

BIODIVERSITY AND OIL PALM: INTEGRATING SCIENCE AND POLICY 8 APRIL 2008 ZSL SCIENTIFIC MEETING RESEARCH POSTERS

Oil palms and orangutans

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It is widely acknowledged that the conversion of high conservation value forests to monoculture oil palm plantations is now the most urgent threat to the continued existence of orangutans in the wild. As land is cleared for development, orangutans are forced into sparse fragments of forest with poor resource availability and low population carrying capacities. Consequently, lethal conflict is a frequent occurrence in plantations as orangutans are forced out of degraded forest fragments in search of enough food for survival.

The Sumatran Orangutan Society supports companies with a commitment to non-destructive palm oil production, and has developed field projects to assist companies in meeting this shared goal. We provide training and support to oil palm plantation workers and smallholders in best-practise methods of dealing with human-orangutan conflict on plantation estates.

We are also working with local communities living adjacent to the Leuser Ecosystem to replant large areas of forest, illegally converted to oil palm plantations within the protected area. The restoration of this critical orangutan habitat enhances the protection of high conservation value forests and supports local sustainable development initiatives.

Seeing RED: paying to save the rainforest

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Payments for environmental services are en vogue in conservation. With increasing demands for action on climate change, innovative market-based mechanisms were developed to finance sustainable growth and reduced carbon emissions through the Clean Development Mechanism of the Kyoto Protocol (CDM). Tropical deforestation is an environmental cause célèbre, yet continues apace. Despite its contribution to carbon emissions - approximately 20% of the global total - payments to conserve carbon in standing forests were not included under the CDM. This is due to a suite of concerns from enduring technical issues such as 'permanence' and 'additionality', to broader socio-political issues including sovereignty over natural resources and impacts on economic growth. Yet the policy area is dynamic: in Bali 2007 the UNFCCC COP 13 adopted the concept of compensated reductions in deforestation, under the acronym REDD (Reduced Emissions from Deforestation and Degradation). In principle this scheme will offer direct payment for the services of carbon sequestration and storage provided by tropical forests.

A series of pilot studies are being developed in tropical countries, including Indonesia, which is now the third largest emitter of carbon after USA and China. Successful implementation of REDD projects will provide support for the notion that the scheme can be considered as a viable development strategy that can compete with options such as large-scale agriculture, including palm oil plantations. Ultimately, selecting areas important for both biodiversity and carbon storage may mean that paying the opportunity cost for forest conservation is an economical mechanism for tackling climate change and conserving habitat.

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Enhancing biodiversity within oil palm plantation; economic impact on users and best practice

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Conversion of tropical forest ecosystems to palm oil plantation has caused a loss of native biodiversity. This study is being conducted to investigate the effects of various conservation strategies on biodiversity within plantations in Sabah, Malaysia. Biodiversity will be sampled using butterflies as an indicator species; cylindrical baited traps will be used to collect specimens in native forest, intensive oil palm and plantations containing conservation strategies. The economic cost of each strategy to palm oil producers will be calculated along with consequences for consumer prices. The willingness of consumers to pay a premium for 'biodiversity friendly' biofuel will be ascertained using semi-structured interviews with people from within the palm oil industry in Sabah, and with biofuel consumers in Europe.

The project aims to establish the economic viability of conservation strategies within palm oil. Recommendations for management and evidence of good practice will be developed and disseminated to other growers throughout oil palm growing regions of the world. The strategies cannot hope to maintain levels of biodiversity seen in native forest of these regions but may go some way to mitigating negative impacts of plantation agriculture.

Species richness of ants and the impact of invasive "tramp" ant species in plantations of oil palm *Elaeis guineensis* in Borneo and the Peninsula Malaysia

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Malaysia is a famous hot spot of biodiversity; for example, more than 630 species of ants are reported from Kinabalu National Park in Borneo (<http://www.antbase.net>). However, in the last 30 years the conversion of primary forest into agricultural land has expanded rapidly. In 2000 more than 3 million ha were covered by plantations of the oil palm *Elaeis guineensis*, a native wetland species from West Africa. Establishment of oil palm plantations includes clearing of the land and terracing of the ground, leading to a complete change of the ecosystem. Until recently, we had little information about the insects that live in these huge agricultural areas.

As a basis for further research we assessed diversity of ant communities in canopies of oil palm plantations in Malaysia and investigated the influence of non-native ant species.

Arboreal ant fauna was monitored by cutting and examining palm fronds in two large oil palm plantations in Sabah and the Peninsula Malaysia that have been farmed with integrated pest management for at least 10 years. We sampled the ant fauna of 1193 palms. Species richness of ants was low in both plots with 34 ant species in Peninsular Malaysia and 35 species in Borneo. Three species *Technomyrmex albipes*, *Oecophylla smaragdina* and *Anoplolepis gracilipes* dominated the arboreal communities. A high influence of non-native species was found: 47% of all species occurrences belonged to nine invasive "tramp" ant species. The high abundance of these pan-tropical ant species may endanger the natural ant diversity in Borneo.

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Conservation under an oil palm environment - the Wilmar experience

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The concept of conservation under an oil palm environment is an old practice in PPB Oil Palms Bhd, a subsidiary of Wilmar International Limited. This concept started in the group around mid-1990s, long before the concept of high conservation value forest was introduced to the oil palm industry. The driver for such conservation effort was the environmental services it provides to the plantations in terms of river bank protections, water catchment preservation and erosion control. River bank erosion and high sedimentations affect the water quality and incur expensive mitigation measures. These steeper areas also have lower yield potential. Economic factors were then, the prime mover of these efforts rather than sustainability. Over the years, we discovered that by our efforts, we are also protecting the habitats of a wide range of biodiversity. Recognising that these areas can offer an alternative habitat for wildlife, such as mammals, birds and even reptiles, the entire perception that oil palm plantation is a field of mono culture changes. Surveys of these protected areas revealed the presence of a range of threatened species, such as orangutan and proboscis monkeys, as well as wild cattle and even elephants. These conservation areas form an integral part of the migratory corridors connecting one habitat to a larger landscape forest like Tabin Wildlife Sanctuary. With the introduction of the concept of high conservation forest through the implementation of the Roundtable Sustainable Palm Oil, this commitment and understanding has gone beyond protection. Now we are looking at value enhancement.

Today, we have a total of 10,000 ha (5% of planted area) of conservation areas spread over three regions of Sabah (2,000 ha), Sarawak (1,500 ha), Central Kalimantan (5,000 ha) and 1,500 ha in Jambi. Conservation under an oil palm environment is truly a journey of self discovery.

Patterns of land-cover change and bat diversity over a fragmented Malaysian landscape

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Rainforest fragmentation is a major conservation concern, particularly in rapidly developing South-east Asia where oil palm plantations are expanding. However, assessments of the impacts of fragmentation, and the contribution of fragments to landscape mammal diversity have not been limited in this region. Bats, particularly insectivorous species inhabiting the forest interior, are a large component of mammal diversity and potential indicators of ecosystem quality.

We describe patterns of landscape change and bat diversity in forest fragments in central Pahang, Peninsular Malaysia. Land-use maps and remote sensing techniques were used to create a time series of land-use change over 35 years and select forest sites for bat surveys.

Land-use classifications between 1966 and 2001 show forest fragmentation to be associated with expanding rubber and then oil palm plantations. Few forest remnants (< 100 ha) remain in these large permanent tree crop estates, but relatively large forest fragments have been retained in areas protected for wildlife conservation or permanent forestry applications.

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Bat inventories from 27 forest fragments and seven sites suggest that fragments contribute substantially to landscape-level bat diversity. However, bat abundance and species richness is positively related to forest area, suggesting that small fragments (< ca. 150 ha) have lower bat diversity value than larger fragments (> ca. 300 ha). Thus, plantation managers should conserve large fragments in concessions, but small fragments should also be safeguarded if possible, or used to promote connectivity across the landscape. Further study will use randomisation techniques to compare bat assemblages in continuous forest with forest fragments, and microsatellite analysis to describe population structuring of several species over the fragmented landscape.