410. HISTORICAL COLLECTIONS AND CONSERVATION PLANNING IN AMAZONIAN PLANTS. HOPKINS, MICHAEL; Filer, Denis; Martins-da-Silva, Regina. Embrapa Amazonia Oriental, Belém, Pará, Brazil and University of Oxford, UK.

Sound conservation planning should be based on good knowledge of species distributions. For Amazonian plants this knowledge is inadequate due to inadequate collection density and coverage. Models suggest that many rare species have yet to be collected. Modeling of species distributions could help, but inadequate georeferencing of historical collections makes modeling of actual distributions difficult. Comparative accuracy of scaling of environmental variables and biological data is essential. In this paper we illustrate a two step georeferencing system for Amazonian plants, using images form various sources: herbarium sheets, literature and notebooks. Using the data-base system BRAHMS, the rough estimate of location can be more accurately plotted using various types of images of maps. The consequences of differences in species distribution modeling using different scales (using GARP) are illustrated.

411. THE EFFECT OF ALTERED FLOODPLAIN REGIMES ON THE TERRESTRIAL YELLOW-FOOTED ANTECHINUS AND SUBSEQUENT MANAGEMENT IMPLICATIONS. HORROCKS, GREGORY F.; Mac Nally, Ralph. Australian Centre for Conservation Biology, School of Biological Sciences, Monash University, Clayton, Victoria 3800, Australia. greg.horrocks@sci.monash.edu.au.

Alteration of normal flow regimes can significantly change the natural dynamics of the biota on lowland floodplains. As a response to surrounding agricultural development, the Murray River has undergone major hydrological change resulting in an irregular pattern of inundation. Floodplain areas that have previously been annually flooded have now remained dry for several years. Managers introduced an artificial flood and we investigated the post-flooding response of the numerically dominant terrestrial mammal, Yellow-footed Antechinus (a small carnivorous marsupial), after a series of dry years. Trapping was undertaken 18 months prior to the artificial flood and for another four years afterwards. After the flood, the normally low numbers increased tenfold and have gradually declined in subsequent dry years. The flooding appeared to produce a population surge engendered by the high availability of food, namely, large-bodied, flood-dependent invertebrates (e. g. carabid beetles). The antechinus is an opportunistic, explosive breeder that can respond rapidly to favorable food conditions following flooding. We suggest that without regular flooding, this species currently persists in unnaturally low numbers and may be at risk of local extinction in water-deprived areas.

412. THE STRUCTURE OF POLYPORE FUNGAL COMMUNITIES IN RELATION TO THE AMOUNT AND QUALITY OF DOWNED LOGS. HOTTOLA, JENNI; Ovaskainen, Otso; Hanski, Ilkka. Metapopulation Research Group, Department of Biological and Environmental Sciences, University of Helsinki, PO Box 65, FIN-00014 University of Helsinki, Finland. Corresponding author: E-mail: jenni.hottola@helsinki.fi (JH).

Our research addresses the dependence of the occurrence of wood-decomposing fungi on the local abundance and quality of dead wood and on the size and connectivity of the respective forest stand. Particular attention is paid to threatened and near-threatened species, which account 37% of all polypore species in Finland. The data consist of 13,000 dead trees and 4,000 occurrences of 116 species, of which 43 are classified as threatened or near-threatened. The occurrence of common species is not expected to be constrained by dispersal and they can use most of the dead wood available. In support of this, the occurrence of the common species is well explained by the number and diversity of downed logs in the forest stand. In contrast, the occurrence of the threatened species is best explained by the total volume of logs and particularly by the occurrence of large and much-decayed logs. Furthermore, the connectivity and size of the forest stand is significant for the occurrence of the threatened species. These results have the following management implications. For the common species it is helpful to increase the amount of dead wood much regardless of the quality and the current density of dead wood. In contrast, for the threatened species the quality of downed logs is important, and these species require a minimum amount of resource locally to have viable populations.

413. POPULATION GENETIC ANALYSIS OF *Arapaima gigas*: IMPLICATIONS FOR MANAGEMENT AND CONSERVATION. HRBEK, TOMAS; Crossa, Marcelo; Sampaio, Iracilda; Farias, Izeni P. Laboratório de Evolução e Genética Animal, Departamento de Biologia, I.C.B., Universidade Federal do Amazonas, Estrada do Contorno 3000, Manaus, AM, 60077-000, Brazil, tomas_hrbek@ufam.edu.br (TH, IPF). Biology Department, University of Puerto Rico - Rio Piedras, San Juan, PR, 00931-3360, Puerto Rico (TH). Projecto Várzea, Instituto de Pesquisa Ambiental da Amazônia (IPAM), Santarém, PA, 68005-080, Brazil (MC). Núcleo de Estudo Costeiros, Campus da Bragança, Universidade Federal do Pará, PA, 68600-000, Brazil (IS).

In the present study we report a population genetic analysis of *Arapaima gigas*, and its implication for conservation and management. *Arapaima* is an important, but critically over-exploited giant food fish of the Amazonian várzea. Analysis of 2347 b. p. of mtDNA, and 14 variable microsatellite loci from 139 individuals sampled in seven localities within the Amazon basin suggests that *Arapaima* forms a continuous population with extensive genetic exchange among localities. Weak effect of isolation-by-distance is observed in microsatellite data, but not mtDNA data. *Arapaima* has low genetic diversity, and it shows a signature of genetic bottleneck in the middle and lower reaches of the Amazon system, areas of heaviest exploitation. Spatial autocorrelation analysis of genetic and geographic data suggests that genetic exchange is significantly restricted at distances greater than 2800 km. We recommend implementing a source-sink metapopulation management and conservation model by creating high quality várzea reserves separated by distances less than 2800 km. This conservation strategy would: 1) preserve all of the current genetic diversity of *Arapaima*; 2) create a set of reserves to supply immigrants for locally depleted populations; 3) preserve core várzea areas in the Amazon basin on which many other species depend.

414. ECOLOGICAL STOICHIOMETRY BRIDGING LANDSCAPE AND SPECIES IN TROPICAL FORESTS: ANT FUNCTIONAL GROUPS SPATIALLY RESPONSE TO SOIL CARBON: PHOSPHORUS RATIO. HU, JACKSON CHENG-HENG. Conservation Biology Program, University of Minnesota, USA 1243 Fifield Ave, St. Paul, MN 55108, USA huxx0058@yahoo.com.

Ant diversity is an evolutionary outcome supported by stoichiometric flows of energy and matter between species and landscape. Elemental constraints in organism-substrate compositions can reg-