

**A Rapid Survey of Yellow-Cheeked Crested
Gibbon and Bird Species in Da Chais Commune,
Bi Doup-Nui Ba National Park with a view to
developing an ecotourism programme in the area**

(Technical report)



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1. INTRODUCTION

Bi Doup-Nui Ba National Park, situated in Lac Duong District in north-eastern Lam Dong Province, was decreed a national park in 1986. Bi Doup-Nui Ba is one of the larger protected areas in Vietnam, encompassing 72,573 ha. It is mountainous and forms a vital watershed to three distinct water catchment areas. It falls within a landscape which has been independently identified by leading national and international scientists as one of the highest conservation priorities within the Greater Annamites Eco-Region.

There are two main forest types in Bi Doup–Nui Ba Nature Reserve: Coniferous forest, which is dominated by *Pinus kesiya* with smaller amounts of *P. merkusii*, covers 21,019 ha, or 29% of the nature reserve and evergreen forest covers 36,069 ha, or 51% of the nature reserve. In addition, the upper montane zone contains a small area of elfin forest. Bi Doup–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.

The indigenous population of the buffer zone of Bi Doup–Nui Ba Nature Reserve comprises mainly of members of the K'ho, Chu Ru, Ede, and Ba Na ethnic minorities. Over the last decade, the population of the buffer zone has increased significantly, as a result of both natural population increase and immigration from other provinces in Vietnam. Much of this immigration has been spontaneous, in response to high population pressures in the source provinces, and to perceived economic opportunities in the Central Highlands.

There is great, as yet untapped, potential for ecotourism at Bi Doup-Nui Ba National Park in the form of day trips or overnight trips from the nearby tourist destination of Dalat and possibly also from Nha Trang. It is very important however that great care is taken when setting up any tourism project in the park to ensure that the project does not have any adverse effect on either the fauna or flora of the park and that it should bring some benefit to the local community. To minimise disturbance, numbers of visitors participating in tours need to be strictly limited.

Potential attractions for ecotourists to Da Chais Commune, Bi Doup-Nui Ba National Park, have been identified as Yellow-cheeked Crested Gibbons, endemic and speciality birds of the Dalat Plateau and the unique flora of the park.

To estimate the number, distribution and conservation status of Yellow-cheeked Crested Gibbon and some key bird species in Da Chais Commune, Bi Doup-Nui Ba National Park, we reviewed the previous survey of Thinh (2008) of Yellow-cheeked Crested Gibbon and Tuoc (2009) of mammals and Trai (2009) of birds in addition to a field survey carried out between 28th June and 2nd July 2009. The aim of this report is to have an overview on the biodiversity of Yellow-cheeked Crested Gibbons and bird species in the researched area based on the survey data to develop a simple ecotourism tour and trail in the natural forest. The detailed objectives and activities are:

- Identify the current status of gibbon/bird populations, their habitats in the Da Chais Commune and the area within the Bi Doup-Nui Ba Protected Area immediately adjacent to the commune
- Impact assessment on these species from ecotourism activities
- Propose possible options for introducing ecotourism services purposes to benefit local communities in the survey area

2. METHODS

2.1. Study site

Field surveys were carried out at two locations, namely Bi Boup-Nui Ba Mountain and Gia Rich Mountain and along Road 723 between Klong Klanh Ranger Station and Hon Giao Ranger Station.

Table 1: Research locations and research Date

No.	Ranger Station	Research Locations	Camp site (UTM)	Research Date No of days would provide an index of effort here

1	Klong Klanh, Giang Ly and Hon Giao	Along Road 723 and Gia Rich summit		29-30 June and 1 July 2009
2	Bi Doup-Nui Ba	From station to peak (pine plantation forest)		1 July 2009

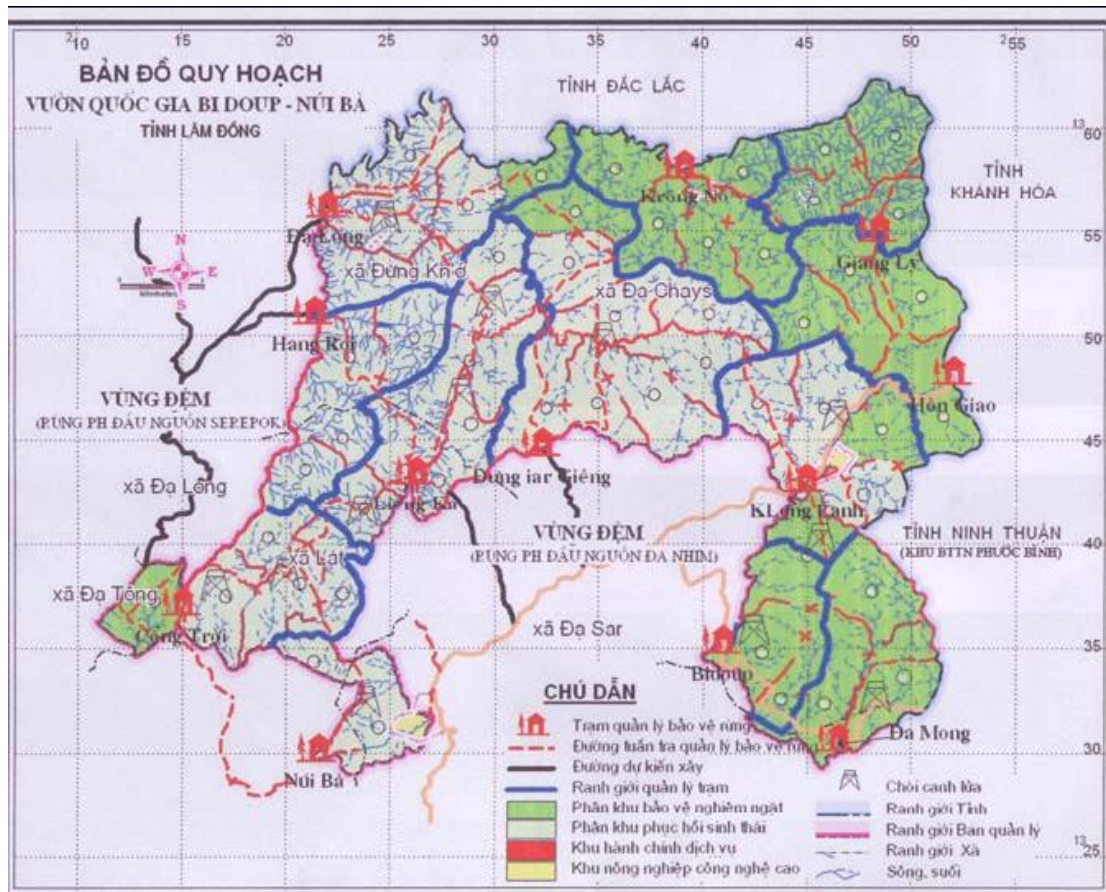


Figure 1: Map of Bi Doup-Nui Ba

2.2. Personnel

1. Van Ngoc Thinh – WWF Vietnam Programme
2. Richard Craik – Vietnam Birding
3. Le Canh Nam – Ecotourism Department, BDNB NP
4. Nguyen Van Thuong – Klong Klanh Ranger Station, BDNB NP
5. Dinh Ba Kha – Klong Klanh Ranger Station, BDNB NP
6. Cil Ha Moc – guide from Klong Klanh Village



Photo 2. Survey team at Gia Rich summit, BDNB National Park

2.3. Itinerary and Survey Effort

Table 2 summarizes the detailed itinerary and achievements of the survey from June 28th to July 2nd 2009.

Table 2. Summary Itinerary and Effort for the survey

Date	Activities	Achievements
28/6/09	Travelled to BDNB National Park and met with WWF Da Lat team for logistics discussion	Formulated a plan for the field surveys
29/6/09	AM: Travelled to Klong Klanh Ranger Station and met with and interviewed staff of the national park. Brief visit to the proposed ecotourism site PM: Conducted interviews in Klong Klanh Village and briefly surveyed the start of the Gia Rich trail for birds	Prepared maps of the trails to be surveyed for ecotourism Identified key species and priority areas for gibbons and birds

		Reviewed the trails and decided to survey the trail to Gia Rich summit Prepared first daily bird list
30/6/09	AM: Rapid survey of Gia Rich to the summit PM: Rapid survey to Bi Doup-Nui Ba Ranger Station	Identified gibbon groups Surveyed bird species and prepared second daily bird list Surveyed potential ecotourism trails Identified and discussed potential ecotourism trails
1/7/09	Am: Gibbon and bird surveys along Road 723 PM: Discussion and feedback session with WWF Da Lat Team	Identified location of gibbon groups Surveyed bird species and prepared third daily list
2/7/09	Returned to Hue (Thin) and HoChi Minh City (Richard)	

2.3. Methods

3.2. 3.3.2 Literature Review

Information from previous primate and bird surveys at Bi Doup-Nui Ba were reviewed before the start of the survey. Literature for previous surveys is presented in Table 2.0. Few surveys on mammals, primates and particularly gibbons have been conducted at Bi Doup-Nui Ba National Park prior to this research. Information about gibbons and birds in the research areas published in previous reports is essential to

assess and compare the abundance of gibbon populations, in the past and present. Most studies were undertaken in the same areas and were focused on gibbons and birds.

3.3. Table 2.0 Previous studies on primate and mammal populations in BDNB NP

Report	Location of study	Remarks
Van Ngoc Thinh, 2008	Cong Troi, Klong Klanh, Giang Ly and Hon Giao, Bi doup mountain	Mammals , primates, gibbons
Do Tuoc, 2009	Whole NP	Mammals
Le Trong Trai, 2009	NP	Birds

2.3.2. Field surveys

Field surveys were conducted in forest areas along trails and along Road 723 in Da Chais Commune and Nui Ba forest areas based on interviews with national park staff and local guides. Because gibbons are shy and difficult to approach in the wild, therefore, the recording method using directional microphone was the most efficiency method that our survey team was using in the field during this study. We were successful in recording gibbon songs in the vicinity of Mount Gia Rich and along Road 723 road. Unfortunately due to adverse weather conditions, we were not able to access the summit of Mount Bi Doup to survey gibbon populations there. Our methods helped record the presence of gibbons and estimate populations in the research areas without disturbing the animals. Daylight surveys started from around 04:30 until 12:00 noon and again from 13:00 until approximately 17:00. Tapes of gibbon songs are stored and used to analyze the group structure (members of groups).

Birds were surveyed on foot using binoculars and an I-Pod and speaker to broadcast calls and songs of target species. The main target species was Collared Laughingthrush, a Dalat Plateau endemic listed as endangered in the IUCN Red List, found in broadleaved evergreen forest above 1,500 metres.



Photo 3. Collared Laughingthrush (Photo by Nguyen Tran Vy)

Other target species were another endemic bird, Vietnamese Cutia, and the restricted range Yellow-billed Nuthatch. At the end of each day a daily bird list of species recorded was prepared. Bird names follow Robson (2008).

Gibbon surveys were conducted in the early morning using a ‘listening post’ approach based on the methods of Brockelman & Ali (1987), which has been successfully implemented elsewhere in Vietnam (Long *et al.*, 2000). Gibbon songs were recorded from 05:30 to 07:30 dependant on weather conditions. During the survey, gibbons sang from 05:25 to 06:10 for periods of from 8 to 14 minutes. They started singing again at 07:00 to 09:00 with a duration of from 5 to 7 minutes.

Mammal identification was based on the knowledge of each survey participant. Footprints followed Van Strien (1983), Kanjanavanit Oy (1997), Pham Nhat *et al.* (2001). Vietnam conservation status followed the Vietnam Red Data Book (MOSTE, 2000) and Decree No. 32/2006/ND-CP; globally status followed the 2006 IUCN Red List of Threatened Species (The 2006 IUCN Red List of Threatened Species, website: www.redlist.org) and CITES (CITES Secretariate, 1998). Herpetological identification followed Campden-Main (1970).

3. RESULTS

3.1. Mammals in Da Chais Commune, Bi Doup-Nui Ba National Park

3.1.1. Yellow-cheeked Crested Gibbon (*Nomascus gabriellae*)

According to local people, gibbons are common in BDNB National Park. Rangers from Klong Klanh and Giang Ly reported that they frequently heard gibbon songs from their stations.

In fact, we heard gibbon songs every day during the survey and observed at the eastern end of Road 723 at Gia Rich mountain range at the coordinates of N: 12 08 51 and E:108 40 11. Following the survey results and review of the 2008 survey results, there is thought to be a total of 17 gibbon groups comprising of 54 individuals recorded in the survey areas. Detailed information of gibbon records is given in Table 3 and Figure 2. According to the results, Da Chais Commune contains a large population of Yellow-cheeked Crested Gibbons (*N. gabriellae*). This is a significant population and it is important that the species receives full protection in the national Park.

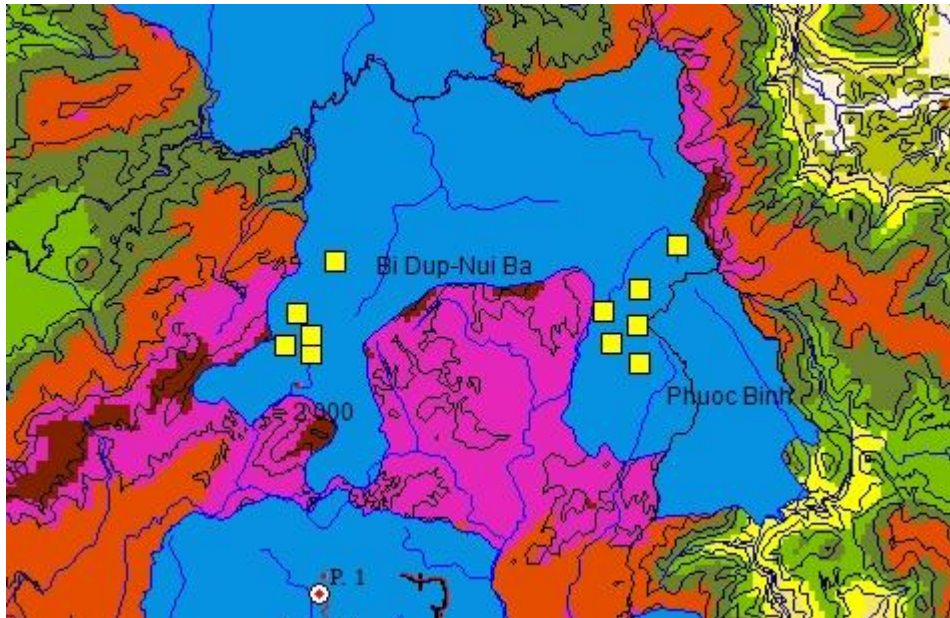
Table 3. Summary results of the 2008 and 2009 gibbon population census at Da Chais commune, BDNB NP

3.4. Gibbon recorder in Da Chais

Groups	Time	Distance	Compass bearing	N_ UTM	E_ UTM	Male	Female	Young
Review data (Thin, 2008)								
1.	11/01	2Km	193	12 08.787	108 39.554	1	2	1
2.	11/01	1,5Km	110	12 11.300	108 40.942	1	2	?
3.	12/01	1,5Km	50	12 11.300	108 40.942	1	2	1
4.	12/01	1Km	30	12 11.628	108 41.104	1	2	?

5.	13/01	0,5Km	120	12 11.800	108 41.450	1	1	1
6.	15/01	1,5Km	250	12 08.004	108 23.143	1	1	?
7.	15/01	2Km	330	12 09.120	108 23.200	1	2	?
8.	16/01	1,5Km	120	12 10.015	108 22.043	1	1	2
Current survey (
9.	30/June			12 08 51.7	108 40 116	1	1	1
10.	30/June			Thinh	Gia Rich	1	1	0
11	30/June			Thinh	Gia Rich	1	1	0
12	1/ July			Richard	Klong Klanh	1	1	0
13	1/ July			Nam	First trail	1	1	0
14	1/ July			Thinh	Giang ly station	1	1	0
15	1/ July			Thuong	Thong 2 la det	1	1	0
16	1/ July			Thuong	Thong 2 la det	1	1	0
17	1/ July			Thuong	Thong 2 la det	1	1	0

Map 3. Distribution of Yellow-cheeked Crested Gibbons in Bi Doup-Nui Ba National Park



3.1.2. *Other mammals*

The survey was also concerned with populations of other primates in the national park. However, no other primates were observed during the survey. Based on interviews with local people in Klong Klanh villages and a review of previous data, other primates in the national park include Black-shanked Douc Langur (*Pygathrix nigripes*), Slow Loris (*Nycticebus* sp.), Stump-tailed Macaque (*Macaca arctoides*) and Pig-tailed Macaque (*M. leonina*).

3.1.3. *Douc Langurs*

According to interviews, Black-shanked Douc Langur (*Pygathrix nigripes*) is present in Da Chais Commune, BDNB National Park. Most local people who use the forest regularly can describe and report distribution and locations of this species.

In fact, the number of douc langur populations in BDNB National Park would be higher than numbers that were reviewed during this survey in parts of the national park. Thus, it is necessary to carry out further surveys to assess the exact number and distribution of douc langur populations in the national park in areas such as Bi Doup and Gia Rich mountains.

The following other mammals were recorded during the survey:

1. Carnivores: bones of some species killed by trapping include one small cat and unidentified Civet.
2. Wild pig was only recorded by its footprints. This species is threatened by trapping.
3. One (01) Black Giant Squirrel was observed July 01st, 2009
4. Squirrels: Observations of one-bellied squirrel
5. Rats: Two rat individuals were trapped during the survey

3.4 Bird species composition in Da Chais Commune

The focus of the bird survey was to establish which endemic and near-endemic bird species of broadleaved evergreen forest above 1,500 metres on the Dalat Plateau were present in Da Chais Commune.

Four species fitting this criteria were recorded with three of them, the endangered Dalat Plateau endemic Collared Laughingthrush (*Trochalopteron yersini*), the near endemic White-cheeked Laughingthrush (*Dryonastes vassali*) and Yellow-billed Nuthatch (*Sitta solangiae*), appearing to be locally common in the appropriate habitat. The fourth species, Vietnamese Cutia (*Cutia legalleni*), a near-threatened endemic of the southern Central Highlands of Vietnam and South-east Laos was also recorded and is also likely to be fairly common in the appropriate habitat.



Photo 4. White-cheeked Laughingthrush (Photo by Luyen Nguyen)

Further surveys of the broadleaved evergreen forest at Da Chais Commune may also confirm the presence of Black-hooded Laughingthrush (*Garrulax milleti*), a near-threatened species restricted to the southern Central Highlands of Vietnam and adjacent South-eastern Laos while areas of native pine forest should hold populations of the near-threatened Dalat Plateau endemic, Vietnamese Greenfinch (*Chloris monguilloti*).

A total of three mixed species bird flocks were encountered during the survey, two in broadleaved evergreen forest along Road 723 between Giang Ly and Hon Giao Ranger Stations, and one on the first summit of Gia Rich. These flocks comprised of typical species of montane forest on the Dalat Plateau such as Grey-chinned Minivet, White-throated Fantail, Grey-headed Canary Flycatcher, Yellow-cheeked Tit, Grey-crowned Tit, Mountain Tailorbird, White-tailed Leaf Warbler, Grey-cheeked Warbler, Rufous-capped Babbler, White-browed Shrike Babbler, Chestnut-fronted Shrike Babbler, Blue-winged Siva, Silver-eared Mesia, Mountain Fulvetta, Black-headed Sibia, White-bellied Erpornis and Mrs Gould's Sunbird.

Table 4. List of bird species recorded during survey

Key to Locations in Table 4:

A = Klong Klanh Ranger Station

B = Road 723 between Giang Ly and Hon Giao Ranger Stations

C = Gia Rich Mountain

Date	Species	Location	Remarks
1/7	Crested Serpent Eagle	B	
30/6	Mountain Imperial Pigeon	C	
29/6, 1/7	Spotted Dove	A, B	
1/7	Barred Cuckoo Dove	A	
29/6	Wedge-tailed Green Pigeon	B	
1/7	Grey-headed Parakeet	A	
1/7	House Swift	A	
30/6	Golden-throated Barbet	C	
30/6	Bay Woodpecker	B,C	
30/6, 1/7	White-browed Shrike Babbler	B, C	
1/7	Chestnut-fronted Shrike Babbler	B	
1/7	White-bellied Erpornis	B	
29/6	Large Cuckooshrike	A	
30/6	Grey-chinned Minivet	C	
29/6	Long-tailed Minivet	A	
29/6, 1/7	Slender-billed Oriole	A	
29/6, 1/7	Ashy Woodswallow	A	
1/7	White-throated Fantail	B	
29/6	Ashy Drongo	A	
30/6	Indochinese Green Magpie*	C	Heard on trail to Gia Rich summit at approx. 1,600m
29/6, 30/6,	Burmese Shrike	A, B, C	

1/7			
30/6, 1/7	Mrs Gould's Sunbird	B, C	
1/7	Plain-backed Sparrow	A	
1/7	Eurasian Tree Sparrow	A	
1/7	Paddyfield Pipit	A	
30/6	Yellow-billed Nuthatch*	B, C	Near endemic. Seen twice in mixed flocks
29/6	Vinous-breasted Myna	A	
1/7	Black-collared Starling	A	
30/6, 1/7	Lesser Shortwing	B, C	
30/6	White-tailed Robin	C	
30/6, 1/7	Grey Bushchat	A, C	
29/6	Slaty-backed Forktail	C	
29/6, 1/7	Large Niltava	B	1 captive juvenile at Hon Giao Station
1/7	Little Pied Flycatcher	B	
29/6	Snowy-browed Flycatcher	B	1 captive juvenile at Hon Giao Station
1/7	Grey-headed Canary Flycatcher	B	
1/7	Yellow-cheeked Tit	B	
1/7	Grey-crowned Tit	B, C	
29/6, 1/7	Red-whiskered Bulbul	A, B	
29/6	Black Bulbul	A	
1/7	Mountain Tailorbird	B	
29/6, 30/6, 1/7	Grey-bellied Tesia	B, C	

1/7	Grey-cheeked Warbler	B	
1/7	White-tailed Leaf Warbler	B	
1/7	Mountain Fulvetta	B	
1/7	Rufous-capped Babbler	B	
29/6, 1/7	White-cheeked Laughingthrush*	B, C	Near endemic. Two flocks of 30+ birds seen
30/6	Collared Laughingthrush*	C	Dalat Plateau endemic. Three pairs seen on Gia Rich between 1,550 and 1,700m
30/6	Vietnamese Cutia*	C	Near endemic. One pair seen at first summit of Gia Rich
1/7	Blue-winged Siva	B	
1/7	Silver-eared Mesia	B	
1/7	Black-headed Sibia	B, C	
1/7	Russet Bush Warbler	A	
30/6, 1/7	Hill Prinia	A, C	

Threats

3.5. Hunting/Trapping

Trapping activities are a major threat to wildlife in the survey area. During the field survey, we encountered and destroyed both new and old snares at Mount Gia Rich. Survey participants also encountered remains of animals killed by these traps including large mammals and birds. Local people from Klong Klanh village reported hunting, particularly of primates, in the national park. One local hunter reported that he trapped “munjac, deer, monkey and douc langurs”. Rangers at Giang Ly Ranger

Station had confiscated two juvenile birds, a Snowy-browed Flycatcher and a Large Niltava, from local children on the morning we were visited. Unfortunately both these juvenile birds would have died within a day or two of capture.

Hunting and trapping must have seriously impacted populations of terrestrial animals including primates and birds in the survey area. All existing traps in the national park should be located and destroyed and measures need to be taken to prevent people accessing the forest for hunting and trapping. In addition an educational programme should be created for local people to raise awareness of the value of mammals and birds for ecotourism.

3.6. Habitat disturbance

Although the survey area is a restricted area of the national park, survey participants encountered local people entering the forest to collect remains of wartime ordnance to sell as scrap metal. There is much evidence of human activities within the survey area.

3.7. Agricultural encroachment

- Coffee plantation extension
- Agricultural land extension
- Farming

4. Conclusions and Recommendations

4.2. Recommendations for proposed tours

During the survey the participants researched and discussed several potential tour options with a view to introducing ecotourism to the Da Chais Commune area of Bi Doup-Nui Ba National Park. It was decided to focus on two tour options from Dalat, a half-day tour and a two-day/one night tour with overnight camping. Through these

tours visitors would be able to experience early morning gibbon calls, see endemic and speciality birds and learn about the unique flora of the national park.

Proposed Tour 1: Half-Day Tour from Dalat

Tour Summary: A half-day introduction to the natural history of Bi Doup-Nui Ba National Park including Yellow-cheeked Crested Gibbons, endemic and speciality birds of the Dalat Plateau and the unique flora of the area

An early start from Dalat by road to arrive at Da Chais Commune and be in position for the first gibbon calls by 05:30. Two locations have been identified as listening posts for gibbon calls at Da Chais Commune: the Krempf's Pine site on Road 723 between Giang Ly and Hon Giao Ranger Stations and the start of the Gia Rich trail at the edge of the broadleaved evergreen forest.

A local guide will first introduce visitors to the Yellow-cheeked Crested Gibbon with information on recognising the calls of male, female and juveniles, visual identification of male, female and juvenile gibbons and details of diet, breeding, distribution and perhaps most importantly threats to their survival.

When the gibbons have finished calling the guide will then introduce visitors to a second aspect of the natural history of Bi Doup-Nui Ba National Park, some typical birds of the park including some endemic and speciality species of the Dalat Plateau. The guide will attract mixed species flocks by using playback of the call of Collared Owlet or by imitating the call on a simple bamboo whistle. The guide will identify the bird species in the flock, show visitors each species in a field guide and inform the visitors on which birds are particularly special to the area.

The third part of this introduction to the natural history of Bi Doup-Nui Ba National Park will focus on the unique flora and in particular *Pinus kremfii*, *Pinus dalatensis*, *Fokienia hodgsonii*, typical trees of montane evergreen forest and medicinal plants and their uses.

The tour could finish with a short walk up Hon Giao Mountain to experience typical moist rainforest.

Proposed Tour 2: Two-Day/One-Night Tour from Dalat (Note: Due to problems of access during the rainy season this tour would only be possible in the dry season between December and April)

Tour Summary: An adventurous two-day tour including camping overnight at the summit of Mount Bi Doup with an introduction to the natural history of Bi Doup-Nui Ba National Park including Yellow-cheeked Crested Gibbons, endemic and speciality high elevation birds of the Dalat Plateau and the unique flora of the area.



Photo 5. Summit of Mount Bi Doup (Photo by Richard Craik)

Leave Dalat by road at 09:30 arriving at the dirt road that leads to Bi Doup-Nui Ba Ranger Station around 11:00. From here it is approximately 45 minutes by motorcycle with an experienced local driver on dirt roads to Bi Doup-Nui Ba Ranger Station. On arrival at Bi Doup-Nui Ba Ranger Station a picnic lunch is served in the forest by the river.

After lunch it is then a three-hour trek from the ranger station to the summit camp area. The trail leads through conifer forest for the first two hours and before entering montane evergreen forest. (An alternative option is to hire a motorcycle from the ranger station for a 40-minute ride through the conifer forest and then trekking for approximately one hour to the summit.) Tents and camping equipment will be carried by the guides and support team and a camp will be set-up near the summit. Dinner will be cooked and served by the support team. Overnight in tents pre-erected by the guides and support team.

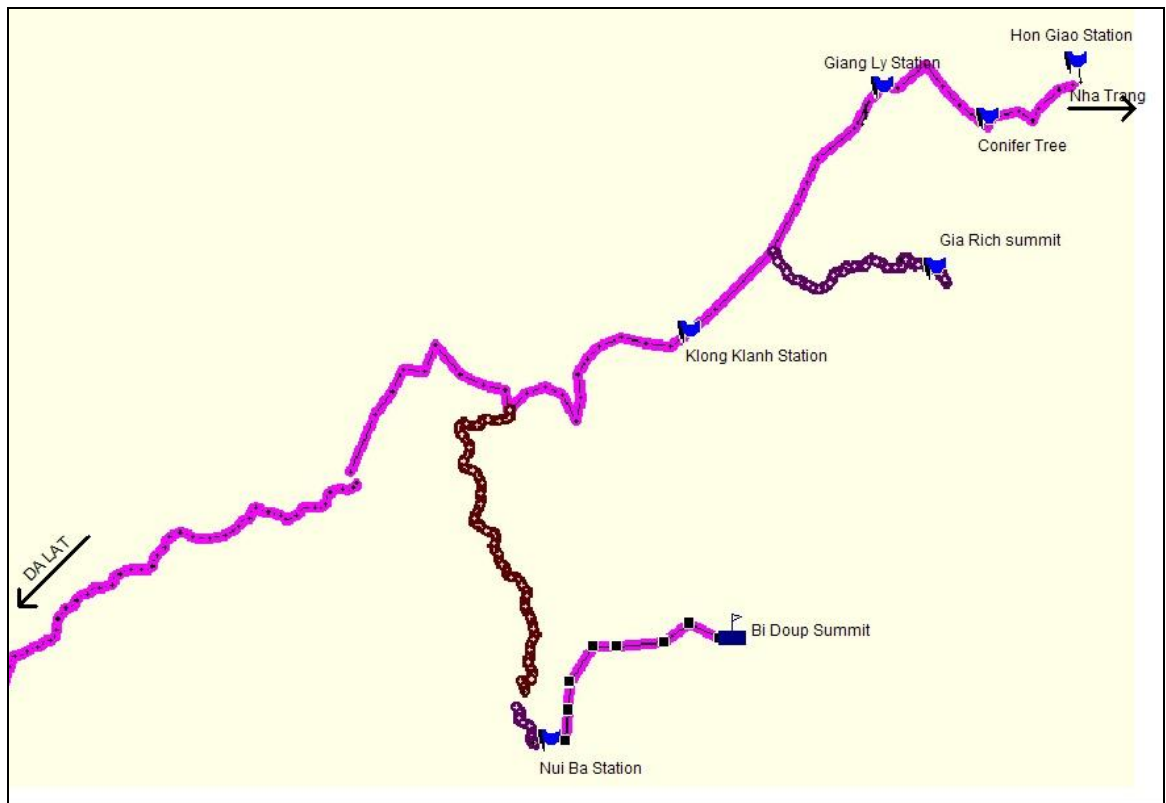
An early start to the summit of Mount Bi Doup at 05:00 for gibbon listening before returning to camp for breakfast. After breakfast the guide will take the visitors birding and use playback of Collared Owlet calls (or imitate the call on a bamboo whistle) to attract mixed species flocks. The guide will identify the bird species in the flock, show visitors each species in a field guide and inform the visitors on which birds are particularly special to the area. (In addition to the birds seen at lower levels there is a bird species found at the summit of Mount Bi Doup, Indochinese Fulvetta *Fulvetta danisi bidouensis*, that cannot be seen elsewhere in the national park.)

As in the half-day tour, the local guide will also introduce the unique flora and in particular *Pinus kremfii*, *Pinus dalatensis*, *Fokienia hodgsonii*, typical trees of montane evergreen forest and medicinal plants and their uses.

At 10:30 motorcycles will pick-up the visitors and guide from the camp and return to the Road 723 where transport will be waiting to return to Dalat.

Note: This tour requires additional equipment and services including motorcycles with experienced drivers, motor cycle helmets for visitors, good quality tents, porters to carry camping equipment and food supplies and a cook in addition to the local guide.

4.2 Maps for trail and information



4.3 Training, preparation & equipment needed for proposed tours

Training

A training course would be needed for a team of selected local guides and rangers covering the following:

- gibbon call recognition and general knowledge of Yellow-cheeked Crested Gibbon identification, diet, breeding, distribution, etc.
- bird identification (visual and vocal) covering species typically found at Bi Doup-Nui Ba National Park paying particular attention to endemic and speciality species.
- identification of the special and typical flora of Bi Doup-Nui Ba National Park paying particular attention to endemic and speciality species such as *Pinus krempfii*, *Pinus dalatensis*, *Fokienia hodgsonii*, broadleaved montane evergreen forest and medicinal plants and their uses.

We would recommend that locals from Da Chais Commune who would already have an imitate knowledge of the local fauna and flora would make the best candidates to be trained as local guides. In addition this would give local people an incentive to protect the fauna and flora and would lead to a reduction in hunting and trapping of wildlife and the collection of forest products.

Preparation of Trails

Suitable trails would need to be researched and prepared in areas containing the endemic and speciality flora as well as medicinal plants along Road 723, at the start of the trail to Mount Gia Rich and at the summit of Mount Bi Doup.

Equipment

Equipment needed would include the following:

- Good quality two-man tents
- Camp cooking equipment
- First aid kits
- Motor cycle helmets
- Binoculars
- Field Guides for mammals, birds (and flora?)
- MP3 players or I-pods and speakers for playback of bird calls or bamboo whistles
- Uniforms for guides

Estimated cost of setting up the proposed tours

These estimated costs are based on the training and equipping of two local guides and facilities for up to 10 pax at any one time.

- | | |
|--|--------------|
| - Training course for local guides (3 days): | 2,000.00 USD |
| - 6 x Good quality two-man tents: | 1,000.00 USD |
| - Camp cooking equipment: | 300.00 USD |
| - 2 x First aid kits: | 100.00 USD |
| - 10 x Motor cycle helmets: | 200.00 USD |
| - 2 x Good quality binoculars: | 600.00 USD |

- 2 x Field Guides for birds (and flora?):	100.00 USD
- 2 x MP3 players/I-pods and speakers:	500.00 USD
- 6 x Uniforms for guides (Shirt or T-shirt & cap):	150.00 USD

Total estimate for initial set-up costs: 4,950.00 USD

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References

1. Ministry of Science, Technology and Environment (2000). *Red Data Book of Vietnam (Vol. 1: Animals)*. Science and Technics Publishing House, Hanoi.
2. CITES Secretariat. 1998. *Checklist of CITES Species*. World Conservation Monitoring Centre, Cambridge, UK.
3. IUCN (2007) *2007 IUCN Red List of Threatened Species*. Downloaded in <http://www.iucn.org/2007Redlist/>
4. Nadler, T., Momberg, F., Nguyen Xuan Dang, Lormée, N. 2003. *Vietnam Primate Conservation Status Review 2002, Part 2: Leaf Monkeys*, FFI Vietnam Program and Frankfurt Zoological Society, Hanoi.
5. Pham Nhat, Nguyen Xuan Dang and Polet G. (2001). *Field guide of mammals in Cat Tien National Park*, Cat Tien National Park and Fauna & Flora International – Indochina Programme, Hanoi, 145 pages.
6. Ministry of Science, Technology and Environment (2000). *Red Data Book of Vietnam (Vol. 1: Animals)*. Science and Technics Publishing House, Hanoi.
7. BirdLife International and Forestry Inventory and Planning Institute (2001). *Source book of existing protected areas in Vietnam*. Hanoi, Vietnam: BirdLife International Vietnam Programme and Forestry Inventory and Planning Institute.
8. Pham Nhat, Nguyen Xuan Dang and Polet G. (2001). *Field guide of mammals in Cat Tien National Park*, Cat Tien National Park and Fauna & Flora International – Indochina Programme, Hanoi, 145 pages.

9. Van Peenen P.F.D., Ryan P.F., Light R.H. 1969. *Preliminary identification manual for Mammals of South Vietnam*. US National Museum Smith. Ins. City of Washington.
10. Van Strien, N.J. 1983. *A Guide to the Tracks of Mammals of Western Indonesia*. School of Environmental Conservation Management. CIAWI, Bogor.
11. Brockelman WY, Ali R (1987): Methods of surveying and sampling forest primate populations. In: Marsh CW, Mittermeiner RA (eds.): *Primate Conservation in the Tropical Rain Forest*. Alan R Liss, New York, pp. 23-62
12. Long B, Swan SR, Kry Masphal (2000): *Biological Survey in Northeast Mondulkiri*. Fauna & Flora International, Hanoi.
13. Van Ngoc Thinh, Nadler, T. Roos, C. and Hammerschmidt, K. (2009). Taxon-Specific Vocal Characteristics of Crested Gibbons (*Nomascus* spp.). *Indochina proceeding of Primatology*. Frankfurt Zoological Society, Hanoi.
14. Robson, C. (2008) *A Field Guide to the Birds of South-East Asia*