GLOBAL TREES CAMPAIGN

Looking closer- seeing the trees from the forest

Putting the trees back into forest conservation

Trees encompass a highly varied group of some 100,000 species[1]. They play numerous roles that directly benefit our lives. They provide us with timber, food, fuel and medicines. They act as a crucial sink for anthropogenic carbon emissions[2]. They provide the physical structure for the most biologically diverse ecosystems on earth, tropical forests, and embody our sense of natural vigour and a healthy planet.

Individual tree species often play a keystone role in their ecosystems, supporting a multitude of other species from their position at the base of trophic pyramids in ecological networks. Removing the foundations of ecosystems risks a domino effect of extinctions. The U.S. Fish and Wildlife Service have estimated that losing one plant species from an ecosystem can create a cascade of up to 30 other localised plant and animal extinctions[3].

Despite their importance, however, over 8,000 tree species are threatened with extinction. Even so, only a tiny percentage of trees have been assessed by the IUCN Red List criteria compared with other major species groups (Table 1). This is indicative of a wider problem- conservation effort to date has largely failed to consider trees as species in need of targeted conservation action.

Species group	Percentage assessed
Mammals	100
Birds	100
Amphibians	91
Fish	34
Corals	39
Trees	11

Table 1. Percentage of selected species groups assessed by IUCN red list criteria (adapted from IUCN 2013).

The Global Trees Campaign is a partnership between:

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Box 1 - Strength in diversity

The benefits we obtain from trees are amplified when a greater diversity of species are present. Forests that contain a higher number of tree species show greater soil carbon storage and so improve climate regulation[4]. Greater tree species richness is also correlated with increases in nutrient cycling[5] and biomass production[6,7]. Many plants and animals depend on multiple tree species for their survival. For example the Endangered golden-headed lion tamarin (*Leontopithecus chrysomelas*) uses 155 tree species, of which 55 are considered fundamental to the species' persistence[8].

Not all trees are equal- Moving beyond a 'one size fits all' approach to forest conservation to a tailored approach for tree species

Conservation of forest habitat does not guarantee the survival of the diverse tree species that exist within different forest ecosystems. Trees have diversified over the last 360 million years into a range of physical forms and so have contrasting responses to widespread threats to biodiversity such as habitat disturbance.

For example, after logging is undertaken in Atlantic rainforest it is predicted that some pioneer species will reach pre-disturbance levels in 100 years, while other species may take 4000 years[9]. Therefore effective forest restoration may require species specific action through enrichment planting of those species which may not re-establish naturally.

Individual tree species can face threats that are unique to that species. These may arise either as a direct result of species' ecology and include the species' specific habitat requirements and reproduction challenges such as poor natural regeneration and dispersal). These require biological knowledge of the species to undertake appropriate management (Box 2).

Box 2 - Abies ziyuanensis

The Critically Endangered conifer species *Abies ziyuanensis* is estimated to number less than 600 individuals confined to an area of 4 ha within two reserves in China. With a skewed age structure towards old senescent individuals, targeted management is required to ensure the successful propagation of the remaining individuals of this species. In this case a species specific management plan is being implemented by nature reserve staff. This identified the need to initiate germination trials to improve recruitment and remove early successional bamboo *Fargesia* sp, which out-competes the conifer in heavily degraded habitats.

This species-specific management for *Abies ziyuanensis* also supports the restoration of the wider ecosystem by creating conditions to allow the regeneration of other slow growing species.

Human threats can originate from the unique properties of certain species that create high and unsustainable demand for particular species products. A clear example of this is the growing global demand for particular timber species (e.g. rosewoods, ebonies, magnolias) or bark harvesting of the red stinkwood (*Prunus africana*) for European medicinal markets. Such selective extraction of particular trees and bespoke threats requires conservation action that is likewise tailored to meet these specific challenges (Box 2).

Broad scale habitat management has clear differences from conservation management of individual species. For example interventions to conserve threatened species such as the black rhino, by conducting anti-poaching patrols, are very different from efforts to conserve the rhino's savannah habitat by regulating grassland wildfires .

This difference between the threats facing and management needs of habitats and species are readily understood for the animal kingdom. However this distinction between habitat scale and species scale management tends to be overlooked in the case of tree species. We suggest that the reality of this 'broad-brush' approach to forest conservation is insufficient to meet the threats facing many non-generalist and threatened tree species.

We advocate the need for **species specific conservation action** for trees. We believe that a range of approaches that tackle different conservation challenges and operate at different spatial scales are needed to effectively conserve biological diversity. In this way species focussed initiatives can act as an essential risk-spreading and **complementary** component of large scale habitat conservation[10].

Box 3 - The Siamese rosewood (Dalbergia cochinchinensis)

Siamese Rosewood is a hardwood that can be sold for $50,000 per cubic metre for use in furniture manufacture. This large financial incentive has led to extensive illegal harvesting of the species in South-East Asia and the murder of national park ranger in Thailand's Pang Sida National Park as park staff strive to protect the park's rich biodiversity.

A recent grant supporting an enforcement initiative to reduce illegal poaching of the Siamese rosewood has helped support the training of 43 park rangers in wildlife monitoring, first aid and provide navigational and communications equipment. By raising the profile of anti-wildlife trafficking enforcement of plants as well as animals the project aims to reduce poaching levels inside the park and improve communication with other agencies such as the border patrol police to improve holistic policing of the wildlife trade of both plants and animals[11].

Bearing fruit – The opportunities and benefits of a species approach for trees

The inclusion of trees within conservation initiatives also presents opportunities for meeting broader biodiversity objectives. By channelling conservation effort through keystone tree species that influence a large number of other taxa, trees present an opportunity to maximise the societal and biodiversity benefit of conservation interventions (Box 3).

The physical properties of trees, including their large size and prominence also make trees suitable 'flagship' species to be used as a means of securing additional funding for conservation interventions with landscape level benefits e.g. the Siamese rosewood (*Dalbergia cochinchinensis*).

The existence of strong cultural connections to certain iconic tree species can be used to raise public involvement in conservation initiatives. They act as a 'social hook'[12], capturing public interest and helping to increase awareness of the importance of conservation (Box 4).

Box 4 - Ya'axche Conservation Trust

In 2002 a Belizean conservation NGO changed its name to the Ya'axche Conservation Trust. Ya'axche is the local name of the Cotton tree (C*eiba pentandra*) and the organisation took this name in an effort to achieve greater resonance with the local Mayan community. Maya people believed that the Gods sit on the lofty branches of the tree, watching the everyday world below, while the tree's deep roots connect the human world with the spirit world beneath the ground. The Cotton tree, therefore, acts as the essential connection between humans and spirits. Drawing on these strong cultural ties, the Ya'axche Conservation Trust uses the Cotton tree to embody and represent their efforts to holistically conserve the natural world.

YA'AXCHÉ CONSERVATION TRUST

Seeing the trees from the forest

We suggest that the current paradigm of forest conservation is overlooking the silent disappearance of many tree species. We champion the need for targeted conservation action for tree species to complement broader landscape level conservation.

The Global Trees Campaign work towards a tailored approach for conserving individual tree species. We provide technical support and advice on implementing species focused conservation, and encourage others to take action for threatened trees.

If you would like to find out more or view any of our resources for undertaking tree conservation then please visit our website:

http://www.globaltrees.org/

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