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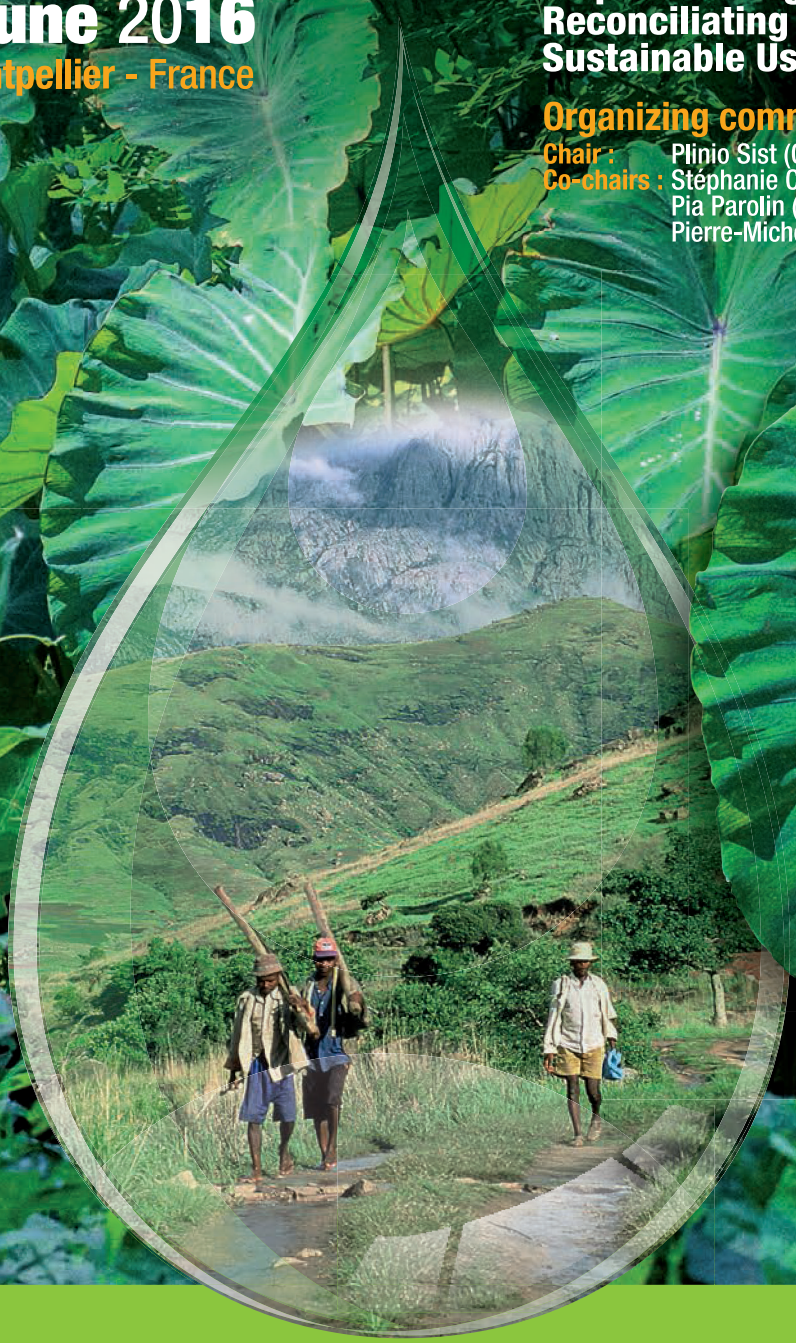

PROGRAM & ABSTRACTS

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O26-03 – S26 *Ecological impacts of forest disturbance in the brazilian amazon*
Tuesday 21 June / 10:00-12:00 – Antigone3

Prioritizing forest protection, reforestation, and avoided disturbance in the eastern Amazon

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Maintaining and restoring critical ecosystem processes and ensuring the persistence of native biodiversity in human modified landscapes will require a combination of habitat protection, restoration and rehabilitation. But how should limited resources be allocated to these different conservation activities to achieve the best ecological outcomes at regional scales, while minimizing economic and social costs? Here we address the problem of strategic landscape planning in multiple-use mosaic landscapes of the eastern Amazon. We explore trade-offs among protecting relatively undisturbed primary forest, avoiding degradation and restoring degraded primary forest, and rehabilitating forest through passive reforestation and protection of secondary forests. Extensive survey data on bird, invertebrate and tree biodiversity were linked with remote sensing data to model species distributions and biodiversity patterns as well as estimates of above-ground carbon stocks in a range of land-use types and forest conditions. Validated models were used to map habitat values across two municipalities in the eastern Amazon under current and possible future management scenarios The resulting maps were used to explore trade-offs among management actions and to identify priority areas for habitat protection, rehabilitation and restoration, using conservation planning software Zonation. These prioritization analyses identified the most cost-effective balance and spatial configuration of forest protection, restoration and rehabilitation, while accounting for connectivity requirements, relative costs, risks of fire and logging, environmental regulations, and uncertainty in species distributions and other inputs. We find that where restoration imposes significant opportunity and implementation costs efforts to avoid and reverse the degradation of standing forests can deliver greater returns on investment for biodiversity conservation, especially in human-modified landscapes that now dominate so much of the tropics. Systemic planning of management options at regional scales can substantially improve expected biodiversity outcomes while minimizing costs and risks, and provide valuable information for regulators, conservation practitioners and landowners in this biologically unique region.

O26-04 – S26 *Ecological impacts of forest disturbance in the brazilian amazon*
Tuesday 21 June / 10:00-12:00 – Antigone3

Extinction debt on reservoir land-bridge islands

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Background: Over 58,000 large dams operate globally, and are increasingly developed in high carbon- and conservation-value habitats such as the Brazilian Amazon. Inundation of terrestrial landscapes during reservoir filling can create land-bridge islands that retain remnant communities of formerly continuous habitat. Biological communities inhabiting reservoir islands are subject to a range of synergistic environmental factors such as area- and edge-effects, driving changes in species richness and community composition. Reservoir islands are often proposed for species conservation in dam development policies, to help mitigate some of the detrimental impacts associated with flooding terrestrial habitats. However the degree of species retention on islands, and hence, whether islands are effective for long-term conservation is unknown. We ask (1) do species on reservoir islands experience an extinction debt, i.e. compared to continuous habitat, does island species richness decrease with increasing island isolation time? and (2) how does island size, and distance to continuous habitat and other islands relate to patterns of species richness and rates of species loss?
Method: Species richness data for five broad taxonomic groups (mammals, birds, herptiles, invertebrates, and plants) from 252 reservoir islands (size <1-1690ha; isolation time <1-92 years) and 84 mainland control sites from nine dams in South America, Central America and Asia were analysed using linear mixed effects models; the influence of isolation time, island area, and distance on patterns of species richness were assessed.
Results: Taxa inhabiting reservoir islands exhibit extinction debt in <100 years of isolation; island area mediates the rate and magnitude of species loss, but even the largest islands show depauperate species richness compared to mainland continuous habitat. Distance to mainland or other islands did not influence island species richness.
Conclusion: Extinction debt is evident across all taxonomic groups and dams studied, and enhanced conservation measures for existing reservoir island communities are therefore needed. Long-term degradation of tropical tree communities on reservoir islands could lead to additional and unaccounted-for carbon loss from tropical dams. Environmental licensing assessments as a precondition for future dam development should explicitly consider the long-term fate of island communities when assessing biodiversity loss vs energy output.