In general, palm leaf rainforests are distinctive categories of mesophyll rainforests, with a conspicuous and significant proportion of the upper strata (canopy layer) comprising either feather or fan leaf palms. It should be noted that palm leaf size is not used in the classification of rainforests. The differentiation of palm leaf rainforest requires recognition of the distinctive photographic signature made by palms when present in the upper canopy layer. Extensive areas of mesophyll rainforest in the Black Mountain (Kuranda) and Daintree regions are examples of where palms are dominant in lower sub-canopy layers but do not extend to the upper canopy layer and are therefore not included in this category of palm leaf rainforests.

The formation recognises feather leaf (typically *Archontophoenix alexandrae*) and fan leaf (*Licuala ramsayi* var. *ramsayi*) dominated rainforests as two distinctive alliances, although they may intermix. Palm leaf rainforests can occur across a range of geological substrates and topographic positions although the development of both formations relies on impeded drainage and permanent soil moisture. Swampy depressions on lowland coastal plains provide habitat for the most extensive occurrences with feather leaf forms generally inhabiting swampier localities on soils with higher nutrient status than fan leaf forms (Tracey, 1982).

The feather palm vine forest alliance is sub-divided into associations based on topographic, structural and floristic variations. Typically, associated canopy species including *Ristantia pachysperma*, *Nauclea orientalis*, *Acmena hemilampra* and *Alstonia scholaris* provide the floristic expression of the type aligned most closely to Tracey's(1982) original Type 3a rainforest. A floristic variation with dominant *Barringtonia racemosa* and *Syzygium tierneyanum* has been identified in the Eubenangee Swamp area, while an upland variant is also found on the steep slopes of Bell’s Peak (Cairns map sheet).

Two fan palm associations are recognised on the basis of differences in both topography and floristic composition. Upland swamp habitats in the Towalla area are composed predominantly of *Licuala ramsayi* and *Pandanus spp.* and provide a rare notophyll rainforest variant.

### Facts and figures

#### Vegetation alliances

<table>
<thead>
<tr>
<th>Alliance</th>
<th>Current extent in the bioregion</th>
<th>Area protected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feather palm vine forests (FPVF)</td>
<td>3,285 ha</td>
<td>1,781 ha (54%)</td>
</tr>
<tr>
<td>Fan palm vine forests (FAPVF)</td>
<td></td>
<td></td>
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</tbody>
</table>

#### Geography

Scattered and highly fragmented remnants occur across the coastal plain from just south of Ingham to Ayton. They are best developed on poorly drained alluvium associated with the overflow flood plains of both major and minor watercourses. Small areas are also mapped on the foothills in the Julatten and Daintree areas and there are a number of upland examples on the Cairns, Bartle Frere and Thornton Peak map sheets. Strongholds for feather palm dominated rainforests are the coastal plain from Innisfail north to Gordonvale, with well preserved examples contained within the Ella Bay, Russell River and Eubenangee Swamp National Parks. Fan palm forests are well preserved in the Mission Beach (Hull River National Park) and the Daintree National Park.

#### Impacts and changes

The formation has been subject to extensive pressure through fragmentation, changes to hydrology and severe cyclone damage, particularly in the Innisfail/Ella Bay area. A combination of these factors has helped facilitate extensive invasion by pond apple (*Annona glabra*) into the sub canopy and understorey layers in a number of areas, but most notably in the Daintree and Innisfail areas. Examination of palm rainforests found in unfragmented portions of Ella Bay National Park suggests that in an undisturbed condition, this forest type is relatively robust and capable of successful and rapid regeneration from extreme wind damage. Unfragmented examples also tend to be relatively resistant to pond apple invasion. Alteration to hydrology as a result of the drainage of adjacent swamplands has caused changes to the floristic composition of fragmented communities.

### References

Key values

• Provides foraging habitat for *Casuarius casuarius johnsonii* (Southern Cassowary)
• Seasonal wetland habitat values
• Outstanding aesthetic values
• Habitat for rare and threatened plant species.

Threatening processes

• Changes to wetland hydrology
• Exotic weed invasion by species such as *Annona glabra* (pond apple) and *Harungana madagascariensis* (harungana)
• Ecological edge effects associated with fragmentation.

Tenure

Major areas are within the boundaries of the World Heritage area with some well preserved examples conserved in the Daintree, Hull River, Russell River and Ella Bay National Parks. Isolated remnants scattered across the coastal plains of the Wet Tropics are largely freehold.

Management considerations

• Edge effects in fragmented remnants
• Exotic species invasion in severely disturbed areas
• Hydrological changes caused by adjoining agricultural land uses
• Impacts of wildfire on forest margins
• Impact of feral animals such as pigs.