



## HIGH ECOLOGICAL VALUE

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High ecological value is a concept somewhat insufficiently developed and spread; the project will help better define it, and disseminate it to the greatest number.

A basis for reflection was developed during a workshop of experts in September 2014, with three attributes of forested areas: 1) diversity, 2) dynamics and ecosystem functioning, 3) age and maturity.

### 1) BIOLOGICAL DIVERSITY

Biodiversity-outstanding forest sites encompassing high concentrations of not just tree species, but the multitude of other plants, animals and fungus that inhabit forest ecosystems and their associated genetic diversity. Biological diversity can be considered at different levels, including landscapes, ecosystems, species, populations, and genetics. Complex interactions among these levels help maintain ecosystem functions, and increase their resilience and adaptability to changing environmental conditions<sup>[1]</sup>.

- **Rarity**

- Sites characterised by rare forest habitat types defined by a dominant tree species endemic or with limited distributional range
- Sites concentrating a significant number of endemic flora and fauna species
- Sites containing rare or threatened flora and fauna species
- Sites containing rare or threatened habitat types

- **Richness**

- Sites concentrating high numbers of flora, fauna and fungus species
- Sites concentrating high numbers of habitat types
- Sites seasonally concentrating significant populations of migratory species

### 2) ECOSYSTEM FUNCTIONING

Forest sites that are large-enough<sup>[2]</sup>, well-structured<sup>[3]</sup>, and with a good representation of functional species groups<sup>[4]</sup>, maintaining the ecological processes that support natural dynamics, and ensuring resilience to environmental risks. Ecological processes include: (i) decomposition, nutrient cycling and carbon storage in soil and plant biomass; (ii) regulation of microclimate and hydrological processes; (iii) animal-plant and plant-plant interactions; (iv) natural disturbances supporting succession dynamics and mosaic-like forest patchiness providing habitat requirements for the species.

- **Size**

- Large forest sites preserving good environment conditions in the forest interior
- Forest sites embedded in a large natural landscape matrix providing connectivity among forest patches

- **Ecological processes**
  - Sites maintaining good soil conditions (e.g. litter layer, organic matter, soil structure) favouring water infiltration and soil retention (e.g. no erosion signals)
  - Sites maintaining good regeneration conditions of the dominant and companion tree species
  - Sites with a patchiness structure emulating natural disturbances and succession dynamics, including the very unique silvo-pastoral systems
- **Functional species groups**
  - Sites including the different tree species that characterise the natural habitat types
  - Forest sites hosting “landscape species”, such as large mammals and raptors

### 3) OLD-GROWTH

Old-growth forests are stands that have matured into a community with substantial numbers of large trees that are elder for their species, multi-layered canopies with gaps that result from the deaths of individual trees, standing dead trees, and coarse woody debris on the forest floor. Old growth is not defined by the single trees, but embraces the maturity, complexity and diversity of the entire forest community. An ancient forest is not just trees, but also the shrubs, herbs, ferns, fungi, insects, birds, mammals, reptiles, and the whole biological diversity within.

- **Ancientness**<sup>[5]</sup>
  - Forest sites maintaining a minimum number of large trees that are elder for the species per hectare
  - Forest sites maintaining a minimum number of standing dead trees and coarse woody debris in the forest floor
  - Forest sites where indicator species associated with senescent trees and dead wood are present
- **Maturity**
  - Sites including different age classes (young, mature, old growth, senescent)
  - Sites with the canopy closure and stratification that characterize the species mature conditions
  - Multi-layer forest sites including indicator species per each layer (forest floor, understory, canopy)

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[1] [www.cbd.int](http://www.cbd.int)

[2] It is important to keep forest stands in the transformed landscape as large as possible, including the mosaic-like patchiness related to forest dynamics. From a landscape perspective it is important to maximize the forest size and minimize the edge effect. Large forest stands provide the necessary habitat requirements for species depending on the spatial and temporal concentrations of resources through the landscape, and connectivity fulfilling species movements' needs. Forest stand shape is also important to help maintain the microclimate conditions and the species composition related to natural forest ecosystems, thereby avoiding the edge effect to the interior forest habitat.

[3] Forest structure in terms of: (i) natural tree species composition; (ii) the presence of different age classes, from the regeneration, to young, mature, old-growth, senescent and deadwood; (iii) the canopy closure and stratification in different size-classes; (iv) the presence of different layers (forest floor, understory, intermediate canopy, emergent canopy); (v) the patchiness in forest-structure, with a mosaic-like structure including forest gaps, stands of different canopy tree species and age classes, determined by the natural disturbances and species dynamics.



[4] Groups of species that play similar roles in an ecosystem process (e.g. plants; herbivores; carnivores; seed-dispersal fauna; decomposers). At least one species per functional group is essential to ecosystem functioning. Redundancy – having more than one species per functional group – increases forest resilience, as it prevents loss of functioning in times of disturbance if species within functional groups are able to replace or compensate for each other.

[5] In the selection criteria, the concept of “ancientness” is linked to the presence of forest features related to the continued existence of the forest over hundreds of years, close to the natural longevity of dominant tree species.