Bi Dup-Nui Ba Nature Reserve

Alternative site name(s)
Bi Doup-Nui Ba, Thuong Da Nhim
Province(s)
Lam Dong
Area
64,000 ha
Coordinates
$12^0$00' - $12^0$19'N, $108^0$21' - $108^0$44'E
Agro-ecological zone
South-eastern
Decreed by government
Yes
Management board established
Yes
Investment plan prepared
Yes
VCF eligibility criteria met
A, B, C
Social screening criteria met
A, B, C
Conservation needs assessment prepared
Yes - 2003
Operational management plan prepared
Yes - 2003
Tracking tool completed
Yes - 2003 (score: 38)
Map available
Yes

Conservation status

Decision No. 194/CT of the Chairman of the Council of Ministers, dated 9 August 1986, decreed the establishment of two separate nature reserves: Nui Ba, with an area of 6,000 ha, and Thuong Da Nhim, with an area of 7,000 ha. These two proposals were later combined to form the basis for establishing Bi Dup-Nui Ba Nature Reserve (MARD 1997).

Prior to 1993, the area was managed by the management boards of Da Nhim Hydropower Reservoir Watershed Protection Forest, Lac Duong Forest Enterprise and Lam Vien Special-use Forest. However, on 22 October 1993, management responsibility for Bi Dup-Nui Ba Nature Reserve was transferred to a Special-use Forest management board established by Decision No. 1496/QD-UBTC of Lam Dong Provincial People's Committee (Anon. 1995).

In 1995, an investment plan for Bi Dup-Nui Ba was prepared by the Forest Inventory and Planning Institute, in collaboration with Lam Dong Provincial FPD. This investment plan proposed establishing a 71,062 ha nature reserve, comprising a strict protection area of 50,503 ha and a forest rehabilitation area of 20,559 ha. Later that year, the investment plan was approved by Lam Dong Provincial People's Committee and the former Ministry of Forestry (Anon. 1995).

On 26 December 2002, the Special-use Forest management board was restructured as a nature reserve management board by Decision No. 183/QD-UB of Lam Dong Provincial People's Committee. The management board currently has 10 members of staff, based at six guard stations (Lam Dong Provincial FPD *in litt.* 2003). According to Lam Dong Provincial FPD (*in litt.* 2003), the total area of the nature reserve is 64,366 ha, and it is under the management of Lam Dong Provincial DARD.

Bi Dup-Nui Ba is included on a list of Special-use Forests to be established by the year 2010, prepared by the FPD of MARD, as a 64,000 ha nature reserve (FPD 2003); this list has not yet been approved by the government.

Topography and hydrology

Bi Dup-Nui Ba Nature Reserve is located in Lac Duong district in the southern Annamite mountains. The topography of the nature reserve is mountainous, and most of the site lies above 1,400 m. The highest point in the nature reserve is Mount Bi Dup in the east, which reaches 2,287 m. Mount Lang Bian (also known as Nui Ba), a 2,167 m peak, lies just outside of the nature reserve to the west.

The nature reserve lies in three distinct catchments. The east of the nature reserve, around Mount Bi Dup, lies in the catchment of the Da Nhim river, which feeds

Da Nhim hydropower dam. The west of the nature reserve, around Mount Lang Bian, lies in the catchment of Suoi Vang hydropower dam, which drains into the Da Dung river. Finally, streams originating in the north of the nature reserve feed the Dak Krong Kno river, which flows north-west then north-east, before joining the Srepok river.

Biodiversity values

There are two major forest types at Bi Dup-Nui Ba Nature Reserve: coniferous forest, and evergreen forest. The coniferous forest is dominated by *Pinus kesiya* with smaller amounts of *P. merkusii*. This forest type covers 21,019 ha or 29% of the nature reserve (Anon. 1995). Coniferous forest is a seral vegetation type, formed as a result of repeated burning; if the forest was not burnt, succession to broadleaf evergreen forest would occur (Eames 1995).

Evergreen forest covers 36,069 ha or 51% if the nature reserve (Anon. 1995). The evergreen forest contains significant coniferous elements, such as *Pinus dalatensis*, *Calocedrus macrolepis*, *Fokienia hodginsii* and *Podocarpus imbricatus*. The evergreen forest can be broadly classified into two forest formations: lower montane and upper montane. The lower montane evergreen forest is dominated by species in the Fagaceae and Lauraceae families, including *Castanopsis indica*, *Lithocarpus* spp., *Quercus* spp., *Cinnamomum* spp. and *Litsea* spp. The upper montane evergreen forest is characterised by the presence of the genera *Syzygium* and *Rhododendron* (Eames and Nguyen Cu 1994). Within the upper montane zone, Bi Dup-Nui Ba supports a small area of elfin forest (Anon. 1995).

Bi Dup-Nui Ba Nature Reserve supports high levels of plant diversity and endemism. During field surveys in 1993 and 1994, a total of 827 vascular plant species were recorded at the site, of which 87 are endemic to the Central Highlands of Vietnam. An indication of the level of plant endemism is given by the fact that 23 plant species described from the area have been assigned the specific names *dalatensis*, *bidoupensis* or *langbianensis* (Anon 1995). Many of the plant species recorded at Bi Dup-Nui Ba are globally threatened.

The fauna of Bi Dup-Nui Ba Nature Reserve is also very species rich, and exhibits high levels of endemism. To date, a total of 382 vertebrate species have been recorded at the nature reserve, comprising 89 species of mammal, 202 species of bird, 62 species of reptile and 29 species of amphibian (Anon. 1995). A number of mammal species of conservation concern have been recorded at Bi Dup-Nui Ba, including Yellow-cheeked Crested Gibbon *Hylobates gabriellae* and Gaur *Bos gaurus* (Eames and Nguyen Cu 1994). In addition, the investment plan reports the occurrence of the recently discovered, endemic Large-antlered Muntjac *Muntiacus vuquangensis* (Anon. 1995).

Bi Dup-Nui Ba Nature Reserve lies within the Da Lat Plateau Endemic Bird Area (EBA) (Stattersfield *et al.* 1998). Seven of the eight restricted-range bird species that occur in this EBA have been recorded at the site in recent years: Crested Argus *Rheinardia ocellata*, Yellow-billed Nuthatch *Sitta solangiae*, Black-hooded Laughingthrush *Garrulax milleti*, White-cheeked Laughingthrush *G. vassali*, Collared Laughingthrush *G. yersini*, Short-tailed Scimitar Babbler *Jabouilleia danjoui* and Vietnam Greenfinch *Carduelis monguilloti* (Eames 1995). Bi Dup-Nui Ba contains two Important Bird Areas: Lang Bian and Bi Dup (Tordoff 2002).

Conservation issues

The overall level of human impact on the nature reserve is moderate. One of the greatest threats to biodiversity comes from shifting cultivation. As well as resulting in forest loss, the associated fires promote the spread of fire-climax coniferous forest dominated by *Pinus kesiya*. As the biodiversity value of coniferous forest is lower than that of evergreen forest, this transition tends to reduce the biodiversity value of the nature reserve (Eames and Nguyen Cu 1994). In order to link fragmented patches of evergreen forest, Eames and Nguyen Cu (1994) recommended that corridors of coniferous forest should be carefully managed to promote ecological succession to evergreen forest.

Alongside shifting cultivation, one of the main causes of forest loss at Bi Dup-Nui Ba has been charcoal production and fuelwood collection. Charcoal production has already lead to the destruction of most of the evergreen forest on Mount Lang Bian. As the principle market for charcoal and fuelwood is Da Lat

city, the continued expansion of this urban centre is likely to lead to increased pressure on the forest resources of Bi Dup-Nui Ba Nature Reserve (Eames and Nguyen Cu 1994).

In the recent past, parts of Bi Dup-Nui Ba Nature Reserve were under forest enterprise management and were the focus of commercial logging operations. The focus of these operations was the selective extraction of species of high economic value, such as *Fokienia hodginsii*. A network of logging roads was built along ridges in the evergreen forest, in order to facilitate the extraction of these species. Commercial logging resulted in the destruction of much evergreen forest, although this practice now appears to have ceased (Eames and Nguyen Cu 1994). Despite the cessation of commercial logging, there exists a plan to construct a road, linking Da Lat city and Ninh Thuan province, through the south-eastern part of the nature reserve. As well as causing the loss and fragmentation of natural habitats, the construction of this road may facilitate illegal exploitation of the natural resources of the nature reserve, and spontaneous migration into the area.

Other threats to biodiversity at Bi Dup-Nui Ba include hunting and the over-exploitation of non-timber forest products, including orchids, which are sold in Da Lat city (Eames and Nguyen Cu 1994).

Another conservation issue is the fact that the nature reserve does not include the summit of Mount Lang Bian. This mountain, which lies immediately outside of the nature reserve, is a historical collecting locality for the globally endangered Grey-crowned Crocias *Crocias langbianis*, a bird species endemic to the southern Annamites. The biodiversity values of Mount Lang Bian are currently being eroded by unsustainable tourism development, including the construction of a road part way to the summit, and the operation of wildlife restaurants on the mountain.

Other documented values

The principal economic value of the proposed nature reserve is catchment protection. Loss of forest cover could result in increased severity of both droughts and flooding, with negative repercussions for downstream communities that depend upon rivers originating within the nature reserve for irrigation and potable water, and on the operation of the Da Nhim and Suoi Vang hydropower dams.

The nature reserve also has high potential for ecotourism development, and revenue generated could theoretically support conservation activities at the site. However, given the net negative environmental impacts of tourism development on Mount Lang Bian and the current limited capacity of the nature reserve management board to manage impacts, extreme caution should be exercised in this regard.

Related projects

The national 661 Programme is currently funding forest protection contracts for c.13,000 ha of forest at the nature reserve.

Conservation needs assessment

A conservation needs assessment was conducted for the site in November 2003 by BirdLife International, in collaboration with the nature reserve management board, with support from the Cat Tien National Park Conservation Project. Based on an assessment of the biodiversity values of the site, and the direct and indirect threats to them, 19 high priority activities for VCF support were identified:

- increased coordination with local stakeholders for forest protection activities;
- education and awareness-raising activities;
- community co-management initiatives;
- research on sustainable harvesting levels for non-timber forest products (NTFPs);
- negotiated agreements for sustainable NTFP use by local communities;
- capacity building for nature reserve staff;
- increased patrolling intensity;
- negotiated no-hunting agreements with local communities;
- gun and trap-control programmes;
- baseline biodiversity surveys and ecological monitoring programmes;
- strengthened law enforcement;
- development of appropriate fire management strategies;
- participatory boundary demarcation;

- increased resources for forest protection teams in dry season;
- negotiated household/village agreements on fire prevention;
- rapid distribution of weather forecast information;
- coordination with construction companies, sign forest protection agreements;
- integration of nature reserve objectives into provincial and national infrastructure development and tourism development plans;
- negotiated agreements for sustainable timber use by local communities.

Operational management plan

An operational management plan was prepared for the site in November 2003 by BirdLife International, in collaboration with the nature reserve management board, with support from the Cat Tien National Park Conservation Project. The priority management actions formulated were as follows:

1. strengthen the capacity of the nature reserve management board;
2. control over-exploitation of NTFPs;
3. control hunting and trapping of animal species;
4. control forest fires;
5. conduct targeted biological research;
6. demarcate the national park boundary;
7. implement an education and awareness-raising programme;
8. engage all stakeholders in conservation.

Eligibility against VCF criteria

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

Criterion	Eligibility
A_I	SA3 - Southern Annamites Main Montane Block
A_{II}	VN036 - Bi Dup; VN037 - Lang Bian
B_I	Decision No. 194/CT, dated 09/08/86
B_{II}	Nature Reserve
B_{III}	Under provincial management
C_I	Management board established
C_{II}	

Social screening requirements

A social screening report was prepared for the site in November 2003. Bi Dup-Nui Ba meets social screening criteria A, B and C. Bi Dup-Nui Ba does not meet criterion D, because the management board has not yet negotiated and reached agreement with local communities on acceptable levels of local use of specified resources within the nature reserve.

Criterion	Eligibility
A	The people's committee chairmen of all communes located in the buffer zone and core area of the nature reserve were consulted in the preparation of the conservation needs assessment
B	People living in the buffer zone and core area, and all sections of these communities, were consulted during the preparation of the conservation needs assessment
C	Draft results of the conservation needs assessment were fed back to all local communities and their comments were taken into account in the final conservation needs assessment
D	

Literature sources

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