AMENDMENTS TO APPENDICES I AND II OF THE CONVENTION

Other Proposals

A. PROPOSAL

Includion of nine species of Chamaedorea (and their natural hybrids) in Appendix I and nine other species of Chamaedorea (and their natural hybrids) in Appendix II (species named below), except exclude from Appendix II specimens of C. elegans and C. seifrizii that are artificially propagated.

B. PROPONENT

The United States of America.

C. SUPPORTING STATEMENT

1. Taxonomy

11. Class: Liliopsida (Monocotyledonae)

12. Order: Arecales

13. Family: Palmae (= Arecaceae)

131. Subfamily: Arecoideae

14. Species: Chamaedorea K.L. Willdenow

141. Inclusion in Appendix I of:

a) C. amabilis H.[A]. Wendland ex U. Dammer 1904
b) C. ferruginea H.E. Moore 1951
c) C. glaucifolia H. Wendland 1854
d) C. klotzschiana H. Wendland 1854
e) C. montana F.M. Liebmann ex C.F.P. von Martius 1849
f) C. oreophila C.F.P. Martius 1849
g) C. pulchra M. Burret 1933
h) C. stolonifera H. Wendland ex Hooker fil. 1892
i) C. tenella H. Wendland 1880

142. Inclusion in Appendix II of:

j) C. cataractarum C.F.P. Martius 1849
* k) C. elegans C.F.P. Martius 1830
[syn. = Collinia elegans (Martius) Liebmann ex A.S. Oersted]
l) C. ernesti-augusti H. Wendland, C.F. Otto & Dietrich 1852
[syn.= Eleutheropetalum ernesti-augusti (Wendl. et al.) Oersted]
m) C. metallica O.F. Cook ex H.E. Moore 1966
n) C. radicalis C.F.P. Martius 1849
o) C. rojasiana P.C. Standley & J.A. Steyermark 1947
* p) C. seifrizii Burret 1938
q) C. simplex Burret 1933
r) C. tuerckheimii (Dammer) Burret 1933

* except specimens that are artificially propagated; see comments section 342. Parts an Derivatives below.

The genus Chamaedorea is composed of perhaps 100 species of small, dioecious (male and female individual) palms of the tropical rain forest and cloud forest understory. The name means 'gift on the ground' - perhaps originally referring to the shining bright-colored fruits that are very easily reached (Stearn, 1972). Cut leaves, mature whole plants, seedlings and seeds are exported. Chamaedorea is a complex genus needing taxonomic revision, but these 18 species are among the best known, and are not expected to be lost through synonymy (Moore, 1951, 1958, 1966; Burret, 1933, 1938). A horticulturist member of The Palm Society appears to have a large grant to study some taxonomic aspects of the genus in cultivation [D. Hull in litt. to U.S. Scientific Authority (US-SA), 15/04/89].

143. Hybrids: No natural hybrids are presently known in Chamaedorea (Balick, 1988). Artificial hybrids of some of these 18 species have been created, for example:

C. 'Florida Hybrid' = C. erumpens H.E. Moore x C. seifrizii

Created by B. Greer in Miami in the 1940s (Edmondson, 1989), this is artificially propagated in Mexico and extensively in Florida, U.S.A.

C. x katzeri Loebner 1909 = C. concolor Mart. x C. ernesti-augusti
C. x romana Guillaumin 1923 = C. ernesti-augusti x C. schiedeana Mart.

15. Common Names: The genus Chamaedorea sometimes goes under the foliage-trade names commodore, emerald, jade, and teepee; C. elegans and C. radicalis are among those so traded (Hodel, 1988b). Some of the names can have a more specific meaning to some people [e.g. xate jade is C. oblongata Mart. to foliage collectors in the Guatemalan Petén (Heinzman and Reining, 1988); teepee was derived from C. tepejilote Liebm. ex Mart., but is now often misapplied (Hodel, 1988b)]. The names used more specifically below also are usually not unique to these species:

a) coligallo
b) none
c) blueleaf chamaedorea palm
d) none
e) none
f) none
g) none
h) climbing fishtail palm
i) none

j) guayita de los arroyos; cascade palmá
k) pacaya; pacayito; kiik; xate hembra; dwarf parlor palm; parlor palm; neanthe bella palm; good-luck palm; dime-store palm
l) guaya de abajo; guayita
m) miniature fishtail palm; sweetheart palm
n) none
o) pacaya; molinillo
p) bamboo palm
q) none
r) none

2. Biological Data

21. Distribution: Early post-Columbian distributions in the six countries where the species are known to occur are unknown, but are inferred to have been much greater when tropical moist forests were relatively undisturbed. Dr. H. Quero of the Universidad Nacional Autónoma de Mexico (that country's leading expert on the family, who is writing the Palmae for Flora Mesoamericana), recently carried out field work under a project of the IUCN SSC Palm Specialist Group to ascertain the current status in the wild of Mexican palms. Sixteen of these 18 species occur in Mexico, where 10 are endemic. Seven of the 18 species occur (one of them only possibly) in Guatemala, with one species endemic. Of the seven nonendemic species, two occur (one of them only possibly) in both countries above and in Belize, and one of those species also is in Honduras; one species is only in Costa Rica and possibly Panama (five of the countries are Parties to CITES; Mexico stated (26/04/89) that it may join in the latter part of 1989). The known distribution for each species is as follows:

a) Costa Rica (Alajuela and Cartago Provinces); Panama ? (Coclé Province) (Hull in litt. to US-SA, 15/04/89; no record at Missouri Botanical Garden: W. D'Arcy, pers. comm. to B. MacBryde, 9/05/89)

b) Mexico (Oaxaca State)
c) Mexico (Chiapas State
d) Mexico (South-West)
e) Mexico (Oaxaca)
f) Mexico (Oaxaca)
g) Guatemala (Alta Verapaz Department)
h) Mexico (South)
i) Mexico
j) Mexico (Oaxaca)
k) Guatemala (Petén Department); Mexico (Veracruz State and Oaxaca)
l) Belize; Guatemala; Honduras; Mexico (Veracruz and Chiapas)
m) Mexico (Veracruz)
n) Mexico (eastern)
o) Guatemala (Quezaltenango Department); Mexico
p) Belize (Hodel, 1988b); Guatemala (Hodel, 1988b); Mexico (Yucatan and Tabasco States)
q) Guatemala; Mexico
r) Guatemala; Mexico (Veracruz)

22. Population: Mexico proposed to include Chamaedorea in Appendix II at the Plenipotentiary Conference of Washington, D.C. (Delegation of Mexico, 1973). Vovides (1981) published a preliminary list of Mexican plants that were considered rare or in danger of extinction. He included eight species of Chamaedorea; six of them are in this proposal. With the IUCN system of Red Data categories (Davis et al., 1986), he at that time considered:

| | | | |
|---|---|---|---|
| | C. elegans | Indeterminate | (proposed for App. II here) |
| | C. ernesti-augusti | Vulnerable | ( " " " " " ) |
| | C. klotzschiana | Rare | ( " " App. I " ) |
| * | C. metallica | Endangered | ( " " App. II " ) |
| * | C. seifrizii | Vulnerable | ( " " " " " ) |
| | C. stolonifera | Indeterminate | ( " " App. I " ) |

Dransfield et al. (1988) provide a more recent report on the vulnerability of the palms of the New World, which incorporates the results of an extensive 1985-1987 conservation and utilization survey, including some field work in Mexico by Dr. Quero, and which was a project of the Palm Specialist Group (Johnson, 1986).

All nine species proposed for Appendix I are designated by Dransfield et al. (1988) as Endangered (IUCN category) on a world basis; eight of these are endemic to Mexico, and one is in Costa Rica and possibly Panama. Conservation status for the nine species proposed for Appendix II, Dransfield et al. (1988) designated as follows:

| | SPECIES | STATUS: WORLD AND REGIONAL | | NATIONAL |
|---|---|---|---|---|
| * | C. cataractarum | Endangered | -- | Mexico: Endangered |
| | C. elegans | Vulnerable | -- | Mexico: Endangered; Guatemala: Unknown |
| | C. ernesti-augusti | Unknown | -- | Mexico: Endangered; Belize, Guatemala, Honduras: Unknown |
| * | C. metallica | Endangered | -- | Mexico: Endangered |
| * | C. radicalis | Endangered | -- | Mexico: Endangered |
| | C. rojasiana, | -- Indeterminate | -- | Mexico: Endangered; |
| | C. simplex, and | | -- | Guatemala: Indeterminate |
| | C. tuerckheimii | -- | | |
| * | C. seifrizii | Endangered | -- | Mexico: Endangered; Belize: (new report), Guatemala: (native?) |

Four of the species (marked * above) that Dransfield et al. (1988) indicate as Endangered are proposed for Appendix II; three are endemic to Mexico, and C. seifrizii was thought to be endemic to there until Hodel (1988b) discovered it in Belize and "perhaps even in Guatemala." For C. seifrizii, there is thus the question of whether its range extension affects the species' vulnerability. The other three species (and as an additional reason, C. seifrizii) are not proposed for Appendix I because they are artificially propagated to a significantly greater extent than any of the species that are so proposed. We question somewhat whether the speculated extent of trade in them from the wild is correct, in view of their ease of cultivation, their availability as artificially propagated specimens, and the lack of a survey in Mexico (especially) of the extent to which any of these 18 Chamaedorea are in cultivation and artificially propagated. In addition, even if the extent is correct, Resolution Conf. 5.14 provides guidance considered applicable: the conservation strategy for these species may be to strongly facilitate the expanding artificial propagation of them and not overly restrict the availability of the artificially propagated specimens. To tightly regulate the large numbers of artificially propagated specimens of these four species as is required for Appendix I species, would be counterproductive to shifting the supply from wild specimens to those from cultivation. Furthermore, Mexican law would prohibit export of any of their artificially propagated specimens of these four species if they are on Appendix I. More discussion of this complex topic is presented at section 32. Legal International Trade and section 41. [Protection Status] National.

While there has been some recent field work in Mexico, and the ranges and vulnerability of these 18 palms are reasonably well known and their habitats are surely diminishing, no studies have been carried out to determine precise population densities in habitat for most of these species. Such lack of precise knowledge is unfortunately the usual situation for plants. However, Heinzman and Reining (1988) have surveyed populations of C. elegans in the Petén of northern Guatemala, and found that in protected areas there were 5,933 plants per hectare; in unprotected areas there were only 1,460 plants per hectare. It can be inferred that the population trends of all 18 species are declining, not only as areas are subject to increasing pressure by land clearing, but from unregulated forest-gathering activities (cf. Moore, 1977). Loss of tropical rain forest is now well known (Buschbacher, 1986).

23. Habitat: These Chamaedorea palms occur in the understory of tropical moist forests of Mexico and Central America. Timber extraction and forest slash-and-burn for milpa agriculture and ranching are occurring at accelerating rates in the region (D'Arcy, 1977; Myers, 1980; Burley, 1985). Chamaedorea amabilis, C. glaucifolia, C. klotzschiana and C. tuerckheimii are among the highly ornamental species, but often found in exclusive, narrow microclimates not easily attained in cultivation. Yet collectors have been known to devastate entire local populations of these species for the hobby and nursery-pot trades (Hodel, 1988a, 1988b). Chamaedorea radicalis occurs on limestone outcrops in México's Sierra Madre Oriental with a Vulnerable (IUCN status) palm, Brahea moorei (Moore, 1973, 1977; Dransfield et al., 1988). Habitat conversion is the major threat to all these species in the wild; the trends are decreasing habitat and species' loss (Myers, 1988).

3. Trade Data

31. National Utilization: The estimated 100 (-110-130) species of Chamaedorea palms (Uhl and Dransfield, 1987; Walters et al., 1984) are small, attractive ornamental plants (McCurrach, 1960) that are taken from the wild and cultivated in homes, patios and grounds within their native areas for aesthetic purposes by indigenous and westernized peoples, and émigrés. In this way new species and new ornamentals sometimes are discovered (Hodge, 1981). No data on the quantities used locally are known.

32. Legal International Trade: Quero (1986) reported that Mexico was exporting (1) cut leaves and (2) (mature) entire plants of C. cataractarum, C. elegans, C. radicalis and C. seifrizii to the U.S.A. Data on the exports as to source and quantities by species are not available.

Edmondson (1989) surveyed the nursery trade of Chamaedorea in Florida, U.S.A., in 1987: (1) Thousands of bundles of cut foliage were imported from Mexico and Guatemala for use in floral arrangements. Included among the species identified were C. elegans, C. seifrizii and perhaps C. simplex. Quantities by species and sources are unknown. (2) She did not report on trade in mature whole plants. (3) Additionally, in fall 1987, she found that 40,000-50,000 seedlings of C. elegans were being imported from Mexico each week. Their precise source(s) in Mexico are

unknown; some might come from farms noted just below. (4) Edmondson (1989) also gathered data on Chamaedorea seeds imported from Mexico and Central America. On an annual basis, these approximate amounts are [with about (360-)565-1360 seeds per kg, or (800-)1250-3000 seeds per pound, depending on the species and how much the seeds have been dried]:

| | | |
|---|---|---|
| C. cataractarum | 385 kg | 850 pounds |
| C. elegans | 83,350 " | 184,000 " |
| C. ernesti-augusti | 90 " | 200 " |
| C. metallica | 270 " | 600 " |
| C. radicalis | 360 " | 800 " |
| C. seifrizii | 6,795 " | 15,000 " |

An unknown percentage of these seed imports may originate from cultivated or artificially propagated plants; it is thought to be a low percentage particularly for the less popular species. Edmondson (1989) reports on three companies artificially propagating C. elegans, C. metallica, C. seifrizii and C. 'Florida Hybrid' on farms in Mexico. She believes that one particular Mexican farm in the Yucatan and one in Belize will be able to satisfy world demand for the seeds of C. seifrizii [4 hectares (10 acres) on the Yucatan farm can yield a crop of 2,265-4,530 kg (5,000-10,000 lbs) of seed annually], although she found that others still collect seeds from the wild. A large family farm in Mexico had 20,000 plants of C. metallica in cultivation, with 40,000-50,000 "yet to be planted." We understand that there are some plantations of Chamaedorea species in Mexico where fields are prepared, the seeds planted, and then the maturing palms are tended only to a limited extent prior to harvest, perhaps in some cases even becoming seminaturalized (G. de la Garza, pers. comm. to MacBryde, 26/04/89).

Hodel (1988b) surveyed the Chamaedorea nursery industry in California, U.S.A., in 1988: (1) He obtained data on cut Chamaedorea leaf imports. In 1986, these totaled 359,219,000 stems, from primarily Mexico (314,419,000), and also Guatemala (40,179,000), Coast Rica (4,145,000) and elsewhere (476,000). No breakdown of data by species was provided, but C. elegans and C. radicalis were identified as included. (2) He did not find any import of mature whole plants collected in the wild in Mexico of either C. elegans or C. seifrizii, although he found (3) about 2,265 kg (5,000 pounds) of nursery-grown [sic] sprouted seeds of C. elagans are exported from Mexico to south Texas, U.S.A, each year. (4) He also obtained the following data on annual import of seeds from Mexico:

| | | |
|---|---|---|
| C. cataractarum | 5,660 kg | 12,500 pounds |
| C. elagans | 90,600-113,250 " | 200,000-250,000 " |
| C. seifrizii | 18,120 " | 40,000 " |

Hodel (1988b) estimated that about 75% of all Chamaedorea species in the California nursery trade originate from seeds collected from wild plants. He also reported that in Hawaii, U.S.A., production of C. elegans has almost ceased because of a ban on import of palm seeds from Mexico to avoid the lethal yellowing disease of palms (known there only from Quintana Roo; McCoy, 1983). In view of the findings of Edmondson (1989) above on Mexican farms cultivating C. elagans, C. metallica and

C. seifrizii, and the statement of de la Garza (1989) on Mexican plantations of some species, the percentage of the most traded species that comes from wild plants is unclear, but it is thought to be lower than for the less traded species.

321. Artificial Propagation Considerations: Resolution Conf. 5.14 b) iii) provides some guidance when considering transfer of a species from a higher-taxon listing in Appendix II to a separate listing in Appendix I, that seems necessary in considering the four species designated by Dransfield et al. (1988) as Endangered but which are proposed for Appendix II (see section 22. Population above). The applicable material from Conf. 5.14 concerns "the ease with which [the species] can be propagated artificially, and the extent to which it is currently available in cultivation from artificially propagated specimens".

Perhaps implicit in that guidance is recognition that CITES' regulation of trade in specimens of Appendix I species artificially propagated for commercial purposes is more stringent than the regulation of trade in artificially propagated specimens of Appendix II species. The permit for artificial propagation of an Appendix I species is valid for only 6 months, in contrast with a certificate of artificial propagation that can be valid for a CITES-unspecified time period (in U.S.A., usually for two years). In U.S.A., we implement commercial export of artificially propagated specimens of Appendix I species with a multiple-shipment permit, so that specimens can be exported repeatedly during the 6-month required duration of the permit, which must then be renewed [CITES Article VII, paragraph 4 and Resolution Conf. 2.12]. U.S. nurseries had complained that the effort and time delays in obtaining a permit shipment-by-shipment were too great, and they usually had given up applying to export artificially propagated specimens of Appendix I species.

We consider that it is to the advantage of most threatened plant species to encourage their artificial propagation, so that an alternative source of supply is available for the species, which often can be artificially propagated in large numbers to meet even an unknown amount of demand. (Chamaedorea seifrizii seems to exemplify this principle.) In general, artificially propagated specimens of Appendix I species especially should be readily available.

Seeds of Appendix I species are regulated under CITES in U.S.A. even if they originate from artificially propagated stock. The benefits of doing so are improved surveillance of the trade in wild seeds [which may be detrimental (e.g. with some species of Chamaedorea )], and better knowledge as to whether specimens claimed as artificially propagated came from wild seeds. (We would not consider them artificially propagated if they were grown from wild seeds, because there is no artificially propagated stock being maintained indefinitely, as Resolution Conf. 2.12 requires.) By the definition of Appendix I species, readily recognizable parts and derivatives are regulated; we interpret this to mean that the parts (e.g. seeds) and derivatives are regulated

even when the specimens are artificially propagated, and consequently "deemed to be specimens of species included in Appendix II" (Article VII, paragraph 4; see also Resolution Conf. 2.12). That is, we do not believe that a delisting of any parts (e.g. seeds) or derivatives can be automatic depending upon whether the specimens are from the wild or artificially propagated. We recognize that some other Parties interpret this subject differently, and do not regulate the Appendix I species' seeds produced by artificially propagated stock, and accept plants grown from wild seeds as artificially propagated. We do not know whether other Parties have a multiple-shipment permit policy.

Seeds would not be regulated for the Appendix II Chamaedorea species. For Appendix II, unlike the definition of animal species, the definition of plant species requires that readily recognizable parts and derivatives to be regulated must be specified in relation to that species. Following Resolution Conf. 6.18 (and others cited therein), these regulated parts and derivatives have been specified generally for plant species, as well as some standard exemptions of parts and derivatives that usually are not regulated (e.g. seeds), and we have accepted the standard exemptions for these palms.

Against these criteria must be weighed the straightforward need to protect the species in the wild from the effects of international trade. At present, seed collection from five of the species proposed for Appendix II does not appear to be a serious threat, although their populations need monitoring. Circumstances for the other four species [designated Endangered in Dransfield et al. (1988)] vary. Chamaedorea seifrizii seems to be more widespread and perhaps therefore plentiful in the wild than previously thought, and to be extensively propagated artificially, including in Mexico and Belize.

Chamaedorea metallica is widely cultivated in South Florida (Edmondson, 1989), and is also well established in cultivation in southern California, Hawaii and Australia (Hull in litt. to US-SA, 15/04/89), and at least is becoming an extensively artificially propagated plant in Mexico (see Edmondson's survey in section 32. Legal International Trade above), but Mexican law would prohibit export of these specimens if C. metallica were in Appendix I.

Chamaedorea cataractarum and C. radicalis were not reported as in cultivation in Mexico (we are not aware of a survey on cultivation of any of these species there), but they are known to be widely cultivated elsewhere. Edmondson (1989) reported C. cataractarum "widely cultivated in the Florida landscape," and C. radicalis widely cultivated in South Florida. Hull (in litt. to the US-SA 15/04/89), stated that C. cataractarum is also a common landscape plant in Hawaii, and that two dealers in South Texas "have established major seed plantations and currently 7,000 pounds (3,170 kg) of seed are available annually." For C. radicalis, Hull states (in litt. 15/04/89) that it is also commonly cultivated in southern California, Hawaii and Australia; that it seeds

readily; and that "worldwide hundreds of pounds of seeds are available in various seed plantations and collections." In view of the ease of cultivation of these four species, and the extent to which they are artificially propagated (including both known and perhaps unknown farms in Mexico, Belize and Guatemala), more detailed information seems necessary to show whether these species are so at risk from trade in wild specimens that they require Appendix I regulation.

33. Illegal Trade: No Chamaedorea species is now listed under CITES. We are not aware of the effect on the Chamaedorea trade of Mexico's new law, implemented in March 1988 after the study of Hodel (1988) but during the study of Edmondson (1989). However, the lack of his mention of it suggests that it was not having an immediate effect in California in 1988. Mexico is concerned that its perhaps seminaturalized plantation populations of Chamaedorea will need to qualify as artificially propagated, to be able to export plants or foliage of the Appendix II species under its new law. Mexico also is concerned that its law would prohibit export of even clearly plantation-grown (i.e. artificially propagated) specimens of palm species included in Appendix I.

34. Potential Trade Threats:

341. Live Specimens: Collecting mature plants in the wild for export is an economic expediency rather than a necessity. Seed propagation and seedling production are feasible, and said to be ongoing on a commercial (mass-market to limited) scale or hobby scale with various Chamaedorea species in several areas [e.g. Australia (Hull in litt. to US-SA, 15/04/89); Belize; Dominican Republic (a nursery in litt. to US-SA, 21/04/89); Europe (Edmondson, 1989); Mexico; and U.S.A. (California, Florida, Hawaii (Hull in litt. to US-SA, 15/04/89)]. Various of these species are also grown in Botanical Gardens in many countries. Placing the 18 Chamaedorea species in Appendix I and Appendix II is necessary to help protect dwindling wild populations, and stimulate artificial propagation of seeds and seedlings, and perhaps foliage, for export. Seedlings of course would be regulated as whole plants.

342. Parts and Derivatives: Current intensive cutting of Chamaedorea foliage results in the destruction or weakening of large numbers of individual wild plants; it may be sustainable for some species at less intensive levels. Intensive collecting of seeds is slightly less threatening to a population, but the amount of collection of seeds that might be sustainable is unknown. The addition to Appendix I of 9 of the 13 Chamaedorea palms designated as Endangered species (Dransfield et al., 1988) would contribute to reducing pressures on their wild populations in part by regulating export of their seeds. Seeds of the Appendix II Chamaedorea would not be regulated. The 1985-1989 experience of the Parties with regulation of seeds of Appendix II cycads (Cycadaceae and Zamiaceae) suggests some of the counterconservation effects of such regulation, and is somewhat similar to the situation with these palms (see the U.S. proposal for this 7th meeting to delist these cycads seeds).

Exports of foliage of the Appendix I and the Appendix II palms would be regulated. Guatemala has under development a forest management plan for the northern Petén to exploit on a sustainable basis the cut foliage of C. elegans (and C. oblongata) for the florist trade (Heinzman and Reining, 1988). This industry employs up to 7,000 persons, and exported 140 million leaves in 1987, for an export value to Guatemala of nearly US$ 2 million. The management plan includes monitoring to ensure sustainability of the harvest. The return from these two palms and other sustainable extractions from the forest has been found as valuable, if not more valuable, than conversion of the forest to milpa (slash-and-burn) agriculture (Heinzman and Reining, 1988). Export of leaves of C. elegans under CITES can be fully compatible with this enterprise: a review of an export application by Guatemala to decide to issue a permit if the export is not detrimental, is a method to monitor the harvest for sustainability as they intend.

It is proposed that artificially propagated specimens of C. elegans and C. seifrizii be excluded from the listing, because of their extensive artificial propagation (or complete artificial propagation potential) in several countries. For example, in Florida Edmondson (1989) found the nursery industry "nearly self-sufficient in the cultivation of C. seifrizii," thus artificially propagating most of an estimated 4 million plants a year (some nurseries have had propagation stock 15-40 years). She also found that farms in Mexico and Belize will be able to satisfy world demand in this species (see section 32. Legal International Trade above).

For C. elegans, Edmondson (1989) found cultivation beginning on one farm and around several villages in Mexico. She estimated that nearly all seed is imported from Mexico, and it is said to be reliably available every year (for over 20 years) at the same steadily low price (there was even an overabundance of seed and lowering of price in 1988), suggesting that wild populations may be stable or that the amount cultivated on farms and plantations is increasing. One Florida nursery stated (in litt. 21/04/89 to the US-SA) that they artificially propagate their annual 400,000 C. elegans and C. seifrizii in the Dominican Republic, and Hodel (1988b) reported some propagation of C. elegans in Mexico (see section 32. above). Hull (in litt. to US-SA, 15/04/89) states that "efforts have been made to establish large plantations in Hawaii" of C. elegans for the foliage industry, but it is unknown whether these have succeeded.

For those Parties that allow specimens grown from wild seeds to be classified as artificially propagated, there is no question that this is the source of most C. elegans [and since Edmondson (1989) states that seed is available from Mexico "readily and reliably every year at low prices" and "there currently is no shortage of the species", it appears that seed collection may not (at least yet) be detrimental to the survival of this species]. Some villagers have collected seed of this species for 25 years (Edmondson, 1989), suggesting that this may be an example where a

reliable economic return from the species in the wild has helped to preserve the populations (cf. Hull in litt. to US-SA, 15/04/89).

4. Protection Status

41. National: Belize has no rare plant conservation or national trade law (Fuller and Swift, 1987). Costa Rica has a law that can control export of ornamental plants (Davis et al., 1986). Guatemala regulates nontimber forest products through taxes and licenses (Heinzman and Reining, 1988). Mexico implemented a 1987 new law in March 1988 that now strictly regulates and usually prohibits removal of plants from the wild; also, it prohibits export of artificially propagated specimens of species in Appendix I (G. de la Garza, comm. to 12th North American Region CITES Meeting, 26/04/89). Hull (in litt. to US-SA, 15/04/89) reports that C. amabilis may be in a few protected sites in Costa Rica.

42. International: Costa Rica lists Chamaedorea sp. (palmera) in a second group of species that "desaparécen con menos rapidez" (are disappearing with less rapidity) that it includes in the Annex to the Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere [OEA/Ser.A/74a (SEPF); Organization of American States, 1967; cf. Prance and Elias, 1977]. It is unclear whether "sp." is intended to mean a single species, or is an error for "spp." and covers all species in the genus; the same style is used for several other genera (e.g. Cedrela, Myroxylon, Euterpe) and is suggestive that the intent is Chamaedorea spp. Article VIII of that Convention states that "the protection of the species mentioned in the Annex ... is declared to be of special urgency and importance. Species included therein shall be protected as completely as possible, and their ... taking, shall be allowed only with the permission of the appropriate government authorities in the country". (Guatemala in 1965 listed C. aguilariana Standley & Steyermark in the Annex.)

43. Additional Protection Needs: It is recommended that the Parties where these Chamaedorea are native consider including appropriate species in the Annex to the Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere, or that Costa Rica make clear that it already includes them. Mexico and Panama are also Parties to that treaty, but have only listed fauna; Belize and Honduras are not Parties. Efforts to encourage conservation of these 18 species also are underway through the IUCN Botanic Gardens Conservation Secretariat. Artificial propagation of the species should be strengthened.

5. Information on Similar Species

Moore (1958) provides a useful key to the species of Chamaedorea in Guatemala. Burret (1933) is still the most complete treatment of the genus. The approximately 80 other species of Chamaedorea (Glassman, 1972) suffer from a lack of information about their conservation status. The generalization can be made that they share the threat of extinction by loss of habitat (tropical wet, moist or mixed lowland to mountain forests) throughout the range of the genus: principally Mexico through Central America, South to Brazil and Bolivia (cf. Moore, 1973). Uhl and Dransfield (1987) provide a modern compendium to differentiate the genera of palms.

6. Comments from Countries of Origin

To be sought. Some preliminary comments from Mexico via Dra. Graciela de la Garza G., Subsecretaría de Ecología, Dirección General de Conservación Ecología de los Recursos Naturales, Mexico City, Mexico, are incorporated.

7. Additional Remarks

In the horticultural trade some of these species may be misidentified under other names, or misnamed (i.e. names misapplied), e.g. (Bailey, 1976):

| | |
|---|---|
| C. cataractarum | some material grown under this name is C. oreophila |
| C. elegans | often offered as Neanthe bella O.F. Cook, an invalid name |
| C. ernesti-augusti | often misidentified seeds from Belize and Mexico are this species |
| C. 'Florida Hybrid' | some material grown under this name is C. seifrizii |
| C. metallica | sometimes grown under the name C. tenella |
| C. seifrizii | some material grown under this name is C. 'Florida Hybrid' |
| C. stolonifera | much material so named is C. brachypoda Standley & Steyermark (pacaya), a rare species of Guatemala and El Salvador |

Sufficient understanding and information existed to make the present proposal. A further, more detailed investigation of the exploitation of native Chamaedorea species in Mexico is planned. Dr. H. Quero of the Universidad Nacional in Mexico again would conduct the research (funding is anticipated).

8. References

Bailey, L.H., Hortorium Staff, 1976. Hortus Third. Macmillan Publishing Co., New York, New York, U.S.A. 1290 pp.

Balick, M.J., 1988. Natural hybridization in neotropical palms, pp. 29-30 in Dransfield et al., op. cit. below.

Burley, F.W., proj. dir., 1985. Tropical Forests: A Call for Action. Part 1, The Plan; Part 3, Country Investment Profiles. World Resources Institute, Washington, D.C., U.S.A. 49 pp. + 22 pp.

Burret, M., 1933. Chamaedorea Willd. und verwandte Palmengattungen. Notizblatt 11: 724-768.

Burret, M., 1938. Eine interessante neue Chamaedorea-Art aus Mexiko. Notizblatt 14: 268-269.

Buschbacher, R.J., 1986. Tropical deforestation and pasture development. BioScience 36(1): 22-28.

D'Arcy, W.G., 1977. Endangered landscapes in Panama and Central America: The threat to plant species, pp. 89-104 in Prance and Elias, op. cit. below.

Davis, S.D. et al., 1986. Plants in Danger: What do We Know? Threatened Plants Unit, IUCN Conservation Monitoring Centre. IUCN, Gland, Switzerland and Cambridge, U.K. 461 pp.

Delegation of Mexico, 1973. Proposed list of species (flora) for Appendix II. Plenipotentiary Conference to conclude an international convention on trade in certain species of wildlife. Doc. 7 (Add. 6). 1 p.

Dransfield, J., D. Johnson and H. Synge, 1988. The Palms of the New World: A Conservation Census. IUCN-WWF Plants Conservation Programme, Publ. 2. Gland, Switzerland. 30 pp.

Edmondson, N., 1989. Chamaedorea species in cultivation (in Florida): Threatened New World palms in cultivation. Report for WWF Project 3322. 15 pp.

Fuller, K.S. and B. Swift, 1987. Latin American Wildlife Trade Laws, rev. ed. TRAFFIC (U.S.A.), Washington, D.C.

Glassman, S.F., 1972. A Revision of B.E. Dahlgren's Index of American Palms. Phaner. Monogr. 6. J. Cramer, Lehre, Germany. 294 pp.

Heinzman, R. and C. Reining, 1988. Sustained rural development: Extractive forest reserves in the northern Peten of Guatemala. Report to USAID/Guatemala (U.S. Agency for International Development). Yale School of Forestry and Environmental Studies, New Haven, Conn., U.S.A. 84 pp.

Hodel, D.R., 1988a. Letter to N. Uhl in Principes 32: 95.

Hodel, D.R., 1988b. The genus Chamaedorea in commerce in California. Report for WWF Project 3322. 6 pp.

Hodge, W.H., 1981. Finca Las Cruces, a Costa Rican garden. Principes 25(2): 47-53.

Johnson, D.V., 1986. Economic botany and threatened species of the palm family in Latin America and the Caribbean. Final report for WWF Project 3322. 150 + 55 pp.

McCoy, R.E., ed., 1983. Lethal Yellowing of Palms. Univ. Florida Agric. Expt. Sta. Bull. 834. 100 pp.

McCurrach, J.C., 1960. Palms of the World. Harper & Brothers, New York, N.Y., U.S.A. 290 pp.

Moore, H.E., Jr., 1951. Various new palms. Gentes Herbarum 8: 223-238.

Moore, H.E., Jr., 1958. Chamaedorea in P.C. Standley and J.A. Steyermark, Flora of Guatemala. Palmae. Fieldiana, Bot. 24: 196-299. (Includes key to 32 spp.).

Moore, H.E., Jr. 1966. Chamaedorea metallica - a new species from cultivation. Principes 10: 44-50.

Moore, H.E., Jr. 1973. Palms in tropical forest ecosystems of Africa and Latin America, pp. 63-88 in B.J. Meggers et al., Tropical Forest Ecosystems in Africa and South America: A Comparative Review. Smithsonian Institution Press, Washington, D.C., U.S.A.

Moore, H.E., Jr., 1977. Endangerment at the specific and generic levels in palms, pp. 267-282 in Prance and Elias, op. cit. below. [Reprinted 1979. Principes 23(2): 47-64].

Myers, N., 1980. Conversion of Tropical Moist Forests. (U.S). National Academy of Sciences, Washington, D.C. 205 pp.

Myers, N., 1988. Tropical-forest species: Going, going, going ... Sci. Amer. 259: 132.

Organization of American States, 1967. Listas de especies de fauna y flora en vías de extinción en los Estados miembros. La Convención para la protección de la flora, de la fauna, y de las bellezas escenicas naturales de los países de America. Washington, D.C., U.S.A. 48 pp.

Prance, G.T. and T.S. Elias eds., 1977. Extinction is Forever. New York Botanical Garden, Bronx, N.Y., U.S.A. 437 pp.

Quero, H.J., 1986. Utilization and status of palms in Mexico. Report prepared for WWF Project 3322. 7 pp.

Stearn, W.T., 1972. [A.W. Smith's] A Gardener's Dictionary of Plant Names, rev. ed. Cassell & Co., London, U.K. 391 pp.

Uhl, N.W. and J. Dransfield, 1987. Genera Palmarum: A Classification of Palms Based on the Work of Harold E. Moore, Jr. L.H. Bailey Hortorium of Cornell University and the International Palm Society. Allen Press, Lawrence, Kansas, U.S.A. 610 pp.

Vovides, A.P., 1981. Lista preliminar de plantas mexicanas raras o en peligro de extinción. Biótica 6(2): 219-228.

Walters, S.M. et al., 1984. Chamaedorea Willdenow, p. 71. The European Garden Flora Vol. 2. Cambridge Univ. Press, Cambridge, U.K.