Pu Luong Proposed Nature Reserve

Alternative site name(s)
Phu Luong
Province(s)
Thanh Hoa
Area
17,662 ha
Coordinates
$20^0$21' - $20^0$34'N, $105^0$02' - $105^0$20'E
Agro-ecological zone
North Central Coast
Decreed by government
No
Management board established
Yes
Investment plan prepared
Yes
VCF eligibility criteria met
A, B, C
Social screening criteria met
None
Conservation needs assessment prepared
No
Operational management plan prepared
No
Tracking tool completed
No
Map available
Yes

Management history

Pu Luong is not included on any government decision regarding the national Special-use Forests system (MARD 1997). However, in 1998, an investment plan was prepared by the Forest Inventory and Planning Institute (FIPI), which proposed establishing a 17,662 ha nature reserve, comprising a strict protection area of 13,320 ha and a forest rehabilitation area of 4,343 ha (Anon. 1998a). This investment plan was approved by Official Letter No. 556/BNN-KH of MARD, dated 9 February 1999, and by Decision No. 495/QD-UB of Thanh Hoa Provincial People's Committee, dated 27 March 1999 (Thanh Hoa Provincial FPD *in litt.* 1999). Following the approval of the investment plan, a nature reserve management board was established by Decision No. 472/QD-UB of Thanh Hoa Provincial People's Committee, dated 24 April 1999. The management board currently has 21 permanent members of staff, based at three guard stations, and is under the management of Thanh Hoa Provincial FPD (Le Xuan Cai, Vice-director of Pu Luong Nature Reserve *in litt.* 2003).

Pu Luong is included on a list of Special-use Forests to be established by the year 2010, prepared by the FPD of MARD, as a 17,662 ha nature reserve (FPD 2003); this list has not yet been approved by the government.

Topography and hydrology

Pu Luong proposed nature reserve is located in Quan Hoa and Ba Thuoc districts, in north-western Thanh Hoa province. To the north-east, the nature reserve is bordered by Mai Chau, Tan Lac and Lac Son districts, Hoa Binh province. The proposed nature reserve lies along two parallel mountain ridges, that run from north-west to south-east, and are bisected by a central valley. This valley contains several human settlements and a large area of agricultural land, and, hence, is not included within the proposed nature reserve.

The two mountain ridges in the proposed nature reserve have starkly contrasting landforms, based on their different substrates. The smaller, south-western ridge is made up of mostly igneous and metamorphic rocks, and consists of rounded forested hills and wide, shallow valleys. The larger, north-eastern ridge is composed of heavily dissected limestone karst, and is a continuation of the limestone range that runs from Cuc Phuong National Park to Son La province. Elevations in the proposed nature reserve range from 60 to 1,667 m.

The hydrology of the limestone ridge is complex, and there is little or no permanent surface water. On the south-western ridge, surface water is more common and streams are much less seasonal. However, the main drainage features of the proposed nature reserve are located in the central valley. This valley is not

continuous but has a saddle at its mid-point, which forms the watershed between two small rivers. One of these rivers flows north-west along the valley, and joins the Ma river, which runs to the west and south of the proposed nature reserve. The other river flows south-east along the valley, and joins the Ma river further downstream.

Biodiversity values

Pu Luong has been the site of surveys by FIPI in 1997 and 1998 (Anon. 1998a, Le Trong Trai and Do Tuoc 1998), and was part of a survey for Delacour's Leaf Monkey *Trachypithecus delacouri* conducted by the Frankfurt Zoological Society and the Endangered Primate Rescue Centre (Baker 1999).

In 2003, a programme of biodiversity surveys was initiated at the proposed nature reserve by the *Pu Luong-Cuc Phuong Limestone Landscape Conservation Project*, implemented by Fauna & Flora International (FFI). To date, detailed surveys have been undertaken of vegetation, mammals, fish, butterflies, snails and cave invertebrates. Further field surveys, focussing on primates and birds, will be carried out at the site in early 2004 (N. Furey *in litt.* 2004).

The primary forest at Pu Luong proposed nature reserve is classified as closed evergreen tropical seasonal forest. Five major subtypes occur as a result of local variations in underlying substrate and elevation: lowland broadleaved forest on limestone (60 to 700 m); lowland broadleaved forest on schist/shale and clayey sandstone (60 to 1,000 m); broadleaved submontane forest on limestone (700 to 950 m); coniferous submontane forest on limestone (700 to 850 m); and broadleaved submontane forest on basalt (1,000 to 1,650 m). The proposed nature reserve also supports a range of secondary vegetation types, including secondary forests, bamboo, scrub and agricultural land (Averyanov *et al.* 2003).

The results of recent botanical work at Pu Luong indicate that the proposed nature reserve supports a diverse flora, with at least 1,109 vascular plant species documented at the site. From a conservation perspective, three primary forest subtypes found at the site may be considered particularly significant. The first, primary lowland forest on limestone and schist/shale, occurs near the eastern border of the site, in the Co Lung area. Primary forest in the area extends from 60 to 1,000 m, and, at the lowest elevations, supports very high plant species diversity (Averyanov *et al.* 2003).

The second significant primary forest subtype, primary coniferous submontane forest on limestone, is restricted to a few peaks within the uplands of the Co Luong area and supports outstanding plant diversity, particularly with respect to lithophytes and epiphytes. The globally threatened conifer *Pinus kwangtungensis* forms a conspicuous element of the flora within this forest subtype (Averyanov *et al.* 2003).

The third significant primary forest subtype is primary submontane forest on basalt, which occurs on the upper slopes of the south-western mountain ridge within the proposed nature reserve. The primary forest on these upper slopes is characterised by very high plant species diversity, including several nationally threatened conifers (Averyanov *et al.* 2003).

With regard to the vertebrate fauna of Pu Luong, a total of 84 mammal species (including 24 bat species), 162 bird species, 55 fish species, 28 reptile species and 13 amphibian species have been recorded at the proposed nature reserve to date (Anon. 1998a, Dang Ngoc Can 2003, Mai Dinh Yen *et al.* 2003, Vu Dinh Thong 2003). Pu Luong proposed nature reserve is an important site for the conservation of the globally critically endangered, endemic primate, Delacour's Leaf Monkey. The population at Pu Luong has been estimated to number 40 to 45 individuals, making it one of the largest known populations in Vietnam (Baker 1999).

Knowledge of the invertebrate fauna of the proposed nature reserve remains rudimentary. However, recent surveys conducted at the site indicate that its insect fauna includes at least 158 species of butterfly and 96 species of land snail, including 12 snail species possibly endemic to the site. Most promising perhaps, the botanical uniqueness and natural isolation of certain forest formations at the site suggests that the proposed nature reserve has strong potential to support high levels of invertebrate endemism and, quite possibly, new taxa to science (Monastyrskii and Phuong 2003, Vermuellen and Maassen 2003).

It is likely that Pu Luong has strong faunal and floral affinities with Cuc Phuong National Park, which is situated to 25 km to the south-east, along the same

limestone range. However, the higher elevations at Pu Luong and the presence of more extensive areas of evergreen forest means that Pu Luong can be expected to support a number of species that do not occur at Cuc Phuong. Indeed, the results of recent survey work conducted at Pu Luong proposed nature reserve indicate that this is in fact the case (N. Furey *in litt.* 2004). Consequently, the faunas and floras of the two sites are complementary, and the conservation of both sites is necessary to conserve the full range of biodiversity of the limestone range.

Conservation issues

Thanh Hoa Provincial FPD (*in litt.* 2000) consider the main threats to biodiversity at Pu Luong proposed nature reserve to be illegal clearance of forest for agriculture, hunting of wild animals, forest fire and illegal mineral exploitation. Orchid collection was also reported by Baker (1999).

In addition, the management board of Pu Luong proposed nature reserve is planning several activities to tackle what it sees as the main threats to conservation. These activities include the establishment of two additional guard stations; collaboration with local police on gun control, perhaps through a programme of gun registration and a ban on carrying guns within the proposed nature reserve; raising awareness of the existence of the protected area and dissemination of information on forest management regulations among local communities; development of local forest protection regulations for each village; issuing of forest protection contracts for forest areas in the buffer zone; and reforestation of 100 ha of deforested land on the south-western ridge (O. Maxwell *in litt.* 2000)

Other documented values

Forest in the proposed nature reserve has a role in protecting the watershed of the Ma river, the largest river in Thanh Hoa province. Just as importantly, the forest has an important role in protecting the water resources of local communities. Already, water is scarce during the dry season, because of the limestone geology of much of the area. Therefore, forest loss would be expected to increase periods of drought, leading to reduced agricultural productivity.

Low levels of mineral exploitation have been noted in the area, principally extraction of limestone for construction and gold prospecting. Although a small number (c.100) of illegal gold miners are thought to be present in the proposed nature reserve at any one time, this number is said to be much reduced from a peak in the mid 1990s.

Related projects

In collaboration with government partners, the FFI Vietnam Programme is currently implementing a medium-sized World Bank/GEF project entitled the *Pu Luong-Cuc Phuong Limestone Landscape Conservation Project*. The objectives of this project are: to protect the Pu Luong-Cuc Phuong limestone range and its wildlife through the establishment of a new protected area, strengthening the existing protected areas system and building the capacity of relevant stakeholders; to improve the conservation status of Delacour's Leaf Monkey; and to generate public support for karst conservation. Pu Luong is a geographical focus of this project, which will be implemented for three years from 2002.

A series of complementary activities to the medium-sized World Bank/GEF Project are being implemented at Pu Luong under the Spanish Agency for International Cooperation-funded *Pu Luong-Cuc Phuong Community Management and Eco-tourism Development Project*, currently being implemented by FUNDESO, in partnership with FFI and FPD, and with technical support from DED. The objectives of this project are to reduce poverty and contribute to socio-economic development compatible with forest and biodiversity conservation in selected buffer zone communes of Pu Luong proposed nature reserve. The project will be implemented for two years from 2002.

Conservation needs assessment

A conservation needs assessment has not been conducted for the site, although SNV and FFI plan to conduct one in the second half of 2004.

Operational management plan

An operational management plan has not been prepared for the site, although SNV and FFI plan to prepare one in the second half of 2004.

Eligibility against VCF criteria

The site is eligible for VCF support because it meets criteria A, B and C.

Criterion	Eligibility
A_I	NA1 - Northern Indochina Limestone
A_{II}	
B_I	Proposed Special-use Forest
B_{II}	Nature Reserve
B_{III}	Under provincial management
C_I	Management board established
C_{II}	

Social screening requirements

A social screening report has not been prepared for the site.

Criterion	Eligibility
A	
B	
C	
D	

Literature sources

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