

Animal Conservation Student Poster Award

in partnership with the Society for Conservation Biology

1st Prize

Awarded to Nirmal Bhagabati¹, Will Turner², Thomas Brooks² and Larry Gorenflo³

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HUMAN PRESSURES ON AMPHIBIAN BIODIVERSITY ARE CONCENTRATED IN REGIONS CRITICAL TO CONSERVATION

We investigated how global-scale spatial patterns of past and emerging human pressures (population, habitat conversion and land agricultural suitability) overlap with the distribution of amphibian biodiversity, and how this knowledge can help guide future conservation action. We overlaid an equal-area hexagon grid over the earth's land surface and evaluated irreplaceability (via C-Plan) of grid cells for amphibians in the context of human dimensions measures. 66% of highly irreplaceable (conservation-critical) sites are densely populated, compared to only 35% of the remaining sites. 85% of the most irreplaceable sites are not optimal for agriculture, and 90% have substantial unconverted habitat. Thus, the main emerging threat to these regions may be population pressure rather than commercial agriculture. We cannot limit conservation to sparsely populated areas, since most of the irreplaceable sites are also densely populated. Emerging human impacts on amphibian biodiversity are notably concentrated in north-western South America, coastal North America, Central Africa, Madagascar, northern Australia and Borneo, making these (among others) priority regions for amphibian conservation.

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2nd Prize

Awarded to Mark Otieno¹, Simon Potts¹, Andy Wilby², Ben Woodcock³, Alice Mauchline¹ and Mary Gikungu⁴

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LANDSCAPE DRIVERS OF POLLINATION AND BIOCONTROL IN KENYA

Local communities of insects are influenced by both the local management used on the farm and also the context of the farm in the wider landscape. However, the relative contributions of these two drivers of community structure are generally not known. The present study investigates the impacts of both drivers in tandem, on biodiversity of pollinators and natural enemies and delivery of related ecosystem services to an economically important crop, pigeon pea. The study was conducted in a series of nine paired farms along a gradient of landscape context in Kibwezi, Kenya. Results indicate reduced pollinator abundance on farms where pesticides were applied. Pollinator visitation also significantly increased with fertilizer usage which may be due to an increase in flower attractiveness with greater crop growth with additional nutrient availability. Pollinator visits to flowers was significantly higher on farms closer to seminatural habitats than ones more distant. This could be due to surrounding vegetation providing pollinators with nesting sites or alternative forage resources. Proximity of farms to semi-natural habitats and pesticide usage appear to be important drivers of pollinator abundance and diversity. More intense and focused studies on the responses of natural enemies are required before firm conclusions can be drawn.

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3rd Prize

Awarded to Sarah J. Corey¹, Thomas A. Waite, Lesley Geills Campbell, Anil K Chhangani, Jennifer Rice, Paul F Robbins

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DOES REMOTELY SENSED LAND-COVER CHANGE SIGNAL LATENT IMPACTS ON TREE SPECIES DIVERSITY WITHIN A PROTECTED AREA?

Land-cover change detected within protected areas should be cause for concern. Such change could be the signature of chronic illicit activities including fuelwood collection and livestock grazing, which could leave a legacy of ecological degradation. Using remotely sensed data, we recently documented extensive land-cover change in the Kumbhalgarh Wildlife Sanctuary in Rajasthan, India. Vegetation density changed in a quarter of pixels during the first 13 years (1986-1999) following the sanctuary's establishment, with many patches showing a decrease and others showing an increase. Here, we use on-the-ground data subsequently collected in 132 random plots to explore whether the remotely sensed changes indicated impending changes in diversity of woody plants. We show that species richness, species sharing, species assemblages, and incidence of invasive and useful species were statistically similar among plots in which vegetation density had decreased, increased, or remained similar. Not only did we fail to provide evidence for wholesale shifts in diversity following land-cover change, but we also report that intensity of disturbance associated with human activities was similar across plot types. Our findings prompt further reflection on the efficacy and outcome of restrictions on resource use within protected areas flanked by large populations of resource-dependent humans

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Highly Commended

Awarded to Nancy-Anne Rose¹ and Phil Burton²

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IDENTIFYING TEMPORAL CORRIDORS FOR CONSERVATION PLANNING IN THE CONTEXT OF CLIMATE CHANGE

A changing climate means that protected areas may no longer be able to sustain the biological features they are expected to protect through time. To address this issue, we identified and mapped several temporal corridors using bioclimatic envelope models based on the current range of selected targets, an interpolation tool that facilitates mapping of current and future climates, and GIS software. A temporal corridor represents a portion of a particular target, for example, an ecological zone, the range of a focal species that could persist over time, which if set aside for conservation may succeed in providing long-term protection from climate-driven changes. A series of GIS layers representing a target's bioclimatic envelope for four timeslices were intersected with the resulting overlap representing a target's temporal corridor. For example, the areal extent of the Interior Douglas-Fir zone increases with 0.03% of its envelope remaining in British Columbia's Central Interior. Ideal bioclimatic conditions for the lichen *Nephroma occultum* are predicted to increase by 17% and the temporal corridor suitable for its persistence approximates its current distribution. Temporal corridors represent potential sites that could be set aside for conservation with the expectation that bioclimatic conditions will remain suitable for a particular target. As such, the concept and application of temporal corridors could be an important component of future protected area planning and biodiversity conservation.

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Highly Commended

Awarded to Heather Lessig¹, William J. McShea and Jeffrey R. Walters

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DISTRIBUTION AND SPECIES RICHNESS PATTERNS OF BIRD COMMUNITIES IN HIGH ELEVATION FORESTS

The Southern Appalachians support a unique forest ecosystem at high elevations in which the breeding distribution of several bird species of conservation concern extends to unusually southern latitudes. Dual threats of rising global temperatures and potential wind energy development impact these high elevation forests across multiple scales. Understanding which bird species are sensitive to elevational gradients and how species richness patterns change over this gradient is critical for conservation planning and management and also contributes to a better understanding of regional patterns of biodiversity. We conducted bird surveys and corresponding site and landscape level habitat surveys at 36 high elevation sites on public forests in Virginia over three summers. We monitored 95 species at 1,095 points, including 11 species of conservation concern. We examined effects of elevation in combination with other environmental covariates on species richness patterns at multiple scales. In addition, for a subset of nine particular elevation-sensitive species, we investigated the relative importance of habitat characteristics at the local versus the landscape scale. Results highlight the scale dependency when determining species distribution and regional patterns of species richness and the need to consider multiple habitat factors in conservation planning and management.

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