

## **Habitat change and biodiversity maintenance: two faces of the same process?**

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What generates biological diversity, how is it maintained and how does it function and vary through time are fundamental questions in a time of change. How can we quantify biodiversity and what are the consequences of human-induced global change have become central points if we want to save and preserve the most diversity of our planet. In order to have a correct picture of how biodiversity arises and is sustained, we need to be able to construct a rigorous predictive model of this process. Changes in temperature or primary productivity have been considered as the major factors responsible for the dramatic molluscan turnover that occurred in the western Atlantic over the Plio-Pleistocene boundary. But these theories have not been tested ecologically with a reliable enough data set to draw definitive conclusions. Over 400 collections (782 taxa, 190,000 specimens) from the panamic region were analyzed for changing molluscan life habits and trophic composition across 12 million years. Preliminary results show that although abundance of predatory gastropods and suspension feeding bivalves declined considerable, its diversity was maintained. On the other hand, the development of reef habitats brings about the diversification of a specific reef dweller molluscan fauna. In spite of the fact that shelf ecosystems changed noticeable in trophic structure since the Late Pliocene, most of the other ecological life habits remained stable. The faunal turnover was probably the result of the declining regional nutrient supply with its transition from heterotrophic and nutrient rich to more phototrophic and nutrient poor ecosystems. Changes in western Atlantic ecosystems compared with those present in the eastern Pacific were of such magnitude that these regions represent today two distinct macroecological entities.

Habitat loss is a process of environmental change in which a natural habitat is rendered functionally unable to support the species present. This process may be natural or unnatural, and may be caused by habitat fragmentation, geological processes, climate change, or human activities such as the introduction of invasive species or ecosystem nutrient depletion. These animals are examples of the exceptional biodiversity of (c) the islands of Sumatra and Borneo. Other species include the (b) Sumatran tiger and the (d) Sumatran elephant, both of which are critically endangered. Rainforest habitat is being removed to make way for (e) oil palm plantations such as this one in Borneo's Sabah Province. - habitat destruction - habitat fragmentation - habitat degradation (including pollution) - global climate change - the overexploitation of species for human use - the invasion of nonnative species - the spread of disease. The seven major direct threats to biodiversity are the consequence of ...increasing human population and consumption. The higher the human population density, and the larger the city, the more closely ...human activities must be regulated because of the greater potential for destruction is greater. globalization. the increasing interconnectedness of the world's economy. ecological footprint. the influence a group of people has on both the surrounding environment and locations across the globe as measured by global hectares per person.

**BIODIVERSITY AND HABITAT. What is Biodiversity?** Biodiversity is defined as the variety of all life forms plus the habitats and natural processes that support them. It includes all forms of life from bacteria, viruses, and fungi to grasses, forbs, shrubs, trees, worms, insects, amphibians, reptiles, fish, birds, mammals, agricultural crops and livestock, and humans. Natural processes include pollination, predator-prey relationships, and natural disturbances such as floods and wildfires. Interactions between living and non-living things occur at all these scales at the same time. Ecosystems develop in response to local conditions, which are influenced by such things as climate patterns, soil types, and topography. Species Diversity. habitat modification and destruction and the extinction of populations and species go hand in hand. The extent to which humanity has already wreaked havoc on Earth's environments is shown indirectly by a recent study of human appropriation of the products of photosynthesis (Vitousek et al., 1986). When a population playing a certain role is wiped out, ecosystem services suffer, even if many other populations of the same organism are still extant. Crop yields will be more difficult to maintain in the face of climatic change, soil erosion, loss of dependable water supplies, decline of pollinators, and ever more serious assaults by pests. At the present time, data on the rates and direction of biodiversity loss remain sparse and often uncertain. Patterns and maintenance of biodiversity. (M. Wikelski and B. Kempenaers). Contents. Changes in biodiversity can have dramatic effects on human health, ecosystem functioning and the stability of ecosystem services<sup>4,5</sup>. Current climate change and human alteration of landscapes influence biodiversity in many unforeseen ways<sup>6</sup>. Studying patterns and processes of vertebrate biodiversity in nature allows for experimental scientific approaches using a variety of techniques, including state-of-the-art bio-logging<sup>7</sup>. Here we concentrate on two aspects of biodiversity that are heuristically tractable and amenable to experimental studies: i) the diversity of vertebrate species, particularly birds, and ii) the diversity of life history traits among those species.