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Restoring habitat for the Bornean elephant

Like most tropical countries, Sabah State (East Malaysia) in Borneo Island is experiencing ever more intense conflicts between meeting the economic demands of the corporate sector and preserving the ecological foundation upon which the economy ultimately depends. It is a biodiversity hotspot (for both plants and animals) and home to an enigmatic flagship species, the Bornean elephant (*Elephas maximus borneensis*) (Fig. 1). This subspecies of the Asian elephant is threatened with extinction, as deforestation has destroyed much of its habitat, food supply and migration routes. Without immediate protection and expansion of the forest, Borneo could lose its elephants and the world would lose another majestic keystone species.

In the Lower Kinabatangan Wildlife Sanctuary (Fig. 2), Bring the Elephant Home Foundation cooperates with HUTAN (Kinabatangan Orang-utan Conservation Programme), KOPEL Community Cooperative (MESCOT), Danau Girang Field Centre (DGFC) and the Sabah Wildlife Department to restore elephant habitat. Recently, the Forest Restoration Research Unit (FORRU) of Chiang Mai University joined the collaboration, by providing a

Figure 1. The Bornean elephant *(Elephas maximus borneensis)* in the Lower Kinabatangan Wildlife Sanctuary, Sabah, Borneo. A: Elephants at the riverbank near Sukau, on the way to the old palm oil plantation field site, lot 2, January 2013. B: About 20 elephants gather at the riverbank before crossing the Kinabatangan River, lot 6, May 2013. C: Elephants near the Danau Girang Field Centre, where researchers track their movement using GPS-collars, lot 6, May 2013. All photographs taken by Antoinette van de Water.

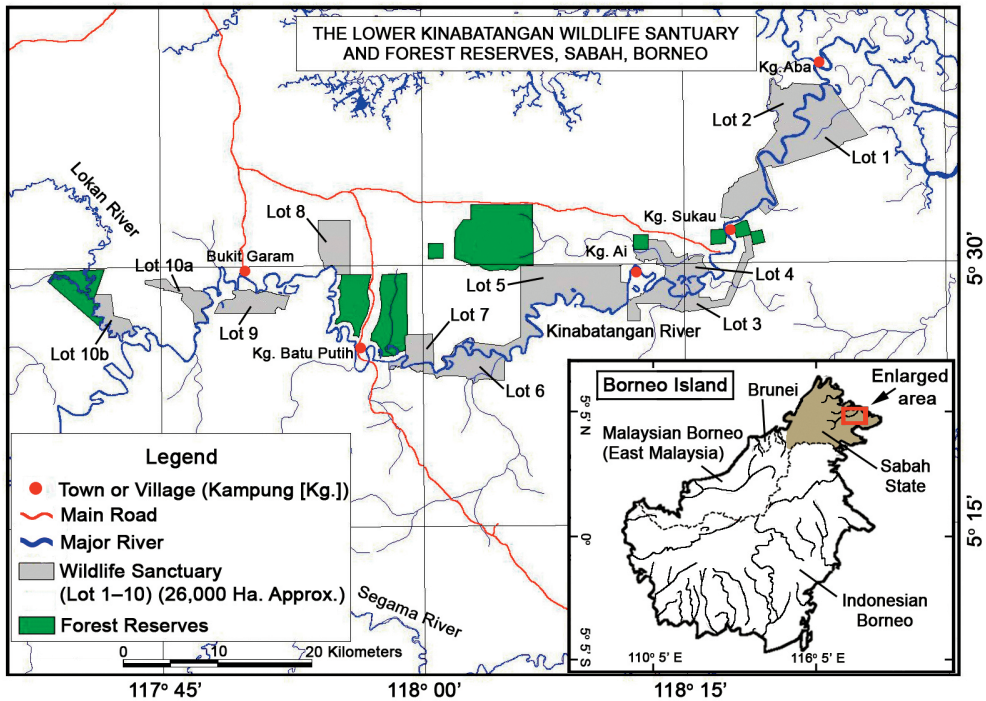

Figure 2. Map of an area of the Lower Kinabatangan Wildlife Sanctuary and forest reserves, Sabah, Borneo. The Bornean elephants use the area from lot 1 to 7. The long terms objective is to create a green wildlife corridor along the Kinabatangan River so that the elephants can follow their migration routes without passing plantations.

4-day workshop for the reforestation teams from Borneo, which included nursery training, research and reforestation techniques to improve the current reforestation programs.

DGFC researchers and the staff of HUTAN and MESCOT have identified the most urgent areas for forest restoration work. Bring the Elephant Home funds part of the project and helps, in a practical way, to translate research data into action. The project focuses on creating and expanding forest corridors along the river, to facilitate elephant movements and reduce human-elephant conflicts, by converting oil palm plantations back into near-natural forest and maintain biodiversity. Another objective is to strengthen local communities, so that economy and ecology can be mutually reinforcing.

The first target is to transform an old oil palm plantation, which has recently been incorporated into a protected area, back into a forest ecosystem, thus reconnecting fragmented patches of forest and restoring an elephant migration route.

The project also includes research in planted sites to continually improve planting methods (adaptive management). The project has established test plots to evaluate field performance of candidate framework tree species and to identify which ones are the most suitable for restoring riverine tropical rainforest in Borneo, which is often subjected to flooding. In June 2013, previously established plots were expanded. A randomized complete block design was

Figure 3. Activities to restore habitat of the Bornean elephant. A: Forest restoration workshop at the research nursery of FORRU (Chiang Mai University) with a focus on nursery maintenance, research and reforestation techniques to improve the current reforestation programs of HUTAN and MESCOT. B: The beginning of the transformation of a palm oil plantation back into a forest ecosystem. The planted seedlings have been covered by cardboard mulch mats in order to suppress the weed growth and reduce the labor cost of weeding. Also, they help to preserve the moisture into the soil and will turn into compost when rotten down. C: Numbering and labeling the seedlings before planting them out in the experimental plots by members of HUTAN, the Lower Kinabatangan Wildlife Sanctuary, Sabah. D: Members of HUTAN are using a vernier caliper to measure the root collar diameter of the planted trees of the experimental plots during a tree monitoring workshop near Sukau, Sabah.

adopted, testing 15 indigenous forest tree species (20 individuals per species per plot) for field performance, both in an oil palm plantation and along an old logging road. The plots are monitored (tree height, crown width, root collar diameter, health and weed scores) for both relative species performance and the effects of various fertilizer treatments, two weeks after planting and subsequently, at the end of the first and second flood seasons. The first report will be published in March 2015 and will provide a guide as to the most suitable tree species for swampy areas, in oil palm plantations and other degraded areas. This collaborative project lays the foundation for a sustainable program that grows, plants and cares for a minimum of 25,000 trees annually, hopefully playing a major role in the conservation of both the Bornean elephant as well as the multitude of other species with which it shares its habitat.

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