

## World Heritage Sites

### Protected Areas and World Heritage



## CENTRAL HIGHLANDS OF SRI LANKA SRI LANKA

*Sri Lanka's highlands are situated in the south-central part of the island. The property comprises the Peak Wilderness Protected Area, the Horton Plains National Park and the Knuckles Conservation Forest. These montane forests, where the land rises to 2,500 m above sea-level, are home to an extraordinary range of flora and fauna, including several endangered species such as the western-purple-faced langur, the Horton Plains slender loris and the Sri Lankan leopard. The region is considered a super biodiversity hotspot.*

### COUNTRY

Sri Lanka

### NAME

Central Highlands of Sri Lanka

### NATURAL WORLD HERITAGE SITE

2010: Inscribed on the World Heritage List under natural criteria (ix) and (x).

### STATEMENT OF OUTSTANDING UNIVERSAL VALUE

The UNESCO World Heritage Committee issued the following Statement of Outstanding Universal Value at the time of inscription:

#### Brief Synthesis

The Central Highlands of Sri Lanka is a serial property comprising three component parts: Peak Wilderness Protected Area, Horton Plains National Park and Knuckles Conservation Forest. Its forests are globally important and provide habitat for an exceptional number of endemic species of flora and fauna. The property includes the largest and least disturbed remaining areas of the submontane and montane rain forests of Sri Lanka, which are a global conservation priority on many accounts. They include areas of Sri Lankan montane rain forests considered as a super-hotspot within the Western Ghats and Sri Lanka biodiversity hotspot. More than half of Sri Lanka's endemic vertebrates, half of the country's endemic flowering plants and more than 34% of its endemic trees, shrubs, and herbs are restricted to these diverse montane rain forests and adjoining grassland areas.

**Criterion (ix):** The property includes the largest and least disturbed remaining areas of the submontane and montane rain forests of Sri Lanka, which are a global conservation priority on many accounts. The component parts stretch across the Ceylonese rainforest and the Ceylonese monsoon forest. In the montane forests represented by the three serial properties, the faunal elements provide strong evidence of geological and biological processes in the evolution and development of taxa. The endemic purple-faced langur of Sri Lanka (*Semnopithecus vetulus*) has evolved into several morphologically different forms recognizable today. The Sri Lankan leopard, the only representative in the island of the genus *Panthera*, which diverged from other felids about 1.8 million years ago, is a unique sub-species (*Panthera pardus kotiya*). All three nominated properties provide habitat to this subspecies of leopard, endemic to Sri Lanka. Long isolation and the concomitant evolutionary processes have also resulted in a Sri Lankan molluscan fauna that is the most distinct in the South Asian region.

**Criterion (x):** The montane forests in the three serial components contain the only habitats of many threatened plant and animal species and are therefore of prime importance for their in-situ conservation. The property features exceptionally high numbers of threatened species, extraordinary levels of endemism, and high levels of species richness in a number of taxonomic groups. Of the 408 species of vertebrates 83% of indigenous fresh water fishes and 81 % of the amphibians in Peak Wilderness Protected Area are endemic, 91 % of the amphibians and 89% of the reptiles in Horton Plains are endemic, and 64% of the amphibians and 51% of the reptiles in the Knuckles Conservation Forest are endemic.

## Integrity

The small size of the components of the nominated property is a result of the limited extent of the most significant rain forest areas remaining on Sri Lanka. However, provided the property is effectively protected and managed, these areas are sufficient, especially since many of the plant and animal species have highly localized distributions. The boundary of the Peak Wilderness Protected Area includes a range of protected zones, and this component has a common boundary with the Horton Plains National Park. Effective arrangements to protect the properties from the impacts of surrounding land-use, as well as to address a range of threats are required, including via functioning buffer zones.

## Protection and Management Requirements

The property has strong and effective legal protection through a combination of state ownership and a range of different protective legislation. The management of the three components of the nominated property is delivered by a number of different site specific management plans that need to be kept continually reviewed and updated, and made consistent with each other. An overall management system for the whole property is required, to ensure consistency of management, monitoring and presentation of the property, in addition to that provided by the individual management plans. Adequate and sustained budgets are required for the management of the property as a whole, and within each component.

The nature and magnitude of existing and potential threats to the three nominated properties varies between the components, and includes a number of issues. In case of the Peak Wilderness Protected Area, the major human use is from around two million pilgrims who visit the Adam's Peak annually and contribute to both forest and environmental degradation along the pilgrim trails leading up to the peak. Illicit gem mining is also a threat. Additional threats come from the spread of invasive species, forest die-back, occasional fires and vandalism and pressure for cultivation of cardamom. Effective action is required to ensure all of these threats do not impact on the Outstanding Universal Value of the property. A strong programme of engagement with the communities who live in the area surrounding the property is an essential requirement of its approach to management. In addition to the complementarity between its different components, the property has a strong link with the Sinharaja Forest Reserve, a World Heritage Site in the southern part of Sri Lanka. Links between these two World Heritage properties should be encouraged as part of the management systems of both properties.

## IUCN MANAGEMENT CATEGORY

Unassigned

## BIOGEOGRAPHICAL PROVINCE

Ceylonese Rainforest (4.2.1) and Ceylonese Monsoon Forest (4.13.4)

## GEOGRAPHICAL LOCATION

The sites are located in the south centre of the island approximately 90 km due east of Colombo.

### Component area

### Coordinates of centre point

Peak Wilderness Protected Area	N 6° 48' 04 96"	E 80° 37' 31 13"
Horton Plains National Park	N 6° 48' 22 07"	E 80° 47' 47 55"
Knuckles Conservation Forest	N 7° 27' 08 82"	E 80° 48' 07 56"

## DATES AND HISTORY OF ESTABLISHMENT

- 1969: Horton Plains National Park declared as a Nature Reserve  
1988: Horton Plains National Park designated as a National Park  
2000: Knuckles Conservation Forest declared as a Conservation Forest

## AREA

The inscribed World Heritage property is 56,844 ha. The buffer zone is 72,645 ha. The buffer zone is identified conceptually but not legally defined or demarcated.

Component part	Property	Buffer zone
Peak Wilderness Protected Area (PWPA)	22,379 ha	37,571 ha
Horton Plains National Park (HPNP)	3,160 ha	no buffer
Knuckles Conservation Forest (KCF)	31,305 ha	35,074 ha
<b>TOTAL</b>	<b>56,844 ha</b>	<b>72,645 ha</b>

## LAND TENURE

The Peak Wilderness Protected Area and Horton Plains National Park are state-owned. Most of the area of the Knuckles Conservation Forest is state-owned with the exception of several small private land lots which the State is trying to acquire.

## ALTITUDE

Peak Wilderness Protected Area: from 700 m to 2,243 m above sea level

Horton Plains National Park: from 1,800 m to 2,395 m above sea level

Knuckles Conservation Forest: from 1,068 m to 1,906 m above sea level

## PHYSICAL FEATURES

The most prominent physiographic feature of PWPA is the prominent Adam's Peak range that reaches an elevation of 2243 m. The terrain is very rugged with steep escarpments covering about 50% of the area in the upper slopes. The bedrock is often exposed while in the lower sections of the escarpments, there is a mantle of lithosols and skeletal soils. Rock knobs - steep-sided and often dome-shaped exposures of bedrock - cover over 5% of the area.

Most of HPNP consists of gently undulating land forming a highland plateau situated at the southern edge of the arc of the anchor-shaped Central massif. It forms the highest tableland in Sri Lanka at an average elevation of 2200 m. Towards the west, the land rises to Kirigalpotha, a peak at an elevation of 2395 m, and towards the northeast there is an equally sharp rise to Totapolakanda at an elevation of 2357 m. In contrast, towards the south there is a sheer drop of nearly 1000 m down the escarpment referred to as the Southern Wall, and the view from a point described as *World's End* stretches across the broad plain of the low country and out to the sea beyond.

KCF is located in the very heart of the extremely rugged Knuckles massif which lies to the northeast of Kandy, and is separated from the Central massif by the Kandy plateau and the Dumbara valley. The main range trends in a southwest-northeast direction, with southwestern slopes and northeast trending offshoots. It consists of peaks, a complex of interconnected ranges, steep escarpments with near vertical rock faces, plateaux and river valleys. Within the Knuckles massif there are 35 peaks, of which 14 are over 1500 m in altitude. On the western side of the Knuckles range, the land slopes moderately southwestwards into the Hulu Ganga valley without any interruption. The tributaries of the Hulu Ganga flow down the dip slopes of the range, often carving out vertical-sided amphitheatres, which reach almost to the crest of the range. On the northeastern side of the range, there is a series of rock escarpments overlooking the valley of the Kalu Ganga, Heen Ganga, and the Mahawali Ganga itself. These escarpments fall hundreds of meters in sheer vertical rock faces. Escarpments are, in fact, a major land form in the massif, often reaching hundred of meters in height. One of the characteristic features of the land-forms in the whole massif is the alternation of dip slope and scarp slope providing a breath-taking panoramic view of the range.

## CLIMATE

There are two basic rainfall regimes in Sri Lanka. In the southwest of the country, there is rainfall throughout the year with two peak periods corresponding to the southwest and northeast monsoons. Here the annual rainfall is 2500 mm going up to 5000 mm or higher in different parts of what is referred to as the wet zone. The other regime is a seasonally dry one where rainfall is less than 1900 mm, with a dry period from June to August. This is referred to as the dry zone. Between the dry zone and the wet zone a transitional zone (ecotone) referred to as the intermediate zone is recognised. Rainfall data from stations close to the PWPA suggest that the rainfall in this area is at the highest end of the wet zone range (up to 5000 mm or higher). The mean annual rainfall is given as 4320 mm.

In HPNP, the average annual rainfall is 2534 mm, which is towards the lower end of the wet zone range. The climate is humid, and a short dry spell may occur between January and March. The mean annual temperature is 13-15°C. The night temperature may drop to below zero and it is not uncommon to see ground frost during the months that correspond to the northern winter.

In KCF a good part of the area receives heavy, intense rainfall, mostly from November to February. Considerable variations have been observed in the annual rainfall recorded in locations even a few kilometres apart. The annual average rainfall varies from 2540 mm to 5080 mm. The annual mean temperature at the elevation of 915 m ranges from 13 to 18.5°C and it drops further with increase in elevation. The monsoonal winds are strong, often reaching gale force.

## VEGETATION

Due to Sri Lanka's evolutionary history as a component of the Deccan Plate during its northwards drift since the beginning of the Tertiary period and right up to the Miocene, and with land connections also occurring since then up to the Holocene, the island shares many biotic taxa with peninsular India. Of the 173 families of angiosperms, 167 are peninsular; of the 1038 non-endemic genera 942 are peninsular;

and of 2002 non-endemic species 1841 are peninsular. The total number of indigenous plants species in Sri Lanka is around 7,000. This includes over 3,000 angiosperm species of which 845 are endemic to the island. Among the pteridophytes, 57 of 314 species are endemic. It is this extraordinary endemism that occurs mainly at specific and intra-specific rank that makes the Sri Lankan flora of outstanding interest. Half of the country's endemic flowering plants and more than 34% of its endemic trees, shrubs, and herbs are restricted to these diverse montane rain forests. The altitudinal range and location of the Knuckles at the ecotonal boundary between Sri Lanka's wet and dry climate zones has given rise to a diverse range of vegetation, which includes most of Sri Lanka's major associations. The flora of the Knuckles is so distinct that it is recognized as a separate floristic region within Sri Lanka. It contains part of a relict flora of Deccan-Gondwanic origin with a high level of species endemism and many montane and submontane taxa at the northern limits of their ranges in Sri Lanka. The flora of the Peak Wilderness and Horton Plains, which is a relic of Gondwanic flora, is characterised by high species endemism and much localized species distributions.

## **FAUNA**

The indigenous faunal species include 678 species of vertebrates and 262 species of migrant birds. The property provides critical habitat to a number of endemic vertebrate species including amphibians, reptiles, birds and mammals: endemism rates are 50 percent in reptiles, 54 percent in freshwater fishes and 85 percent in amphibians. These include two of the world's 25 most endangered primates: the Critically Endangered western purple-faced langur (*Trachypithecus vetulus nestor*) and the Endangered Horton Plains slender loris (*Loris tardigradus nycticeboides*). The endemic purple-faced langur of Sri Lanka (*Semnopithecus vetulus*) has evolved into several morphologically different forms which occur within the three serial properties and exhibit allopatry, which could be considered as an ongoing process. Molecular genetic analysis shows that the Sri Lankan leopard, the only representative in the island of the genus *Panthera*, which diverged from other felids about 1.8 million years ago, is a unique sub-species (*Panthera pardus kotiya*) and distinct among the 10 sub-species of leopard found the world over. All three components provide habitat to this subspecies of leopard, endemic to Sri Lanka. The property may contain more than a third of the Sri Lankan amphibian species, including two dozen or more Sri Lankan endemics. CHSL provides habitat for 23 endemic frog species of the *Philautus* genus alone, of which at least 7 species are completely confined to the property). Up to 13 of the 23 endemic bird species that make Sri Lanka an Endemic Bird Area occur in the Peak Wilderness and Horton Plains.

## **CONSERVATION VALUE**

The property includes the largest and least disturbed remaining areas of the submontane and montane rain forests of Sri Lanka, which are a global conservation priority on many accounts. The component parts stretch across two Udvardy biomes and provinces: the Ceylonese rainforest and the Ceylonese monsoon forest in the biome of tropical dry or deciduous forests (incl. monsoon forests) or woodlands. The Central Highlands of Sri Lanka rainforest system has an exceptionally high level of biodiversity per unit area of forest, and can in fact be considered a super-hotspot within the Western Ghats and Sri Lanka biodiversity hotspot, with a high proportion of its biota being endemic. Over 90 per cent of the island's endemic biota is concentrated in a most extraordinary way in the natural forests of the wet zone, in the southwest quarter. The exceptional features of this fragment of the world's rainforest system relate to the world's geological history following the breakup of the southern super continent of Gondwana.

## **CULTURAL HERITAGE**

The development of Adam's Peak within PWWA, as a religious monument, is linked to Sri Lanka's ancient civilization where the ruling monarchs, while building thousands of reservoirs to store water and provide the people with sustainable living conditions, also placed great emphasis on promoting religious values. PWWA, with the focus on what is believed to be the footprint of Lord Buddha atop the mountain, has a cultural heritage that dates back to the pre-Christian era. The mountain is also associated with the deity Saman who is said to be the custodian of this area, and many religious practices are associated with paying homage to this deity. These beliefs and practices have an equally long tradition as the worship of the footprint. HPNP presents a cultural landscape of a different kind. Studies in many parts of Sri Lanka have revealed that Mesolithic man, called *Homo sapiens balangodensis*, the progenitors of Sri Lanka's aboriginal people the veddas, had occupied many different parts of the country.

## **LOCAL HUMAN POPULATION**

PWPA: There are a few people living within the component part but there is no clear indication to their precise number. The population located within the buffer zone cannot be estimated but contains many village communities.

HPNP: There is no resident population in this component part.

KCF: There are a few small village communities within this component part. According to the 1994 management plan, the total population of the buffer zone was 40,253.

## **VISITORS AND VISITOR FACILITIES**

In PWPA, visitors, mainly pilgrims ascending the mountain, number nearly two million during the six-month pilgrim season. The state provides basic facilities such as resting places for pilgrims, while other needs (like food and drink) are catered for by private parties that set up stalls during the pilgrim season.

Most visitors visit HPNP only for the day. Overnight accommodation is available but limited. The number of visitors annually between 2001 and 2005 has been between 150,000 and 200,000. The trend has been a constant increase in numbers.

The KCF can be approached from two directions, each with a visitor facility that includes dormitories, dining facilities and a lecture room. In addition to the dormitories, Illukkumbura has two eco-lodges for eight people in each lodge. The visitor statistics are as follows: Illukkumbura entrance - 2,082 in 2005, 1,967 in 2006; Deanstone entrance - 999 in 2005, 2,283 in 2006

## **SCIENTIFIC RESEARCH AND FACILITIES**

Earlier species surveys and the recent biodiversity baseline survey provisionally identified some indicator species. More definite information, however, will have to wait for further studies in the three areas.

## **MANAGEMENT**

The whole of the PWPA is state-owned; the Conservation Forests within the PWPA are under the charge of the Forest Department whilst the newly declared Peak Wilderness Nature Reserve, and the pilgrim trails and peak are under the administrative control of the Department of Wildlife Conservation (DWLC). The PWPA comprises several parts falling under three categories of areas under protective legislation: (a) The Peak Wilderness Nature Reserve (in nine blocks) which is a highly protected area under the provisions of the Fauna and Flora Protection Ordinance (FFPO), (b) the pilgrim trails and peak, which have the status of sanctuary under the provisions of FFPO, and (c) the three conservation forests have been designated under the provisions of Forest Ordinance.

The whole of HPNP is state-owned and under the administrative control of DWLC. HPNP has been designated under the provisions of FFPO. The FFPO also provides for prohibition of damaging activities within one mile of the boundary of both HPNP and PWPA.

The KCF has also been declared as Conservation Forest in 2000 under the provisions of the Forest Ordinance. The Government of Sri Lanka has additionally notified 'Knuckles Environmental Protection Area' under the National Environment Act, 1980 under which ensures special protection in relation to planning schemes and projects to an area including KCF.

## **MANAGEMENT CONSTRAINTS**

As noted in the Operational Guidelines, in the case of serial properties, a management system or mechanism for ensuring the coordinated management of the separate components is essential. The three component properties are administered by separate Management Plans which are outdated and sometimes not consistent. The nomination contains an explanatory note on revising the system of management for PWPA, HPNP and KCF following inscription on the World Heritage List. More efforts are needed to engage the local communities and CBOs in providing protection to the property. Coordination could be made more broad-based by including other relevant stakeholders such as civil society representatives and economic interests in site protection and the implementation of environmental regulations. A fully effective management and monitoring framework for tourism should be established.

## **COMPARISON WITH SIMILAR SITES**

There are ten existing natural World Heritage properties inscribed under biodiversity criteria in the Indo-Malayan realm. Keoladeo National Park in India is however very small (2,873 ha), inscribed primarily for

its wetland values, and does not include notable forest values. In addition to nine comparable inscribed properties, three Tentative List sites in the Indo-Malayan realm were also selected for this analysis due to their notable forest values: Western Ghats, (India); Transborder Rainforest Heritage of Borneo, (Indonesia/Malaysia); and Cat Tien National Park, (Viet Nam). CHSL includes the largest and least disturbed remaining areas of the submontane and montane rain forests in Sri Lanka's south-western wet zone. These forests are globally important as they provide habitat for an exceptional number of endemic species of flora and fauna. The moist forests of the Western Ghats and southwestern Sri Lanka are globally distinct due to their long history and isolation. The forests and rivers of the Western Ghats, India, have been identified by IUCN as being of potential Outstanding Universal Value in previous gap analyses. However, especially in terms of endemism, the comparably smaller Sri Lankan montane rain forests are of equal importance.

The component parts of CHSL stretch across two Udvardy biomes and provinces. The only other natural World Heritage property in these provinces is Sinharaja Forest Reserve (SFR) (inscribed in 1988 under both biodiversity criteria), which is also in Sri Lanka, and also belongs to the Ceylonese rainforest province. Biogeographically, SFR is strongly related to the property. They share values as the most important remnants of once extensive and contiguous natural forests. The contrast is that Sinharaja represents more lowland rain forests, whereas CHSL represents the Sri Lankan montane rain forests. Based on available information, the property is overall comparable in species richness and endemism to a number of Indo-Malayan World Heritage properties inscribed under criterion (x). In terms of species richness, CHSL surpasses smaller properties but is surpassed by some larger properties and properties that include "less isolated" rain forests. However, it contains high levels of endemism.

## **STAFF**

There is no indication to the number of staff involved in the protection of the property.

## **BUDGET**

The conservation and management of the property is financed from the consolidated fund of the Government through the annual national budget. The final allocations for the areas falling under the two departments cover the salaries of the staff, travelling expenses and administrative costs. The approximate annual allocations are as follows:

- PWPA (under the DFOs Ratnapura and Nuwara Eliya): SL Rs 3 million;
- PWPA (under DWLC): SL Rs 3.8 million;
- HPNP (under DWLC): SL Rs 7.1 million;
- KCF (under the DFOs Kandy and Matale): SL Rs 3.7 million.

Several other activities including the construction of buildings at PWPA, HPNP and KCF have been carried out through donor funded projects. For example, in the year 2006, SL Rs 17 million was used at HPNP, mainly for construction work, from an Asian Development Bank (ADB) supported project.

## **LOCAL ADDRESSES**

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Conservator General of Forests, "Sampathpaya", Rajamalwatta Road, Battaramulla, Sri Lanka

## **REFERENCES**

The principal sources for the above information were the original World Heritage nomination, IUCN's evaluation report and Decision 34 COM 8B.9 of the UNESCO World Heritage Committee.

## **DATE**

November 2011, January 2012.