NUS National University of Singapore | Department of Biological Sciences, Faculty of Science

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SEMINAR

Wed, 18 Mar 2026 | 4 pm | S3-05-02 Conference Room 1

Hosted by Assoc Prof Ryan Chisholm

Natural Solutions in a Warming World: Connectivity, Protected Areas, and the Future of Tropical Biodiversity

Climate change and biodiversity loss are often treated as parallel crises, yet in the tropics they are deeply intertwined. Contemporary warming is occurring up to orders of magnitude faster than most historical climate transitions, while simultaneously interacting with habitat loss, hunting, and other human pressures. Nowhere are the stakes higher than in lowland tropical forests, which harbor the majority of Earth's species. In this talk, I integrate paleoclimate perspectives, large-scale biodiversity datasets, movement and metapopulation models, and long-term field experiments from Southeast Asia to ask three questions: (1) How unprecedented is current warming in an evolutionary context? (2) Do protected areas and landscape connectivity meaningfully conserve biodiversity under global change? and (3) Which species interactions and ecological processes most strongly regulate tropical forest structure and carbon storage? Drawing on statewide connectivity planning in Borneo, continental analyses of protected area effectiveness, and a 12-year ecosystem study in Sabah, Malaysia, I show that well-designed protected areas and corridors measurably increase biodiversity both inside and beyond their boundaries, and that species interactions can buffer—or amplify—the effects of biodiversity loss. I conclude by discussing how "ecological digital twins" and global biodiversity analytics can support evidence-based conservation, climate adaptation, and emerging biodiversity finance.

By Jedediah Brodie

Craighead Endowed Chair of Conservation, University of Montana

Professor Jedediah Brodie is the Craighead Endowed Chair of Conservation at the University of Montana and a conservation biologist whose research focuses on tropical forest ecology, climate resilience, and species interactions. Working across Southeast Asia, Africa, and the Americas, he studies how anthropogenic changes, including hunting, logging, and climate, affect biodiversity, habitat connectivity, and forest carbon dynamics. His research integrates long-term field studies (using camera traps, acoustic monitoring, and drone-based surveys) with ecological modeling to understand community dynamics, ecosystem resilience, and the consequences of defaunation for carbon storage. He has contributed to large-scale conservation planning efforts, including identifying 350,000 hectares for new protected areas in Sabah and developing landscape connectivity strategies in Sarawak, Malaysia, with the goal of advancing solutions that benefit both biodiversity and human livelihoods. He was recently an elected councilor to the Association for Tropical Biology and Conservation, is a research fellow at the Universiti Malaysia Sarawak, and co-chairs the Climate Change and Protected Area specialist group for the IUCN-WCPA.