Preliminary Red Listing of MesoAmerican dry forest tree species

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Introduction

This work aimed to provisionally assess the red list status of tree species native to the seasonally dry tropical forests (SDTF) of MesoAmerica (Central America and Mexico). MesoAmerican SDTF covers approximately the coastal plain of the Pacific from north west Costa Rica to southern Sonora in north western Mexico and the north and west of the Yucatan Peninsula of Mexico.

Methodology

Candidate species were primarily derived from a database of Oaxacan and Honduran dry forests species held by the author and from the checklists of Fishbein et al (1998), Janzen & Liesner (1980), Lott (unpublished), and secondarily (given the limitations noted below) from Hawthorne & Hughes (unpublished). A qualifying height of 4 m was set, thus only trees and shrubs capable of reaching this height were included. It is acknowledge that some of the species included may only be occasionally found to reach such a height.

Each candidate species was then searched on the on-line database w3Tropicos of the Missouri Botanic Garden http://www.tropicos.org/ . This herbarium contains good representation of Mesoamerican species, and the visual mapping facility of the database allowed very rapid ocular assessment of the distribution of each species and therefore their extent of occurrence.

At this point all species were given preliminary assessments based on their extent of occurrence inferred from w3Tropicos and all the sources and checklists listed above. The distribution of the Least Concern (LC) species were also summarised in order to justify their assignment to this categorisation.

Species not immediately assigned to the LC category were also summarised at this stage, and were searched on google.com for further information, although in most

cases this turned up little of use. Legumes where searched on the International Legume Database and Information Service (http://www.ildis.org). Further refinement of the candidate species' distribution was then provided by consultation with relevant floras, monographs and checklists in the library of the Royal Botanic Gardens, Edinburgh. Principal amongst the floras were *Flora de Nicaragua, Flora de Novo-Galiciana, Flora Neotropica* and *Flora Mesoamericana.* However, with the exception of *Flora de Nicaragua*, the incompleteness of these floras meant that information was not available for all candidate species.

Sources consulted for each candidate species are detailed in the evaluation form of each species.

The distribution of each species is described in terms of the countries in which they occur and, in the case of Mexico and the USA, the states within the country. LC species are listed separately, alphabetically by family and genus. Each LC species is described as 'widespread', which implies they have areas of occupancy inferred to be in excess of 20 000 km^2. However, species with distributions inferred to be greater than but close to 20 000 km^2 were considered for inclusion in the Near Threatened (NT) category.

Assignment to critical (CR), endangered (EN), or vulnerable (VU) categories was most commonly justified by the red list criterion B1a b(iii). This implies an extent of occurrence below a certain threshold, severe fragmentation of the habitat and continuing decline in quality of that habitat. References relating to conversion and fragmentation of Mesoamerican seasonally dry tropical forests are therefore also included with each assessment (except LC species).

In total the status of 549 trees and shrubs were assessed (twelve of which had been assessed before). This resulted in:

- 458 species categorised as Least Concern
- 1 species categorised as Critically Endangered, 17 as Endangered and 28 as Vulnerable
- 39 categorised as Near Threatened
- 6 species categorised as data deficient

Of those that had been previously assessed, the status of five species was left unchanged (so new data forms were not completed) and seven species were assigned revised categories.

Completed Red List forms for these species are given in separate files. Given the limited scope of this work, in particular the lack of consultation with in-country experts, these assessments should be regarded as preliminary.

Annotated Reference List

1) Fishbein, M., Wilson, R.K., Yetman, D.A., Jenkins, P., & Martin, P.S. (1998). Annotated list of Río Mayo vascular plants. In *Gentry's Río Mayo Plants: The tropical deciduous forest and environs of northwest Mexico.* eds P.S. Martin, D.A. Yetman, M. Fishbien, P. Jenkins, T.R. van Devender & R.K. Wilson, pp. 167-522. University of Arizona Press, Tuscon.

The Rió Mayo region of Sonora in northwest Mexico is at the northern extreme of the range of Mesoamerica's SDTF. This checklist is not exclusive to dry forest but includes pine and pine-oak forest species, however information on the habitat preferences of each species makes clear which are from SDTF. It also provides invaluable notes on habit (tree, shrub, liana etc) limited information on chorology (distribution) and ethnobotanical notes.

2) Gillespie, T. (unpublished) *Family and scientific names of plants encountered in tropical dry forest of Nicaragua*

This unpublished checklist, kindly lent by the author, is a simple list of species collected in Nicaraguan SDTF, with no information on habit, habitat preference or chorology.

3) Gordon, J E; Hawthorne, W D; Reyes-García, R; Sandoval, G; & Barrance, A J (2004) Assessing Landscapes: A case study of tree and shrub diversity in the seasonally dry tropical forests of Oaxaca, Mexico and southern Honduras. *Biological Conservation* 117, 449-442

This publication is not a checklist, but contains information on the distribution of Oaxacan and Honduran SDTF species that the authors consider to be of 'restricted

distribution'. It is the only, as yet, published documentation from a larger database of SDTF species found in these two areas that summarizes distributions of many other species based on collections held in the National Herbarium, Mexico City (MEXU) and the El Zamrrano Herbarium, Honduras (EAP).

4) Janzen, D.H. & Liesner, R. (1980) Annotated checklist of plants of lowland Guanacaste Province, Costa Rica, exclusive of grasses and non-vascular cryptograms. *Brenesia*, 18, 15-90.

This checklist is, along with those of Chamela-Cuixmala (below), from one of the best studied dry forest floras in the region. It covers a significant part of what is now the Guanacaste Conservation Area, near the southern extreme of Mesoamerican SDTF. It is largely limited to SDTF and gives useful information on habit and identification notes. It is now, however, quarter of a century old and the taxonomy/synonomy is a little out of date and thus requires careful use in red listing exercises.

5a) Lott, E.J. (in prep) *Listado Anotado De Las Plantas Vasculares De Chamela-Cuixmala*

5b) Lott, E.J. (1993) *Annotated checklist of the vascular flora of the Chamela Bay region, Jalisco, Mexico.* Occasional Papers of the California Academy of Sciences: 148: p. 1-60.

These two checklists are for the Chamela-Cuixmala Biosphere Reserve in western central Mexico. The 'in prep' checklist, which the author kindly allowed to be used for this work, is an updating and expansion of the 1993 publication. Both are very useful, containing information on appearance and habit of each species, with the updated version also giving invaluable information on distribution and habitat preference.

6) Hawthorne, W H & Hughes C E (unpublished) *Draft annotated checklist for seasonal forest of Quintana Roo, Mexico*, DFID

This unpublished checklist, kindly lent by the authors, was compiled in remarkably quick time for a consultancy for DFID to support a forest management project. It requires treating with caution as it is based on a very rapid review of relevant literature (principally Flora de Guatemala) with a minority of the species listed subsequently being found in the surveys the authors carried out. Thus it cannot be

assumed that all species listed are SDTF species. However, it does contain useful information on habit and chorology for some species.

7) Martínez, E., Sousa, M., & Ramos Álvarez, C. H. (2001) *Listados Florísticos de México: Región de Calakmul, Campeche*. UNAM, Mexico City.

This checklist is based on collections from the National Herbarium, Mexico City and field work in Campeche, Mexico, a state containing significant areas of SDTF. It is unfortunately limited in its ambition, and therefore in its utility for redlisting, since it contains no additional information on habit, habitat (non-SDTF species cannot therefore be distinguished from SDTF species) or chorology. Further, it does not distinguish between those species confirmed from within the Calakmul Biosphere Reserve and those from the wider region.

8) Reyes-García, A. & Sousa S., M. (1997) *Listados Floristico de México: Depresión Central de Chiapas: La Selva Baja Caducifolia.* UNAM, Mexico City.

This checklist, from the same series as that of Martínez et al, is also based on collections from the National Herbarium, Mexico City an SDTF area in Chiapas, Mexico. It is similarly limited.

9) Salas-Morales, S.H., Saynes-Váquez, A., & Schibli, L. (2003) *Flora de la costa de Oaxaca: lista florística de la región de Zimatán*. Boletín de la Sociedad Botánica Mexicana, 72, 21-58

This recently published checklist, from an area of Oaxaca, Mexico that is principally composed of SDTF, also fails to distinguish between non-SDTF species and SDTF species, and gives no information on habit or chorology.

10) Turner, R.M.; Bowers, J.E. & Burgess, T. L. (1995) *Sonoran Desert Plants: an ecological atlas*. University of Arizona Press, Tucson.

This book provides information on Sonoran desert species, which include many SDTF species, including habit and chorology.

11) Yetman, D.A., Van Devender, T.R., Estudillo, L., & Reina Guerrero, A.L. (2000). *Monte Mojino: Mayo people and trees in southern Sonora*. In The Tropical

Deciduous Forest of Alamos: biodiversity of a threatened ecosystem. eds R.H. Robichaux & D.A. Yetman, pp. 142-151. University of Arizona Press, Tucson.

This book covers a similar geographical area, and similar species to Fishbein et al, but is less comprehensive.