

# Xate in the Columbia River Forest Reserve



## A preliminary investigation

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## Introduction

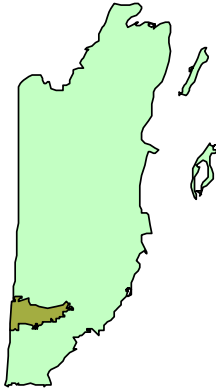


Figure 1. Location of CRFR within Belize

The Columbia River Forest Reserve (CRFR) is an approximately 60,000 hectare (148,357 acres) national protected area which is situated in the southern part of the country (Figure 1). Perhaps due to its size, remote location and challenging terrain, the CRFR is little documented. And research has generally focused on discrete areas within the CRFR (e.g. Bird, 1994, 1998; Meerman & Matola, 2004).

“Xate” is a forest resource that has been extracted from Meso-American forests for years. The leaves are exported for use in flower arrangements. Specifically in Guatemala, the Xate harvest is an important industry. In the year 2001, Guatemala exported 3,184 metric tons of Xate (Ramirez, 2002), largely originating from the Petén district.

The recent interest in Belize for “Xate” as a forest resource and its potential for sustainable extractive use, initiated the investigation into the occurrence and density of “Xate” in the Columbia River Forest Reserve.

In the past few years, Xate has become a hot commodity in other parts of Belize, most notably in the Chiquibul forests just north of the CRFR. One of the reasons why Xate extraction from the CRFR has not been previously considered is the destruction wrought by hurricane Iris in 2001 (Meerman, 2001 and see figure 2) which made access into the CRFR problematic (but note that Illegal Xate extraction from the Burgos Plain in the NW corner of the CRFR is probable). Fears also existed that canopy removal by the hurricane would also have affected the natural Xate stands. Impacts of which may have been further aggravated by manmade stresses upon the CRFR such as runaway milpa fires in the year 2003 (figure 2). Fires raged through parts of the CRFR during early May 2003.

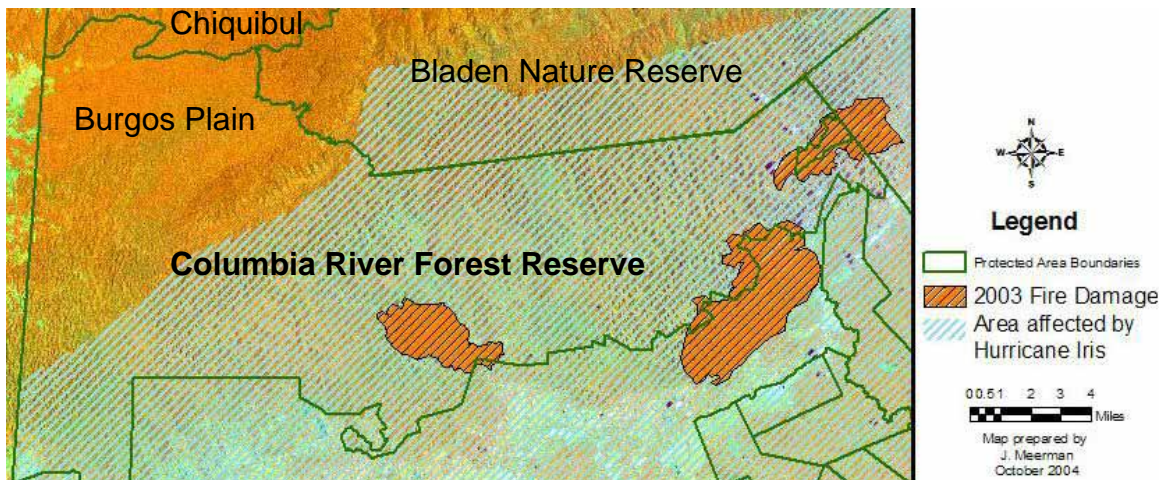


Figure 2. Satellite image (April 30, 2003, RGB: 354) of the Columbia River Forest Reserve with indicated Protected Area boundaries and areas affected by Hurricane Iris (2001) and by escaped milpa fires (2003).

The name “Xate” refers to a variety of palms of the genus *Chamaedorea*. They all have in common that they are used in the ornamental cut leaf trade. A web search has revealed that there are three *Chamaedorea* species that frequently are named “Xate”, these are:

- *Chamaedorea elegans*: Xate, Xate hembra, Palmita
- *Chamaedorea oblongata*: Xate macho, Jade
- *Chamaedorea ernesti-augustii*: Xate, Guayita, Pata de Vaca, Fishtail,

Most important appears to be *Chamaedorea ernesti-augustii*. In 2001 alone, 227 million leaves of this species were collected in the Petén and the Chiquibul constituting 67 % of the total Xate extraction (Ramirez, 2002). In Belize, this species is apparently also the one most commonly harvested by illegal Guatemalan “Xateros” (Bridgewater et al., 2004). The reason for its popularity is possibly that the other species don’t travel as well and thus are less profitably transported across long trade routes.

*Chamaedorea elegans* appears to be rare and of localized occurrence in Belize. Its worldwide distribution is limited to an area between Veracruz, Mexico, through the Peten, Guatemala into The Vaca plateau of Belize. *Chamaedorea ernesti-augustii* has a similar range but reaches into central Honduras. *Chamaedorea oblongata* has the widest range of the three species and occurs from Southern Mexico into Nicaragua. In Belize, the latter is probably the most common and widespread (Henderson et al. 1995).

The ecological preferences of the various Xate species are not exactly understood, but at least *Chamaedorea ernesti-augustii* appears to be a lime loving species and is usually found in conjunction with limestone outcroppings.

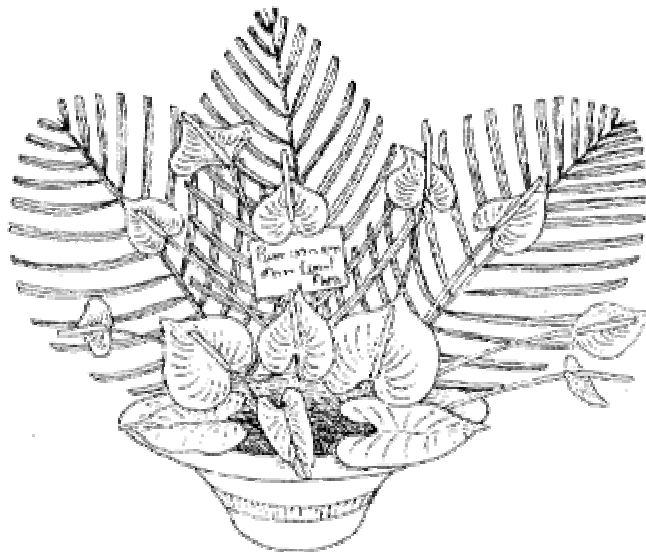
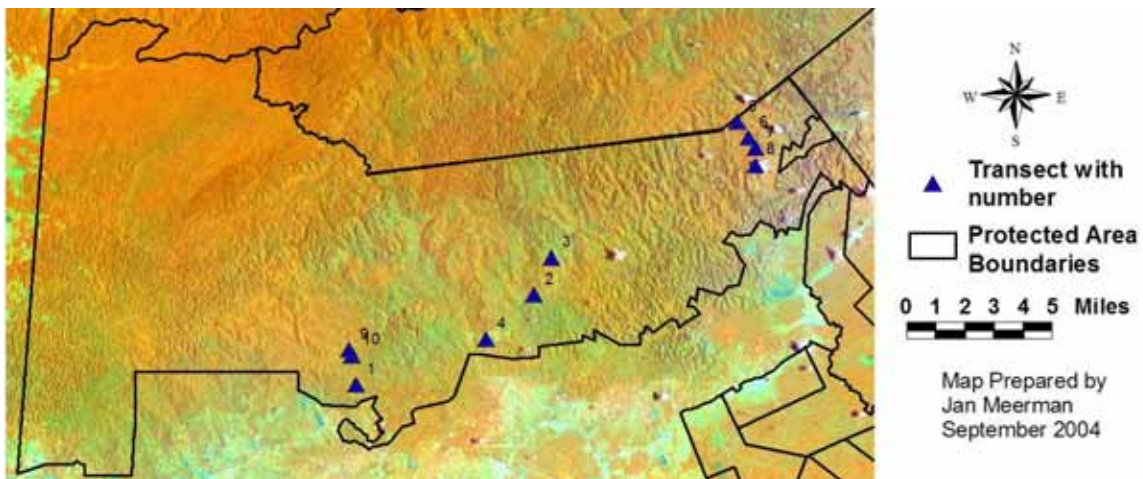


Illustration: Cuauhtemoc Acosta Garcia

## Methodology

Fieldwork as part of a wider scope Rapid Ecological Assessment (Meerman, 2004) was carried out between May and August 2004. The core of the research consisted of vegetation transects. The methodology used for the vegetation transects has been adapted from the methodology used by the Forest Planning and Management Project in Belize (Shawe, 1997). This methodology involved the opening of a 200 meter long line through the vegetation under study. The actual transect consists of a 4 m wide band along this cut line. In this transect, all trees with a diameter at breast height (dbh) of more than 10 cm are counted, dbh measured and where possible identified.

While these transects are designed for establishing tree-diversity, the same methodology was here used to assess Xate diversity and density. Each *Chamaedorea* palm was identified and counted in these 800 m<sup>2</sup> transects. No dbh was established because all plants had stems considerably thinner than 10 cm. A total of 10 transects was established and thus a total area of 8000 m<sup>2</sup> (= 0.8 ha = approx. 2 acres) was investigated.



*Figure 3. Satellite image (April 30, 2003, RGB: 354) of the Columbia River Forest Reserve with indicated Protected Area boundaries and transect locations.*

The transects were situated throughout the central and eastern half of the Columbia River Forest Reserve. Figure 3 indicates presents a visual presentation of the various transects. Table 1 indicates the UTM coordinates of the transects.



## Results

As table 1 indicates, a total of 242 individuals from 4 *Chamaedorea* species were encountered (on a total of 0.8 ha). Holst et al (2003) report a 5<sup>th</sup> species from the western most section of the Columbia River Forest Reserve: *Chamaedorea schippii* But this species was not encountered on any of the transects. The locations of the other *Chamaedorea* species listed by Holst et al (2003) are included on the distribution maps under the “Species Discussion”

Table 1. Distribution and population density of *Chamaedorea* plants by transect. The location of each transect is indicated by its UTM coordinates (NAD 27, Central America, Zone 16)

Northing y	1804315	1809233	1811257	1806895	1818571	1817866	1817166	1816404	1806131	1805907
Easting x	283183	293003	293802	290152	304044	304951	305018	304980	282824	282974
Transect Nr.	1	2	3	4	5	6	7	8	9	10
<i>Chamaedorea ernesti-augusti</i>		8	4		10	6		10		
<i>Chamaedorea geonomiformis</i>	17								1	
<i>Chamaedorea oblongata</i>	1									
<i>Chamaedorea pinnatifrons</i>		3	4	3	47	1	3	15	9	12
<i>Chamaedorea tepejilote</i>	13			3					10	6
<b>TOTAL</b>	<b>32</b>	<b>13</b>	<b>11</b>	<b>10</b>	<b>62</b>	<b>13</b>	<b>10</b>	<b>33</b>	<b>29</b>	<b>28</b>

It was possible to compare the Xate counts of the current study with the counts made during the Forest Planning and Management Project (FPMP) permanent sample plot project (Figure 2, Bird, 1998, Forest Department Database). During the FPMP study (in the 8 geographically coinciding transects. See figure 4), a total of 1480 *Chamaedorea* palms (The FPMP study did not distinguish between *Chamaedorea* species) were tallied, which translates to 74 palms per acre. (The national average over 30 plots in the FPMP study was 64 palms per acre). During the present study, we counted 121 *Chamaedorea* palms/acre (242/0.8 ha).

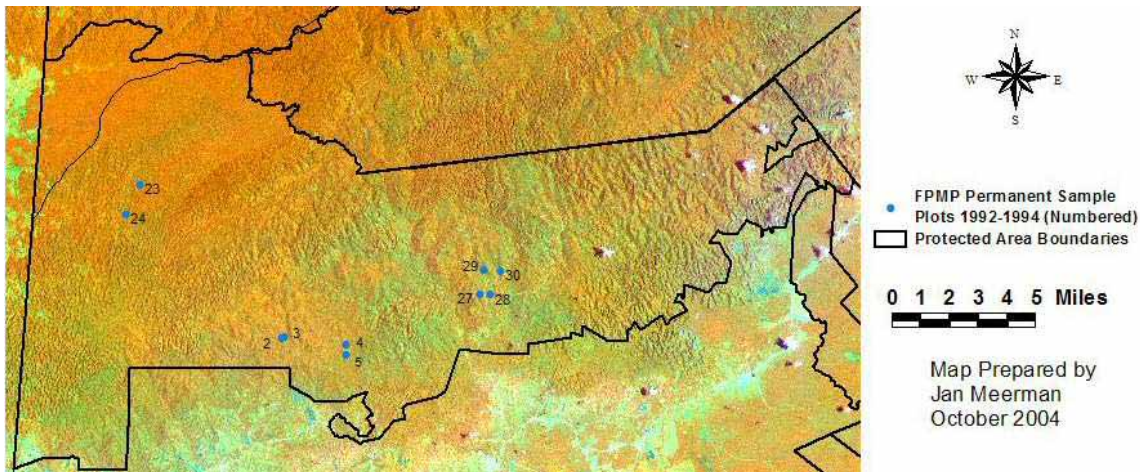


Figure 4. 1992 Permanent Sample Plots (PSP's) established by the Forest Planning and Management Project (FPMP) (Bird 1998).

Although these figures indicate a healthy *Chamaedorea* population in the CRFR, harvesting of this resource under the current conditions has to be considered unfeasible. Due to the tangled post-hurricane vegetation, access to most of the CRFR is effectively limited to the logging roads. Moving of these logging roads in order to harvest Xate requires intensive machete work, which reduces the economic feasibility of any harvesting program. Furthermore off all the *Chamaedorea*'s present in the CRFR, only *C. ernesti-augusti* seems to have direct commercial value and the population density of this species does not appear to be very high when compared with the Chiquibul Forest Reserve (Bridgewater et. al., 2004)

For the time being the inaccessibility of the Xate resources may be a blessing in disguise. Intensive extraction of secondary forest products nearly invariably goes hand in hand with wildlife depletion. This depletion of wildlife is dramatically obvious in the areas of the Chiquibul forest that are frequented by Guatemalan Xateros (Forest Department Records, Bridgewater et al, 2004). Such impacts have been documented by McNab (1998) for the Maya Biosphere Reserve in Guatemala.



*Illustration: Cuauhtemoc Acosta Garcia*

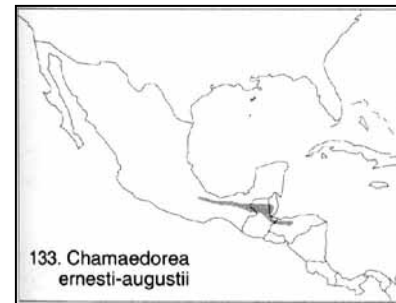
## Species discussion

### *Chamaedorea ernesti-augustii*



Figure 5. *Chamaedorea ernesti-augustii*

Figure 6.  
Distribution  
map. Source:  
Henderson *et*  
*al.* 1995



Appears to be of localized occurrence in Belize. Its worldwide distribution is limited to an area between Veracruz, Mexico, through the Petén, Guatemala into central Honduras.

This species is also called “fishtail” and is illegally harvested throughout the Vaca Plateau of the Cayo District, Belize. The species is found throughout the CRFR on hilly terrain on limestone based soils.

The species was encountered in 5 of the 10 transects and a total 38 individuals was counted resulting in an average density of 19 individuals per acre.

This number appears low compared to the figures reported from the Chiquibul Forest Reserve where an average density of 83 individuals per acre has been reported. (Bridgewater *et al.*, 2004). But the same authors warn that it is dangerous to extrapolate fishtail abundances from a small plot size to a larger area as abundances have been shown to change greatly over short distances.

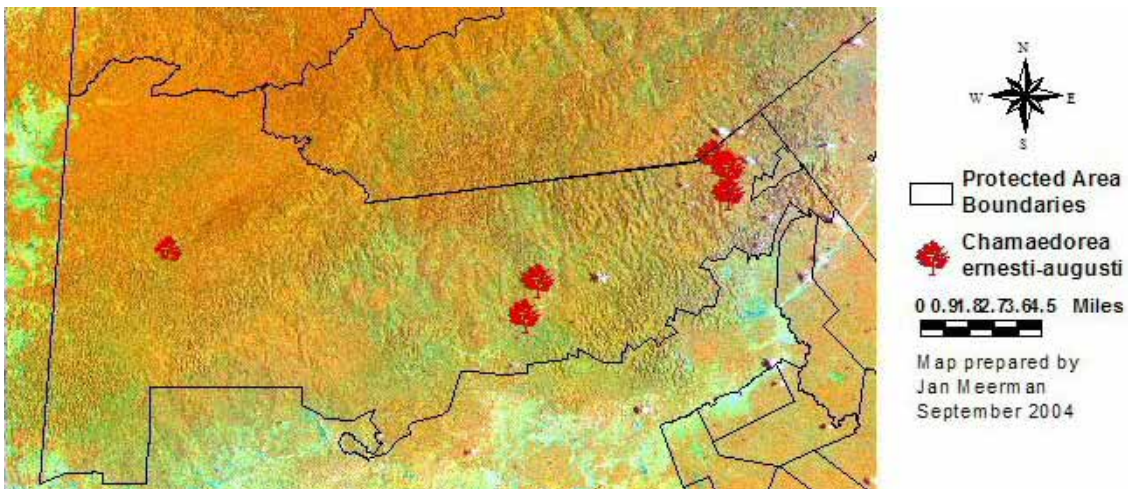


Figure 7. Records of *Chamaedorea ernesti-augustii* in the Columbia River Forest Reserve

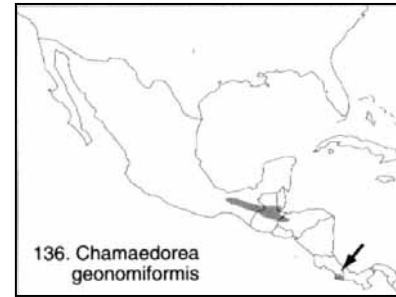


*Chamaedorea geonomiformis*.



Figure 8. *Chamaedorea geonomiformis*

Figure 9.  
Distribution  
map. Source:  
Henderson et  
al. 1995



This species appears to be of localized occurrence in Belize. Its worldwide distribution is limited to an area between Veracruz, Mexico, through the Petén, Guatemala just into Honduras.

This species somewhat resembles *Chamaedorea ernesti-augustii* but is smaller and has narrower, more elongated leaves. This species does not appear to be suitable species for “xate” harvesting.

The species appears to be restricted to the western half of the CRFR. We encountered 18 specimens over 2 transects resulting in an average density of 9 individuals per acre.

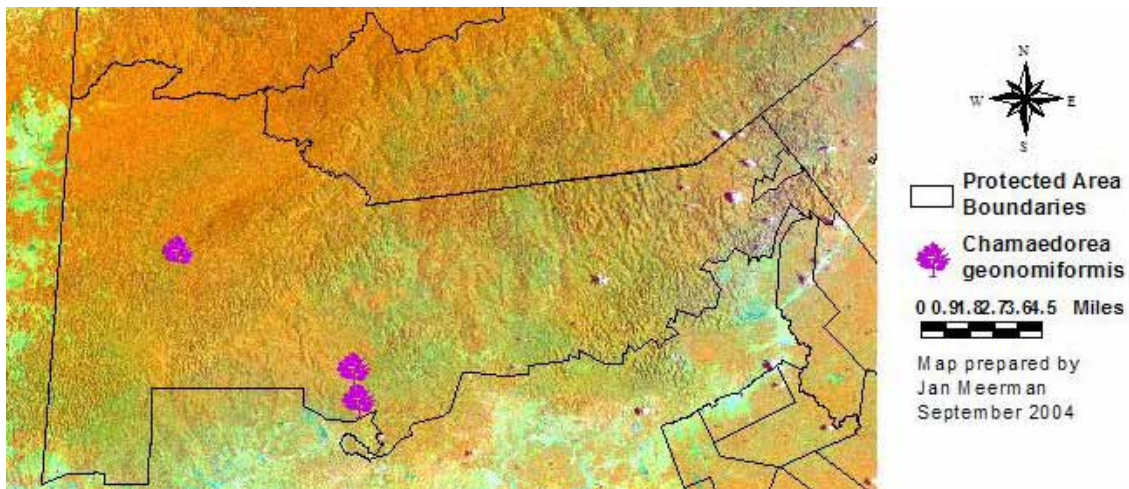


Figure 10. Records of *Chamaedorea geonomiformis* in the Columbia River Forest Reserve

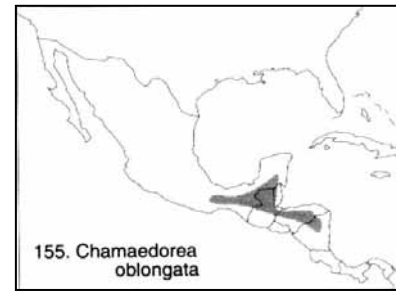


*Chamaedorea oblongata*:



Figure 11. *Chamaedorea oblongata*

Figure 12  
Distribution  
map. Source:  
Henderson et  
al. 1995.



*Chamaedorea oblongata* has a limited distribution in Central America, it occurs from Southern Mexico into Nicaragua. In Belize, the latter is probably the most common and widespread (Henderson et al. 1995).

This shiny, deep-green species is generally very common in Belize, but during the CRFR fieldwork it was encountered on only one of the transects. Holst et al (2003) also report the species from the Union Camp area in the west of the CRFR.

In Guatemala this species is harvested and traded under the name “Jade”. However, Guatemalan Xateros entering Belize do not appear to harvest this species (Bridgewater et al., 2004).

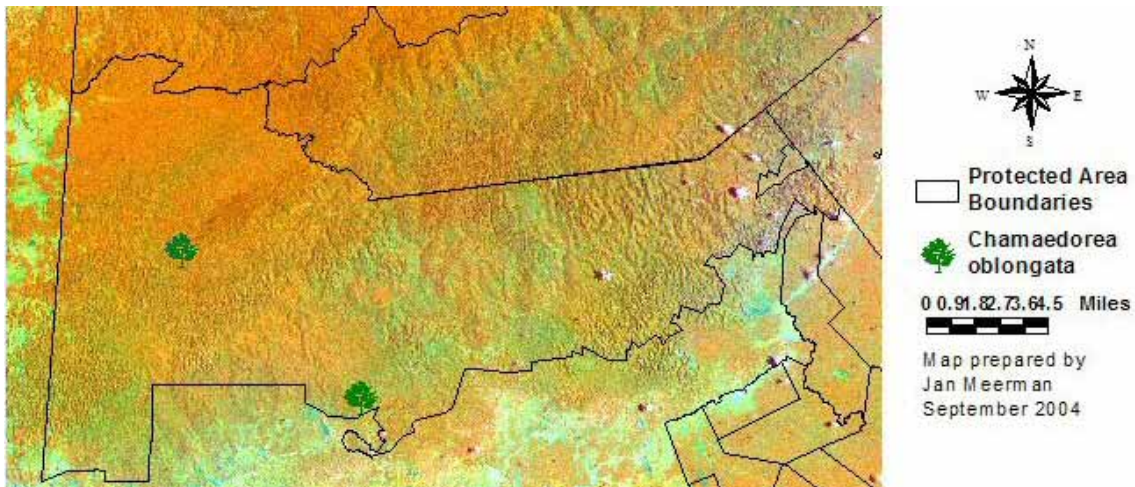


Figure 13. Records of *Chamaedorea oblongata* in the Columbia River Forest Reserve

*Chamaedorea pinnatifrons*.



Figure 14. *Chamaedorea pinnatifrons*

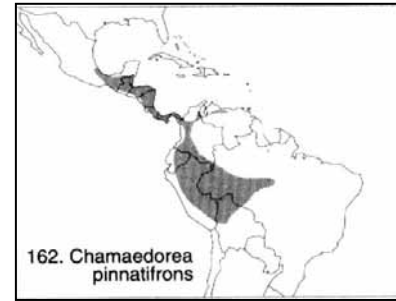


Figure 15. Distribution map. Source: Henderson et al. 1995.

This species is widely distributed through much of meso-America and South America. It could be confused with *Chamaedorea oblongata*. The easiest way to distinguish this species is by its paler green leaves and the yellow leaf base. The taxonomic status of the Belizean plants is unclear. Possibly the Belize Populations need to be referred to as *C. neurochlamys* (Bridgewater et. al., 2004)

This species does not appear to be suitable species for “xate” harvesting.

The species was encountered in nearly all transects (9 out of 10) and by far the most

common species around. We counted 97 individuals, resulting in an average density of 48 individuals per acre.

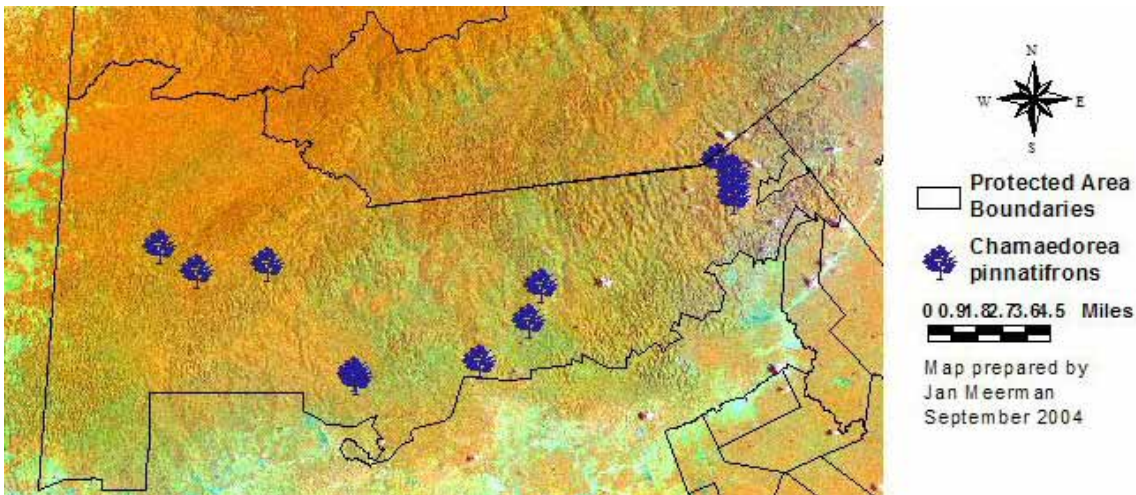


Figure 16. Records of *Chamaedorea pinnatifrons* in the Columbia River Forest Reserve

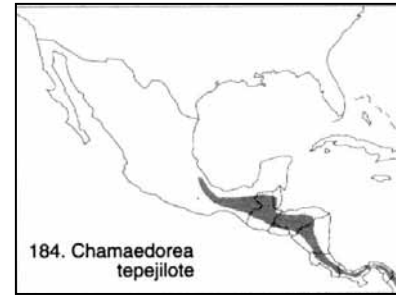


*Chamaedorea tepejilote*.



Figure 17. *Chamaedorea tepejilote*

Figure 18.  
Distribution map.  
Source: Henderson  
et al. 1995.



This species is widely distributed throughout Meso-America. It is a very large species that usually grows in clumps and is thus easily distinguished from the other *Chamaedorea* species in the CRFR.

This species does not appear to be suitable for “xate” harvesting but locally has great economic value as the source of “Pacaya” which are the flower buds which are harvested as a vegetable. In Guatemala “Pacaya” is cultivated and varieties exist that have much larger flowering buds than the wild plants.

The species was encountered on only 4 of the transects and 32 individual plants were counted. Many of these were young plants. It appears that this species may have suffered more from the impact of Hurricane Iris than the other species.

The average density of this species calculates as 16 individuals per acre.

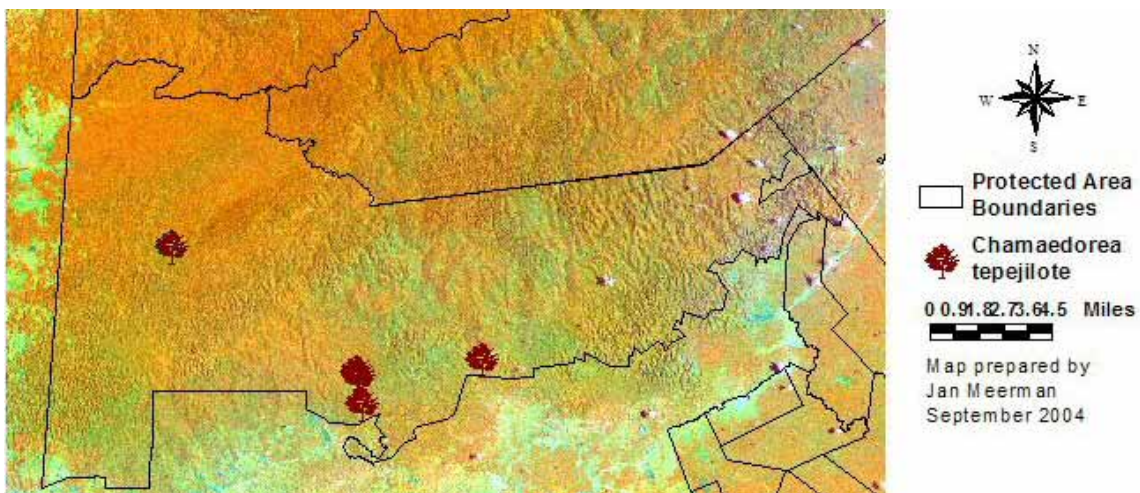


Figure 19. Records of *Chamaedorea tepejilote* in the Columbia River Forest Reserve.



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