

Endangerment of Colombian Palms

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ABSTRACT

The conservation status of all palm species known to occur in Colombia is revised. Twenty two species are considered endangered, and a brief account of each is provided; 17 species are considered vulnerable; 18 species are considered rare; 121 species are insufficiently known; and 80 species are not threatened. The urgent need of further field work is stressed.

Colombia has been recognized long ago as one of the countries with the largest palm floras in the world (Dugand 1940, Corner 1966). Located in the northwestern corner of South America, its palm flora includes both North American genera not found elsewhere in South America (e.g., *Cryosophila*, *Reinhardtia*), and many exclusively South American genera not found in the North American continent (e.g., *Iriartella*, *Leopoldinia*, *Lepidocaryum*). Besides this, the physiographic and climatic diversity of the country, particularly the intricate topography of the Andes, provide a great richness of habitats for palms. Actually, palms grow in almost all of Colombia, except on the highest Andean mountains, and in the driest areas of the country. My latest count of Colombian palms, which includes much unpublished information, gives 261 species in 47 genera. One hundred and one of the species are endemic to the country.

The economic importance of Colombian palms has been recognized since the times of the first explorers (Patiño 1985 for references), and has gained increasing attention in the last decades.

But despite this richness, diversity, and economic importance, Colombian palm flora remains very poorly known, and

detailed floristic treatments (Galeano and Bernal 1987) or generic monographs (Balick 1986, Henderson, unpubl.; Skov and Balslev, unpubl.) are just beginning to appear.

Colombian natural vegetation has been greatly modified by man, particularly in the Andean region. As a consequence, many species of plants have become very rare (Fernández-Pérez 1977) or threatened. This is particularly true for palms, which, as pointed out by Moore (1977), have three disadvantages: they have a single growing point; they are widely used by man; and usually they are not very successful in disturbed habitats.

Many species of palms have been described from the Andean mountains and interandean valleys of Colombia, and therefore they are likely to be somehow threatened. Nevertheless, the poor knowledge of many genera, and the lack of extensive field work in search of palms, have made it impossible in the past to assess their degree of threat. Actually, no work has ever been published on the conservation status of Colombian palms. Moore (1977), based on his own field experience in Colombia, pointed out some species that he considered endangered or vulnerable. Galeano and Bernal (1984) made a short review of the endangerment of *Ceroxylon* species; and Ruiz (1984) pointed out the endangerment faced by *Attalea victoriana*.

An indication of our scarce knowledge on this subject is the fact that by September 1986, the Threatened Plants Unit's database at Kew Gardens listed 250 species

of palms occurring in Colombia, of which 215 (86%) were treated as unknown, that is, no information on their conservation status was available.

Extensive field work with palms in Colombia for the last eight years, mostly in the Andean region, has provided the opportunity to gather very valuable information on the distribution and conservation status of Colombian palms, besides the understanding of the identity of the palms themselves. This information is the main body of this work, but information from other sources has also been taken, when available.

A dramatic example of the urgent need of field work to refine our information on this matter is the fact that, based on available data, several Colombian palms were listed as endangered at the TPU's database by 1986, or by Johnson (1986). Our current knowledge, however, shows that several of these species must be transferred from the "Endangered" category, some of them, surprisingly, to the "not threatened" category. This is due to the fact that recent exploration in the Pacific lowlands, where most of the referred species grow, has revealed that they are not so restricted and uncommon as formerly thought.

Geographic Areas

For the purpose of assessing endangerment of Colombian palms, I have divided the country into seven geographic areas (Fig. 1): The Amazon Region, and the Llanos, both located east of the Andes, and roughly separated by Río Guaviare; the three Andean Cordilleras; the interandean valleys of Río Cauca and Río Magdalena; the Pacific Region, west of the Andes; the Northern Plain, north of the Andes; and the isolated Sierra Nevada de Santa Marta. Most of the Llanos and the Amazon Region, the eastern slopes of the Eastern Cordillera, as well as most of the Pacific Region, including the western slopes of the West-

ern Cordillera, are largely undisturbed, and it is in those areas that most of the species I consider not threatened grow. The Sierra Nevada de Santa Marta still has large forested areas, but the status of its palms is poorly known. It is on the Cordilleras, along the Río Cauca and Río Magdalena valleys, and on the Northern Plain, that natural vegetation has been most severely changed, and it is there that most of the threatened palm species occur.

National Parks

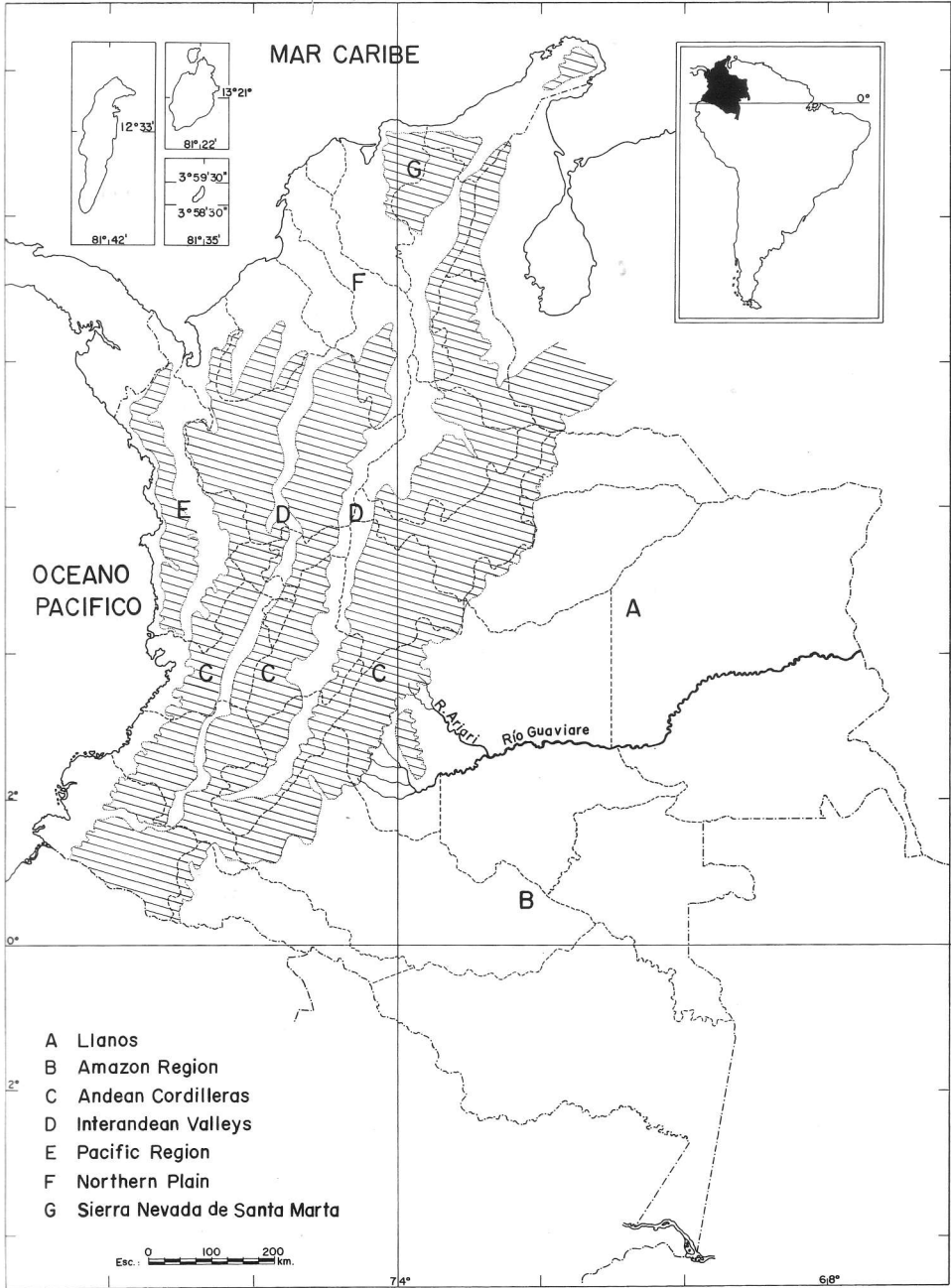
The Colombian system of national parks comprises 32 parks (Fig. 2), with a total area of 48,105 km², that is, 4.3% of the country's area (Anonymous 1984). All of these areas are controlled by INDERENA, the national institute for natural resources and environment. Although most climates and vegetational formations are represented within this system of national parks, at least four important areas are not covered in any park. They are: central Chocó, which has been considered the world's rainiest region; the northernmost region of the Central Cordillera; the Río Magdalena valley; and the Río Negro basin, in the Amazon Region. All of these areas have a number of endemic palms, and of many other plants as well.

Two other small, private reservations are worth mentioning. They are: La Planada Reservation, in Departamento de Nariño; and Finca Meremberg, in Departamento del Huila. They are both located in southwestern Colombia.

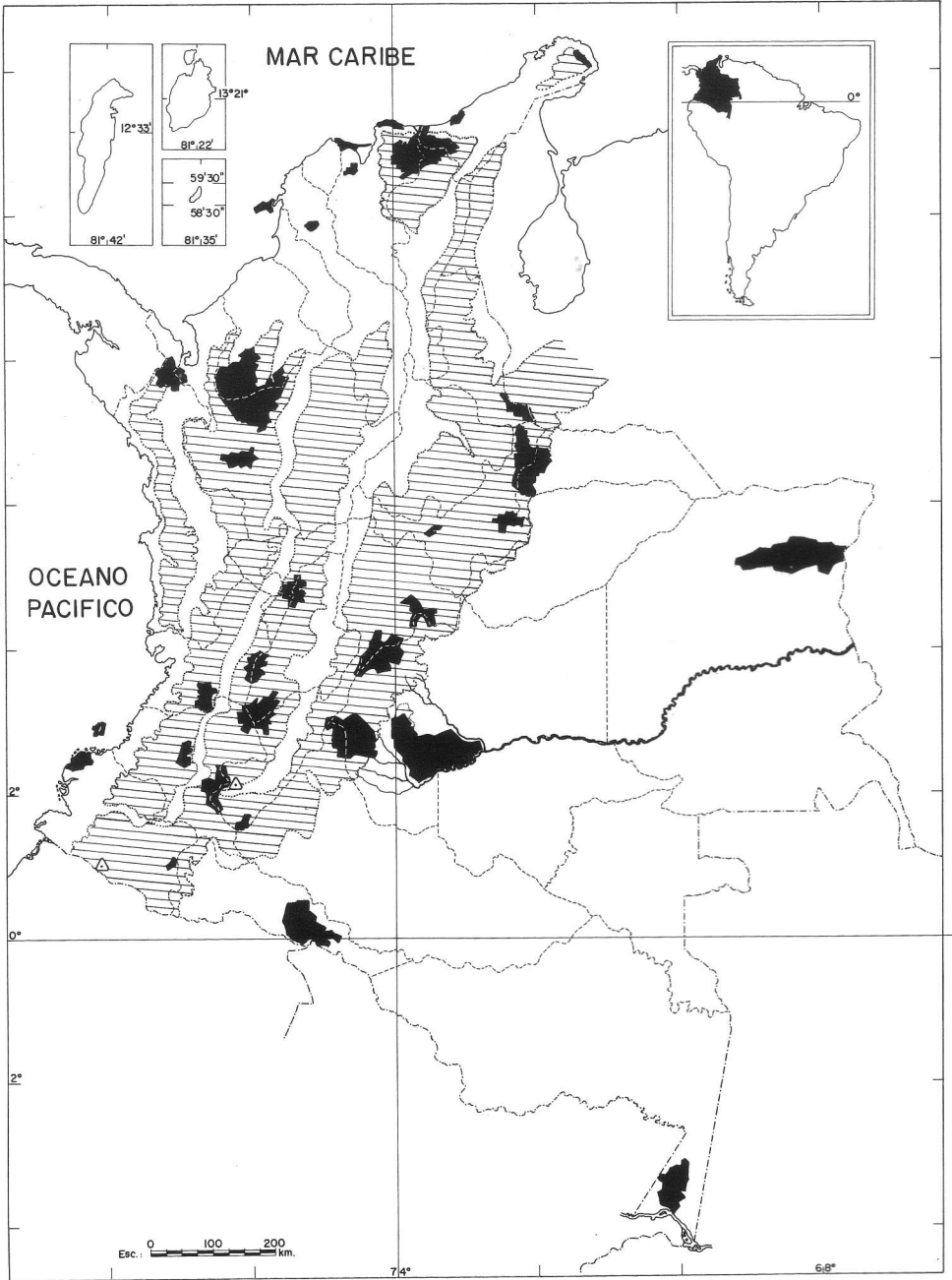
Although palms grow in most of these protected areas, no information exists either on the species found on each of them, or on their conservation status there. Because of this, the occurrence of a species in a national park or a private reservation has not been taken into account to alter the category assigned to that species.

Conservation Status

I have assigned each of the 261 palm species I presently recognize from Colom-



1. Major geographic areas of Colombia.



2. National Parks and private reservations in Colombia.

Table 1. Status of Colombian Palms. Figures presented in this paper, contrasted with those at the TPU's database by September 1986.

Category	TPU 1986	Bernal 1987
Endangered	13	22
Vulnerable	9	17
Rare	0	18
Indeterminate	1	0
Insuff. known	220	121
Not threatened	7	80
Cultivated	—	3
Total	250	261

bia to one of the Red Data Book categories "Endangered," "Vulnerable," "Rare," "Insufficiently known," or "not threatened," as defined by IUCN (Anonymous 1980). So far, no Colombian palm is known to have become extinct. Under the "Insufficiently known" category I have included those species recorded from areas that have been so poorly studied for palms, that it is possible that they are actually not threatened, as is the case for many species of the Amazon Region. Thus, my "Insufficiently known" includes those species usually treated as "Unknown," and marked with a query.

Table 2. Endangered palms in Colombia.

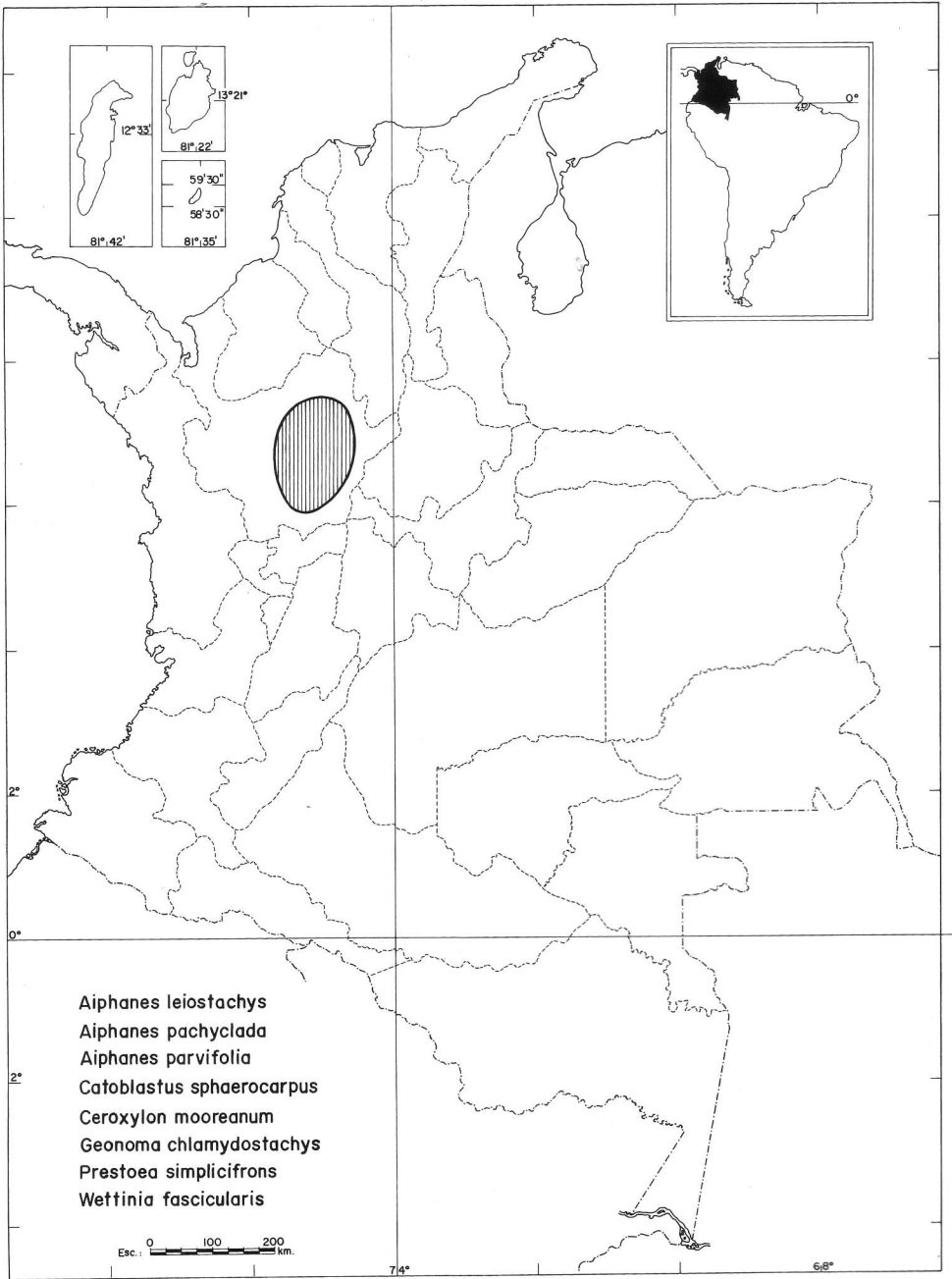
Endemic	Non-endemic
<i>Aiphanes leiostachys</i> Burret	<i>Attalea colenda</i> (O. F. Cook) Balslev & Henderson
<i>Aiphanes pachyclada</i> Burret	<i>Ceroxylon alpinum</i> Bonpl. ex DC
<i>Aiphanes parvifolia</i> Burret	<i>Ceroxylon sclerophyllum</i> Dugand
<i>Attalea victoriana</i> Dugand	<i>Ceroxylon vogelianum</i> (Engel) H. A. Wendl.
<i>Catoblastus andinus</i> Dugand	<i>Geonoma solitaria</i> (Engel) Jahn
<i>Catoblastus microcarpus</i> Burret	<i>Phytelephas pittieri</i> O. F. Cook
<i>Catoblastus sphaerocarpus</i> (Burret) Burret	<i>Reinhardtia koschnyana</i> (H. A. Wendl.) Drude ex Dammer
<i>Ceroxylon mooreanum</i> Galeano & Bernal	<i>Syagrus sancona</i> Karsten
<i>Cryosophila kalbreyeri</i> (Dammer ex Burret) Dahlgren	
<i>Geonoma chlamydostachys</i> G. Galeano	
<i>Phytelephas karstenii</i> O. F. Cook	
<i>Phytelephas tumacana</i> O. F. Cook	
<i>Prestoea simplicifrons</i> (Burret) DeNevers & Henderson	
<i>Wettinia fascicularis</i> (Burret) Moore & Dransfield	

According to my estimate, 22 species of Colombian palms are endangered, 17 species are vulnerable, 18 species are rare, 121 species are insufficiently known, and 80 species are not threatened. Table 1 shows these figures, contrasted with those at the TPU's database by September 1986. This shows clearly how much our knowledge has progressed, but how large the gaps in our knowledge are as yet. In the following account, reasons will be given for the inclusion of every species in the "Endangered" category, followed by annotated lists of the species included in the remaining categories.

Endangered Species

"Taxa in danger of extinction, and whose survival is unlikely if the causal factors continue operating. Included are taxa whose numbers have been reduced to a critical level or whose habitats have been so drastically reduced that they are deemed to be in immediate danger of extinction" (Anonymous 1980).

There are 22 Colombian species of palms that I consider to fall in this category (Table 2). Fourteen of the species are endemic to Colombia, and therefore they are also endangered at the world level. Eight species



3. Distribution of some endangered palms endemic to Colombia.

are non-endemic. I will treat the species of each group separately.

Endemic Species

Aiphanes leiostachys

An understory palm, known only from a very restricted area at the north of the Central Cordillera, in Antioquia (Fig. 3), in a largely deforested area. Unlikely to occur in any national park. Apparently a well-defined species.

Aiphanes pachyclada

An understory palm 2 meters tall, known only from two collections in a small area in the Central Cordillera in Antioquia (Fig. 3), where forest has disappeared to a great extent, and is still being actively destroyed. It does not regenerate in open areas, and it has not been found elsewhere in Colombia. Unlikely to occur in any national park. Apparently a well-defined species.

Aiphanes parvifolia

Also an understory palm, known only from two collections in the same area as *A. pachyclada* (Fig. 3). Unlikely to occur in any national park. Apparently a well-defined species.

Attalea victoriana

A stemless palm endemic to the Río Cauca basin, from South Antioquia to north of Valle, up to 1,600 m of altitude (Fig. 4). Most of its range now converted into agriculture, and the palm very scarce, usually with very small populations. Cultivated in gardens in some towns. Indicated as a promising species for its oily seeds (Ruiz 1984). Unlikely to occur in any national park. Probably conspecific with *A. rhynchocarpa* Burret, of the same area, but this does not alter its status.

Catoblastus andinus

A slender palm 6 m tall, known only from two close localities on the Eastern Cordi-

llera in Boyacá and Santander (Fig. 5). Locally abundant in a very small area, not seen further to the north. Does not regenerate in open areas. The stems are cut for use in fence construction. Might be in El Cocuy National Park, but not actually reported so far. Apparently a well-defined species.

Catoblastus microcarpus

A tall palm with distichous leaves. Fairly common in a small remnant forest patch near the type locality (Fig. 4), where forest has almost completely disappeared. A population southeast of this one, at the border of Tamá National Park, apparently the same species, but also very restricted. Does not regenerate in open areas. Apparently well-defined.

Catoblastus sphaerocarpus

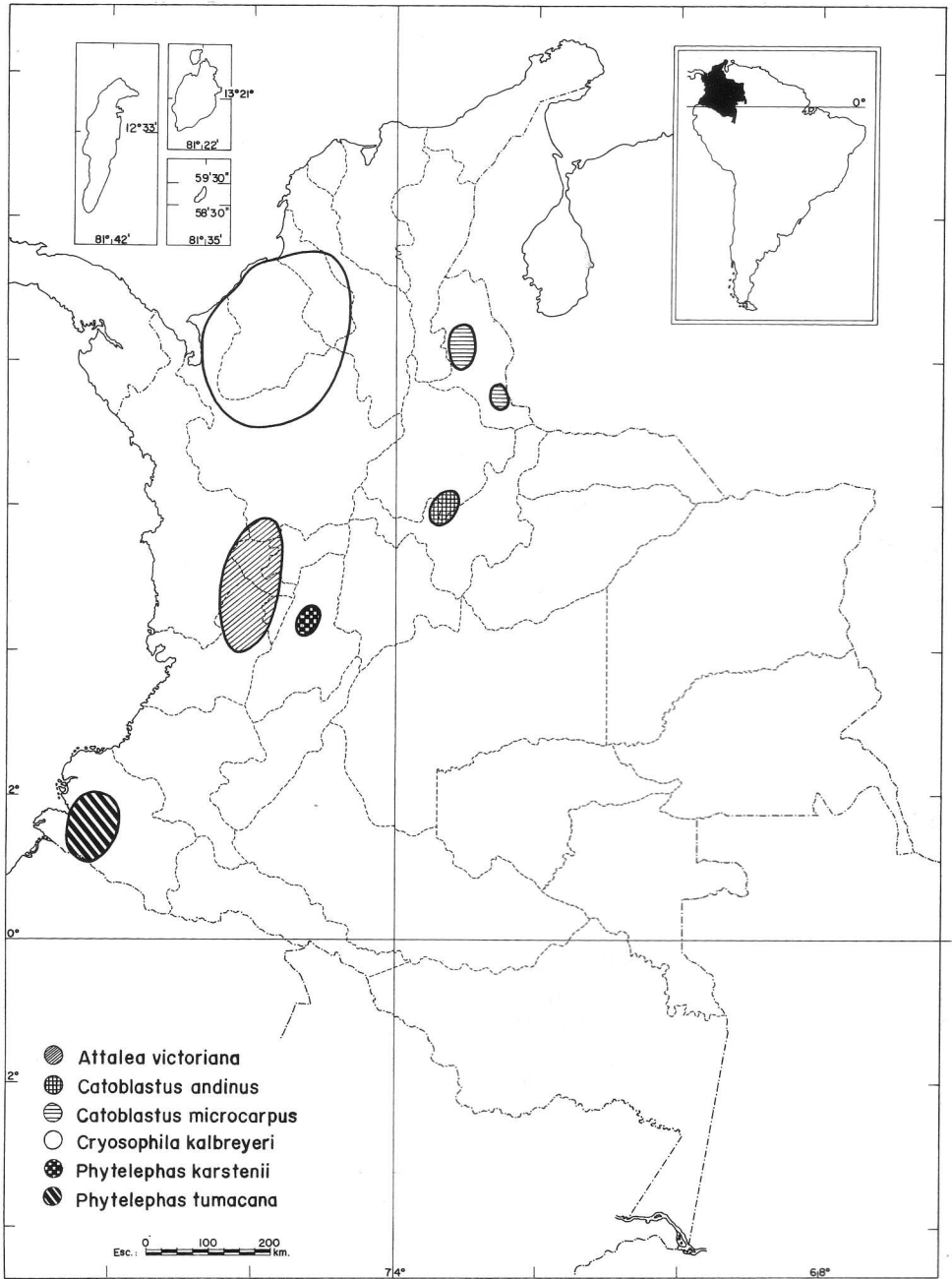
A tall forest palm known only from two localities on the Central Cordillera in Antioquia (Fig. 3), where forest has mostly disappeared. Not found elsewhere. First collected in 1880; the area where it was rediscovered in 1980 has been greatly destroyed after the construction of a new highway between the country's two largest cities. Does not regenerate in open areas. Unlikely to occur in any national park. Apparently well-defined.

Ceroxylon mooreanum

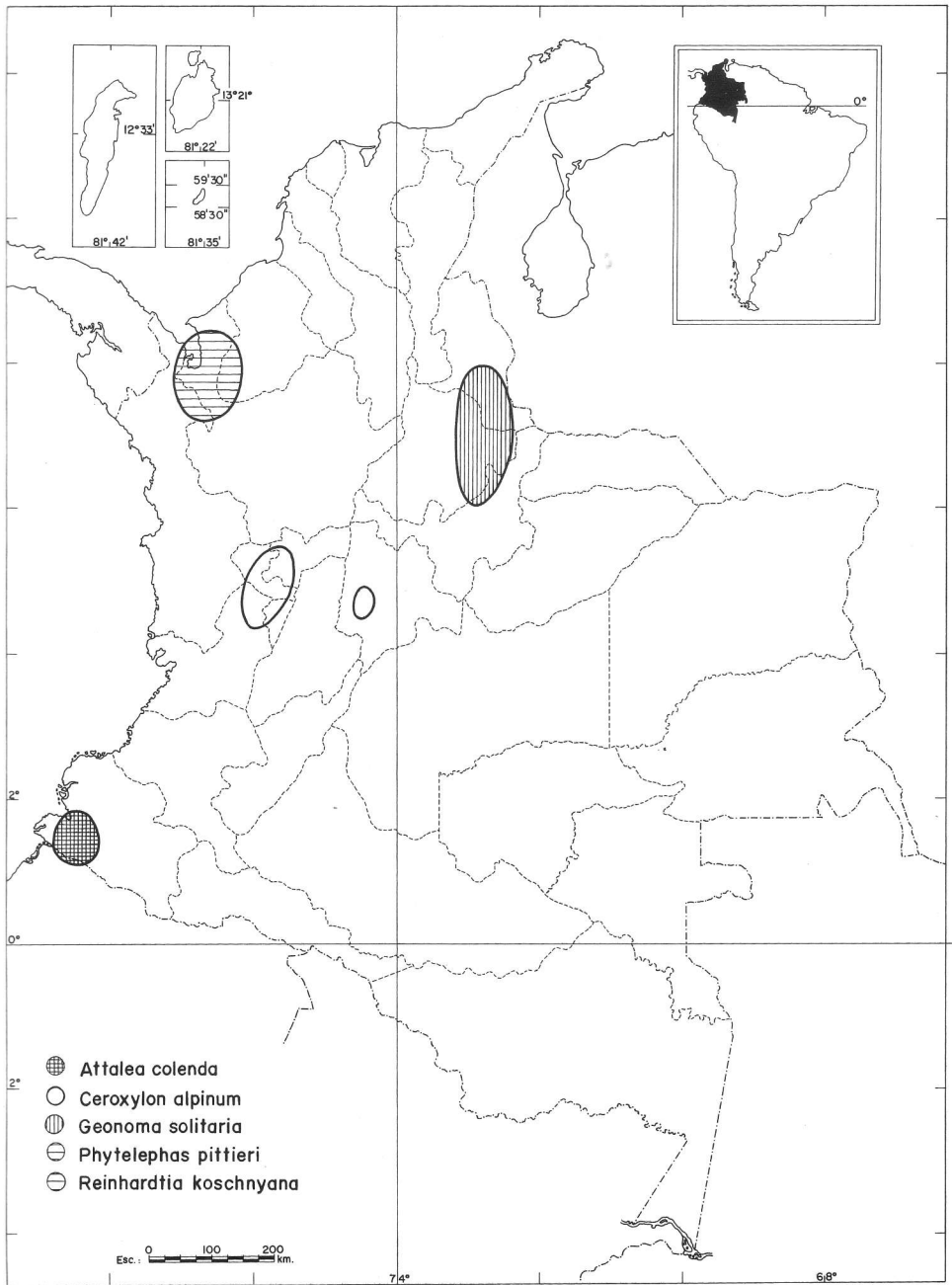
Known only from five individuals, all of them cultivated, but said to have been brought from nearby mountains on the Central Cordillera in Antioquia (Fig. 3), where no adults were seen. Dioecious. Two of the trees are isolated males.

Cryosophila kalbreyeri

Known only from a few localities in north-western Colombia (Fig. 4), usually in small populations. All areas where it has been found have been deforested or are under threat. No seedlings ever seen in open



4. Distribution of some endangered palms endemic to Colombia.



5. Distribution of some endangered non-endemic palms in Colombia.

areas. Might be in the northern lowlands of Paramillo National Park, but so far not actually reported. Leaves much appreciated for broom-making. Probably conspecific with *C. albida* Bartlett, from eastern Panama.

Geonoma chlamydostachys

First collected as late as 1981, this small understory palm has been found only in the wet forests of the middle Río Magdalena (Fig. 3), where forest destruction has increased after the construction of a highway connecting the country's two largest cities. Like most understory species of *Geonoma*, it probably does not regenerate in open areas. Unlikely to occur in any national park. It could become extinct very soon.

Phytelephas karstenii

Restricted to a very small area near Rovira, Departamento del Tolima (Fig. 4), where some 20 individuals were found in a coffee plantation in 1987 (G. Galeano, pers. comm.). It is said that there are other individuals on another farm. Unlike other species of *Phytelephas*, this one was not seen growing in open areas. Not found in any national park. If this species is different from the one that grows further to the north in the Río Magdalena valley, which seems to be the case (A. Barfod, pers. comm. to G. Galeano), then it is in immediate danger of extinction.

Phytelephas tumacana

Apparently restricted to a small area in Departamento de Nariño (Fig. 4), near the Ecuadorean border, where forest is being replaced by African oil palms. Not reported farther to the north in Nariño or Cauca departments, or to the south in Ecuador. Probably in no national park. Formerly exploited for the vegetable ivory of its seeds. A well-defined species.

Prestoea simplicifrons

Known only from the type locality (Fig. 3), where it was collected in 1880 and rediscovered in 1985. Forest has been almost completely destroyed, and the palm does not regenerate in open areas. Not common in the remnant forest patches. Not found in any national park. In immediate danger of extinction. A well-defined species.

Wettinia fascicularis

Known only from a few localities at the northern end of the Central Cordillera in Departamento de Antioquia (Fig. 3), in remnant forest patches and semi-open areas, where seedlings do not seem to develop into adults. Apparently in no national park. A well-defined species.

It must be stressed that eight of these endangered species (Fig. 3) are endemic to a small area at the northern end of the Central Cordillera in Antioquia, where forest has mostly disappeared or is currently being destroyed. None of them regenerates in open areas. The region is far away from any national park, and there seems to be no definite protection for any of them. The understory species, particularly the species of *Aiphanes* and *Prestoea simplicifrons*, might become extinct very soon.

Only two of the fourteen endangered endemic species are cultivated, both of them as ornamentals: *Attalea victoriana*, and *Ceroxylon mooreanum*. Other species deserve cultivation.

At least one half of these endangered species are known to be useful to man in different ways, and one of them, *Attalea victoriana*, is an oil-yielding plant.

Non-endemic Species

Attalea colenda

Known only from a small area in Nariño (Fig. 5), where forest is being actively destroyed to establish oil-palm plantations.

Table 3. *Vulnerable palms in Colombia.*

Endemic	Non-endemic
<i>Aiphanes lindeniana</i> (H. A. Wendl.) H. A. Wendl.	<i>Bactris pilosa</i> Karsten
<i>Aiphanes linearis</i> Burret	<i>Ceroxylon quindiuense</i> (Karst.) H. A. Wendl.
<i>Aiphanes simplex</i> Burret	<i>Chamaedorea pinnatifrons</i> (Jacq.) Oerst.
<i>Astrocaryum malybo</i> Karsten	<i>Elaeis oleifera</i> (Kunth) Cortés
<i>Astrocaryum triandrum</i> Galeano, Bernal & Kahn	<i>Geonoma lehmannii</i> Dammer ex Burret
<i>Catoblastus distichus</i> R. Bernal	<i>Geonoma lindeniana</i> H. A. Wendl.
<i>Catoblastus megalocarpus</i> (Burret) Burret	<i>Geonoma marggraffia</i> Engel
<i>Euterpe cuatrecasana</i> Dugand	
<i>Prestoea dasystachys</i> (Burret) Bernal, Galeano & Henderson	
<i>Wettinia hirsuta</i> Burret	

Now uncommon, most individuals left in pastures. Not found in national parks. Does not grow north of this area, but is quite abundant in western Ecuador. An important oil-yielding palm (Cook 1942, Acosta-Solís 1971, Patiño 1977, Balslev and Henderson 1987).

Ceroxylon alpinum

In Colombia now restricted to very small populations, usually of scattered individuals, in a small area on the drainages of Río Cauca and Río Magdalena (Fig. 5), between 1,300 and 2,000 m of elevation, mostly in areas of coffee plantations, where it does not regenerate (Moore and Anderson 1976). Dioecious. Considered endangered by Moore (1977). Probably in Los Nevados National Park, but not actually reported so far. Probably also in Venezuela and Ecuador, but identifications requiring confirmation. A well-defined species.

Ceroxylon sclerophyllum

Widespread from Venezuela to Peru (G. Galeano, pers. comm.). In Colombia it is found from Norte de Santander to Nariño, seldom in large populations, mostly scattered individuals, usually in altered areas, with no regeneration. Unexpanded leaves are cut for Palm Sunday ceremonies, which sometimes requires felling the tree. Dioecious. Grows in the National Parks of Tamá and Farallones de Cali. Probably conspecific with *C. parvifrons* (Engel) H. A. Wendl. (G. Galeano, pers. comm.).

Ceroxylon vogelianum

Widespread from Venezuela to Peru, but always extremely uncommon, even in undisturbed areas. Forest has been destroyed throughout a large part of its range in Colombia. Unexpanded leaves are cut for Palm Sunday ceremonies, trees

Table 4. *Rare palms in Colombia.*

Endemic	Non-endemic
<i>Aiphanes acaulis</i> Galeano & Bernal	<i>Ammandra decasperma</i> O. F. Cook
<i>Ceroxylon schultzei</i> Burret	<i>Bactris coloniata</i> L. H. Bailey
<i>Chamaedorea murriensis</i> G. Galeano	<i>Bactris paula</i> L. H. Bailey
<i>Chelyocarpus dianeurus</i> (Burret) H. E. Moore	<i>Chamaedorea deckeriana</i> (Klotzsch) Hemsl.
<i>Desmoncus cirrhiperus</i> Gentry & Zardini	<i>Geonoma procumbens</i> H. A. Wendl. ex Spruce
<i>Geonoma divisa</i> H. E. Moore	<i>Geonoma triandra</i> (Burret) W. Boer
<i>Oenocarpus circumtextus</i> Mart.	<i>Reinhardtia gracilis</i> (H. A. Wendl.) Drude ex Dammer
<i>Orbignya cuatrecasana</i> Dugand	<i>Synechanthus warscewiczianus</i> H. A. Wendl.
<i>Phytelephas schottii</i> H. A. Wendl.	<i>Wettinia oxycarpa</i> Galeano & Bernal

Table 5. *Insufficiently known palms in Colombia.*

Endemic	
<i>Aiphanes duquei</i> Burret	<i>Chamaedorea latisecta</i> (H. E. Moore) A. Gentry
<i>Aiphanes erinacea</i> (Karst.) H. A. Wendl.	<i>Chamaedorea</i> sp. (<i>Morenia corallina</i> Karsten)
<i>Aiphanes fosteriorum</i> H. E. Moore	<i>Chamaedorea</i> sp. (<i>Morenia lindeniana</i> H. A. Wendl.)
<i>Aiphanes gelatinosa</i> H. E. Moore	<i>Chamaedorea</i> sp. (<i>Morenia</i> cf. <i>macrocarpa</i> Burret)
<i>Aiphanes hirsuta</i> Burret	<i>Chamaedorea</i> sp. (<i>Morenia montana</i> (H. & B.) Burret)
<i>Aiphanes killipii</i> (Burret) Burret	<i>Chamaedorea</i> sp. (<i>Morenia robusta</i> Burret)
<i>Astrocaryum cuatrecasatum</i> Dugand	<i>Euterpe andina</i> Burret
<i>Attalea amygdalina</i> Kunth	<i>Euterpe aphanolepis</i> Burret
<i>Attalea rhynchocarpa</i> Burret	<i>Euterpe brevicaulis</i> Burret
<i>Attalea septuagenata</i> Dugand	<i>Euterpe frigida</i> (Kunth) Burret
<i>Attalea uberrima</i> Dugand	<i>Euterpe oocarpa</i> Burret
<i>Bactris cuvaro</i> Karsten	<i>Euterpe parviflora</i> Burret
<i>Bactris duplex</i> H. E. Moore	<i>Euterpe rhodoxyla</i> Dugand
<i>Bactris kalbreyeri</i> Burret	<i>Euterpe zephyria</i> Dugand
<i>Bactris macrotricha</i> Burret	<i>Geonoma dicranospadix</i> Burret
<i>Bactris obovata</i> Burret	<i>Geonoma paradoxa</i> Burret
<i>Bactris santae-paulae</i> Engel	<i>Hyospathe pallida</i> H. E. Moore
<i>Catoblastus anomalus</i> (Burret) Burret	<i>Hyospathe simplex</i> Burret
<i>Catoblastus cuatrecasatii</i> Dugand	<i>Hyospathe wendlandiana</i> Dammer ex Burret
<i>Catoblastus engelii</i> H. A. Wendl. ex Burret	<i>Phytelephas dasyneura</i> Burret
<i>Catoblastus inconstans</i> Dugand	<i>Prestoea cuatrecasatii</i> H. E. Moore
<i>Catoblastus kalbreyeri</i> (Burret) Burret	<i>Prestoea pubens</i> H. E. Moore
<i>Catoblastus velutinus</i> Burret	<i>Scheelea humboldtiana</i> (Spruce) Burret
<i>Chamaedorea columbica</i> Burret	
<i>Chamaedorea dryanderiae</i> Burret	
<i>Chamaedorea kalbreyeriana</i> H. Wendl. ex Burret	
Non-endemic	
<i>Acoelorrhaphe wrightii</i> (Griseb & H. A. Wendl.) H. A. Wendl. ex Becc.	<i>Desmoncus tenerimus</i> (Mart. ex Drude) Mart. ex Burret
<i>Aiphanes orinocensis</i> Burret	<i>Desmoncus vacivus</i> L. H. Bailey
<i>Bactris amoena</i> Burret	<i>Euterpe catinga</i> Wallace
<i>Bactris aristata</i> Mart.	<i>Euterpe karsteniana</i> Engel
<i>Bactris caribaea</i> Karsten	<i>Euterpe oleracea</i> Mart.
<i>Bactris chaetospatha</i> Mart.	<i>Euterpe purpurea</i> Engel
<i>Bactris cuspidata</i> Mart.	<i>Geonoma</i> aff. <i>appuniana</i> Spruce
<i>Bactris fissifrons</i> Mart.	<i>Geonoma densa</i> Linden & H. A. Wendl. ex H. A. Wendl.
<i>Bactris granatensis</i> (Karsten) H. A. Wendl.	<i>Geonoma heinrichsiae</i> Burret
<i>Bactris hirta</i> Mart.	<i>Geonoma helminthoclada</i> Burret
<i>Bactris humilis</i> (Wallace) Burret	<i>Geonoma interrupta</i> (R. & P.) Mart.
<i>Bactris lakoi</i> Burret	<i>Geonoma jussieuana</i> Mart.
<i>Bactris leptospadix</i> Burret	<i>Geonoma pachydicrana</i> Burret
<i>Bactris macana</i> (Mart.) Pittier	<i>Geonoma pinnatifrons</i> Willd.
<i>Bactris piritu</i> (Karsten) H. A. Wendl.	<i>Geonoma pulcherrima</i> Burret
<i>Bactris riparia</i> Mart.	<i>Geonoma pulchra</i> Engel
<i>Bactris schultesii</i> (L. H. Bailey) Glassman	<i>Geonoma seleri</i> Burret
<i>Calyptrogyne ghiesbreghtiana</i> (Linden & H. A. Wendl.) H. A. Wendl.	<i>Geonoma sodiroi</i> Dammer ex Burret
<i>Chamaedorea bartlingiana</i> H. A. Wendl.	<i>Geonoma spinescens</i> H. A. Wendl. ex Burret
<i>Chamaedorea geomiformis</i> H. A. Wendl.	<i>Geonoma triglochis</i> Burret
<i>Chamaedorea linearia</i> L. H. Bailey	<i>Geonoma weberbaueri</i> Dammer ex Burret
<i>Chamaedorea pauciflora</i> Mart.	<i>Hyospathe concinna</i> H. E. Moore
<i>Chamaedorea pygmaea</i> H. A. Wendl.	<i>Hyospathe lehmannii</i> Burret
<i>Coccothrinax jamaicensis</i> R. W. Read	<i>Leopoldinia major</i> Wallace

Table 5. Continued.

Leopoldinia piassaba Wallace
Leopoldinia pulchra Mart.
Lepidocaryum casiquirense (Spruce) Drude
Lepidocaryum guainiense (Spruce) Spruce ex
 Drude
Lepidocaryum tenue Mart.
Lepidocaryum tessmannii Burret
Manicaria atricha Burret
Manicaria martiana Burret
Mauritia carana Wallace
Mauritiella aculeata (Kunth) Burret
Mauritiella cataractarum Dugand
Mauritiella martiana (Spruce) Burret
Mauritiella subinermis (Spruce) Burret

Orbignya luetzelburgii Burret
Pholidostachys pulchra H. A. Wendl. ex Burret
Pholidostachys synanthera (Mart.) H. E. Moore
Prestoea brachyclada (Burret) Bernal, Galeano &
 Henderson
Prestoea latisecta (Burret) Bernal, Galeano & Hen-
 derson
Scheelea insignis (Mart.) Karsten
Socratea rostrata Burret
Syagrus inajai (Spruce) Becc.
Syagrus orinocensis (Spruce) Burret
Wettinia maynensis Spruce
Wettinia verruculosa H. E. Moore

often being felled. Dioecious. Grows in El Cocuy National Park, and probably also in Tamá.

Geonoma solitaria

Restricted to a small area of highlands on the Eastern Cordillera, from Norte de Santander to Boyacá (Fig. 5). Named "*solitaria*" by Engel (1865), who saw only one individual at the type locality, and failed to find any other during his travel in the country. Uncommon, most areas now deforested or threatened. Often left in open areas, but seedlings were not seen. Grows in Tamá National Park, and probably also in El Cocuy. Probably also in Venezuela, just across the Colombian border.

Phytelephas pittieri

Grows in a small area in northwestern Colombia, in Antioquia, Chocó, and Córdoba (Fig. 5). Locally abundant at some places, but all forest there being rapidly destroyed. Sometimes left in pastures, but apparently with no regeneration. Dioecious. Grows also in Panama.

Reinhardtia koschnyana

A dwarf understory palm, formerly very abundant in the forests of the Urabá region in Antioquia (Fig. 5), one of the areas of fastest forest destruction in the country, and a center of agricultural development.

Does not thrive outside the forest. Apparently in no national park. Ranges from Nicaragua to Colombia, and is considered also endangered in Costa Rica and Panama (Johnson 1986). In immediate danger of extinction.

Syagrus sancona

Grows in several areas of Colombia, most of them now converted into pastures or agriculture, where the conserved palms do not regenerate. Usually uncommon throughout its range. Considered endangered by Moore (1977). Grows in Reserva Nacional Natural La Macarena, but certainly not protected there. Widely distributed in northwestern South America.

Vulnerable Species

"Taxa believed likely to move into the Endangered category in the near future if the causal factors continue operating. Included are taxa of which most or all the populations are decreasing because of over-exploitation, extensive destruction of habitat or other environmental disturbance; taxa with populations that have been seriously depleted and whose ultimate security is not yet assured; and taxa with populations that are still abundant but are under threat from serious adverse factors throughout their range" (Anonymous 1980).

Table 6. *Not-threatened palms in Colombia.*

Endemic	
<i>Acrocomia antioquiensis</i> Posada-Arango	<i>Geonoma chococola</i> W. Boer
<i>Aiphanes concinna</i> H. E. Moore	<i>Lepidocaryum allenii</i> Dugand
<i>Aiphanes kalbreyeri</i> Burret	<i>Prestoea simplicifolia</i> G. Galeano
<i>Aiphanes monostachys</i> Burret	<i>Scheelea attaleoides</i> Karsten
<i>Attalea nucifera</i> Karsten	<i>Scheelea butyracea</i> (Mutis ex L. f.) Karsten ex H. A. Wendl.
<i>Catoblastus pubescens</i> (Karsten) H. A. Wendl.	<i>Scheelea excelsa</i> Karsten
<i>Catoblastus radiatus</i> (Cook & Doyle) Burret	<i>Syagrus allenii</i> Glassman
<i>Euterpe kalbreyeri</i> Burret	<i>Wettinia castanea</i> Moore & Dransfield
<i>Geonoma calyptrogynoides</i> Burret	
Non-endemic	
<i>Aiphanes macroloba</i> Burret	<i>Geonoma euspatha</i> Burret
<i>Asterogyne martiana</i> (H. A. Wendl.) H. A. Wendl. ex Hemsl.	<i>Geonoma juruana</i> Dammer
<i>Astrocaryum acaule</i> Mart.	<i>Geonoma laxiflora</i> Mart.
<i>Astrocaryum chambira</i> Burret	<i>Geonoma leptospadix</i> Trail
<i>Astrocaryum jauari</i> Mart.	<i>Geonoma macrostachys</i> Mart.
<i>Astrocaryum macrocalyx</i> Burret	<i>Geonoma maxima</i> (Poit.) Kunth
<i>Astrocaryum standleyanum</i> L. H. Bailey	<i>Geonoma oxycarpa</i> Mart.
<i>Attalea allenii</i> H. E. Moore	<i>Geonoma piscicauda</i> Dammer
<i>Attalea ferruginea</i> Burret	<i>Geonoma pycnostachys</i> Mart.
<i>Bactris balanophora</i> Spruce	<i>Geonoma undata</i> Klotzsch
<i>Bactris barronis</i> L. H. Bailey	<i>Hyospathe elegans</i> Mart.
<i>Bactris coloradonis</i> L. H. Bailey	<i>Jessenia bataua</i> (Mart.) Burret
<i>Bactris concinna</i> Mart.	<i>Iriartea deltoidea</i> R. & P.
<i>Bactris guineensis</i> (L.) H. E. Moore	<i>Iriartella setigera</i> (Mart.) H. A. Wendl.
<i>Bactris major</i> Jacq.	<i>Lepidocaryum gracile</i> Mart.
<i>Bactris maraja</i> Mart.	<i>Manicaria saccifera</i> Gaertn.
<i>Bactris monticola</i> Barb. Rodr.	<i>Mauritia flexuosa</i> L. f.
<i>Bactris sigmoidea</i> Burret	<i>Mauritiella macroclada</i> (Burret) Burret
<i>Bactris simplicifrons</i> Mart.	<i>Maximiliana maripa</i> (Correa de Serra) Drude
<i>Catoblastus aequalis</i> (Cook & Doyle) Burret	<i>Oenocarpus bacaba</i> Mart.
<i>Catoblastus drudei</i> Cook & Doyle	<i>Oenocarpus mapora</i> Karsten
<i>Chamaedorea integrifolia</i> (Trail) Dammer	<i>Pholidostachys dactyloides</i> H. E. Moore
<i>Chamaedorea lanceolata</i> (R. & P.) Kunth	<i>Prestoea decurrens</i> (H. A. Wendl. ex Burret) H. E. Moore
<i>Copernicia tectorum</i> (Kunth) Mart.	<i>Raphia taedigera</i> (Mart.) Mart.
<i>Desmoncus orthacanthos</i> Mart.	<i>Sabal mauritiiiformis</i> (Karsten) Griseb. & H. A. Wendl. ex Griseb.
<i>Dictyocaryum lamarckianum</i> (Mart.) H. A. Wendl.	<i>Socratea exorrhiza</i> (Mart.) H. A. Wendl.
<i>Euterpe precatória</i> Mart.	<i>Socratea hecatonandra</i> (Dugand) R. Bernal
<i>Geonoma acaulis</i> Mart.	<i>Socratea montana</i> Bernal & Henderson
<i>Geonoma brongniartii</i> Mart.	<i>Welfia regia</i> H. A. Wendl. ex André
<i>Geonoma camana</i> Trail	<i>Wettinia cladospadix</i> (Dugand) Moore & Dransfield
<i>Geonoma cuneata</i> H. A. Wendl. ex Spruce	<i>Wettinia quinaria</i> (Cook & Doyle) Burret
<i>Geonoma deversa</i> (Poit.) Kunth	

There are 17 Colombian palm species currently recognized to be vulnerable (Table 3), 10 of which are endemic to the country. All of these species grow on the Andean Cordilleras or in the valley of Río Mag-

dalena, but *Euterpe cuatrecasana* grows also in the Pacific lowlands, and *Bactris pilosa* and *Elaeis oleifera* grow also in the Northern Plain. While for most species the main threat is habitat destruction, the major

threat for *Euterpe cuatrecasana* is the large-scale destruction of its populations for the industrial production of palm heart.

At least 8 of these vulnerable species are useful to man.

Rare Species

"Taxa with small world populations that are not at present endangered or vulnerable but are at risk. These taxa are usually localized within restricted geographical areas or habitats or are thinly scattered over a more extensive range" (Anonymous 1980).

There are 18 Colombian palms that are not under apparent immediate threat, but which are not very common or widespread. They must be considered rare (Table 4). Eight of them are endemic to Colombia. All but two of the species known to be rare grow in the Pacific lowlands or on the western slopes of the Western Cordillera. One species, *Ceroxylon schultzei*, appears to be endemic to the Sierra Nevada de Santa Marta, and another, *Phytelephas schottii*, is quite common in a very small area on the Eastern Cordillera, where it seems to be out of immediate threat. *Oenocarpus circumtextus* is a poorly known taxon that was proposed as an endangered species by Moore in 1980 (Johnson 1986), and maintained in that category at the TPU's database at Kew. However, according to I. S. Turner, of Harare, Zimbabwe (pers. comm.), who visited La Pedrera (the only known locality) in 1983, and collected seeds and photographed the palm, it is not in danger, since there is no threat over the lonely area, the soil being too rocky for agriculture. Therefore, I am treating this species as rare.

Insufficiently Known Species

There are 121 species of Colombian palms that are either very poorly known, or whose range, frequency, and potential or actual threats are not known. All of

these palms have been included under the "Insufficiently known" category (Table 5). This figure represents 46% of all palms known to occur in Colombia, and it shows the great need of further field work for palms in this country. Fifty one of these species are endemic to Colombia. It is possible that a number of these palms, particularly those growing in the Amazon Region, could turn out to be not threatened, but, on the other hand, it is very probable that many of the insufficiently known species from the Andean region, most of which are endemic, will be found to be vulnerable or endangered.

Not-Threatened Species

There are 80 species of Colombian palms that I consider to be not threatened (Table 6), 17 of which are endemic. The not-threatened species fall into two groups: most species are considered to be not threatened because they are quite abundant and widespread over a large area of rather undisturbed vegetation, mostly in the Pacific lowlands and the western slopes of the Western Cordillera, or on the eastern slopes of the Eastern Cordillera, the Llanos or the Amazon Region; a few species, on the other hand (e.g., *Acrocomia antioquiensis* and *Attalea nucifera*) grow in quite disturbed areas, but they regenerate and develop in such areas, and their populations do not seem to decrease.

Further field work will no doubt give us a sharper image of the situation. For the time being, the available information already depicts a critical panorama with 15% of the species known to be threatened. It is to be hoped that immediate actions are taken by conservation organizations, so that these unique organisms can be saved from their imminent extinction.

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