

# **Towards an Integrated Management Plan for Belum-Temengor Rainforest: Concept and Strategy**

**(Malaysian Nature Society)**

## **1 Introduction**

The Belum Temengor Complex refers to 320,000 ha of Sundaic lowland and montane forest, is one of the last remaining and largest contiguous tropical rainforest in northern Peninsular Malaysia. Located in Northern Perak, it consists of what was previously the Belum Forest Reserve and the Temengor Forest Reserve and is contiguous with the Hala-Bala Wildlife Sanctuary and Bang Lang National Park in southern Thailand. At its centre lies the dendritic Tasik Temengor. The lake (172 km<sup>2</sup>) is the result of the damming of several rivers for the purpose of irrigation, water catchment and generating hydro-electricity.

In 1994 and 1998, the Malaysian Nature Society (MNS) organized two scientific expeditions into two sites within the forest complex to document its rich biological diversity and propose for it to be gazetted as a protected area. In fact, in 1995, MNS submitted a report to the State of Perak entitled "Management Guidelines for Proposed Belum Nature Park" (MNS, 1995)

A third expedition, organized by the Forestry Department Peninsular Malaysia (FDPM) in 2003, further consolidated earlier findings. Through these expeditions, the forest complex was known to support healthy populations of large mammals (e.g. Asian elephants *Elephas maximus*, tigers *Panthera tigris*, Malayan tapir *Tapirus indicus*, primates *Hylobates* and *Presbytis* spp. etc.), birds (e.g. pheasants, hornbills, trogons, broadbills etc.), reptiles and amphibians and others. Plants also exhibited a high diversity and some are endemic to the forest complex. The forest complex is also home to the local indigenous tribes of Jahai and Temiar, numbering about 10,000 individuals

.In 1993, DYMM Paduka Seri Sultan Perak Sultan Azlan Shah declared the formation of the Royal Belum State Park. However, official gazettelement of the Royal Belum State Park under the Perak State Park Corporation Enactment 2001 was only finally done in April 2007.

The new Royal Belum State Park covers 117,500 ha of forest and consists of the northern section of the Belum Temengor Complex. The southern section of the BT Complex consists of the remaining portion of the Belum Forest Reserve and the Temengor Forest Reserve remains as production forest.

## **1.1 Biodiversity Richness of Belum Temengor Forest Complex**

The biodiversity richness of the Belum Temengor Complex is a national heritage with great value for scientific study, academia and even eco-tourism.

### **1.1.1 Ecosystems**

The BT Complex has a number of distinct ecosystems, forest types and habitats. These include the following; Hill Forest, Ridge Forest, Edaphic & Montane Forest, Upper Stream River Zone and the Lake. These ecosystems support a wide range of flora and fauna.

The BT Complex is also famed for its salt licks which provide essential nutrients to a wide variety of wildlife, from butterflies to elephants. The lake itself supports a high diversity of fish. The lake and the streams that flow through the forest reserves are rich in fish life and the conservation of the forest reserves will ensure that diversity is sustained. Both these features also have high tourism potential.

### **1.1.2 Species**

The BT Complex is rich in species diversity. Even based on the few scientific expeditions and studies which were mostly quite restricted geographically, there are already many interesting findings. Here are some highlights.

#### **1.1.2.1 Flora**

Based on the research already done and the scientific expeditions, the BT complex is believed to have over 3,000 species of flowering plants. Many of these are endemic to just the northern Peninsula. For example, there are recorded 46 species of palms of which 15 are endemic. Other highlights include reports of 30 species of gingers (20% of the total number of Peninsula species) and a variety of rare orchids. There are also reports of many species of other plants and also mosses and ferns.

#### **1.1.2.2 Mammals**

There are over 100 species of mammals including the Asian elephant, Malayan Tiger, Leopard, Seladang (Gaur), Sun-bear, Sumatran Rhinoceros and Malayan Tapir. At least 13 globally threatened and 14 near-threatened mammals are found here. The extremely high concentration of large mammals found here could be the highest in the country, giving it added importance as a biodiversity conservation area and as an eco-tourism draw. The BT Complex is also where many elephants in the PERHILITAN elephant translocation programme are released which partly explains the relatively large number of elephants here.

#### **1.1.2.3 Birds**

The Belum-Temengor was recognized internationally as an Important Bird Area as it supports 8 globally threatened and 52 near-threatened birds (Gregory-Smith, 1995; Lim and Tan, 2000; BirdLife International, 2004). It has at least 274 species of birds and the only place in Malaysia where all 10 hornbill species found in Malaysia can be seen.

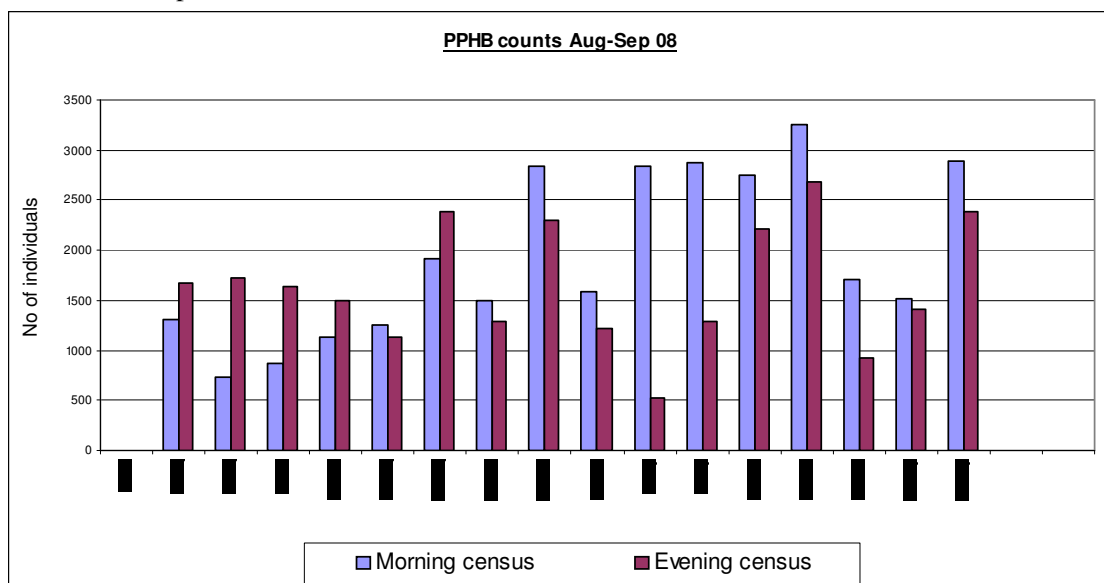
It is also an important site as this is the only known location where mass movement of the Plain-pouched Hornbill (*Aceros subruficollis*) which is classified as Vulnerable has been reported. This was first discovered in August 1992 when about 300 individuals were seen making dawn and dusk flights from Tasik Kenering (Ho and Supari 1993). The following year, during the MNS led the first Heritage and Scientific Expedition into Belum-Temengor, observers counted 2,421 individuals on 24 November 1993 flying in a north-south direction in the evening over the Sg. Halong base camp area which is located in the Temengor Forest Reserve. Since then, MNS surveys have recorded many incidences of this mass movement which crosses the Temengor Lake.

### 1.1.3 Integrity of Belum-Temengor as one Ecosystem

The division of the forest into Royal Belum State Park and Temengor Forest Reserve is a man-made one. The contiguous forest is actually one functional ecosystem. The animals have always moved and traveled between the two parts and may be dependent on the whole forest complex for their survival.

This is best illustrated by the mass movement of the Plain-pouched Hornbill (PPHB). Below in Table 1 is the sightings made during the most recent survey carried out by MNS between August and September 2008. The highest count was of 3,261 individuals.

Table 1: Plain-pouched Hornbill Counts



PPHB censuses were conducted everyday, twice a day, from August 1 until September 26, at dawn and late afternoon. The count sites were located at different places. Morning counts were done at Pulau Bidoh and evening counts were done at Kg Tebang, near Pos Chiong. The birds were on a north-east flight path in the morning and on a south-west flight path in the evenings.

A possible reason for this observation is that they roost in the Temengor Forest Reserve but that they feed in the Belum forest area (Yeap et al., 2005). Logging in the Temengor Forest Reserve has been seen to affect the flight path of this bird. It may also be possible that at in January to May, the Plain-pouched Hornbills may go further north to breed.

Therefore the longterm survival of the Plain-pouch Hornbill cannot be achieved by protecting Royal Belum alone but it needs its roosting sites in Temengor and its nesting sites further north to be protected too.

#### **1.1.4 Ecosystem Services**

The Belum Temengor Forest Complex plays an important role in providing ecosystem services such as maintaining the hydrological cycle, providing clean water and reducing erosion and sedimentation. As such, it has been identified as an Environmentally Sensitive Area (ESA) Rank 1 under the National Physical Plan (NPP), and as such, urgent measures must be taken to protect it before it is opened for more logging. This category states that no development, agriculture or logging shall be permitted except for low-impact nature tourism, research and education. It is also identified as part of the Central Forest Spine (CFS) that forms the backbone for connecting ESAs and other protected areas. The National Physical Plan seeks to re-establish the integrity and connectivity of forests and wetlands through the implementation of linkages between these CFSs. This connectivity ensures that wildlife corridors are maintained, enabling movements of important fauna, providing greater protection for them. Thus, protecting the BT Complex will be a key element in achieving Malaysia's national goals.

#### **1.1.5 Ecotourism**

Eco-tourism is the fastest growing sector in the tourism industry worldwide. Belum Temengor has a great potential for ecotourism with its rich biodiversity and beautiful lake system. Even human-animal conflicts such as the crossing of elephants on the East-West Highway could be turned into a potential ecotourism attraction. Ecotourism will be an important tool towards bringing revenue to the conservation of the area as well as benefits to the local population especially the Orang Asli communities.

## **2 Threats to Conservation and Sustainable Use of Resources**

To ensure the conservation of biological diversity and the sustainable use of the natural resources in this area, it is important to consider the threats. For Belum Temengor area the threats include:

1. Poaching
2. Loss of connectivity
  - a. Within due to the East-West Highway Corridor
  - b. Connection with the Central Forest Spine (National Physical Plan)
3. Inappropriate development and logging within buffer area and catchment area
4. Proposed Acacia plantations and conversion to agriculture

5. Proposed petroleum pipeline
6. Forest fires
7. Unplanned Ecotourism development
8. Sectorial Development and Management Plans (including individual Government Department Plans, local district plans, NCER and others).

These issues can only be effectively dealt with by the development of an Integrated Management Plan for Belum Temengor and the establishment of a Management Authority to implement it.

### **3 Integrated Management Plan (IMP) for Belum Temengor**

The following sections will make proposals for the components of an integrated management plan or IMP, its guiding policy, objectives, scope, governance structure and implementation.

#### **3.1 Guiding Policy**

“To protect and maintain the rich natural heritage, biodiversity and environment of the area Belum Temengor area for current and future generations through conservation and sustainable use of natural resources while promoting scientific study, education, health, appreciation of aesthetic values and recreation for the public. “

Conservation of the rich natural heritage, biodiversity and environment of the area Belum Temengor area is the primary objective and all other considerations give way to this.

#### **3.2 Objectives**

1. Conserve Biological Diversity
2. Maintain natural biological and environmental processes.
3. Preserve the landscape features.
4. Encourage sustainable logging.
5. Encourage nature friendly ecotourism development and products
6. Provide benefits, involve and consult with the local community
7. Establish the area as an internationally recognised centre for scientific study, education and recreation for the State of Perak and for the country.

#### **3.3 Scope of IMP**

Royal Belum State Park is incomplete without the protection and management of Temengor Forest Reserve. As was mentioned earlier, the two actually function as one forest ecosystem and habitat block. The Plain-pouched Hornbill is an example of an animal that uses both forests and whose survival may be threatened if Temengor Forest Reserve is not protected or sustainably managed. While Royal Belum is adjacent to the Hala-Bala Wildlife Sanctuary and Bang Lang National Park in southern Thailand, without Temengor Forest Reserve, it is not connected to the Central Forest Spine which

is important in the strategy to maintain connectivity with the other protected areas and biodiversity hot spots further south in the country. Belum Temengor has also been recognized as a Rank 1 Environmentally Sensitive Area. For these reasons, the Temengor Forest Reserve should be included with Royal Belum within the scope of an IMP.

The Temengor Lake is really at the core of the area and the environmental quality of the lake is important to maintain the biodiversity in the lake, ecosystem services, reduce threats to the protected areas and to promote ecotourism. An inappropriate development anywhere within the catchment area of the Temengor Lake that leads to sedimentation and pollution has the potential of impacting the rest of the lake system. The greater catchment area for the lake must therefore also include Grik Forest Reserve and the islands on the lake in addition to Royal Belum and Temengor Forest Reserve.

The Malaysian Nature Society proposes that Temengor Forest Reserve should be also gazetted as a state park like Royal Belum and indeed the two should be treated as one protected area. MNS also proposes that the IMP should also address the wider landscape and catchment area which would also include the Grik Forest Reserve, the strip on either side of the East-West Highway and the whole lake system.

### **3.4 Components of an IMP**

#### **3.4.1 Survey and information gathering**

It is important of course to have as much information as possible to help in the decision making and to identify strengths, weaknesses, opportunities or threats. This should be done through literature reviews, surveys with local residents (mainly the Orang Asli) and consult with all relevant stakeholders. Gaps in information should be identified and future field research determined accordingly.

#### **3.4.2 Analysis / Evaluation**

Analysis of the available information should be carried out to determine any threats and potential threats. Similarly, environmentally sensitive areas and biodiversity hot spots should also be identified together with any potential public use or ecotourism area and areas in need of rehabilitation.

#### **3.4.3 Management Policy and Objectives**

The IMP must have a clear Management Policy and Objectives which has the support of all stakeholders by consensus. A proposed policy and objectives has been described earlier in this paper.

#### **3.4.4 Action Plan/Implementation**

An Action Plan for implementation should be developed towards achieving the policy and objectives agreed to. It should consider identifying responsibilities to all relevant stakeholders involved.

### **3.4.5 Monitoring and Review**

The achievement of the objectives of the Management Plan should have a measurable indicator of success or progress. The IMP should also include a system and schedule for monitoring these indicators and include an external review to determine overall achievement of the objectives and to direct change as necessary.

## **3.5 Developing the IMP**

### **3.5.1 Multi-stakeholder Consultations**

The development of the IMP requires extensive involvement of stakeholders in consultations to determine current use of the resources, future plans for development and their compatibility with the conservation priorities and objectives. For Belum Temengor, the stakeholders include the Government and specifically the Perak State Park Corporation, Forestry Department, PERHILITAN, Town and Country Planning Department, District Office, Angkatan Tentera Malaysia, Polis DiRaja Malaysia, the Ministry of Natural Resources & Environment, Ministry of Culture, Arts and Tourism, Ministry of Transport, Ministry of Science, Technology and Environment, Ministry of Agriculture, and Ministry of Primary Industry; the NCER, Tenaga Nasional, Academia (in the form of interested Universities) and Non-governmental Organisations.

An important stakeholder in the process is that of the Orang Asli of which there are approximately 10,000 people and consist of the Jahai and Temiar tribes. They rely on the natural bounty in this area through fishing, hunting, subsistence farming and harvesting of non-timber products.

These stakeholders should agree to and adopt a common policy, objectives and guidelines to guide the implementation.

From the legal angle, it may be required to develop a managing authority for the entire area. Alternatively, it is possible to get all stakeholders to agree and sign on to a common charter.

An example of this is done for stakeholders in and around European protected areas system which is called the European Charter for Sustainable Tourism in Protected Areas (EU MCCI et al., 2005). By agreeing to the charter all stakeholders agree to protect and enhance the area's natural and cultural heritage, for and through tourism, and to protect it from excessive tourism development, by;

- monitoring impact on flora and fauna and controlling tourism in sensitive locations
- encouraging activities, including tourism uses, which support the maintenance of historic heritage, culture and traditions
- controlling and reducing activities, including tourism impacts, which: adversely affect the quality of landscapes, air and water; use of non-renewable energy; and create unnecessary waste and noise

- encouraging visitors and the tourism industry to contribute to conservation.

### **3.5.2 Zonation**

A proper IMP will need to identify sustainable activities that are to be developed. Suitable sites or zones should then be identified. These may include; Conservation Zones, Rehabilitation Zones, Environmentally Sensitive Areas, Public Usage Areas and Ecotourism Areas. The accepted activities and developments allowed in each zone should be decided and this zonation system will help in the development of the overall management and action plan.

## **4 Governance**

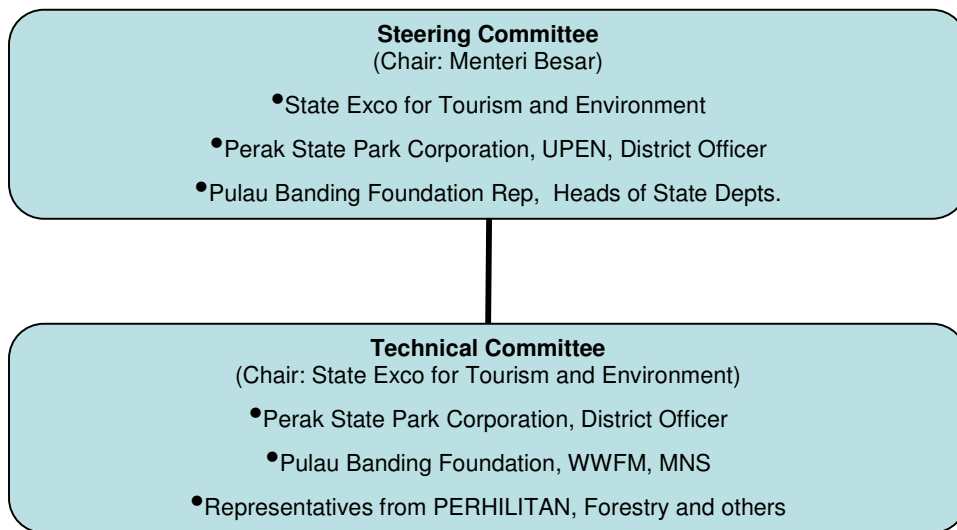
The IMP will require the establishment of a Regional Management Authority which may be called, for example, the Greater Belum Management Authority. It is proposed that the District Office acts on behalf of the Greater Belum Management Authority to implement the IMP under the direct guidance of the District Officer.

The Management Authority will require a Steering Committee that is able to make decisions and set direction. As this is the most important decision making instrument, it is proposed that this is chaired by the Menteri Besar of Perak. It should consist of senior state officials and senior officials of any agency involved in landuse and development planning and also tourism. It is proposed that the Pulau Banding Foundation with its objective of promoting scientific study should be on the committee to represent the interest of academia and researchers. It is also recommended that a conservation NGO with active knowledge and interest in the area be included perhaps on a rotation basis. The two NGOs that currently fit this profile are the Malaysian Nature Society and WWFM. The presence of a representative from the Orang Asli community at this level is also a major advantage in empowering them to be active and participatory in the process.

The decisions and policies of the Steering Committee will then be realized and operationalised by a Technical Committee which would be chaired by the State Exco for tourism and the environment. The committee should consist of representatives from implementing agencies and departments, NGOs and other relevant stakeholders.

The proposed establishment of a Steering and Technical Committees as described above is partly based on the system that is employed in Johor to manage and guide the Johor State Park Corporation in its stewardship of all the state parks.





## **5 Monitoring**

The IMP must have a monitoring program to ensure that it is succeeding in its objectives as well as to be alert to any threats.

There are four areas that require monitoring.

### **5.1 Biodiversity Monitoring**

This is done to ensure the primary objective of biodiversity conservation is being accomplished. The monitoring should give information about the populations of several key species which in turn will give a picture of ecosystem health. Here are some recommended key indicators;

1. Hornbills and other birds. Birds are relatively easy to count compared to other animals and are also a good indicator of overall ecosystem health. The Hornbills are an iconic animal for this region.
2. Elephants. This may be an important indicator for the state of large mammals and sightings along the highway may provide information useful in reducing human-animal conflict as well as providing opportunity to develop ecotourism. WWFM is already involved in studying the Sumatran Rhinoceros which is an endangered species.
3. Fish. With the Temengor Lake central to the region, fish populations may be an important indicator of water quality and the health of this important ecosystem.

## **5.2 Environmental Monitoring**

The unique nature of the area may also be affected by changes in the climate and the physical environment which may be brought about by development inside the area or adjacent to it.

1. Weather monitoring. The standard weather monitoring data of temperature, rainfall and wind intensity should be measured at several metrological stations located throughout the area.
1. Water quality. The health of the lake and its water quality should be maintained. Parameters such as pH, turbidity, total suspended solids, Biochemical Oxygen Demand and coliform bacteria counts should be carried out. There are also biological indicators of water quality such as mayfly larvae and amphibians.

## **5.3 Social Monitoring**

This is important to monitor the impact on the local community and may take the form of surveys or questionnaires which will attempt to determine the socio-economic benefits as well as social impact to the people. It is also important to gauge the support of the community and their level of involvement and participation.

## **5.4 Ecotourism Monitoring**

Increasing tourist activity will also place an increasing strain on the environment and biodiversity. This may be due to noise, compaction or erosion of trails, rubbish, pollution or any impact from tourism activities. Some of the biodiversity monitoring and environmental monitoring can be adapted to look into tourism impact so that mitigating measures might be employed.

## **6 Recommendation**

In conclusion, the conservation of biological diversity, the environment and ecosystem services in the Belum area are faced with many significant threats such as poaching, loss of connectivity, forest fires, inappropriate development and logging within buffer area and catchment area, proposed Acacia plantations and conversion of land to agriculture, proposed petroleum pipeline, unplanned ecotourism development and sectorial Development and Management Plans (including individual Government Department Plans, local district plans, NCER and others).

It is recommended that;

- 1, Temengor Forest Reserve be protected as part of an extended Royal Belum State Park
2. That extensive land conversion on either side of the East-West highway be avoided and instead efforts made to improve the connectivity across that area for the animals.

3. That a transboundary park be developed with the adjacent Hala-Bala Wildlife Sanctuary and Bang Lang National Park in southern Thailand.
4. Establish a Greater Belum Management Authority which will also include the Grik Forest Reserve and the entire catchment area and shoreline of the Temengor Lake and also its islands
5. Develop a stakeholder driven Integrated Management Plan for the entire Greater Belum Management Authority which includes developing landuse practices by identified zones, management, monitoring and review.

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