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## Sustaining Livelihood through Prudent Utilization and Management of Natural Resources

Editors

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Picture credits of front cover: Sarawak Dolphin Project. Illustration black and white of Mount Santubong, and the great moment of Irrawaddy Dolphin cruising along the fishman boat.

## Applying the HCVF toolkit to assess the conservation value of Gunung Singai, Sarawak, East Malaysia

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### Abstract

The HCVF Toolkit for Malaysia was primarily developed to help forest managers comply with Principle 9 in both the Forest Stewardship Council and the Malaysian Criteria and Indicators for Forest Management Certification. These are standard adopted by the National Steering Committee for certification of natural forests in Malaysia. Here, we use it to assess the conservation value of Gunung Singai, an isolated mountain massif in western Sarawak. Based on Criteria HCV 1.2 (Threatened and Endangered Species), HCV1.3 (Endemism), HCV4.1 (Watershed Protection), HCV4.2 (Erosion Control), HCV5 (Basic Needs of Local Communities) and HCV6 (Cultural Identity of Local Communities) Gunung Singai is found to have high ecological and cultural values and warrant management and conservation.

### Introduction

Gunung Singai is a flat-top sandstone mountain, with a peak (01.30.37°N, 110.9.66°E) at 573 m above sea level. The mountain can be clearly seen by those who historically sailed up the Sarawak River towards Kuching, from the Satok Bridge, as well as from any high rise building in Kuching town. It is located about 30 km south-west of Kuching, and can now be reached by a tar-sealed road through Batu Kawa and then through the main Singai Road from Kampung Sudoh, or through a number of smaller roads that passes through Kampung Sinibung, Kampung Tanjong Poting, Kampung Atas. Alternatively, the mountain can be reached via Matang through Sungai Tengah, Kampung Sagah and Kampung Daun. The summit can be reached via a jungle trail, from Kampung Tanjong Bowang, that passes through the Catholic Memorial Pilgrimage Centre.

Gunung Singai was the ancestral home of the Singai Bidayuh (called Bisingai) with eight villages (Giang, Daun, Puot [Segong], Moti, Sajuong, Tuben, Saga and Somu [Atas]) located on the shoulder of the mountain (Nuek, 2002). In the 1970's, the Bisingai started to dismantle their longhouses and settle in their farmlands on the plains. Initially, five longhouses were built near the base of the mountain but now only three (Daun, Atas and Segong) are functional. From the original eight villages at Gunung Singai, there are now 12 villages in the lowland. The site of the old villages at Gunung Singai is now overgrown with

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secondary vegetation. The only reminders of early settlements were broken bottles, jars, kitchen utensils and some Belian (Bornean Ironwood) stumps and “Baruk” pillars. However, the Durian trees that were planted at the old village site and along the route from the old village to the farmland remains, along with other favourite fruit trees, such as langsat (*Lansium domesticum*), rambutan (*Nephelium lappaceum*), cempedak (*Artocarpus integer*), tampoi (*Baccaurea macrocarpa*) and mangosteen (*Garcinia mangostana*). The community continues to maintain the traditional fruit orchard and replant fruit trees. When they are in season, these fruit trees provide fruits to humans and wildlife alike, and the mountain become alive with fruit harvesters.

Although not legally gazetted as protected area, Gunung Singai is a community reserve and recognized as such by all the Bisिंगai. No single family or village can claim the mountain as their own. In order to strengthen the case to conserve Gunung Singai for the community some internationally recognized instruments must be used to assess the value of the mountain. Here, we use the High Conservation Value Forest (HCVF) Toolkit for Malaysia (WWF, 2009) to assess the conservation value of Gunung Singai and propose means to conserve the mountain for the community.

#### *Applying the HCVF Toolkit to Gunung Singai*

The HCVF concept was initially developed for forest management certification to encourage sustainable logging. The HCVF Toolkit for Malaysia is primarily a national guide for identifying, managing and monitoring high conservation value forest for Malaysia (WWF, 2009). In particular the toolkit is intended to help forest managers comply with Principle 9 in both the Forest Stewardship Council (FSC) and the Malaysian Criteria and Indicators for Forest Management Certification (MC & I 2002).

Basically, a HCVF is one that has high ecological and social value. It may be a totally protected forest, house unique or endangered species, provide services to the local community or have critical resources that the local community depends on. The HCVF areas defined by FSC are given in Table 1.

#### *HCVI.1 Protected areas*

Gunung Singai is currently not a protected area. State legislation that establishes totally protected area (TPA) includes National Park and Nature Reserve Ordinance 1998 (NPNRO 1998) which establishes national parks and nature reserves and Wild Life Protection Ordinance 1998 (WLPO 1998) which establishes wildlife sanctuary. Other State legislation establishes conservation areas (Natural Resource and Environment Ordinance 1994) and community

forest (Forest Ordinance 1958). The nearest TPA to Gunung Singai is Kubah National Park (KNP), about 20 km to the north. The Park is linked to Gunung Singai by a stretch of mountain forest, the Sejinjang Mountain Range. Thus in a way, Gunung Singai is contiguous with KNP and can provide an alternative place of refuge for certain wildlife species, therefore fulfilling the role of a protected area. Other protected area are located in the Bau limestone complex, further south, these are Wind Cave Nature Reserve, Fairy Cave Nature Reserve and the proposed Dorod Krian National Park.

Table 1: Types of HCVF areas.

HCV	Element
1	Forest areas containing globally, regionally or nationally significant concentrations of biodiversity values: 1.1 Protected areas, 1.2 Threatened species, 1.3 Endemism, and 1.4 Critical temporal use.
2	Globally, regionally or nationally significant large landscape-level forest.
3	Forest areas that are in or contain rare, threatened or endangered ecosystems.
4	Forest areas that provide basic services of nature in critical situations: water catchments, soil erosion control, barriers to destructive fires.
5	Forest areas fundamental to meeting the basic needs of local communities.
6	Forest areas critical to local communities' traditional cultural identity.

Source: High Conservation Value Forest Toolkit for Malaysia, WWF (2009)

### *HCV1.2 Threatened species*

This criterion addresses the issue of whether the forest of Gunung Singai harbor threatened species of flora and fauna or not and whether these species are protected by the relevant legislation. The International Union for Conservation of Nature (IUCN) Red List of Threatened Species rank species according to their extinction risk, from Critically Endangered (CR) to Least Concern (LC). In conservation terms, whenever the word "Threatened" is used, it normally refers to the following category: Critically Endangered, Endangered (EN), and Vulnerable (VU) while Near Threatened (NT) refers to category of species that are likely to be endangered in future. From the conservation point of view, Critically Endangered species has the highest priority for action and Least Concern, as the name suggested, has the least priority.

To know whether Gunung Singai harbour threatened species or not, a biodiversity survey is required. This was done as part of the Joint Multidisciplinary Expedition organized by UNIMAS and REDEEMS in September 2010 with follow-up surveys in December the same year. The result

of the expedition and that of subsequent fieldwork conducted by scientists and students from UNIMAS recorded at least 30 species of amphibian, 19 species of reptiles, 93 species of birds and 22 species of mammals. About 200 species of plants have been recorded along the trail to the summit of Gunung Singai. The most abundant belongs to the family Selaginellaceae (16.6%), followed by the family of Begoniaceae (8.2%), Euphorbiaceae (6.4%), Fabaceae (5.8%) and Dipterocarpaceae (5.5 %). Eighty-three plants were identified to have medicinal properties based on its use by the Bisingai and other communities in Borneo. In addition, 19 types of fruit trees were recorded along the CMPC trail, the most common being *Langsat* followed by *Durian*, *Tampoi* and *Engkabang*. These were planted by the people of Singai as they travelled up and down this trail from their longhouse to their farm in the lowlands. Based on their size and anecdotal information from the elders, some of these trees are probably more than 100 years old. These data suggest that Gunung Singai is rich in fauna and flora.

The fauna species that are considered to have high conservation value by virtue of being endemic, categorized as threatened and protected by local law is given in Table 1. Twenty-four species are categorized as threatened under IUCN Redlist (IUCN, 2013). Of the reptiles, only the monitor lizard and freshwater turtle are protected by WLPO 1998. Under the same Ordinance, 10 species of birds are protected and one species (Rhinoceros Hornbill) is totally protected; none of the birds are categorized as threatened by IUCN. Fourteen species of mammals are protected, these include 10 bats and four treeshrews, while the Western Tarsier is totally protected.

### *HCV1.3 Endemic species*

Of the 164 fauna species recorded at Gunung Singai, 10 frogs, four reptiles, one bird and three species of mammals are endemic to Borneo. Two frogs are suspected to represent undescribed species (*Limnonectes* sp. and *Leptobrachella* sp.) and await taxonomic investigation.

Table 1. Fauna of conservation importance recorded at Gunung Singai. Conservation status is indicated by endemism, IUCN Red List category and protection by local law.

Scientific Name (Family, Species)	English Common Name	WLPO	IUCN
<b>FROGS</b>			
<b>Ceratobatrachidae</b>			
<i>Ingerana baluensis</i> (Boulenger, 1896)*	Dwarf Mountain Frog		LC
<b>Bufoidea</b>			
<i>Ansonia spinulifer</i> (Mocquard, 1890)*	Spiny Slender Toad		NT

**Dicroglossidae**

*Limnonectes leporinus* (Andersson, 1923)\* Giant River Frog LC

*Limnonectes* sp.\*\*

**Megophryidae**

*Leptobranchella* sp.\*\* Dwarf Litter Frog LC

*Leptobranchium abbotti* (Cochran, 1926)\* Lowland Litter Frog LC

*Leptotalax gracilis* (Günther, 1872)\* Sarawak Slender Litter Frog NT

**Microhylidae**

*Kalophrynus* cf. *intermedius* Inger, 1966\* Intermediate Sticky Frog V

*Metaphrynella sundana* (Peters, 1867)\* Bornean Tree Hole Frog LC

**Ranidae**

*Hylarana picturata* (Boulenger, 1920)\* Spotted Stream Frog LC

*Staurois guttatus* (Günther, 1859)\* Black-spotted Rock Frog DD

**Rhacophoridae**

*Philautus tectus* Dring, 1987\* Obscure Bush Frog V

**REPTILES****Gekkonidae**

*Cryptodactylus pubisulcus* Inger, 1957\* Grooved Bent-toed Gecko LC

**Scindidae**

*Tropidophorus beccarii* Peter, 1871\* Beccari's Water Skink LC

*Tropidophorus brookei* (Gray, 1845)\* Brooke's Water Skink LC

**Crotalidae**

*Trimeresurus borneensis* Barbour, 1912\* Bornean Flat-nosed Pit Viper LC

**Trionychidae**

*Dogania subplana* (Geoffroy Saint-Hillaire, 1809) Asian Softshell Turtle P LC

**BIRDS****Accipitridae**

*Spilornis cheela* Crested Serpent-eagle P LC

**Psittacidae**

*Loriculus galgulus* Blue-crowned Hanging Parrot P LC

**Apodidae**

*Aerodramus* sp. Swiftlet sp. P LC

**Alcedinidae**

*Ceyx rufidorsus* Rufous-backed Kingfisher P LC

**Bucerotidae**

*Buceros rhinoceros* Rhinoceros Hornbill TP NT

**Picidae**

*Sasia abnormis* Rufous Piculet P LC

*Picus puniceus* Crimson-winged Woodpecker P LC

*Picus miniaceus* Banded Woodpecker P LC

*Meiglyptes tukki* Buff-necked Woodpecker P LC

**Turdidae**

*Copsychus malabaricus* White-rumped Shama P LC

**Sturnidae**

*Gracula religiosa* Hill Myna P LC

<b>Estrildidae</b>			
<i>Lonchura fuscans*</i>	Dusky Munia		LC
<b>MAMMALS</b>			
<b>Hipposideridae</b>			
<i>Hipposiderus diadema</i>	Diadem Roundleaf Bat	P	LC
<b>Pteropodidae</b>			
<i>Balionycteris maculata</i>	Spotted-winged Fruit Bat	P	LC
<i>Cynopterus brachyotis</i>	Short-nosed Fruit Bat	P	LC
<i>Dyacopterus spadiceus</i>	Dayak Fruit Bat	P	NT
<i>Penthetor lucasii</i>	Dusky Fruit Bat	P	LC
<b>Nycteridae</b>			
<i>Nycteris tragata</i>	Malayan Slit-faced Bat	P	NT
<b>Rhinolophidae</b>			
<i>Rhinolophus sedulus</i>	Lesser Woolly Horseshoe Bat	P	NT
<b>Vespertilionidae</b>			
<i>Glischropus tylopus</i>	Common Thick-thumbed Bat	P	LC
<i>Kerivoula papillosa</i>	Papillose Woolly Bat	P	LC
<i>Murina aenea</i>	Bronze Tube-nosed Bat	P	VU
<i>Tylonycteris robustula</i>	Greater Flat-headed Bat	P	LC
<b>Tarsiidae</b>			
<i>Tarsius bancanus*</i>	Western Tarsier	TP	VU
<b>Muridae</b>			
<i>Maxomys ochraceiventer</i>	Chestnut-bellied Spiny Rat		DD
<i>Maxomys whiteheadi</i>	Whitehead's Spiny Rat		VU
<i>Niviventer cremoriventer</i>	Dark-tailed Tree Rat		VU
<b>Tupaiaidae</b>			
<i>Tupaia gracilis</i>	Slender Treeshrew	P	LC
<i>Tupaia montana*</i>	Mountain Treeshrew	P	LC
<i>Tupaia picta*</i>	Painted Treeshrew	P	LC
<i>Tupaia tana</i>	Large Treeshrew	P	LC

\*endemic to Borneo Island; \*\*possibly an undescribed species; P = Protected, TP = Totally Protected under Wild Life Protection Ordinance 1998; LC = Least Concern, NT = Near Threatened, VU = Vulnerable, DD = data deficient under the IUCN Redlist Category.

### *Other species of cultural and economic significance*

Some bird species have important cultural significance to the local community. The Rufous-backed Kingfisher's shrill cries, as they fly past, indicate impending disaster in the village, according to pagan beliefs. Others include the Gold-whiskered Barbet ("sogu") whose call announces a death in the village. The Rufous-tailed Tailorbird is perhaps the most famous of the augury bird – its call literally dictates whether the pagan villager will go to his farm, and commence hunting or not. The Emerald Dove and its pigeon relatives are tasty but are also deemed as good pets. In the olden days, young Bisingai kids learned at an early

age how to set up snares and construct cages to keep these birds, and thus develop a healthy respect for the forest and its wildlife.

The *Tapang* trees (*Koompassia excelsa*) are the giants of the forest of Gunung Singai. It is categorized as protected under WLPO 1998. It towers above the rest of the trees to heights of about 50 m above ground, and can be easily recognized from a distance by its light coloured small leaves on a rounded canopy. The *Tapang* trees are favoured by honey bees for nesting, perhaps because its smooth bark makes it easier for the bees to construct its nest. “Do-oh Babai Jorai” – named after the Bisingai Orang Kaya Pemanca, was a particular favourite *tapang tree* for the bees with as many as 20 – 30 nest at one time. Sadly, the tree has been “barren” in the last 30 years. Even if there are plenty of bees there, the skill to construct the ladder (*tatok* in Bisingai language) is now lost among the younger generation of the Bisingai. The *tatok* is made from bamboo poles (“pinodah”) anchored to the tree trunk using bamboo pegs (“sirah”) tied to the poles using vines, all must be collected fresh from the jungle to ensure it is still strong.

Other useful plants include the rattans which the people use to make baskets and mats, and bamboo, which apart from making the “*tatok*” referred to above, is used for constructing bridges, platforms (“*tanyu*”), water containers (“*bulu*”), water channels (“*oyak*”), bird cages, walls and floors of houses, spine for atap roof and of course the famed bamboo shoots for eating. The sap palm (“*nyuok*”) is a source of toddy while its fibre is weaved into twine (“*nuot*”), which can last longer than rattan.

#### *HCV 4.1 Water catchment services*

Many streams originated half-way up Gunung Singai, slightly above the old villages. These streams were the source of water that sustains the old village through an *Oyak*. *Oyak* is a Bidayuh word for water source that is channeled through a bamboo trunk. The bamboo (diameter of at least 5 cm) is normally split open and the nodes removed to allow water to be channeled to a place suitable for collection. It is the Bidayuh version of water pipes or aquaduct.

In the mid-1970s, coinciding with the availability of plastic piping materials and relocation of villages to the lowlands, small dams were constructed above the village through *gotong-royong* (volunteer labour) to hold water which was then channeled to most households through a gravity-feed system. Thus began the era of “piped water” in Singai. All villages, except probably Bobak and Sagah, get their “piped water” from Gunung Singai. Bobak get theirs from Gunung Sijanjang, a separate mountain range between Gunung Singai and Serapi. Studies by UNIMAS conducted in 2010 showed the water quality of several streams in

Singai to be good, conforming to Class IIA of the National Water Quality Standard (NWQS) for Malaysia, and regarded as suitable for potable use upon conventional treatment. Some villagers are still using water from these dams partly to save cost and partly because treated water supply are sometimes unreliable.

#### *HCV 6. Traditional cultural identity*

The Bisingai have pagan origins. In the original culture, the spirits of the land and of their ancestors govern the way of life of the people. Ceremonial huts were constructed at strategic locations along the route to the farms. At these huts various rituals and ceremonies were held to appease the spirits of the land, to protect the people who use the route and farm the land and to pray for bountiful harvest. Central to this pagan culture is the belief in the existence of “Topa” who is God or creator. So although the Bisingai are pagans, they also believe in God. Christianity (Roman Catholic = RC) came to Singai about 1885 in the form of a Dutch missionary named Fr. Felix Westerwoudt. The local community built a “detached” house for him a distance from the longhouse of Kupuo Daun (kupuo is the Bisingai word for kampong or village), this house doubled-up as chapel and priest’s quarters. In 1890, the mission also established a convent near the priest’s house, where the nuns taught the locals elementary domestic science (Chung, 2000). The site is now occupied by the Catholic Memorial Pilgrimage Centre (CMPC). Conversion to Christianity was slow initially, but gathered momentum in the 1960s, particularly with the establishment of mission schools in the village. The first school in Gunung Singai was in fact near Kupuo Somu, this school, around 1960, moved down to Kampung Sudoh.

CMPC was built through donations, labour of love, faith and prayer. The project started in the mid-1980s culminating with the dedication in November 1999 by Archbishop Peter Chung. The main features include: (a) Chapel of Christ the King, (b) amphitheatre, (c) shrine to Mother Mary, (d) dining hall and kitchen, (e) hostels and priest’s house, and (f) a 2-km plank-walk. CMPC has become a major tourist attraction in the last 20 years.

#### **Instruments for Conservation**

The instruments that are available to conserve Gunung Singai includes NPNRO (1998) which establishes national parks and nature reserves, WLPO (1998) which establishes wildlife sanctuary, NREO (1994) which protects watershed and Forest Ordinance (1958) which establishes community reserves. The most restrictive of these protected areas is wildlife sanctuary where no visitors are allowed without a permit, and permit may only be given for research under strict conditions. Hence it is not suitable for the conservation of Gunung Singai.

Gunung Singai is arguably small for a National Park, and perhaps fit the criteria for a Nature Reserve. The strongest workable instrument to protect and conserve Gunung Singai is the NPNRO 1998. Conversion of Gunung Singai into a Nature Reserve will allow visitors to enter upon payment of a fee, which constitutes a permit to enter. The rights of the local community to resources in Gunung Singai and access to CMPC by religious pilgrims should be negotiated into the terms and conditions of conversion of Gunung Singai as Nature Reserve. The rights of local communities to reside and use the resources within the national park have been recognized in Loagan Bunut and Batang Ai National Park (Tisen & Meredith, 2000).

The conservation of Gunung Singai under NREO (1994) and Forest Ordinance (1958) is less restrictive and hence less powerful in terms of protecting the mountain against future incursion or development. Under Section 10 of NREO (1994) NREB may order an area to be conserved to protect the natural resources within and to regulate activities that may pollute the environment. Up to now, the Ordinance has been used to conserve watershed, and Gunung Singai is an important source of water for Singai area, and form part of the watershed of Sarawak Kanan River. Once Gunung Singai is conserved under NREO, activities such as clearing the forest for farming and development of land for commercial purpose can be prohibited. Activities that does not pollute but in fact enhance the environment (such as planting of fruit trees) can be allowed. Under the Forest Ordinance (1958) a community-based organization may apply to the Forest Department to declare an area of forest land as their Community Forest. Such forest can be used exclusively by the community and use regulated to enable the forest to provide continuous service and products to the community in perpetuity or until such time that the community surrenders their rights.

### **Role of REDEEMS and UNIMAS**

Both institutions can potentially play a significant role in documentation and conservation, awareness raising and educating the Bisingai because this is what it will take to make conservation of Gunung Singai work. The Bisingai have to be convinced that their mountain is priceless and therefore need to be conserved, that the natural services and products that the mountain has to offer need to be managed for posterity.

REDEEMS stated mission is to mobilize the Bisingai people to be involved in their development and progress. While trying to bring the people on par with the other communities in the country, REDEEMS should not neglect environmental values and connections which has been very much part and parcel of Bisingai culture and tradition. The right attitude, good behavior and respect for elders and environment however need to be inculcated from a young age. The primary

schools students in the villages, the teachers in these schools, the parents and leaders of the community all play an important role in conserving the environment and the culture of the people because they are part of the ecosystem, and REDEEMS should capitalize on them to propagate good cultural and environmental values among the community at large. REDEEMS should equip the people by focusing on appropriate skill trainings and seminars so that they can raise their income through sustainable activities, in particular those related to ecotourism.

As far as conserving Gunung Singai is concerned, REDEEMS can initiate the process by forming a Gunung Singai Conservation Committee tasked with: (i) identifying the extent of land that is not claimed by the villagers under the last land demarcation exercise initiated by Dayak Bidayuh National Association (DBNA) in 2010; (ii) preparing a working paper to be submitted to the relevant authority to initiate the process of gazetting Gunung Singai as conservation area; and (iii) coming up with a management plan for conservation area. Identifying unclaimed land is important as this will minimize conflict between conservation of land for the community purpose and private use. The Committee should also decide through community dialogue under which legislation (NPNRO 1998 or NREO 1994 or Forest Ordinance 1954) conservation should be effected.

UNIMAS envisioned itself to be an exemplary university of internationally acknowledged stature and a scholarly institution of choice for both students and academics through the pursuit of excellence in teaching, research and scholarship. UNIMAS aims to achieve this through generation, dissemination and strategic application of knowledge. UNIMAS can assist REDEEMS, and have done so since the launching of the Singai multidisciplinary expedition, by making the vast experience, knowledge and skills available in the university to the community. UNIMAS can also give preferential treatment to qualified Bisingai to study and acquire skills and knowledge at undergraduate and graduate level education as well as a place for employment. Only then will the university be relevant locally while still being acknowledged as scholarly institution of choice for students and academics.

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