



MANAGEMENT EFFECTIVENESS ASSESSMENT OF NATIONAL AND STATE PARKS IN MALAYSIA



Ministry of Natural Resources and Environment



NATIONAL AND STATE PARKS OF MALAYSIA

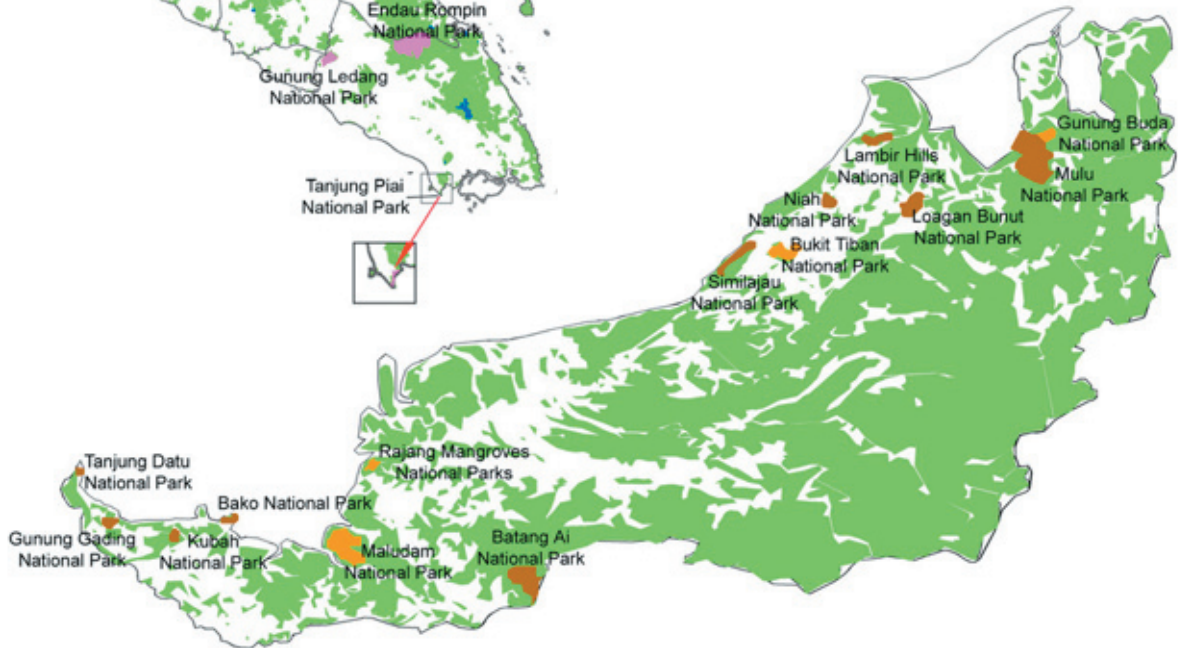
Figure 1. National and State Parks in Peninsular Malaysia



Figure 2. National Parks in Sabah



Figure 3. National Parks in Sarawak



Legend

Park Activities

- Department of Wildlife and National Parks (Assessed)
- Department of Wildlife and National Parks (Not Assessed)
- Perlis State Forestry Department
- Johor National Parks Corporation
- Sabah Parks
- Sarawak Forestry Corporation (Assessed)
- Sarawak Forestry Corporation (Not Assessed)

Land use

- Forest
- Other Land Uses
- Water Bodies

Figure 4. Map of Malaysia



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I. INTRODUCTION

I.1 Background

Malaysia has one of the richest biodiversity in the world. It is a signatory to the Conservation of Biological Diversity (CBD) and has formulated its own National Policy on Biological Diversity whose vision is to “transform Malaysia into a world centre of excellence in conservation, research and utilisation of tropical biological diversity by the year 2020” (MoSTE, 1998).

There are two widely-accepted definitions for protected areas. Article 2 of the CBD defines a protected area as “a geographically defined area which is designated or regulated and managed to achieve specific conservation objectives” (Secretariat of the Convention on Biological Diversity, 2005). A protected area as defined by IUCN (1994) is “an area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means.” The IUCN categories of protected areas are listed in Table I.

Table I: World Conservation Union (IUCN) Protected Area Categories

Category	Description
Ia: Strict Nature Reserve	Area of land and/or sea possessing some outstanding or representative ecosystems, geological or physiological features and/or species, available primarily for scientific research and/or environmental monitoring.
Ib: Wilderness Area	Large area of unmodified or slightly modified land and/or sea, retaining its natural character and influence, without permanent or significant habitation, which is protected and managed so as to preserve its natural condition.
II: National Park	Natural area of land and/or sea, designated to a) protect the ecological integrity of one or more ecosystems for present and future generations, b) exclude exploitation or occupation inimical (harmful) to the purposes of designation of the area, and c) provide a foundation for spiritual, educational, recreational and visitor opportunities, all of which must be environmentally and culturally compatible.
III: Natural Monument	Area containing one, or more, specific natural or/cultural feature which is of outstanding or unique value because of its inherent rarity, representative or aesthetic qualities or cultural significance.
IV: Habitat/Species Management Area	Area of land and/or sea subject to active intervention for management purposes so as to ensure the maintenance of habitats and/or to meet the requirements of specific species.
V: Protected Landscape /Seascape	Area of land, with coast and sea as appropriate, where the interaction of people and nature over time has produced an area of distinct character with significant aesthetic, ecological and/or cultural value, and often with high biological diversity. Safeguarding the integrity of this traditional interaction is vital to the protection, maintenance and evolution of such an area.
VI: Managed Resource Protection Area	Area containing predominantly unmodified natural systems, managed to ensure long term protection and maintenance of biological diversity, while providing at the same time a sustainable flow of natural products and services to meet community needs.

Source: IUCN (1994)

I.2 The Malaysian protected area network

The total land area of Malaysia is approximately 330,433 sq. km., of which 132,828 sq. km. are in Peninsular Malaysia, 123,985 sq. km. in Sarawak and 73,620 sq. km. in Sabah. The major forest types in Malaysia are the lowland dipterocarp forest, hill dipterocarp forest (for Peninsular Malaysia), mixed dipterocarp forest (for Sabah and Sarawak), montane forest, mangrove forest, peat swamp forest, heath forest, beach or coastal forest and forest on limestone.

Forest cover in Malaysia is estimated to be 19.52 million hectares or 59.5% of the total land area (Thang, 2004) of which 14.45 million hectares or 44.0% of the total land area are Permanent Reserved Forests (PRFs) managed by the Forestry Department. The PRFs are further classified into production and protection forests; 3.21 million hectares of the PRFs are classified as protection forests. Together with 2.15 million hectares under National and

State Parks, Wildlife Reserve, Wildlife Sanctuary and other classes of protected areas, the protected area coverage in the country is estimated to be 5.36 million hectares, representing 27.5% of its total forested land or 16.3% of its land area (Forestry Department Peninsular Malaysia, pers. comm.).

It can be said that in practice, there are three different systems for the management of natural resources in Malaysia, corresponding to the geographical regions of Peninsular Malaysia, and Sabah and Sarawak on the island of Borneo.

In Peninsular Malaysia, terrestrial protected areas are mainly managed by the Department of Wildlife and National Parks (DWNP) and the Department of Forestry but increasingly, the various State governments are also becoming involved in protected area management. The States of Johor and Perlis now have their own State Parks while Kelantan and Perak are in the process of gazetting State Parks. Marine protected areas in Peninsular Malaysia are managed by the Federal Marine Parks Section under the Ministry of Natural Resources and the Environment.

All marine protected areas in Sabah are managed by Sabah Parks while the terrestrial protected areas are managed by Sabah Parks, the Sabah Wildlife Department, the Sabah Forestry Department and the Sabah Foundation (a State-owned agency). In Sarawak, all marine and terrestrial protected areas are managed by the Sarawak Forestry Corporation.

1.3 Scope

Given the complexity of the protected area network in Malaysia, it was decided that the scope of this assessment be limited to terrestrial protected areas within the IUCN Category II, i.e. National and State parks*. National parks and State parks were chosen because they are the most recognisable category of protected areas. Federal and State governments accord high priority to the conservation and management of National and State parks. As recreation is one of the objectives of the designation of such areas, National and State parks are viewed as an increasingly important contributor to the local tourism industry.

Table 2 lists the park authorities involved in the assessment, and summarises key data concerning the National and State parks managed by each authority.

Table 2. Key data of protected areas (Category II) managed by different PA authorities in Malaysia

PA authority	PA managed (Category II)	Total no. of terrestrial parks managed	Total area of terrestrial parks (ha)
Department of Wildlife and National Parks ¹	Terrestrial parks in Peninsular Malaysia.	2	435,601
Perlis State Forestry Department ²	Terrestrial parks in Perlis State.	1	5,017
Johor National Parks Corporation ³	Terrestrial parks in Johor State.	3	58,853
Sabah Parks ⁴	Terrestrial and marine parks in Sabah State.	3	243,261
Sarawak Forestry Corporation ⁵	Terrestrial and marine parks in Sarawak State.	14	184,922
TOTAL		24	927,654

Source: This survey as well as the following:

¹ UNEP/WCMC (2004), DWNP-DANCED (1996)

² PSFD/DANCED/WWF-Malaysia (2000)

³ UNEP/WCMC (2004), Johor National Parks Corporation website

⁴ UNEP/WCMC (2004), Sabah Parks website

⁵ UNEP/WCMC (2004), Sarawak Forestry Corporation website

* State parks in Peninsular Malaysia, such as the Perlis State Park, are actually “National parks” using IUCN classification, but are officially recognised as “State parks” to emphasise the fact that these parks are administered by the State authorities, rather than the Federal government.

1.4 Objectives

Establishment of a protected area in itself does not guarantee protection for the biodiversity, environmental, or cultural features that it contains but instead is very much dependent on the management effectiveness of the protected area authority. So far, there has yet to be a system-wide assessment of the management of protected areas in Malaysia, although there have been previous important assessments focusing on individual management authorities, most notably the “Master plan for capacity building and strengthening of protected areas system in Malaysia” (DWNP-DANCED, 1996), which contains an assessment of the management performance of DWNP. In the absence of such a comprehensive assessment, it is difficult to determine how effective the protected area system has been in meeting its conservation objectives.

The overall objective of this rapid assessment exercise is to contribute towards improvement in the management effectiveness of Malaysia’s National and State park system. Specifically, it seeks to:

- Compile and update existing data on National and State parks in Malaysia.
- Identify and analyse the main pressures and threats to the National and State parks.
- Determine the general strengths and weaknesses of National and State park management in Malaysia.
- Examine how best to apply the skills and resources of government, research institutions and non-government agencies to strengthen the management of the National and State park systems.
- Serve as a starting point towards fulfilling the plan of work for protected areas drawn out during the 7th Conference of Parties (CoP 7) to the CBD in 2004 (See Table 3).

Table 3. Selected items of the plan of work on protected areas relevant to the management effectiveness assessment

Activities to be implemented by 2006		
No.	Keyword	Activity
1.1.5	Gap analysis	Conduct national and regional gap analysis
1.2.1	Landscape-scale approaches	Identify lessons learnt in integrating protected areas into broader sectoral plans and strategies
2.2.1	Stakeholders	Carry out participatory national reviews of the status, needs and mechanisms for stakeholder involvement in protected area planning, establishment, government and management.
3.1.1	Policy framework	Identify legislative and institutional gaps and barriers that impede effective establishment and management of protected areas.
3.2.1	Capacity	Conduct a national protected area capacity-building needs assessment and establish capacity building programmes.
3.4.1	Funding	Conduct a study of financial needs and the effectiveness of existing protected areas funding (by 2006)
4.2.1	Management effectiveness	Develop and adopt management evaluation methods and standards.

Source: Adapted from CBD Secretariat & WCPA (2004)

2. METHODOLOGY

2.1 General approach

The assessment was commissioned by the Ministry of Natural Resources and the Environment NRE, with WWF-Malaysia appointed to conduct the assessment. A working group led by the Conservation and Environmental Management Division of NRE was established to plan and implement the assessment.

The assessment was conducted using the RAPPAM (Rapid Assessment and Prioritisation of Protected Areas Management) methodology developed by WWF (Ervin, 2003). The methodology, which utilises a multiple-choice questionnaire, is based on an evaluation framework developed by the World Commission on Protected Areas (WCPA). This questionnaire was adapted by the working group to suit Malaysian conditions, and responses were obtained from each PA authority with facilitation provided by a two-man assessment team from WWF-Malaysia. This guided self-assessment process with individual park authorities was carried out in April 2005. Up-to-date information on National and State parks was also compiled and documented for reference.



Photo 1. Management effectiveness assessment being carried out with the Johor National Parks Corporation

Following this, a Workshop on the Management Effectiveness of National and State Parks in Malaysia was conducted on 3-4 May 2005 in Kuala Lumpur. This participatory multi-stakeholder workshop was attended by about 65 participants comprising representatives from park authorities as well as other stakeholders including relevant government departments, researchers from universities and research institutions, non-governmental organisations, consultants and tour operators.

Preliminary results from the assessment were presented and peer-reviewed during the workshop. Protected area system-wide questions (questions 17-19 of the RAPPAM questionnaire) were answered by workshop participants during the first breakout session. In the second breakout session, participants formulated recommendations on how to improve the management effectiveness of National and State parks in Malaysia.

This report contains the findings from the assessment, as well as recommendations formulated during the workshop.



Photo 2. Group photo of participants of the Workshop on the Management Effectiveness of National and State Parks in Malaysia.

2.2 Scoring

The RAPPAM methodology was designed for broad-level comparison among many protected areas (Ervin, 2003), thus making it appropriate for the purpose of this assessment, i.e. to capture general trends across the board, rather than to focus on individual parks.

The methodology encompasses six main assessment elements, i.e. context, planning and design, inputs, processes, outputs, and outcomes (See Table 4). Each element contains a set of components (divided into park and system level); with each component in turn having a series of criteria which are put forth in the assessment in the form of individual questions. Only five of the six elements are taken into account for the purpose of this assessment. The 'output' element is left out, as the results from this section did not provide useful information.

Table 4. Assessment elements in the modified RAPPAM questionnaire

Element	Context	Planning and design	Inputs	Management processes	Outcomes
Park-level components	<ul style="list-style-type: none"> • Threats • Biological importance • Socio-economic importance • Vulnerability 	<ul style="list-style-type: none"> • Objectives • Legal security • Site planning and design 	<ul style="list-style-type: none"> • Staff • Communication and information • Infrastructure & facilities • Finances 	<ul style="list-style-type: none"> • Management planning • Management practices • Research, monitoring and evaluation 	<ul style="list-style-type: none"> • Pressures
System-level components	<ul style="list-style-type: none"> • PA policies • Policy environment 	<ul style="list-style-type: none"> • PA system design 			

Adapted from Ervin (2003)

The format of the questionnaire is a statement with four options: “yes”, “mostly yes”, “mostly no”, or “no”. The rationale for using this format is that it can help detect general trends, rather than ascertain the exact degree of fulfilment. An example of its application is provided by Ervin (2003), based on question 13a of the original RAPPAM questionnaire, which states: “There is a comprehensive, relatively recent written management plan.” A “yes” answer (score = 5) would indicate that all, or nearly all, of the requirements (written, comprehensive, up-to-date) were met. A “mostly yes” answer (score = 3) could indicate that most of the requirements were met, were likely to be met in the near future, or were all met, but the respondent still had reservations about an unqualified “yes”. A “mostly no” answer (score = 1) could indicate that only a few of the requirements were met (e.g. there is an outdated, ineffectively written plan), or that even if most requirements are met, the results are still unsatisfactory. A “no” answer (score = 0) would indicate that none or almost none of the requirements were satisfied.

In cases where the answer was not known, respondents answered according to the best available information and professional judgement, and the lack of data was noted in the comments section. The accuracy of the data gained from this assessment is dependent on a number of assumptions:

- Competency of the assessment team – that the team was sufficiently well-versed in the assessment method and its underlying rationale, and exercised consistency in their methodology of presenting the questions to each of the park authorities.
- Competency of the park managers – that the park managers had sufficient and accurate knowledge of their parks and management processes, as well as sufficient data to answer the questions accurately.
- Confidence – that sufficient steps were taken to gain the trust of the respondents in the assessment team, the assessment process, and its underlying rationale.

3. RESULTS

3.1 Background of parks covered in the assessment

Of the 23 existing terrestrial National and State parks in Malaysia (at the time of the assessment), a total of 18 parks were assessed, encompassing a total area of 859,738 ha (See table 5). This corresponds to about 16% of the total protected area in Malaysia or 92.7% of terrestrial protected area under IUCN category II. The remaining five terrestrial parks have been gazetted but not fully operational and as such were not included in the assessment. Of these five parks, four are under the management of the Sarawak Forestry Corporation (Bukit Tiban National Park, Maludam National Park, Rajang Mangroves National Park and Gunung Buda National Park) and the remaining one under the Department of Wildlife and National Parks (Penang National Park). Parks that have been proposed or in the process of being established (such as the Royal Belum State Park in Perak, the Selangor Heritage Park in Selangor and the Gunung Stong State Park in Kelantan) were also not included in the assessment.

Table 5. Summary of parks covered in the assessment

Parks covered in this assessment	Management authority	Date established	Size (ha)	Major habitat types
Taman Negara National Park	Department of Wildlife and National Parks	1938-1939	434,351	<ul style="list-style-type: none"> • Lowland dipterocarp forest • Hill dipterocarp forest • Montane forest
Perlis State Park	Perlis State Forestry Department	2000	5,017	<ul style="list-style-type: none"> • White Meranti-Gerutu forest • Limestone vegetation
Endau Rompin National Park	Johor National Parks Corporation	1993	48,905	<ul style="list-style-type: none"> • Lowland dipterocarp forest • Hill dipterocarp forest • Heath forest
Gunung Ledang National Park		1997	10,022	<ul style="list-style-type: none"> • Hill dipterocarp forest • Montane forest
Tanjung Piai National Park		1997	926	<ul style="list-style-type: none"> • Mangrove forest

Parks covered in this assessment	Management authority	Date established	Size (ha)	Major habitat types
Kinabalu Park	Sabah Parks	1964	75,370	<ul style="list-style-type: none"> Mixed dipterocarp forest Montane forest
Crocker Range Park		1984	139,919	<ul style="list-style-type: none"> Mixed dipterocarp forest Montane forest
Tawau Hills Park		1979	27,972	<ul style="list-style-type: none"> Mixed dipterocarp forest Montane forest
Bako National Park	Sarawak Forestry Corporation	1957	2,727	<ul style="list-style-type: none"> Heath forest Open scrubland Mangrove
Kubah National Park		1988	2,230	<ul style="list-style-type: none"> Montane forest Mixed dipterocarp forest Heath forest
Gunung Gading National Park		1983	4,196	<ul style="list-style-type: none"> Mixed dipterocarp forest Montane forest
Batang Ai National Park		1990	24,040	<ul style="list-style-type: none"> Mixed dipterocarp forest Riparian forest Regenerated forest
Tanjung Datu National Park		1994	1,379	<ul style="list-style-type: none"> Mixed dipterocarp forest Beach forest
Niah National Park		1974	3,138	<ul style="list-style-type: none"> Limestone vegetation Mixed dipterocarp forest Heath forest
Lambir Hills National Park		1975	6,949	<ul style="list-style-type: none"> Mixed dipterocarp forest Heath forest
Gunung Mulu National Park		1974	52,865	<ul style="list-style-type: none"> Mixed dipterocarp forest Limestone vegetation Montane forest
Similajau National Park		1976	8,996	<ul style="list-style-type: none"> Mixed dipterocarp forest Beach forest Mangrove forest
Loagan Bunut National Park		1990	10,736	<ul style="list-style-type: none"> Peat swamp forest Mixed dipterocarp forest
TOTAL			859,738	

3.2 Biological and socio-economic importance

Biological and socio-economic importance is assessed based on ten questions (or criteria) respectively. The assessment showed that on average, the biological importance of the parks (average score 4.4) rate higher than their socio-economic importance (average score 4.0). Only two of the parks scored higher in socio-economic importance.

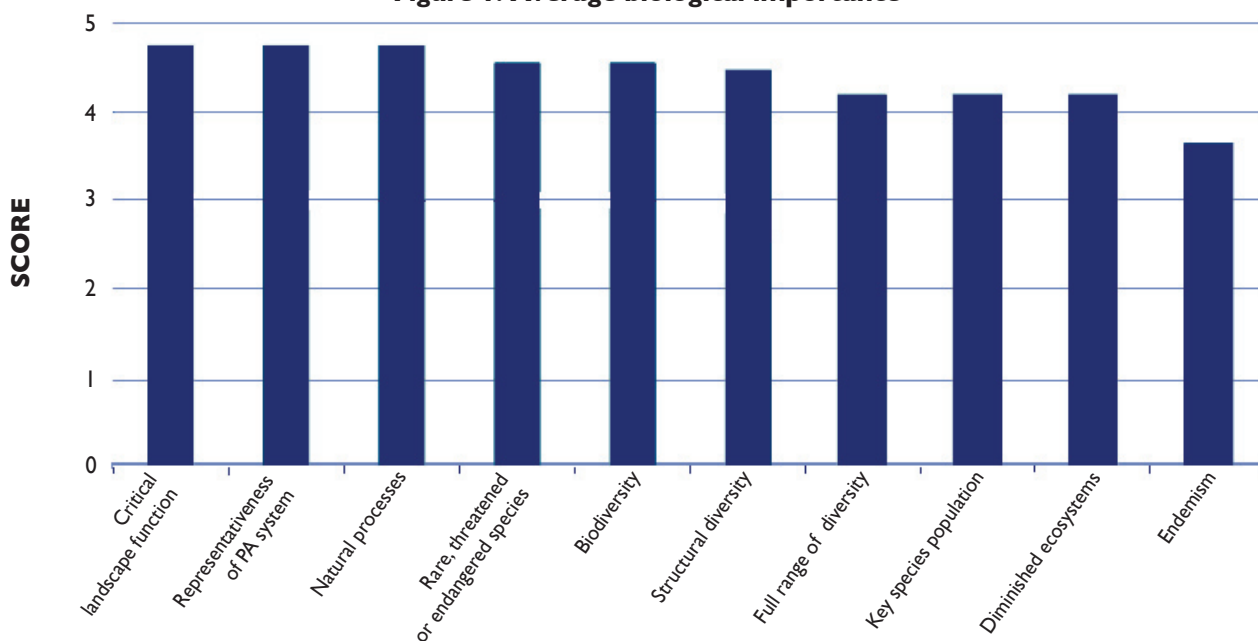
3.2.1 Biological importance

Average scores were relatively high (i.e. above 3) for each of the ten criteria (see Figure 1). This is consistent with existing data which indicate that sites chosen for the establishment of National and State parks in Malaysia are those with outstanding biodiversity value and rarely, if ever, are degraded sites chosen.

All the parks are of high biological importance. They contain high levels of biological diversity, and host a relatively high number of rare, threatened, or endangered species. There was also a relatively high degree of endemism reported (except for Tanjung Piai National Park which consists of mangrove forests and mudflats).

The parks have structural diversities¹ that are consistent with historic norms (i.e. conditions prior to significant human disturbance), and almost all maintain the full range of natural processes and disturbance regimes² associated with their particular ecosystems. The majority of the parks contain ecosystems whose historic ranges have been greatly reduced. They also perform critical landscape functions, i.e. in providing important feeding, breeding, or migration areas for species whose existence would be jeopardised by the alteration of the area.

Figure 1. Average biological importance



3.2.2 Socio-economic importance

Only one park, i.e. Loagan Bunut National Park, scored significantly higher in socio-economic importance. This was because the local communities surrounding the park were highly dependent on the fisheries resources of the freshwater lake in the park, and also due to the fact that parts of the park had already been logged over prior to its establishment.

All the parks have high recreational, aesthetic, and scientific/educational value (see Figure 2). These attributes serve to attract a growing number of visitors. An estimated 223,113 local tourists and 115,859 foreign tourists visited the 18 parks in 2004 (See table 6).

As such, all the parks play a significant role in generating income to the local economies. Apart from providing a range of direct employment opportunities, tourism gives rise to business opportunities through the outsourcing of park services e.g. catering, transport, and maintenance operations. Spin-off ventures in the form of nature and adventure guiding, accommodation, transport, and food outlets outside the park also benefit from tourism activities at the parks.

Local communities living in and around seven of the parks still utilise, albeit to a limited extent, the natural resources for subsistence purposes including food, medicine and construction material. However, most of these communities have integrated into the market economy and are no longer dependent on the park resources for their basic subsistence.

¹ Structural diversity is defined as the array and configuration of species, landscape elements, and ecosystems within a landscape.

² Natural processes are processes which allow the ecosystem to function and evolve, e.g. nutrient cycling, reproduction, predation. Disturbance regimes refer to the patterns of natural disturbances which over time create a landscape's structure and pattern, e.g. fire, flooding, pathogens.

All the respondents were of the opinion that their parks contain plant and animal species with some degree of social, cultural and economic importance. However, most of the parks do not have much religious significance. In cases where a particular park is believed to have some cultural significance, it is usually in the form of a few burial sites located within a small portion of the particular park. The only park which rated high for religious significance is Kinabalu Park which protects Mount Kinabalu, a mountain that has long been associated with local folklore and religious rites.

The parks provide significant ecosystem services, mainly as catchment areas and in flood control.

Figure 2. Average socio-economic importance

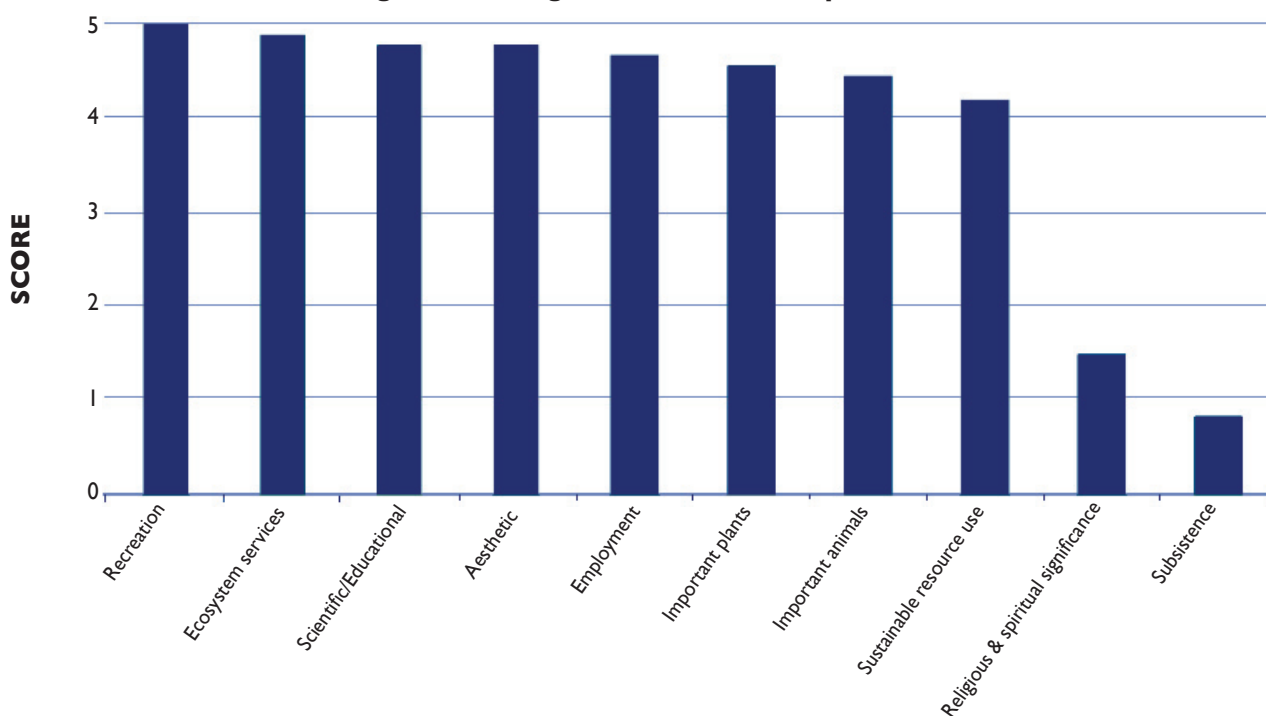


Table 6. Estimated number of local and foreign visitors to parks in 2004

Parks covered in this assessment	Number of local visitors	Number of foreign visitors
Taman Negara National Park	35,750 (55.0)	29,250 (45.0)
Perlis State Park	*7,500 (85.7)	1,250 (14.3)
Endau Rompin National Park	7,858 (83.3)	1,581 (16.7)
Gunung Ledang National Park	9,079 (81.4)	2,076 (18.6)
Tanjung Piai National Park	50,550 (97.9)	1,062 (2.1)
Kinabalu Park	*20,000 (50)	*20,000 (50)
Crocker Range Park	*3,750 (50)	*3,750 (50)
Tawau Hills Park	*20,000 (94.1)	*1,250 (5.9)
Bako National Park	7,077 (29.6)	16,859 (70.4)
Kubah National Park	4,475 (84.9)	796 (15.1)
Gunung Gading National Park	1,786 (24.7)	5,444 (75.3)
Batang Ai National Park	*1,250 (14.3)	*7,500 (85.7)
Tanjung Datu National Park	118 (59.9)	79 (40.1)
Niah National Park	*15,000 (66.7)	*7,500 (33.3)

Parks covered in this assessment	Number of local visitors	Number of foreign visitors
Lambir Hills National Park	12,112 (75.7)	3,895 (24.3)
Gunung Mulu National Park	9,092 (43.0)	12,059 (57.0)
Similajau National Park	*15,000 (92.3)	*1,250 (7.7)
Loagan Bunut National Park	2,716 (91.3)	258 (8.7)
TOTAL	223,113 (65.8)	115,859 (34.2)

Note:

1. Percentages in parentheses

2. Figures marked with asterisk (*) were derived from average of visitor number classes provided in the assessment questionnaire.

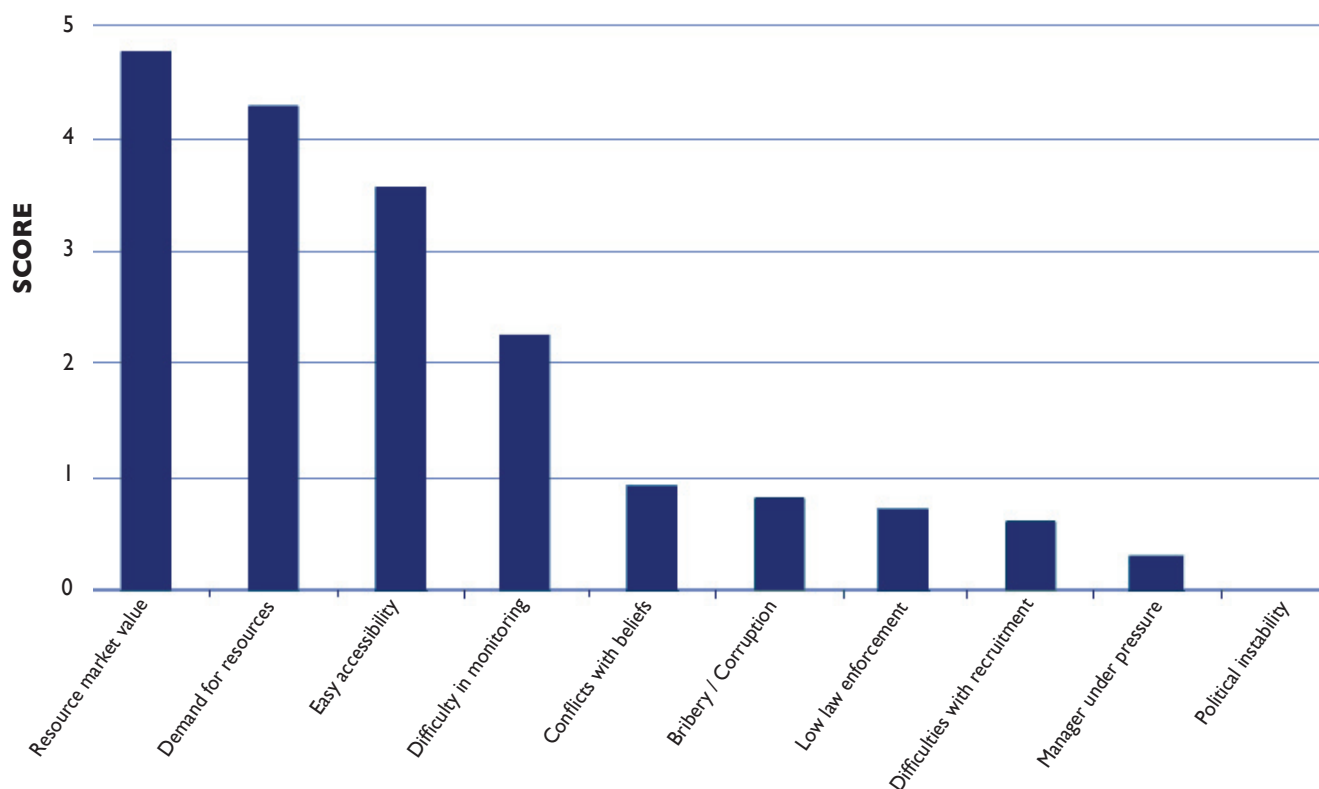
3.3 Vulnerability

The external factors having the most impact on park resources are:

- High market value of timber species in parks, in particular *belian* or Borneon ironwood (*Eusideroxylon zwageri*) in Sarawak, and dipterocarp species in general.
- Strong local and regional demand for park resources, including plant species such as *karas* (*Aquilaria* spp.) for *gaharu* (aloewood), and bushmeat and medicinal products from animal species such as wild pigs (*Sus barbatus* and *S. scrofa*), sambar deer (*Cervus unicolor*), mousedeer (*Tragulus napu* and *T. javanicus*), Malayan sun bear (*Helarctos malayanus*) and pangolin (*Manis javanica*).
- Easy accessibility for illegal activities, including numerous potential entry points, and close proximity to roads and waterways (in some cases international boundaries), as well as easy access to local and international markets for park resources.
- Difficulties in detecting and monitoring illegal activities due to the large tracts of land needed to be monitored, and the challenging environmental conditions (e.g. difficult terrain, dense forest).

Other factors were not very significant in influencing the vulnerability of the parks (see Figure 3). Conversely, the most significant factor contributing to the security of the parks are the stable political (and economic) conditions prevailing in the country. While bribery and corruption does not occur within the parks, some respondents did note that these could be an external factor at the local or regional level. Recruitment and retention of staff was generally not thought to be a problem although it was felt that retaining daily-paid workers was difficult in Sabah. In general, there was little pressure on park managers to unduly exploit park resources.

Figure 3. Average vulnerability



3.4 Pressures and threats

Pressures are defined as forces, activities, or events that have had a detrimental impact on the integrity of the protected area, i.e. that have diminished biological diversity, inhibited regenerative capacity, and/or impoverished the area's natural resources, within the 5-year period prior to the assessment. Threats are pressures that have yet to occur, but have a possibility of occurring; or existing pressures which are likely to continue to occur in the 5-year period following the assessment. A total of 13 categories of pressures and threats were identified and defined, taking into consideration the prevailing socio-economic and environmental conditions in Malaysia.

The degree of each individual pressure and threat is determined based on 3 factors, i.e.:

- Extent – the range across which the impact of the activity occurs;
- Impact – the degree, either directly or indirectly, to which the pressure affects overall protected area resources; and
- Permanence – the length of time needed for the affected protected area resource to recover with or without human intervention.

These three factors were multiplied to obtain the degree of the pressure or threat (see Table 7). For example, a pressure which has a localised extent (score = 1), moderate impact (score = 2), and long term occurrence (score = 3) would result in a degree of 6. In this non-linear scale, a degree of 1-3 is considered mild, 4-9 moderate, 12-24 high, and 27-64 severe.

Table 7. Definitions of extent, impact and permanence

Score	1	2	3	4
Extent	Localised (<5%)	Scattered (5-15%)	Widespread (15-50%)	Throughout (>50%)
Impact	Mild	Moderate	High	Severe
Permanence	Short term (<5 years)	Medium term (5-20 years)	Long term (20-100 years)	Permanent (>100 years)

A total of 101 occurrences of pressures were recorded from the assessment. The pressures most frequently encountered were tourism and recreation (16 parks), illegal hunting (14 parks), waste disposal (14 parks), and illegal extraction of non-timber forest products (NTFP) (11 parks).

A total of 101 occurrences of threats were recorded, most of these being current pressures that are likely to continue in the next five years. The most frequently encountered threats were tourism and recreation (15 parks), illegal hunting (14 parks), waste disposal (13 parks), and illegal extraction of NTFP (12 parks).

Table 8 lists the number of parks where the respective pressures and threats occur, as well as the average degree of these pressures and threats (calculated over the number of parks where the particular pressure and threat occurs). It should be noted that the frequency of occurrence of a particular pressure or threat has little to do with the degree of that pressure or threat. For example, tourism and recreation is the most frequently occurring pressure and threat but is considered to be a mild pressure and threat. Cross-boundary pressure and threat recorded the highest score for average degree.

Table 8. Summary of pressures and threats

Category	Occurrence of pressure (number of parks)	Average degree of pressure ¹ (max. = 64)	Occurrence of threat (number of parks)	Average degree of threat ¹ (max. = 64)
Logging	4	9	4	8
Extraction of timber	7	5	5	5
Illegal land clearing	7	10	8	9
Hunting (illegal)	14	5	14	4
Hunting (legal)	4	4	4	4
NTFP (illegal)	11	5	12	4
NTFP (legal)	4	3	4	1
Fishing	7	2	7	2
Tourism & recreation	16	2	15	2
Waste disposal	14	2	13	2
Alien species	5	6	5	6
Semi-natural	2	1	3	2
Cross-boundary	6	19	6	19
TOTAL	101		101	

Note:

1. Average degrees of pressures and threats are calculated over the total number of parks where the particular pressure or threat occurs.

2.  Moderate  High

3.4.1 Logging

Logging is defined here as the commercial extraction of timber from within the park area, by use of heavy machinery. Logging was a pressure in four parks, of which two were high and two moderate. In most cases, this was the result of legal concessionaires operating close to the periphery of the parks, whose operations extend beyond the boundaries of their concession areas. In some instances the commercial loggers are believed to work in collaboration with individuals from the local community. The general conditions which rendered the parks vulnerable to logging were inadequate boundary demarcation, inadequate monitoring and enforcement, as well as the existing physical conditions within and outside the park, e.g. access roads, surrounding land use, natural barriers. However, in general there is low occurrence of such activities and the degree of this pressure and threat is considered to be moderate. Actions taken by the parks to combat logging include stepping up enforcement activities, public awareness and networking with village heads.

3.4.2 Extraction of timber

Based on recommendations by the respondents, it was decided that a separate category from logging was required, in recognition of the differences in intensities, and underlying causes between large-scale logging operations and low-level timber extraction. So, for the purpose of this assessment, the category “extraction of timber” was created and defined as the harvesting of timber trees at a low level of intensity within the park area, by locals for their own use, without the use of heavy machinery. Extraction of timber represents a mild pressure in four parks, moderate in two parks and high in one park. In two of the parks, this pressure has greatly decreased over the past five years due to a step up in patrolling efforts and improved boundary demarcation, as well as efforts to educate the local community, to the extent that the respondents were certain that it would not pose a threat in the next five years.

3.4.3 Illegal land clearing

This concerns the small-scale clearing of natural areas in the park area for the purpose of housing, settlements, roads, agriculture, tree plantations, and other uses not compatible with protected area management. Illegal land clearing was a pressure in seven parks, the degree of which was high in two parks, moderate in four, and low in one. Of the seven parks, four contained pockets of land traditionally cultivated by local communities. In these instances, although most of the communities had moved out since the parks were gazetted, some continued to work/harvest these cultivated lands. The general stance taken by the management authorities here is to allow harvesting to continue, but with an understanding that there would be no future expansion of these areas, and that no new trees are to be planted.

In two of the parks, land clearing was caused by local people living outside the park with the intention of expanding their cultivated land across the park boundaries. This was linked to inadequate boundary demarcation and a lack of monitoring and enforcement. On the whole, although conversion of land use is localised to small pockets within the parks, the effect of this activity is long term, i.e. will take 20-100 years for the area to recover to its natural state.

3.4.4 Hunting (illegal)

Illegal hunting includes all forms of unsanctioned hunting practices, including poaching for illegal trade, sport hunting, and hunting for subsistence purposes by local communities in parks where there are no legal hunting rights. Illegal hunting occurred in 14 parks, where the pressure and threat for nine parks were considered to be mild, two moderate, and three high. It should be noted that in some cases, hunting by local communities living near the park border, who do not have legal rights to do so, is unofficially tolerated in recognition of their long history of resource use in the park area.

Illegal hunting is perceived to be carried out by people living near the parks as well as outsiders including non-Malaysians. This variety of hunting generally has a mild and short-term impact, as most game animals are those with high reproduction rates such as wild pigs, sambar deer, mousedeer and the barking deer (*Muntiacus muntjak*). However, there were also isolated reports involving larger mammals, such as the Malayan sun bear, the Malayan tapir (*Tapirus indicus*) and the Malayan tiger (*Panthera tigris jacksonii*).

3.4.5 Hunting (legal)

In addition to illegal hunting, certain parks do allow traditional hunting practices by communities accorded resource use rights. There are only four parks where hunting is permitted, and this pressure is generally mild, as the communities with hunting rights target game animals such as wild pigs and deer species. These game animals generally have high reproductive rates, and a low hunting pressure is thus unlikely to have a significant impact on population viability.

3.4.6 NTFP collection (illegal)

Non-timber forest products include food and medicinal plants, building material, resins, and other resources from the park area, either for trade or for subsistence. Illegal NTFP collection pressure is rated mild for four of the parks, moderate for seven of the parks and high for one of the parks. The main concern with regard to NTFP collection is the felling of *karas* trees for *gaharu* (aloewood), mainly by local and foreign collectors working in collaboration with middle-men. A number of arrests for illegal *gaharu* collection have been recorded in parts of Peninsular Malaysia, Sabah and Sarawak. Other main NTFPs collected include rattan, swiftlet nest from caves, petai fruit (*Parkia speciosa*), palm leaves, wild honey and keruing (*Dipterocarpus* spp.) oil.

3.4.7 NTFP collection (legal)

In some parks, local communities are accorded special rights to harvest NTFPs. The NTFPs harvested are similar to those for illegal NTFP collection, except that *gaharu* collection is of a much lower scale. NTFP collection is only legally allowed in four parks. The level of pressure from NTFP collection is considered mild for two of the parks and moderate for another two parks. However, for one of the park under moderate pressure, NTFP collection is expected to decrease in significance such that the threat level is expected to be mild within the next five years. Measures taken by park authorities to reduce this pressure and threat include community development programmes and the installation of honorary wildlife rangers (in the case of parks in Sarawak). In Niah National Park, a sustainable-harvesting scheme (including a four-month closed season to collect black-nest swiftlet nests) is being implemented.

3.4.8 Fishing

For fishing, both legal and illegal activities are combined in the analysis as the overall pressure and threat is low. Seven parks recorded mild levels of pressure and threat while only one park perceived the pressure and threat to be moderate. For the latter case, fishing is by local communities who have no legal rights but are allowed to do so because of their traditional practices. However, there is an increasing tendency for the fishery resources to be harvested for sale. Local communities are accorded fishing rights in Gunung Mulu National Park, Taman Negara National Park and Loagan Bunut National Park. Taman Negara National Park is the only park which issues fishing permits to park visitors as a revenue-generating activity. However, this activity is regulated with only angling allowed at selected river tributaries. The species most sought after are *kelah* or *empurau* (*Tor tambroides*), catfish and arowana.

3.4.9 Tourism and recreation

Tourism is included as a pressure and threat in recognition that some negative impacts may be caused by park visitors. However, it should be noted that tourism and recreation is one of the main objectives for the establishment of National and State parks, and that the average degree of pressure and threat arising from tourism and recreation activities is considered to be low.

The pressure is perceived to be low for 13 parks, moderate for two parks and high for one. Two parks do not consider tourism and recreation to be a pressure or threat at all because of the very low visitor numbers at these two parks. Activities that contribute to this pressure and threat include hiking, camping, boating, motorised vehicle use and other types of recreation. The main impact for most parks is the damage to the trail system due to hiking. Although the impact may sometimes be severe along some trails, the extent is usually very localised. Some parks, as in the case of Gunung Ledang National Park, have taken steps to mitigate the damage, such as the use of coir logs to minimise erosion and to harden trails. For Gunung Mulu National Park and Niah National Park, where caves are a major attraction for visitors, boardwalks are built within the caves to minimise erosion to the cave floor.

3.4.10 Waste disposal

This category encompasses the impacts of inefficient management of both solid and liquid waste, such as overflow from sewage treatment systems, inefficient disposal of solid waste, as well as littering. It is perceived to be a mild pressure and threat for 11 parks, and moderate for three parks. The most common sewage treatment system being used is the septic tank which requires proper maintenance to prevent overflow. A few parks in Sabah and Sarawak have recently installed closed sewage treatment systems.

For most of the parks, solid waste is transported outside the park area to designated municipal dumpsites. However, the availability of municipal dumpsites poses a problem for parks that are not accessible via good sealed roads or are located far from municipal dumps, as transport costs can be quite high.

Littering by park visitors is not a major problem along trails (as the litter can be cleared easily) but can be a greater problem when it occurs in difficult terrain such as inside cave passages. Litter which ends up here may remain for a long time, and may cause environmental contamination if they contain toxic substances. At Taman Negara National Park, visitors who climb Mount Tahan are required to declare the amount of non-biodegradable packaging that they carry and fines are imposed on those who do not dispose solid waste properly. In general, park staff are expected to play a major role in ensuring that solid waste is disposed properly and are usually involved in periodic clean-up along trails.

3.4.11 Alien species

Alien species are species that become established in natural or semi-natural ecosystems or habitat, are agents of change, and threaten native biological diversity (ISSG, 2001). Alien species are recognised as a pressure and threat in five parks. Three of these parks contain a single alien animal species respectively, i.e. the African tilapia (*Tilapia* sp.), the kissing gourami (*Helastoma temminckii*) and the house rat (*Rattus rattus*). The house rat is attracted to the easy availability of food in areas frequented by visitors, while the two alien species of fish had been previously released into the waterways within the park area by humans. The dandelion (*Taraxacum officinale*), which usually occurs in temperate areas, has invaded certain areas of a montane park. Trees of commercial value e.g. teak (*Tectona grandis*) and fruit trees e.g. durian (*Durio zibethinus*), dokong (*Lansium domesticum*), and cempedak (*Artocarpus champeden*) were planted in certain areas in one of the parks by local communities prior to the establishment of the park.

3.4.12 Semi-natural processes

Semi-natural processes are defined as natural processes that have been magnified by human intervention, such as catastrophic floods or fires. Fire was recognised as a mild pressure or threat in two of the parks assessed. Fire was perceived as a threat, but not a pressure in one of these parks, i.e. it had not occurred in the past five years. However, historical evidence suggests that forest fires are a cyclical event here, occurring once in a few years. Since it had not occurred within the last five years, the respondent predicted that it was highly likely to occur again within the next five years.

3.4.13 Cross-boundary influences

Cross-boundary influences include local and regional pollution, increased water runoff, increased nitrogen loads, extraction of water resources and wave action. Cross-boundary pressures and threats are considered to be moderate for four parks, high for one park and severe for one park. Coastal parks are particularly at risk from deposition of pollutants and solid waste due to tidal and wave action. Incompatible land-use in surrounding areas can cause negative impacts on a park if the park is located downstream of logging and agricultural activities. Tanjung Piai National Park is under severe pressure and threat due to wave action, which is causing erosion of its coastline at a reported rate of approximately 8-10 metres a year.

3.5 Management effectiveness

The assessment of management effectiveness takes into consideration three key elements of the management cycle, i.e.: Planning and design, Inputs and Processes, which are in turn divided into their respective components and criteria. For the purpose of this assessment, a score of 3.0 is considered to be the threshold for effective management, i.e. an average score of 3.0 and above is indicative of effective management for each individual criterion, component and element.

System-wide, management effectiveness was found to be quite strong, with all of the elements and their respective components having a score of above 3.0 (See Table 9).

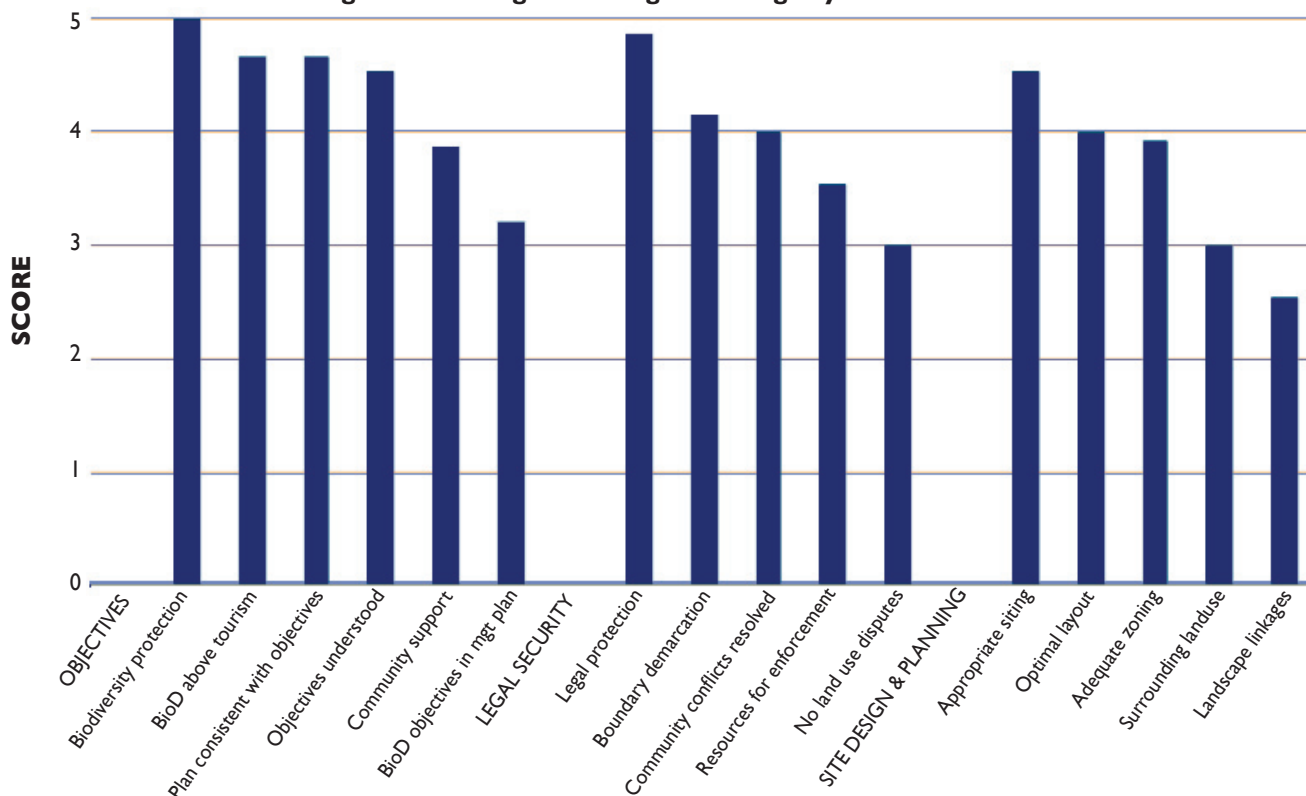
Table 9. Average scores for management effectiveness elements and components

Element	Element score	Component	Component score
Planning and design	3.6	Objectives	3.8
		Legal security	3.3
		Site design and planning	3.6
Inputs	3.9	Staffing	3.8
		Communication and information	3.8
		Infrastructure and facilities	4.1
		Financing	4.0
Management processes	4.0	Management planning	3.7
		Management decision making	4.4
		Research and monitoring	3.8

3.5.1 Planning and design

There are 16 criteria within Planning and design, grouped within three main components, namely Objectives, Legal security and Site design and planning (see Figure 4). The average scores for the criteria were all above the threshold value of 3.0 except for two criteria, specifically “No land-use disputes” and “Landscape linkages”.

Figure 4. Average Planning and design system-wide



3.5.1.1 Objectives

Sound objectives (score 3.8) are the strongest aspect of planning by park authorities. Protection and maintenance of biodiversity is a major objective for all parks, and biodiversity conservation considerations are placed above those of recreation and tourism. Furthermore, park objectives are understood by employees and administrators, resulting in management policies and plans which are generally consistent with the objectives. However, biodiversity-related objectives within the management plans of many of the parks do not have specific reference to key species or habitat, which is important in providing the basis for critical management activities and strategies (See Table 10).

Table 10. Management objectives and critical park activities

Parks covered in the assessment	Specific management objectives	Critical park activities
Taman Negara National Park	<ol style="list-style-type: none"> 1. Biodiversity conservation. 2. Recreation & aesthetic value. 3. Research. 	<ol style="list-style-type: none"> 1. Law enforcement.
Perlis State Park	<ol style="list-style-type: none"> 1. To conserve the biodiversity of the Nakawan range. 2. To protect the watershed. 3. To generate sustainable income to the State through ecotourism. 	<ol style="list-style-type: none"> 1. Gazettement and law enforcement.
Endau Rompin National Park	<ol style="list-style-type: none"> 1. Biodiversity conservation. 2. Education. 3. Scientific research. 4. Tourism. 	<ol style="list-style-type: none"> 1. Law enforcement. 2. Wildlife management.
Gunung Ledang National Park	<ol style="list-style-type: none"> 1. Biodiversity conservation. 2. Education. 3. Scientific research. 4. Tourism. 	<ol style="list-style-type: none"> 1. Environmental management. 2. Law enforcement against poaching.
Tanjung Piai National Park	<ol style="list-style-type: none"> 1. Biodiversity conservation. 2. Education. 3. Scientific research. 4. Tourism. 	<ol style="list-style-type: none"> 1. Visitor management. 2. Law enforcement.
Kinabalu Park	<ol style="list-style-type: none"> 1. To preserve natural ecological system and outstanding natural beauty. 2. To conserve natural water catchment. 	<ol style="list-style-type: none"> 1. Law enforcement.
Crocker Range Park	<ol style="list-style-type: none"> 1. To preserve natural ecological system. 2. To conserve of water catchment. 3. To protect <i>Rafflesia</i> habitat. 	<ol style="list-style-type: none"> 1. Law enforcement.
Tawau Hills Park	<ol style="list-style-type: none"> 1. To preserve natural ecological system. 2. To conserve water catchment. 	<ol style="list-style-type: none"> 1. Law enforcement.

Parks covered in the assessment	Specific management objectives	Critical park activities
Bako National Park	<ol style="list-style-type: none"> 1. To protect all the vegetation types of the State (7 vegetation types) excluding montane forest. 2. To protect endemic species found there e.g. proboscis monkey. 3. To raise public awareness for conservation through education. 4. To facilitate business development from conservation-based activities. 5. To promote and regulate nature-based tourism. 	<ol style="list-style-type: none"> 1. Implementation of <i>in situ</i> conservation projects. 2. Impact assessment. 3. Implementation of routine law enforcement and patrolling. 4. Implementation of co-management through a Special Park Committee. 5. Customer service management.
Kubah National Park	<ol style="list-style-type: none"> 1. To protect catchment area. 2. To preserve the floristic diversity of the area particularly rare and endangered palm species. 3. To preserve the scenic beauty of the area e.g. waterfalls. 4. To promote scientific research on the natural systems. 	<ol style="list-style-type: none"> 1. Conservation of palm species (palmateum established). 2. Awareness programmes for local communities. 3. Research on frogs, gingers and medicinal plants in collaboration with local universities. 4. Routine boundary monitoring and enforcement. 5. Establishment of co-management model through a Special Park Committee.
Gunung Gading National Park	<ol style="list-style-type: none"> 1. To protect the forest ecosystem particularly <i>Rafflesia</i>. 2. To protect the water catchment areas. 	<ol style="list-style-type: none"> 1. Establishment of a co-management model through a Special Park Committee. 2. <i>In situ</i> conservation projects especially on <i>Rafflesia</i> spp. and their habitats. 3. Routine enforcement and patrolling.
Batang Ai National Park	<ol style="list-style-type: none"> 1. To protect the water catchment area. 2. To regulate privileges accorded to the surrounding local community. 	<ol style="list-style-type: none"> 1. Establishment of a co-management model. 2. Regular patrolling, especially along the park boundary which is also the international boundary. 3. Community-based development projects. 4. Management of tourism-related activities. 5. Facilitation of business development from a conservation perspective.
Tanjung Datu National Park	<ol style="list-style-type: none"> 1. To protect the forest ecosystem, coral reefs, and important species specifically gibbons, hornbills, cave swiftlets, Argus pheasant, and marine turtles. 2. To provide <i>in situ</i> conservation of marine turtles and <i>Rafflesia</i>. 	<ol style="list-style-type: none"> 1. Enforcement and maintenance of park boundary, especially along the park boundary which is also the international boundary. 2. Documentation of local community members and establishment of a Special Park Committee. 3. <i>In situ</i> conservation.
Niah National Park	<ol style="list-style-type: none"> 1. To protect the combination of lowland dipterocarp forest, limestone forest and cave system. 2. To protect globally significant prehistoric remnants including wall paintings, wooden boat-shaped coffins, and the site of a Palaeolithic human skull aged to be at least 40,000 years old. 	<ol style="list-style-type: none"> 1. Establishment of a Special Park Committee. 2. Conservation activities. 3. Education and awareness activities. 4. Routine boundary patrolling and river patrolling. 5. Co-management on sustainable management of bird's nest.
Lambir Hills National Park	<ol style="list-style-type: none"> 1. To conserve biological diversity. 2. To protect the water catchment. 3. Recreation. 	<ol style="list-style-type: none"> 1. Development of a Strategic Protection Plan. 2. Boundary demarcation. 3. Formation of a Special Park Committee. 4. Enhance management presence. 5. Conservation education programme.

Parks covered in the assessment	Specific management objectives	Critical park activities
Gunung Mulu National Park	<ol style="list-style-type: none"> To protect and maintain the park's World Heritage status. To ensure the sustainable development of tourism without compromising the park's ecological integrity. 	<ol style="list-style-type: none"> Working towards establishing a co-management model. Local community projects. Conservation education programme. International collaboration with international institutions. Routine boundary clearing/marketing and patrolling. Visitor management.
Similajau National Park	<ol style="list-style-type: none"> To protect the natural scenery of the 20-km coastline comprising golden sand beaches, sandstone cliffs, and small rocky headlands. To protect the forest vegetation that encompasses mangrove forests, kerangas (heath) forest. To protect the fauna, specifically green turtle and estuarine crocodile. To protect the green turtle breeding sites. Recreation and tourism. 	<ol style="list-style-type: none"> Establishment of a Special Park Committee Conservation activities. Education and awareness programme. Routine enforcement. Establishment of a co-management model.
Loagan Bunut National Park	<ol style="list-style-type: none"> To protect the largest natural peat swamp lake. To protect the breeding site of the oriental darter and false gharial. 	<ol style="list-style-type: none"> Law enforcement Establishment of a co-management model. Awareness programme for locals.

3.5.1.2 Legal security

The parks are secure by provisions of law in that they have all been or are soon to be gazetted using the relevant legislation. Boundaries are well demarcated in parks in Sabah and Sarawak, where cut-line boundaries are used in addition to signposts and tree marking. However, in Peninsular Malaysia, boundary demarcation in a few parks is still inadequate. As a result, enforcement staff are sometimes themselves uncertain of the location of these boundaries, thus affecting their ability to effectively detect illegal activities within the borders. In terms of human and financial resources required to detect illegal activities, all respondents were of the view that this was satisfactory in their parks, with the exception of two parks.

Local communities generally support park objectives, although there were segments of the local communities in nine of the parks that did not totally support the respective park objectives due to resource-use related reasons – a trend which has had an effect on park legal security. Unsettled land tenure disputes are an issue in 10 of the parks. For these 10 parks, conflicts with the local community have been, or are in the process of being resolved. However, these conflicts are sometimes difficult to resolve effectively as the disputes can be varied and complicated.

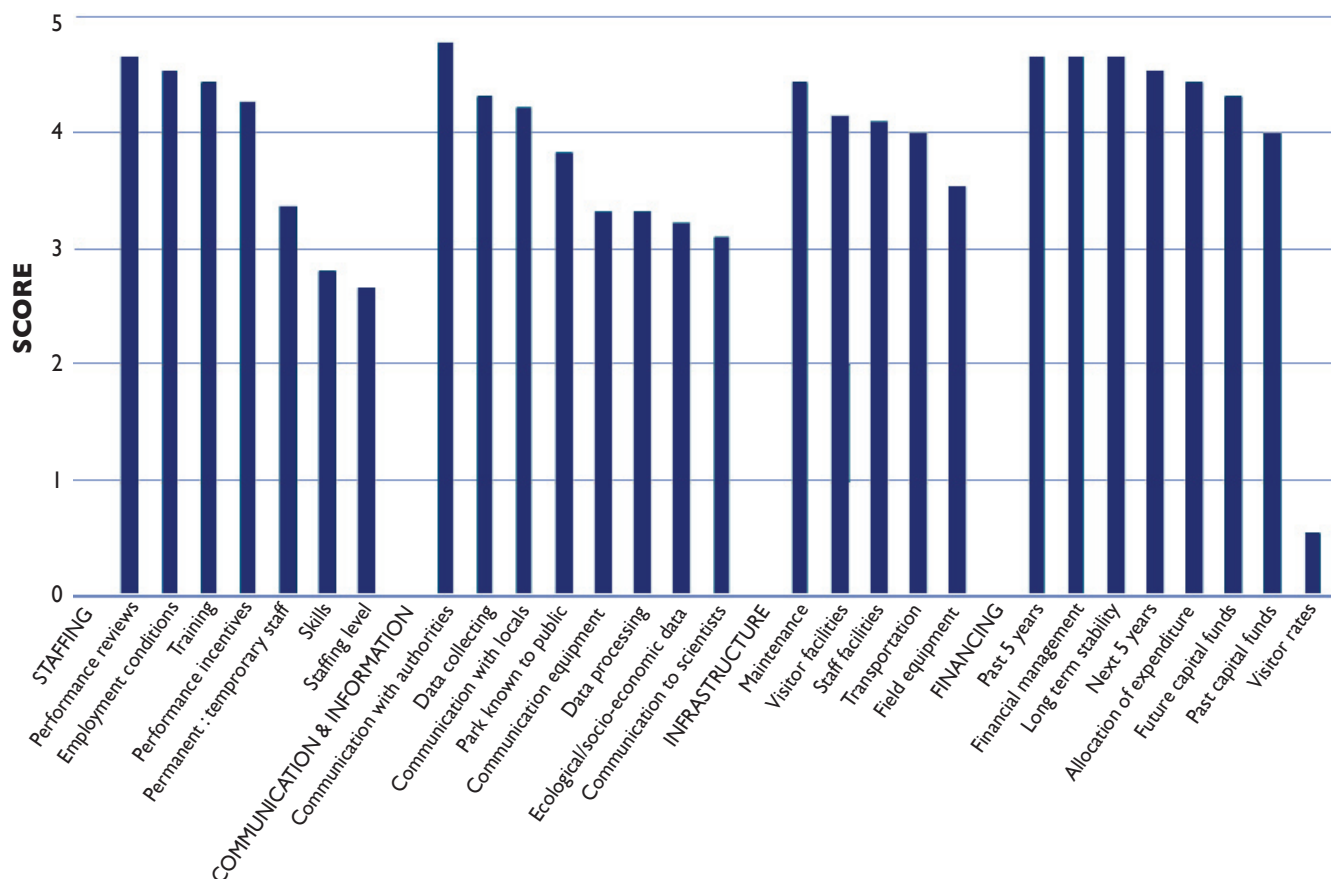
3.5.1.3 Site design and planning

The main weakness in park design is the lack of landscape linkages or wildlife corridors connecting them to other protected areas. This is the case with eight out of the 18 parks, which are in effect 'island parks'. In relation to this, the land use in the areas surrounding five of the parks were not compatible with protected area management. These incompatible land uses include large-scale agricultural plantations and logging. The siting of the parks is generally consistent with their objectives. Layout and configuration of the parks also generally optimise biodiversity conservation, although in some cases certain stretches of the park boundary do not follow natural features (e.g. only includes part of a mountain peak or catchment area) and/or allows for greater access for illegal activities. Most of the parks surveyed have some sort of zoning system in place.

3.5.2 Inputs

For Inputs, there are 28 criteria grouped within four components i.e. Staffing, Communication & information, Infrastructure, and Finances (see Figure 5). Only three criteria fell below the threshold for effective management (i.e. score of below 3.0), specifically “Skills”, “Staffing level” and “Visitor rates”.

Figure 5. Average Inputs system-wide



3.5.2.1 Staffing

At a minimum, staffing should enable critical management activities (defined as any activities necessary to prevent, mitigate, or restore irreplaceable or unacceptable losses to natural or cultural protected area resources) to take place in a timely manner. Seven of the parks noted that their level of staffing was insufficient to achieve this. In addition to staffing levels, an optimal ratio of permanent vs. temporary (contract) staff is also important to enable effective management. However, it should be pointed out that different park authorities have different management systems and the optimal permanent : temporary staff ratio is unique for each park authority. Sarawak Forestry Corporation, for instance, prefer to outsource maintenance work so that there is little need for temporary staff.

Employment conditions were generally considered to be sufficient to retain high-quality staff. Performance incentives are in place in all the parks. Sabah Parks rewards good performance with local and overseas study visits. Sarawak Forestry Corporation has a performance-based remuneration system (bonus scheme) in place. The Department of Wildlife and National Parks and Perlis State Forestry Department staff are eligible for the civil service remuneration scheme, as well as overtime allowance, while Johor National Parks Corporation provides for overtime allowance. In all cases staff performance and progress on targets were assessed periodically.

In terms of technical competency, five of the parks did not have enough staff members with adequate skills to effectively conduct critical management activities. Cited examples of skills that are lacking include proficiency in botany and in wildlife and habitat management, as well as legal know-how.

However, training and development opportunities were generally deemed to be appropriate to the needs of the staff in all parks. Training varied between park authorities, with a mixture of both *ad hoc* and long-term programmes ranging from short-term workshops to informal exchanges between parks, and formal education. A good example of the latter is in Sarawak where the Sarawak Forestry Corporation has close links with Lincoln University, and park staff are given the opportunity to pursue certificate and diploma level courses in ecotourism and park management.

3.5.2.2 *Communications and information*

Sufficient and reliable means of communication, including in-house communication and communication between park staff and other relevant authorities is important to facilitate critical park management activities.

Facilities and equipment are adequate for communication between field-based and office staff (including park managers and headquarters) for all parks, except for Batang Ai National Park and Tanjung Datu National Park which do not have phone lines, mobile phone reception or radio equipment (however, a trunk-radio communication system will be operational at Tanjung Datu by the year end). Lines of communication with other relevant enforcement authorities (e.g. the police, the army etc.) are deemed as adequate for all parks.

Field equipment for data collection, e.g. GPS units, cameras, surveying equipment and binoculars are adequate for most parks. Equipment for processing and analysing data e.g. software programmes for GIS analyses and database management systems, are generally housed at the headquarters of park authorities and these systems are at various stages of implementation.

The parks are generally perceived to be well known to the public, except for Crocker Range Park, which has not been aggressively promoted and has only basic visitor facilities; Tanjung Datu National Park (see above); and Loagan Bunut National Park which is located far from major urban areas (but has satellite telephone and fax services).

In general, communication between park authorities and the scientific community needs to be further enhanced. At present, the specific research needs of the various parks are not communicated sufficiently or effectively to the scientific community. This is one of the underlying causes for the lack of ecological (as opposed to mere species checklists) and sociological data, and this shortfall may consequently affect the effectiveness of park authorities in park planning and management.

Most park authorities are of the opinion that there is adequate communication with local communities but this does not necessarily mean that local communities are involved in park management and planning processes. This will be discussed in greater detail in the Processes section.

3.5.2.3 *Infrastructure and facilities*

Transport infrastructure, such as internal and access roads are generally adequate, although more vehicles are required for a few parks.

Field equipment is generally deemed to be adequate to perform critical management activities, and sufficiently well maintained to ensure long-term use. Staff facilities such as office buildings and staff quarters are, on the whole, adequate for staff to perform critical management facilities.

Visitor facilities are generally appropriate to the level of visitor use in all parks, with the exception of Tanjung Datu National Park, which does not have its own accommodation facilities (although a local village homestay programme was on-going, and park camping grounds were being developed at the time of the assessment). This park is still not well-known due to its remote location and visitor numbers are currently very low.

3.5.2.4 Funding

Financial arrangements vary among the different park authorities. However, for all parks there are two main types of funding – operational funds (for staff remuneration and maintenance) and development funds (for infrastructure and other capital expenditure).

In the case of operational funds, the major source of funding is still from the government (usually the State Government, but for Taman Negara National Park the Federal Government is the main source). All parks are far from being operationally self-sustaining except for Kinabalu Park, which is almost self-sustaining.

Development funds, on the other hand, can be sourced from both the State and Federal Governments, with the bulk of the funding coming from the Federal Government. Development funds are usually for the construction of tourism infrastructure and are usually channelled through the Federal Ministry of Tourism. In addition, Federal funds are also available for specific purposes, such as in response to the designation of a particular park as a RAMSAR³ site.

In the case of the Johor National Parks Corporation, collections from visitor entrance fees and other park charges are channelled to its central funds that are utilised for park operations. There are no specific allocations for individual parks under the corporation and instead, funding is disbursed to the individual parks as and when required.

For Perlis State Park, all revenue from the park is channelled to the State coffers, as there is no specific fund for the operations of the park. However, the State Government usually provides funding to the Perlis State Forestry Department on an annual basis. The Federal Government currently pays for the maintenance of the park officer who is seconded from the Peninsular Malaysia Forestry Department, although the respondent was uncertain as to how long this arrangement would continue.

In Sarawak, there is a similar arrangement whereby all collections from the parks are handed over to the State Government. This arrangement has proved satisfactory, as funding in the five years prior to the assessment has been adequate for the parks to conduct critical management activities as well as for capital investment and this situation is expected to continue in the foreseeable future. In addition to this, the Sarawak Forestry Corporation is expected to start generating revenue through the provision of guiding services, rental of equipment, environmental education packages, sale of books and souvenirs and so on.

Taman Negara National Park has a relatively complicated financial system in that certain forms of revenue from the park (such as visitor entrance fees, camping permits and fishing permits) from its three entry points are channelled to the respective State Governments (the park is situated in three different States, i.e. Pahang, Terengganu and Kelantan) while other sources of revenue are handed over to the Federal Government (e.g. canopy walkway charges, revenue from concessionaires). There is also a Taman Negara Fund managed by DWNP. Donations to the fund are meant solely for the park's use.

Sabah Parks' financial system is highly advantageous to the parks under its management. All revenue collected from the parks is channelled to the Sabah Parks Trust Fund, which is used specifically for park operations. The parks are still eligible nonetheless for operational and development funds from both the State and Federal Governments.

Financial management practices, including timely reporting, accurate book-keeping and sound budgeting procedures, were reported to be efficient and effective for all parks.

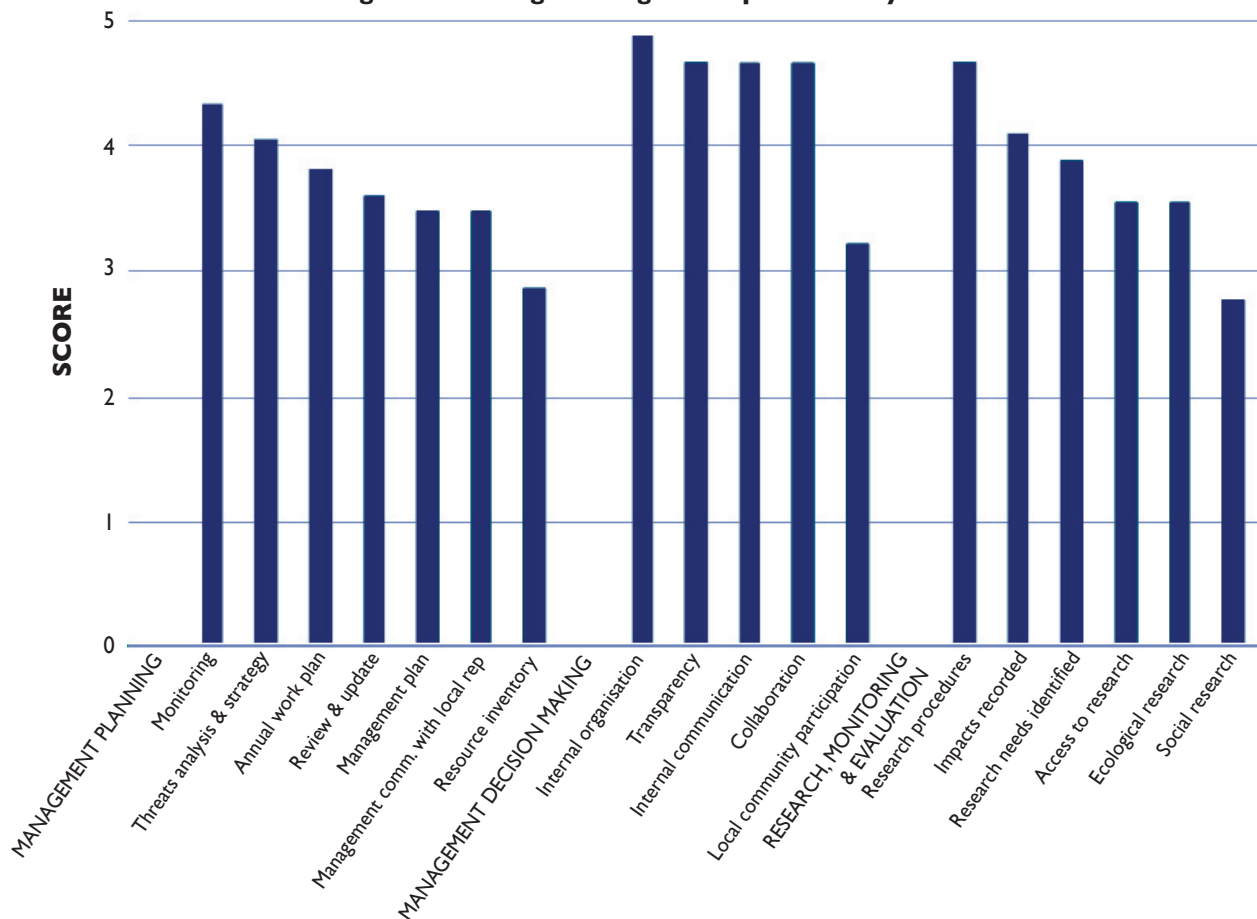
There is a very strong feeling among park authorities that current visitors entrance rates are too low, and do not reflect the biodiversity value of the parks or level of visitor experience offered. An example of this is the entrance fee in Taman Negara, which has remained at RM 1 since the park's inception.

³ The Convention on Wetlands, signed in Ramsar, Iran in 1971, is an inter-governmental treaty which provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. Malaysia became a Contracting Party to Ramsar at the 5th Conference of Parties (or COP) held in Japan in 1993. It ratified the Convention in 1994 and Tasek Bera (a freshwater swamp lake system covering an area of 31,120ha) was declared as its first Ramsar Site.

3.5.3 Management processes

Here, 18 criteria are grouped under three components, namely Management planning, Management decision-making and Research, monitoring and evaluation (see Figure 6). Only two criteria had scores below the threshold value of 3.0, i.e. “Resource inventory” and “Social research”.

Figure 6. Average Management processes system-wide



3.5.3.1 Management planning

Nine of the parks assessed have a comprehensive and recently-written management plan, which is generally reviewed and updated on a regular basis. Some of the parks in Sarawak do not have a management plan *per se* but do have a park business plan and a park protection plan, which contain many elements of a management plan and are reviewed and updated yearly.

Most park authorities have conducted analyses on, and have strategies for, addressing their respective pressures and threats. For example, Sarawak Forestry Corporation uses the Nature Conservancy 5-S planning framework, which provides for a comprehensive analysis of pressures and threats.

Most parks have some sort of inventory of their natural and cultural resources but it is difficult to determine how comprehensive these inventories are.

A common concern among park authorities is the conduct of researchers who do not have a long-term commitment to carry out research activities within the parks and who do not share their findings with the park authorities.

Most of the parks have an annual work plan with specific targets, and results of research and monitoring, whenever available, are incorporated into planning.

3.5.3.2 *Management decision-making*

All parks have a clear internal organisation structure, including clear communication channels and well-defined job descriptions. There is a general view that management decision-making is transparent and there is effective communication among all levels of park staff and the administration. There is also a general perception that there are regular collaborations with partners, local communities and other organisations including research institutions, schools, universities, local businesses and tourism agencies.

There was a range of answers in response to the question of whether local communities are involved in decisions that affect them. In some cases, local communities are represented in the relevant park committees while in other cases, local communities are only informed of decisions that affect them but did not have much opportunity to influence these decisions. In Sarawak, local communities are represented in the Special Park Committees while in the case of Taman Negara, community meetings are held to allow for discussions on issues that affect the local communities.

3.5.3.3 *Research, monitoring and evaluation*

There was a general perception that the impacts of legal and illegal uses of the parks are accurately monitored and recorded. Most park authorities in Peninsular Malaysia are of the opinion that research on key ecological issues is generally insufficient for the needs of the parks. In terms of research on key social issues, most park authorities in Malaysia perceive this to be inadequate for the purposes of park planning and management. Critical research and monitoring needs have been identified in the case of parks in Sabah and Sarawak but this is not the case for Peninsular Malaysia parks with the exception of Perlis State Park. Procedures for conducting research in the parks are generally clearly defined and communicated to researchers. Applications for research in individual parks are usually processed at the headquarters of park authorities.

3.6 National and State park system-level

This section answers the system-wide questions (questions 17-18 of the RAPPAM questionnaire), based on the results from discussions during the first breakout session of the Workshop on the Management Effectiveness of National and State Parks in Malaysia. It should be noted that while the term “system” as discussed in the workshop is limited to the National and State park system, it does, however, include broader National and State policies which are of consequence to this system.

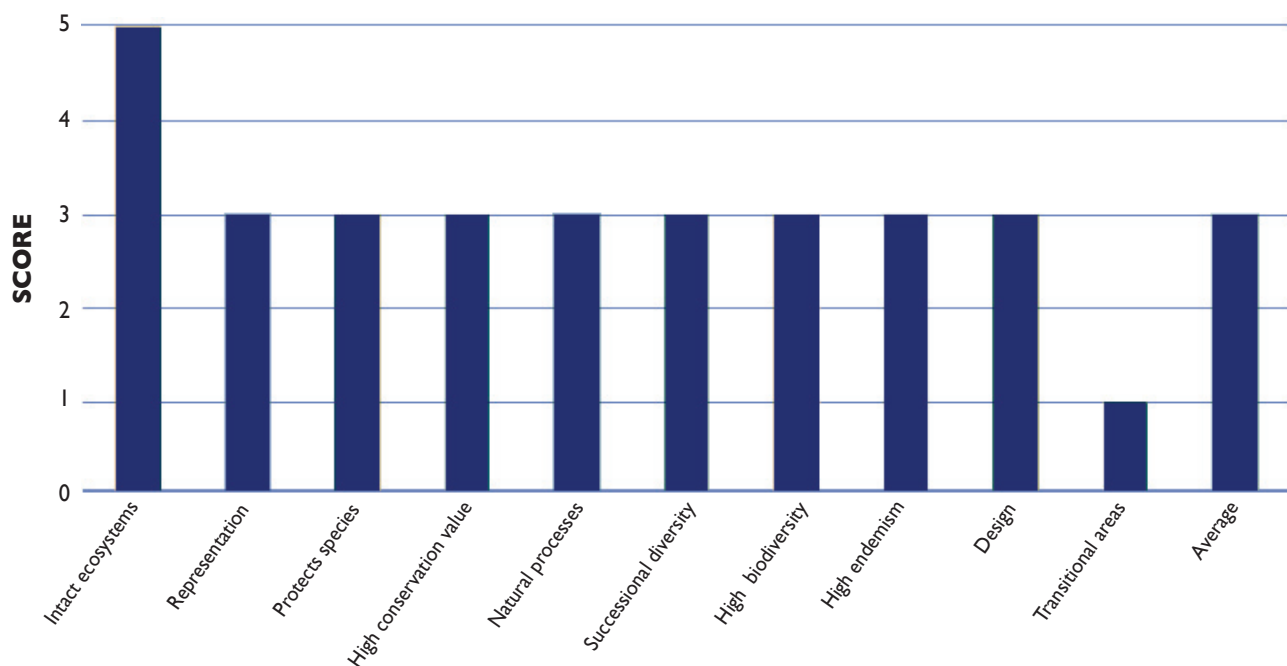
3.6.1 National and state park system-level design

At the system level, most of the ecosystems in the country are represented within the existing National and State parks (see Table 5). Most major forest types in the country (as defined by Soepadmo & Wong, 1995; Symington, 1943; and Wyatt-Smith & Panton, 1995) are represented in the 18 parks assessed, including lowland dipterocarp forest, hill dipterocarp forest, montane forest, limestone forest, kerangas (heath) forest, peat swamp forest, beach forest, open scrubland, White Meranti-Gerutu forest, regenerated forest and riverine forest. Forest and vegetation types under-represented within the National and State park system include freshwater swamp alluvial forest, Gelam forest (Symington, 1943), vegetation on quartz dykes (Wyatt-Smith & Panton, 1995) and Adinandra forest (Symington, 1943). However, vegetation on quartz dykes is represented in the Klang Gates Wildlife Reserve (IUCN Category VI) in Selangor, Peninsular Malaysia and the three other forest types are present in forest reserves. Peat swamp forests are only represented in National parks in Sarawak and not in Peninsular Malaysia or Sabah. Some transition areas between ecosystems such as coastal zones, mangrove forests and riverine and marine interfaces are still not well represented within the National and State park system but are present in forest reserves.

All parks consist primarily of exemplary and intact ecosystems that maintain most natural processes at a landscape level. Sites of high conservation value for key species are usually identified for protection by scientists and conservationists but the gazettelement process may take a long time and not all sites identified are eventually gazetted as protected areas. Sites in Sarawak and Sabah are identified by the State authorities following a systematic process that aims to protect all the different ecosystems found in the State. However, this process is not very apparent in Peninsular Malaysia.

There was a general agreement that the National and State park system is adequate for the protection against the extinction or extirpation of most animal species. Some of the larger mammals such as the seladang or gaur (*Bos gaurus*) and Sumatran rhinoceros (*Dicerorhinus sumatrensis*) are very rare, and populations within the National and State park system may not be sufficient for the long-term survival of the species, which therefore continues to be largely dependent on managed production forests. Among the smaller animals, such as certain reptiles and amphibians, insects, spiders and other invertebrates, there are species with more restricted distributions and a considerable number of these may not be represented within the National and State park system, or even in the other classes of protected areas in Malaysia. This also holds true for certain plant groups, especially herbaceous plants, whose highly localised distribution may be limited to only one, or a few limestone hills or mountain peaks (Chin, 1977; Kiew, 1991).

Figure 7. National and State parks system level design



On the whole, the layout and configuration of most of the parks optimise the conservation of biodiversity. One shortfall is that not all parks are of the optimum size, and some parks do not protect both banks of major rivers. It was also noted that the final layout and configuration recommended by resource managers and conservation planners are subject to approval by State authorities, who may have other priorities.

3.6.2 National and State park system policies

There was a general consensus that the country on the whole still lacks a clear protected area policy that articulates a vision, goals and objectives for the protected area system (see Figure 8). The National Policy on Biological Diversity (MoSTE, 1998) does, however, state in its action plan the need to expand the network of *in situ* conservation areas to ensure full representation of ecosystems and all ecological processes therein. The Federal and State governments have shown some commitment to protecting a viable and representative protected area network but a more coordinated approach is needed, bearing in mind that the interests of the States should also be safeguarded.

The Forest Research Institute of Malaysia (FRIM) has recently been tasked by the Federal Government to compile an inventory of biological diversity in the country. There is a clearing-house mechanism for such information generated from research activities but it is not updated frequently and is very much under-utilised. However, FRIM's scope of work currently does not include compiling a database on protected areas in Malaysia.

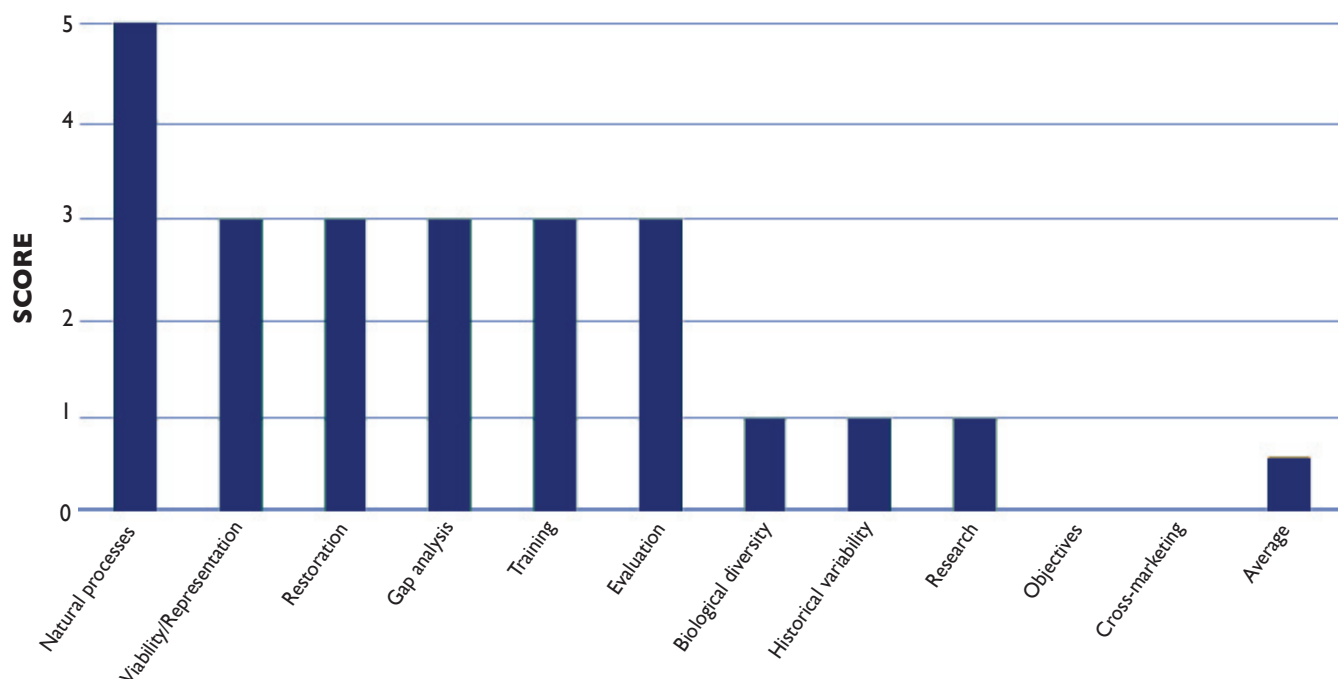
Gap analyses and management evaluations for certain parks are conducted periodically by the individual park management authority but such analyses are not being conducted regularly at the system level. One example of

such an evaluation was conducted under the “Capacity building and strengthening of the protected areas system in Peninsular Malaysia” project which was a collaborative effort between DWNP, the Economic Planning Unit of the Prime Minister’s Department and the Danish Cooperation for Environment and Development (DWNP-DANCED, 1996).

In general, the training and capacity building programme for park staff is somewhat effective but there is room for improvement.

One weakness identified is the lack of a conscious and concerted effort to cross-market the National and State parks for tourism purposes, especially between the different States.

Figure 8. Protected area policies



3.6.3 Policy environment

There was a consensus that the policy environment on the whole in Malaysia is conducive for the effective management of National and State parks (Figure 9). National and State laws relating to protected areas do complement park objectives and there is effective enforcement of these laws at all levels. There is a commitment towards the effective administration of the protected area system but more funding is required.

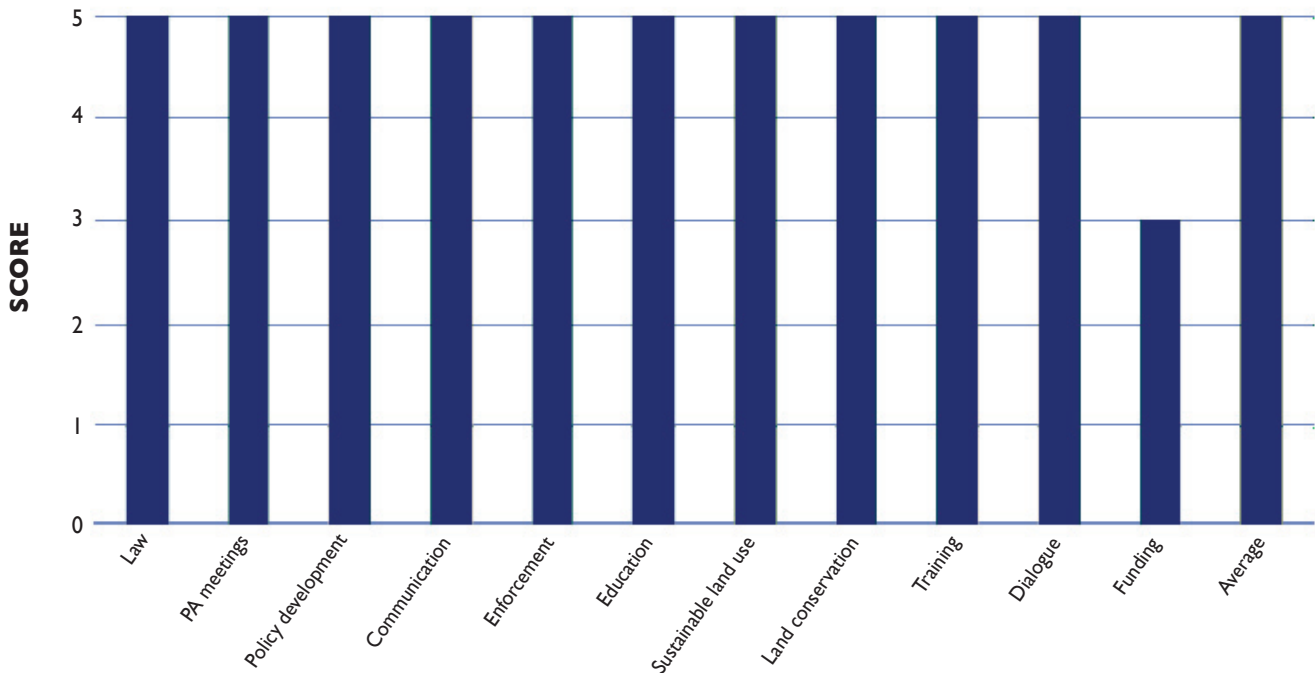
There was a general consensus that environmental protection goals are incorporated into policy development, but these goals may be specific to certain sectors of the government. Communication between natural resource departments and park authorities is perceived to be good.

In general, national policies promote sustainable land management, and an array of land conservation mechanisms is available. However, these policies need to be translated more effectively at the State level.

There was a general consensus that national policies promote environmental education but the implementation can be improved further. Environmental training for government employees is currently focused on agencies dealing directly with environmental management and biodiversity conservation.

Dialogues between the government and social and environmental NGOs are being encouraged under the present administration, and the participation of NGOs in the national planning processes has been increasing.

Figure 9. Policy environment



4. RECOMMENDATIONS

The recommendations that were formulated during the Workshop on the Management Effectiveness of National and State Parks are as follows.

4.1 System-level design

There are many sites of high biodiversity and endemism in Malaysia, and it may not be possible to protect all these areas. Therefore a more systematic approach is needed in order to assign conservation priorities. A starting point could be the National Physical Plan which provides an indication of the spatial requirements for protected areas and environmentally-sensitive areas in Peninsular Malaysia. As recommended by the IUCN, the ecosystem approach should be employed in the design of protected areas. Such an approach would take into account marine and terrestrial ecosystems in a holistic manner.

System-level planning should also take into account the need for landscape linkages between protected areas, which are important for maintaining genetic variability and to serve as corridors for wildlife.

4.2 Boundary demarcation

Park boundaries should be clearly demarcated and this should be a priority during the establishment of a park. There is currently no standard practice nationally and the method differs from one park authority to another. In Sabah, standard boundary markers are used. The Peninsular Malaysia Forestry Department's standard practice is to maintain a 2m-wide clearing along the boundary where betel nut palms (*Areca catechu*) are planted, and to paint red rings around tree trunks to mark the boundary. It is recommended that park boundaries are first surveyed and confirmed by the Land Office before the park is gazetted. It is also recommended that park boundaries be verified every five years.

4.3 Enforcement

Park authorities should have the power to arrest and temporarily detain persons who engage in illegal activities inside the park. It may be necessary for enforcement staff to carry firearms but only if proper training has been conducted. The armed forces and the police may be called upon to help carry out enforcement activities.

Monitoring for enforcement purposes can be carried out at the ground level by conducting patrols along the park's boundaries and access roads. Sub-stations can also be established in order to have a more permanent presence at strategic sites. Local communities can play a role in helping to provide information on encroachment and other forms of disturbances within the park or in surrounding areas. The use of more sophisticated methods for monitoring, such as satellite images and CCTV, should be explored.

4.4 Research and monitoring

Most park authorities acknowledge the need for more ecological and social research, and concede that they do not have the necessary framework and resources to engage in research activities. As such, collaborations need to be established with external research institutions and scientists.

In order to facilitate this, better documentation and communication of the various research needs of the parks to the scientific community is required, as is the streamlining of research application procedures (bearing in mind the Access and Benefit Sharing Bill currently being drafted by the Federal government).

It is recognised that monitoring encompasses monitoring for enforcement purposes and monitoring to ensure the integrity of park's biodiversity. The latter includes monitoring of impacts by visitors on the park's natural resources.

4.5 Community participation

Establishing and maintaining good relationships with local communities is an important factor in reducing pressures and threats from NTFP collection, extraction of timber, hunting, fishing and land-clearing. Greater effort should also be put into involving the local communities in park planning processes and in decisions that affect them. Sarawak's "co-management" concept is a step in this direction and other park authorities should study its implementation.

It is also crucial for park authorities to carry out awareness activities among local communities on the benefits of conserving the park's biodiversity and cultural resources. These outreach activities could be carried out by extension agents rather than park staff, if there are limited human resources.

4.6 Financial stability

The Federal government should be committed to financing parks, as entry fees and other park charges are inadequate to cover the costs of running parks and therefore can only be considered as secondary sources of income. Furthermore, direct revenue to State Governments generated by parks is low. The main beneficiary of the tourism activities generated by parks is the Federal Government, which collects tourism revenues through service charges and taxes.

Parks are unlikely to become operationally self-sustaining. Therefore, the Federal Government should also contribute funds for operations, including maintenance of facilities, based on defined criteria. In order to facilitate this, park authorities should collectively design a standardised reporting format for monitoring financial performance. This reporting format should track capital and operational expenditure against revenue. Studies are needed to determine the 'ideal' budget for an 'ideal' park. This is to allow for the identification of gaps in the present financial accounting systems as well as to set performance standards.

It is recommended that the Federal Government provide seed funds for newly-gazetted parks for purposes such as the preparation of a management plan.

More Government-to-Government collaborations and international development funds should be sought for projects in parks. Assistance from relevant Federal agencies such as NRE and the Economic Planning Unit (EPU) can be sought in the preparation of funding proposals and in securing the funds.

User fees should be restructured to reflect market demands and biodiversity values of the parks. Higher visitor charges could be justified as a form of control to ensure that the carrying capacity of the park is not exceeded. Voluntary monetary contributions by park visitors for conservation purposes should also be introduced within the tourism industry.

Conservation trust funds specific to a particular park or State should be created so that such funds could be used in a more focused manner. This in contrast with revenue from park entry fees which in most cases are handed over to the State Government for general use at its discretion, and may not necessarily be channelled back to the park. Examples of conservation trust funds in existence in Malaysia are the Terengganu Turtle Sanctuary Trust Fund and the Marine Parks Trust Fund.

Many parks are facing revenue loss in entertaining requests for fee waiver or discounts from government agencies conducting official visits as well as civil servants on private visits. In the case of official visits, the costs are usually budgeted for and, as such, the government agencies involved should be expected to pay the normal fees during such visits.

4.7 Marketing

In general, National and State parks in Peninsular Malaysia are still not well-marketed and a more concerted effort should be undertaken to remedy this situation. In this regard, tourism promotional boards and the respective State Tourism Action Councils can play a bigger role. Park authorities should also explore the possibility of having their own marketing arm.

There should also be better coordination among all the tourism agencies and park authorities. Cross-marketing and joint packaging should be implemented among park authorities, as currently no such activities are on-going.

A web-portal can be an effective way of disseminating information on different parks to the general public. Currently, most park management authorities already have their own individual websites.

4.8 Services

There should be better public transportation and transport infrastructure to parks as the lack of this can be a serious obstacle in drawing visitors to the parks. This is especially important considering that a significant number of visitors to parks are independent travellers rather than those on package tours.

Solid waste management should be improved in parks. Park authorities should bear the costs of waste management and should avoid disposing waste in unauthorised dumpsites.

4.9 Capacity building

In view of the increasing number of parks, the Federal government should create more posts for the planning, coordination and management of protected areas. At the ministerial level, a dedicated team is needed for the coordination of protected areas. Park staff should also be given the appropriate training in order to enhance their skill level. A training needs analysis could be undertaken by the parks to achieve this. Staff exchange between parks may also provide staff with more experience.

4.10 Coordination

There is still much room for improvement where the coordination between park authorities is concerned. It is recommended that a meeting of park authorities be held on an annual basis to allow for exchange of ideas and information. The Ministry of Natural Resources and the Environment was identified during the assessment as the lead agency for the coordination of National and State Parks in Malaysia.

5. FOLLOW-UP ACTIONS

The findings from this assessment have generated a considerable amount of interest among park authorities and stakeholders and some concrete follow-up actions are being drawn up.

Immediate follow-up actions include:

- Establishment of an internet discussion group for park authorities and relevant stakeholders. This will allow for the exchange of information and coordination of activities among the different park authorities.
- Publication of a quarterly or half-yearly newsletter focusing on National and State parks in Malaysia. This newsletter could be distributed to all the parks in Malaysia and relevant agencies targeting park visitors as well as park authorities, policy makers, park planners, the research community and other stakeholders. The Ministry of Natural Resources and the Environment has agreed in principle to play a lead role with WWF-Malaysia providing technical support.
- An annual seminar on protected areas, with a different theme each year. By doing so, issues pertinent to park management can be discussed in greater detail and best management practices can be highlighted.

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