In Brief

Farewell to the world's most biodiverse forest?

A Sumatran rainforest sustains more plant species than does any other ecosystem on Earth, according to a recent study sponsored by the World Wide Fund for Nature (WWF), but is likely to disappear in a few years if logging and forest conversion continue unabated. The field study identified 218 vascular plant species in a single 200-m^2 plot at Tesso Nilo, one of Sumatra's largest remaining blocks of lowland rainforest. This number of species was higher than that found in 19 other countries, including Brazil, Cameroon, New Guinea and Peru, using identical sampling methods.

Tragically, Sumatra's lowland rainforests are threatened by logging and forest destruction for oil-palm plantations, say WWF scientists. The Tesso Nilo forest, home to elephants, tigers, gibbons and tapirs, is now a green island surrounded by a sea of plantations and denuded land. As slash-and-burn farmers penetrate ever further into the shrinking forest, conflicts between the settlers and the last remaining elephants have become increasingly common.

WWF is urging the Indonesian Government to establish Tesso Nilo as a protected area, but time is very short. The World Bank estimates that, at present rates of logging and deforestation, primary forests will largely disappear in Sumatra by the year 2005. *WFL*

US$20 billion to count all species on Earth

A new non-profit foundation, called the All Species Foundation has undertaken the ambitious goal of inventorying all species on Earth within the next 25 years (http://www.all-species.org). The model for this enterprise is the Human Genome Project, which ten years ago probably would have seemed as improbable as describing and classifying all the surviving species on Earth. The price tag for the 'all species' venture has been estimated as being as high as US$20 billion, which is to be raised mainly from private donors.

The imagination and scope of describing all species is compelling in its hubris. However, if you had US$20 billion in your pocket and were fascinated with biodiversity, would an inventory of biodiversity be where you would spend your money? We already have a good understanding of the geographical distribution of biodiversity, and know that by protecting ~25 biodiversity hotspots we could protect most of the world's species. Moreover, the cost of these 25 hotspots has recently been estimated to be ~US$25 billion (*Science* 293, 2207–2208). So, would you spend US$20 billion to inventory all species or US$25 billion to protect most species? As conservation non-profits grow in stature and capacity, we will surely find the discussion of 'bang for the buck' playing an increasingly important role in conservation. There are many worthwhile investments for those interested in biodiversity. But surely some investments are better than others. *PK*

Pest risk analysis for invasive species

The World Trade Organization's agreement on the Application of Sanitary and Phytosanitary Measures requires that a nation seeking to exclude a non-native species, or a product that might carry such a species, must perform a quantitative risk assessment. Unfortunately, everything that we have learned about invasion ecology indicates an extraordinary uncertainty associated with predicting the environmental hazard of any particular non-native species, even though the environmental costs of exotic species in general are high and well substantiated.

Representatives from several countries (including Australia, USA, Mexico, Canada, UK and Argentina) recently assembled in Mexico (http://www.nappo.org/PRA-Symposium/PRAsymposium_Eng.shtml) to discuss this challenge. Ecologists should be pleased to learn that impacts on native biodiversity are now to be considered in these risk analyses, as well as the more traditional concerns about impacts on agriculture. It remains to be seen, however, if a procedure for risk analysis can be proposed that meets the needs of developing countries (which lack the resources to conduct intensive species-by-species studies) and that also addresses the surprising ways in which an invasive species can threaten native biodiversity. *PK*

US politicians accuse wildlife scientists of biofraud

In a remarkable case of ill-advised meddling, several members of the US Congress have publicly attacked US Forest Service Biologists for attempting to defraud the public. The 'case' arose because federal biologists sent blind samples of known lynx hairs to test the accuracy of federal laboratories. Hair samples are routinely used to establish the spatial distribution of lynx, which are listed as threatened under the Endangered Species Act, and it is important to know how accurate the labs are that test those hairs.

Following an article in *The Washington Times* that implied an illicit environmentalist agenda on the part of federal scientists, several US representatives in Congress made public statements that the scientists should be fired, without having any understanding of the use of blind control samples. Ignorance is probably the most generous explanation for the behavior of these politicians – others have accused the Congressmen of creating this case to make an attack on the Endangered Species Act (http://www.peer.org/Lynx/). *PK*

Can tax incentives and modifications save biodiversity?

A key tenet of the Republican Party in the USA is that voluntary conservation without 'heavy-handed' Government regulation is the best way to protect our environment. As a first step towards implementing such a policy, President Bush's proposed budget for fiscal year 2003 includes a special conservation lands provision. In particular, the budget seeks to exclude from taxable income 50% of all capital gains associated with the sale of land (or an interest in land or water) to a conservation buyer. To qualify, the sale can be either to a Government agency or to a conservation organization, and the buyer must provide written assurance that the acquisition will serve conservation purposes. This new tax exclusion would be effective for all sales occurring after 31 December 2003. This tax incentive has bipartisan support, as well as the endorsement of The Nature Conservancy, Ducks Unlimited, Defenders of Wildlife, American Farm Bureau, American Farmland Trust and the Association of State Foresters. *PK*

Aquatic ecosystems and climate change

A recent Pew Center on Global Climate Change report suggests that the greatest risks resulting from climate change are to be found in aquatic ecosystems (http://www.pewclimate.org/projects/aquatic_execsumm.cfm). One reason is that the geographical ranges of many aquatic and wetland species are determined primarily by temperature. Even modest temperature increases could eliminate cold-water fish, such as salmon and trout, from many streams. Warm water generally increases primary productivity in aquatic systems, but in doing so might also favor highly undesirable species, including noxious algal blooms.

Although these risks are unarguable, there remains great uncertainty about what the actual outcomes might be. Much of the uncertainty arises because, crucial to any consideration of aquatic systems is precipitation, and climate change implications for rainfall patterns remain an open question. Whereas most climate change research to date has focused on terrestrial systems, the Pew report challenges ecologists to pay much greater attention to aquatic systems. *PK*

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Letters

Intraspecific aggregation and species coexistence

In their research update in *TREE* [1], Murrell *et al.* summarized results of Stoll and Prati's [2] experiment on the effect of intraspecific spatial aggregation on competitive interactions between plant species. They stress correctly that although many mathematical models of plant competition for several spatial patterns in plant populations are available, there are only a few relevant experimental studies. Stoll and Prati's [2] paper was only the fifth study that they were aware of. This shortage of experimental studies is certainly a real phenomenon. However, I can add five more references [3–7]. The first study, by Wolfgang Schmidt [3], deserves particular attention. Prati's [2] experiment lasted six weeks, but Schmidt observed experimental mixtures of two clonal perennials, exotic *Solidago canadensis* and native *Urtica dioica*, for three years. Mixtures of equal density were planted in regular and intraspecifically aggregated fashion (Fig. 1).

This is a textbook example of how, if populations are aggregated intraspecifically, interspecific competition can be seriously reduced and coexistence of competitors facilitated. Nevertheless, even if the results from Schmidt's and other

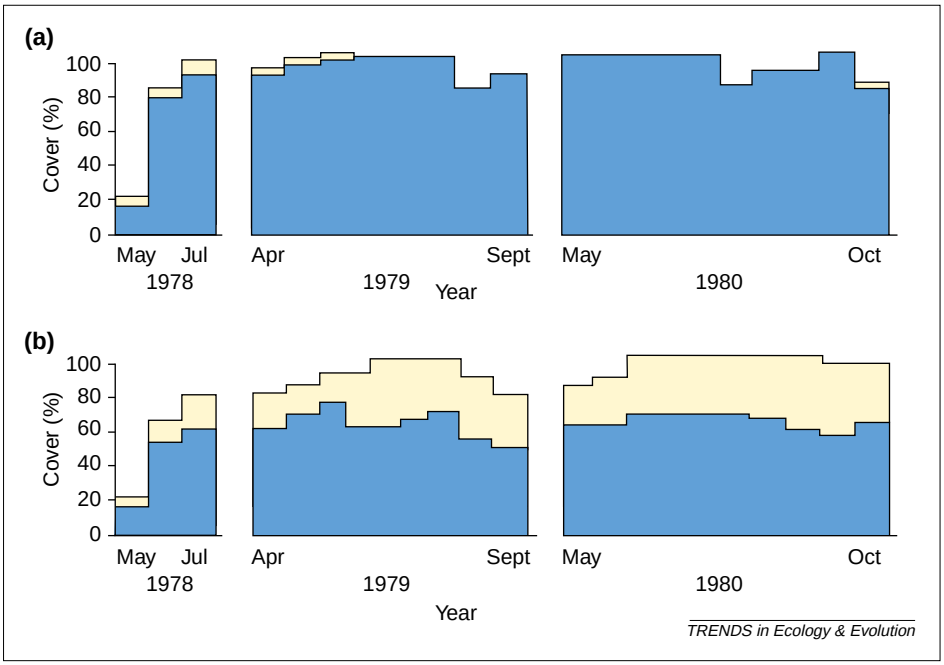

Fig. 1. Temporal changes in cover of two competing species [*Solidago canadensis* (yellow) and *Urtica dioica* (blue)] planted in a regular (a) and intraspecifically aggregated (b) fashion in the Botanical Garden, University of Göttingen. Modified from [3].

