research Professor at James Cook University in Cairns, Queensland, and a former Australian Laureate, one of Australia’s highest academic honours. An environmental scientist whose work spans the tropical world, Laurance has written eight books and over 800 scientific and popular articles. He is currently Australia’s top-ranked researcher in the fields of ecology, evolution and environment, and is ranked 6th globally. He is also a four-time winner of Australia’s Outstanding Science Writing Prize.

Laurance is a Fellow of the Royal Society, the Australian Academy of Science, and the American Association for the Advancement of Sciences, and former President of the Association for Tropical Biology and Conservation. He has received dozens of professional honors, including the Heineken Environment Prize, the BBVA Frontiers in Ecology and Conservation Biology Award, the Society for Conservation Biology’s Distinguished Service Award, and the Zoological Society of London’s Outstanding Conservation Achievement Prize, among others.

Laurance is director of the Centre for Tropical Environmental and Sustainability Science at James Cook University, and founded and directs ALERT—the Alliance of Leading Environmental Researchers & Thinkers—an international scientific organization that promotes environmental sustainability in the tropics and beyond.

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