

# Flora & Fauna in Danau Sentarum

## ECOSYSTEM

Habitats similar to DSNP formerly occurred in East Kalimantan, along the Mahakam River, but this area was already heavily disturbed early this century, and is now virtually devoid of primary habitat. On Sumatra, similar lake systems used to occur along the Siak Kecil River in Riau Province, but these forests have been logged and burnt and are now severely degraded. The largest floodplain lake system in Asia, Lake Tonle Sap in Cambodia, is an order of magnitude larger than Danau Sentarum and used to harbor similar flooded forests. However, centuries of intensive use by Khmer fisher folk have greatly impoverished the area, and Danau Sentarum is superbly rich by contrast. Habitat-wise, DSNP can therefore be regarded as unique. At a species level, DSNP also has a high level of uniqueness, with in the range of 30-43 plants, 12-26 fish species and perhaps one endemic reptile unique to the area.

Characteristic for DSNP are the swamp forests and lakes, which respectively account for 48.75 percent and 23 percent of the Park. Three major types of swamp forest can be identified: tall, stunted and dwarf swamp forest, which have average canopy height of 22-30, 8-15(-22) and 5-8 meters, respectively. Dwarf swamp forest develops in deeply flooded areas, and may be flooded with 4-5.5 meters of water for 8-12 months per year. Tall swamp forest is flooded for 2-3 months annually by 1-2.5 meters of water, and some areas are characterized by peat soils of 0.5-4 meters depth. Stunted swamp forest is intermediate between tall- and dwarf swamp forest in terms of flooding depth and duration. Almost two-thirds of the swamp forest consists of stunted swamp forest, while one third consists of tall swamp forest. Dwarf swamp forest forms a minor element, accounting for 4.8 percent of all swamp forest. Swamp forests are prone to fires, possibly due to the accumulation of large amounts of organic matter in the wet months, and repeated fires appear to be leading to an expansion of dwarf and stunted swamp forest, at the expense of tall swamp forest. Most fires are caused by human interventions, and a marked increase can be noted since 1990. Recently burnt areas and swamp forest regenerating after fires together account for a very significant 17.66 percent of the Park. Heath forests, which extend over 0.2 percent of the Park, are characterized by uniform, fairly small stunted trees, and usually occur on very poor, leached sandy soils on the tops of sandstone ridges. Lowland forest is found on the low hills and ridges around the lake basin, and consists of tall to very tall tree, with emergents attaining 35-45(-55) meters. Because of peat deposits in and around the lake system, the waters of the lakes and streams are colored by tannins, very nutrient-deficient and acidic (pH 4.5-5.5).

## FLORA

More than 500 plant species have been recorded at DSNP, belonging to 99 families. Of these, 262 species occur in the swamp forests, three-quarters of which are trees and shrubs. Aquatic herbaceous species are uncommon, probably because of the significant annual fluctuations in water levels, and are generally limited to more permanent bodies of water near the Kapuas River. The flora includes 30-43 species endemic to the DSNP area, and during recent surveys, eight species new to science were discovered.

## FAUNA

### Mammals

Apart from studies of the Orangutan *Pongo pygmaeus* and the Bornean endemic Proboscis Monkey *Nasalis larvatus*, DSNP's mammal population has been poorly studied. 55 species have been directly observed in the Park, and a further 88 species have been recorded from secondary, anecdotal sources, bringing the total to 143 species. This includes 16 threatened species and 26 species endemic to Borneo. DSNP has the largest inland population of Proboscis Monkeys, but they are elusive, probably due to past hunting pressures, and unlike other populations of this species, they venture far from waterways frequented by fisher folk. A remarkable recent discovery is that the swamp forests and peat swamp forests around Danau Sentarum harbor what may be one of Borneo's largest populations of Orangutan.

### Birds

DSNP's avifauna has been relatively well studied, and has been found to include 237 confirmed and 45 unconfirmed species belonging to 52 families, which is half of the species recorded on Borneo to date. These include 9 threatened and 22 near-threatened species, including the Argus Pheasant *Argusianus argus* and the Storm's Stork *Ciconia episcopus stormi*. The Argus Pheasant, which is listed on Appendix II of CITES, occurs mainly in the hills to the southeast of the Park, where it can regularly be heard. Storm's Stork is listed as extremely rare, and may be considered the world's rarest stork. The vast majority of bird species are forest-dwellers, and waterfowl are relatively rare, probably because of a lack of herbaceous aquatic vegetation cover. Colonial water birds such as egrets and herons have been wiped out due to hunting and egg collecting, and the area has probably never had many ducks or waders.

## Fishes

The lakes of Danau Sentarum are remarkable for their fish diversity, and 240-266 fish species have been identified at the Park and in smaller streams around the area since 1992, including 12-26 new to science. As the lakes measure only 25,000 hectares, this diversity is remarkable when compared to Europe, where a total of only 195 primary freshwater fish are known. In fact, Danau Sentarum harbors one of the world's most diverse fish fauna's of any floodplain lake system: of the 71 tropical and temperate lakes listed for their biodiversity by WCMC (1992), Danau Sentarum (which is not listed) is surpassed only by Lake Tanganyika and Lake Malawi. In the Indonesian context Danau Sentarum is also very rich. Kalimantan, with 394 species (including 340 primary freshwater species), has the richest fish fauna of all Indonesian islands. Of these Kalimantan species, 310 have been recorded in the Kapuas River, which is Indonesia's species-richest. The DSNP fish fauna includes two highly popular aquarium fish: the rare and valuable red variety of the endangered Asian Arowana *Scleropages formosus* or siluk (listed on Appendix I of CITES), and the Clown Loach *Botia macracanthus* or ulanguli. The latter is only known from Danau Sentarum and several locations in Jambi, Sumatra. The Park also harbors many interesting species from families that are primarily marine, such as soles, stingrays and pufferfish.

## Reptiles & amphibians

Three species of crocodile occur at DSNP, including the rare and endangered False Gavia (*Tomistoma schlegeli*), the Estuarine Crocodile (*Crocodylus porosus*), and a third as yet unidentified species. These are listed on Appendix I of CITES, and the first two are also protected by Indonesian law. Reptiles further include 11 species of turtle and tortoise, two species of Monitor Lizard, and numerous snakes. Amphibians are rare in the Park, and the only species found throughout is the River Toad *Bufo asper*, with more species being found in permanent waters near the Kapuas River.