

**EVALUATION OF WILDLIFE AS A NATURE  
TOURISM PRODUCT FOR CONSERVATION IN  
BUNDU TUHAN, SABAH**

**NORASMIL BIN ISMAIL**



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THE DEGREE OF MASTERS OF SCIENCE**

**INSTITUTE FOR TROPICAL BIOLOGY AND  
CONSERVATION**

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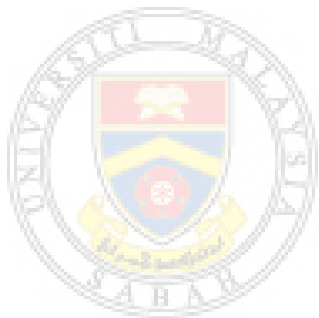
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Norasmil Bin Ismail  
PP20098237



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## CERTIFICATION

NAME : **NORASMIL BIN ISMAIL**  
MATRIC NO. : **PP20098237**  
TITLE : **EVALUATION OF WILDLIFE AS A NATURE TOURISM  
PRODUCT FOR CENSERVATION IN BUNDU TUHAN,  
SABAH**  
DEGREE : **MASTER OF SCIENCE (NATURE TOURISM)**  
VIVA DATE : **11 OCTOBER 2013**

### DECLARED BY

**1. SUPERVISOR**

Mr. Kueh Boon Hee

Signature



**2. CO-SUPERVISOR**

Assoc. Prof. Dr. Henry Bernard

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Norasmil Bin Ismail  
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## ABSTRACT

Nature tourism has been regarded as one of the most ideal conservation strategies under the contemporary context. Nature tourism proffers the application of biological diversity as a natural resource to enhance environmental awareness among nature tourists worldwide and the local community, as well as to generate revenue to propel even more fervent nature conservation efforts, all towards sustainable development. Nature tourism, especially based on wildlife (vertebrates) directly focuses conservation strategy onto highly sensitive and yet interesting organism groups. For this study, the potential of wildlife as a nature tourism product was measured through seven criteria: endemism, rarity, reliability of sightings, morphological attractiveness, behavioral enticement, safety, and linkage to local cultures. The research methods were divisible into three components: wildlife survey (direct and secondary inventory-based studies), human component survey (questionnaire survey, semi-structured interviews, and forum), and statistical analysis (one-way ANOVA) to determine the potential of wildlife as a nature tourism product for conservation in Bundu Tuhan, Sabah. Educational component was given emphasis in the study where forum with the local community for knowledge dissemination were conducted to prepare the local community for long-term self-regulated nature conservation in the area. Sampling periods for the research took place in July 2010 – May 2011. Collectively, 80 individuals of fishes from six species and two families, 657 individuals of amphibians from 37 species and six families, 41 individuals of reptiles from 19 species and seven families, 140 individuals of birds from 38 species and 23 families (observed only), and 155 individuals of mammals from 17 species and five families were recorded in Bundu Tuhan. The Shannon-Wiener index,  $H'$  of fishes' diversity in Bundu Tuhan was 0.9563, amphibians was 2.8928, reptiles was 2.2428, birds was 2.9843, and mammals was 1.6645. Degree of endemism (endemic to Sabah and Borneo) of fishes was 66.7%, amphibians was 73.0%, reptiles was 68.4%, birds was 5.3% (endemic to Borneo only), and mammals was 35.3%. Results from questionnaire survey among tourists (101 respondents), tourist guides (94 respondents), and local people (108 respondents) showed deep interest towards wildlife tourism, and firm belief that wildlife tourism could contribute to conservation. Semi-structured interviews with three respondents (local people) documented specific information about wildlife which was related to their cultures. Wildlife tourism has indeed fulfilled all the seven criteria evaluated and can be highlighted as a new nature tourism product in Sabah.

Keywords: Nature tourism, wildlife, vertebrates, conservation, Bundu Tuhan, Sabah

## **ABSTRAK**

### **PENILAIAN HIDUPAN LIAR SEBAGAI PRODUK PELANCONGAN ALAM SEMULAJADI UNTUK PEMULIHARAAN DI BUNDU TUHAN, SABAH**

*Pelancongan alam semulajadi telah dianggap sebagai salah satu daripada strategi pemuliharaan yang paling ideal dalam konteks kontemporari. Pelancongan alam semulajadi menggunakan kepelbagaian biologi sebagai sumber alam semulajadi untuk meningkatkan kesedaran alam sekitar di kalangan pelancong dari seluruh dunia dan masyarakat tempatan, serta untuk menjana pendapatan untuk menggerakkan lebih banyak usaha pemuliharaan alam semulajadi ke arah pembangunan mampan. Pelancongan alam semulajadi, terutamanya yang berdasarkan hidupan liar (vertebrata) terus memberi tumpuan kepada strategi pemuliharaan atas kumpulan-kumpulan organisma yang sensitif tetapi menarik. Bagi tujuan kajian ini, potensi hidupan liar sebagai produk pelancongan alam semula jadi telah diukur melalui tujuh kriteria: keendemikan, kelangkaan, kebolehnampakan, daya tarikan morfologi, keunikan perlakuan, keselamatan, dan pertalian dengan budaya tempatan. Kajian ini dibahagikan kepada tiga komponen: kajian hidupan liar (secara terus dan data kedua), komponen kemanusiaan (tinjauan borang kaji selidik, temu ramah separa berstruktur dan forum), dan analisis statistik (one-way ANOVA) untuk menentukan potensi hidupan liar sebagai produk pelancongan alam semula jadi untuk pemuliharaan di Bundu Tuhan, Sabah. Komponen pendidikan telah diberi penekanan dalam kajian forum dengan masyarakat tempatan bagi menyebarkan pengetahuan untuk membolehkan masyarakat setempat menjalankan aktiviti pemuliharaan alam semulajadi jangka panjang di kawasan itu. Tempoh persampelan dijalankan pada bulan Julai 2010 – Mei 2011. Secara keseluruhan, 80 individu ikan daripada enam spesies dan dua famili, 657 individu anuran daripada 37 spesies dan enam famili, 41 individu reptilia daripada 19 spesies dan tujuh famili, 140 individu burung daripada 38 spesies dan 23 famili (diperhatikan saja), dan 155 individu mamalia daripada 17 spesies dan lima famili telah direkodkan di Bundu Tuhan. Indeks Shannon-Wiener untuk kepelbagaian ikan di Bundu Tuhan adalah 0.9563, anuran adalah 2.8928, reptilia adalah 2.2428, burung adalah 2.9843, dan mamalia adalah 1.6645. Darjah keendemikan (endemik kepada Sabah dan Borneo) untuk ikan 66.7%, anuran 73.0%, reptilia 68.4%, burung 5.3% (endemik kepada Borneo sahaja), dan mamalia 35.3%. Keputusan daripada tinjauan borang kaji selidik untuk para pelancong (101 responden), pemandu pelancong (94 responden), dan masyarakat setempat (108 responden) menunjukkan minat yang mendalam terhadap pelancongan hidupan liar dan kepercayaan kukuh bahawa pelancongan hidupan liar boleh menyumbang kepada pemuliharaan. Temu ramah separa berstruktur bersama tiga orang responden daripada penduduk tempatan untuk memperoleh maklumat spesifik mengenai hidupan liar dalam tradisi tempatan. Pelancongan hidupan liar sememangnya memenuhi kesemua tujuh kriteria yang telah dinilai dan boleh diketengahkan sebagai produk baru pelancongan alam semulajadi di Sabah.*

*Kata kunci : Pelancongan hidupan liar, hidupan liar, vertebrata, pemuliharaan, Bundu Tuhan, Sabah*

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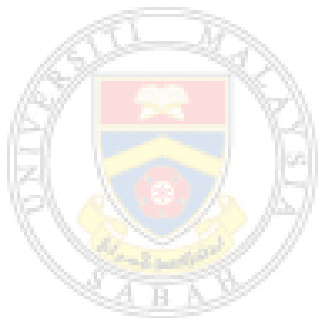
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## LIST OF ABBREVIATION

<b>AF</b>	Anal fin
<b>Alt</b>	Altitude
<b>ANOVA</b>	Analysis of Variance
<b>CE</b>	Critically Endangered
<b>CF</b>	Caudal fin
<b>CRNP</b>	Crocker Range National Park
<b>DF</b>	Dorsal fin
<b>DVFC</b>	Danum Valley Field Centre
<b>E</b>	east
<b>EN</b>	Endangered
<b>GDP</b>	Gross Domestic Product
<b>GPS</b>	Global Positioning System
<b>HB</b>	Head to body length
<b>HF</b>	Hind foot length
<b>HRC</b>	Haleluyah Retreat Centre
<b>IUCN</b>	International Union for Conservation of Nature
<b>LC</b>	Least concern
<b>MITI</b>	Ministry of Trade and Industry
<b>MTPB</b>	Malaysia Tourism Promotion Board
<b>N</b>	North
<b>NE</b>	Not evaluated
<b>NT</b>	Near threatened
<b>PF</b>	Pectoral fin
<b>RH</b>	Relative humidity
<b>SARS</b>	Severe Acute Respiratory Syndrome
<b>STMP</b>	Sabah Tourism Master Plan

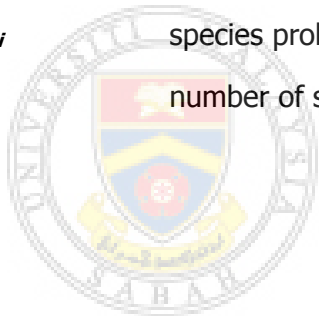
<b>SVL</b>	Snout-vent length
<b>T</b>	Temperature
<b>TDC</b>	Tourism Development Corporation
<b>TIES</b>	The International Ecotourism Society
<b>TL</b>	Tail length
<b>TWR</b>	Tabin Wildlife Reserve
<b>UNEP</b>	United Nations Environment Programme
<b>UNESCO</b>	United Nations Educational, Scientific and Cultural Organization
<b>UNTWO</b>	United Nations World Tourism Organization
<b>VF</b>	Ventral fin
<b>VU</b>	Vulnerable
<b>WT</b>	Water temperature



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## LIST OF SYMBOL

<b>%</b>	Per cent
<b>°</b>	degree
<b>'</b>	minute
<b>cm</b>	centimetre
<b>Log<sub>e</sub></b>	logarithm for $P_i$
<b>mm</b>	millimetre
<b>m</b>	metre
<b>g</b>	gram
<b>H'</b>	diversity value
<b>RM</b>	Ringgit Malaysia
<b><math>P_i</math></b>	species probability value
<b>S</b>	number of species in community



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(Maryati *et al.*, 2000) and at the same time, supports nature conservation to sustain the activity.



**Figure 1.1: International Tourist Arrivals.**

Source: World Tourism Organization (UNWTO) (2012)

In Malaysia, the Tourism Development Corporation (TDC) was established on 10<sup>th</sup> August 1972 under the Ministry of Trade and Industry (MITI), which was responsible to coordinate, development, and promote domestic and international tourism (Mohammad *et al.*, 2009; Tourism Malaysia, 2012). With the inception of the Ministry of Culture, Art and Tourism on 20<sup>th</sup> May 1987, TDC was transformed and became the Malaysia Tourism Promotion Board (MTPB) or also known as Tourism Malaysia, through the Malaysia Tourism Promotion Board Act 1992 (Fifty, 2008; Tourism Malaysia, 2012). Tourism Malaysia aims to contribute to the economic development through tourism, as well as provide increased employment opportunities (Tourism Malaysia, 2012).

According to Tourism Malaysia (2012), tourist arrivals in Malaysia increased from 10.2 million in 2000 to 24.7 million in 2011. Tourism industry contributes to socio-economic development, and shows an upward trend except for 1997 due to the global financial crisis, and for 2003 caused by the outbreak of the Severe Acute

Respiratory Syndrome (SARS) disease and the US – Iraq war (Page and Connell, 2004; Cooper *et al.*, 2008; Mohammad *et al.*, 2009; Karen, 2012). The total revenue received increased from RM 17.3 billion (2000) to RM 58.3 billion (2011). According to the Sabah Tourism Board (2012), tourist arrivals increased from 423,000 (2000) to 1.1 million in 2002. In 2010, tourist arrivals increased to 2.2 million. Tourism earnings have increased to RM38.2 billion in 2006, responsible for 6.7% of Malaysia's nominal Gross Domestic Product (GDP). In 2007/2008, gross tourism industry contribution to GDP has increased from 5.6% to 7.4%, and this industry plays a pivotal role in increasing the living standard of the low-income groups (Mohammad *et al.*, 2009). Several studies indicated that there is an increasing demand for nature-based tourism (Fifty, 2008). Nature tourism therefore, comes to signify an attractive investment proposition for the government. It becomes the duty of the government to utilise tourism's potential for economic development (Fifty, 2008; Mohammad *et al.*, 2009).

Nature tourism in Malaysia and Sabah commenced in early 1980s (Hjulmand *et al.*, 2003; Fifty, 2008; Mohammad *et al.*, 2009; Tourism Malaysia, 2012). Sabah as one of the world's 12-mega biodiversity hotspots with fascinating natural geographic features with diverse flora and fauna (Fifty, 2008) can provide diversification of nature tourism products. Besides that, the equally diverse cultures of the local communities (richness of the indigenous people), freedom from natural catastrophes, support from the government and the private sector (Chew, 1994; Honey and Stewart, 2002b; Butler and Waldbrook, 2003), and freedom from political instability (Kueh, 2006) are also the main factors making nature tourism successful in Sabah.

Nature tourism and conservation have developed close connectivity to one another (Mohammad *et al.*, 2009; 2011), and conservation has become one of the factors that is responsible for the development of nature tourism (Dabrowski, 1994). Conservation of biodiversity must be incorporated into nature tourism development policies and strategies to bring benefits to society, especially the local community (Djoghlaif, 2010). Nature tourism has an important role in conservation,

and provides an impetus for the conservation of natural resources. Besides, nature tourism can also provide for both conservation and economic development in that area. The protection of prime tourism natural resources enhances and perpetuates tourism (Fletcher, 2009). The United Nations Environment Programme (UNEP) believes that nature tourism brings benefits to conservation. UNEP states nature tourism as a tool for conservation and hence, can advance the three basic goals of the Convention on Biological Diversity: (1) To conserve the biological (and cultural) diversity; (2) To promote sustainable use of biodiversity, and (3) To share the benefits with local community (Fletcher, 2009; United Nations Environment Programme, 2012).

Wildlife tourism is synonymous with nature tourism as other nature-based tourism such as ecotourism (Teh and Cabanban, 2007; Ballantyne *et al.*, 2009), rural tourism, conservation tourism, soft tourism, appropriate tourism, sustainable tourism, green tourism, ethical tourism, and conservation tourism (Dawson, 2001). Wildlife tourism gives an opportunity to people to see, admire and learn about wildlife in general (Orams, 2002). Wildlife tourism can be broadly viewed as any tourism activity that has wildlife as its primary interest and focus of attraction. Activities can either be consumptive (hunting and fishing) or non-consumptive (wildlife watching), and in which visitors can interact closely with animals or merely admire from a distance (Ballantyne *et al.*, 2009; 2011a; Catlin *et al.*, 2011; Higham and Shelton, 2011).

Besides, wildlife tourism also can be defined as a tourism genre based on encounters with non-domesticated animals in either the animals' natural environment or in captivity (Ballantyne *et al.*, 2011b). Wildlife tourism has the potential to make a very significant contribution to the conservation of biodiversity, especially of endangered species (Ballantyne *et al.*, 2009; 2011b; Maréchal *et al.*, 2011). For this research, the definition of wildlife tourism adopted was as follows, *"responsible travel with the objectives to see, admire, enjoy and learn about wildlife, without causing serious disturbances and destruction, for conservation and to improve the well-being of the local community. Besides, wildlife tourism also*

*emphasizes on the linkages to the local people (past or at present) found in that area .”*

Bundu Tuhan is located in Ranau District, West Coast Division, Sabah. The area consists of forested areas and areas adjacent to human settlement. Low temperature and high relative humidity, and breathtaking view are characteristic of the area. Bundu Tuhan community was mainly involved in agriculture, and planting vegetables was their main activity. Local people in Bundu Tuhan still live in a traditional way.

## **1.2 Research Statement**

Bundu Tuhan, Ranau was chosen as the research site because the area has been proposed to be a tourism spot by the local community. In addition, the Village Development, Welfare and Safety Committee (JKKK) of Bundu Tuhan strongly supports and encourages the development of nature tourism in Bundu Tuhan.

Besides, there was yet any tourism research conducted at the area. This study on wildlife as a nature tourism product for conservation in Bundu Tuhan, Sabah was the first to be done there.

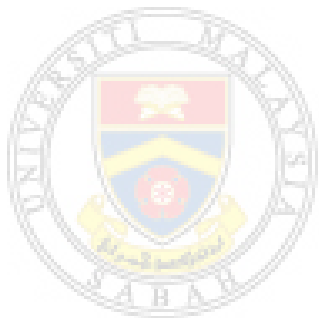
## **1.3 Justification and Aim**

This study aimed to prospect and develop wildlife as a product for nature tourism for nature conservation at Bundu Tuhan, Sabah. From this study, it was expected that nature tourism based on wildlife can be implemented at Bundu Tuhan, for both nature conservation and local community well-being enhancement towards sustainable development. The eventual implementation of the product would spearhead nature conservation using wildlife as a flagship organism group, with communal participation. Hence, nature conservation at Bundu Tuhan could address the *in-situ* conservation of both the species and habitats. The study also involved knowledge and skill dissemination to the local community on the implementation of nature tourism based on wildlife. Besides, this study also aimed to create awareness among tourists (domestic and international) on the importance of wildlife and also nature conservation.

#### **1.4 Objective**

The objectives of the study were:

- i. To determine the potential of wildlife as a nature tourism product for conservation in Bundu Tuhan, Sabah,
- ii. To determine potential wildlife species to be highlighted as products for wildlife tourism in Bundu Tuhan, Sabah,
- iii. To disseminate knowledge and skills pertaining to wildlife tourism to the local community in Bundu Tuhan, Sabah.



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## CHAPTER 1

### INTRODUCTION

#### 1.1 Background

Tourism has grown rapidly since 1945 and become the world's foremost economic phenomenon. Within the tourism industry worldwide, ecotourism is one of the fastest growing sectors. UNWTO has recently estimated that ecotourism is worth about US\$20 billion a year, and together with nature-based tourism, accounts for 20% of global international travel (Fifty, 2008). According to UNWTO, international tourist arrivals increased from approximately 25 million in 1950 to 165 million in 1970. In 1980, the number increased to 286 million, which was a 73.33% increase. The number continued to grow in 1990 to a total of 459 million international arrivals. There were more than 625 million international tourist arrivals in 1999 as reported by UNWTO (Figure 1.1). In 2000, a total of 674 million international tourist arrivals were recorded, and grew up by 39.32% to 939 million tourists in 2010. International tourist arrivals grew up by 4% in 2011 to 980 million (UNWTO, 2012). UNWTO estimated that 7% of the tourism that contributed to the global international tourist arrivals is nature-based tourism (Deng *et al.*, 2002).

Nature tourism is defined as the responsible travel with the objectives to see, admire, enjoy and learn about the environment, including flora and fauna, without causing serious disturbances and destruction, for conservation and to improve the well-being of the local community (Lindberg *et al.*, 1998; Weaver, 1998; Maryati *et al.*, 2000; Dawson, 2001; Diamantis and Westlake, 2001; Deng *et al.*, 2002; Honey and Stewart, 2002a; Kueh, 2005; Mehmetoglu, 2007). Besides, nature tourism also emphasizes on the linkages to the local people (past or at present) found in that area (Kueh, 2005). Nature tourism generates revenue

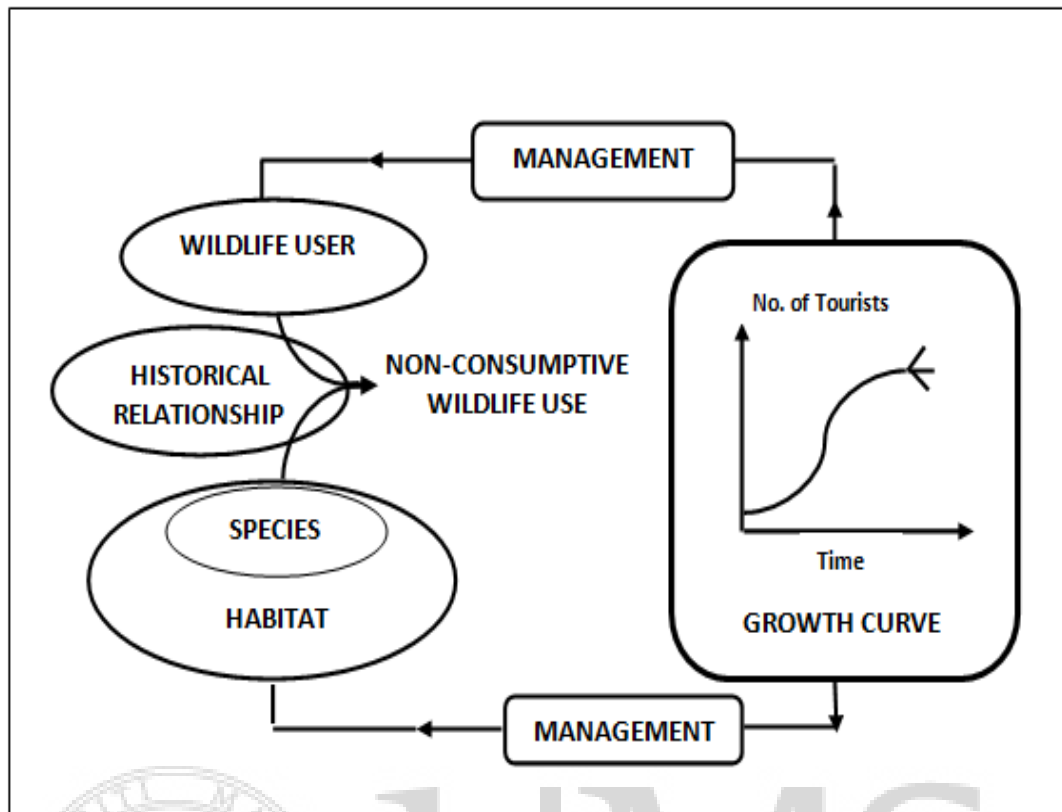
natural areas for the understanding and appreciation of the environment in a way that sustains the resources, culture, economy and local community well-being (Noraini, 2005; Theobald, 2005; Holden, 2008; Richardson and Fluker, 2008; King and Nair, 2013).

Ecotourism was also been defined as responsible travel to natural areas, which conserves the environment and improves the welfare of the local people (Honey, 1999; Honey and Stewart, 2002a). Franklin (2003), Hall (2003), Goeldner and Ritchie (2009) and Mason (2008) defined ecotourism (meaning ecological tourism) as responsible travel in which the visitor is aware of and takes into account the effects of his or her actions on both the host culture and the environment. Besides, The International Ecotourism Society (TIES) defines ecotourism as "responsible travel to natural areas that conserves the environment and improves the wellbeing of the local people".

According to Fletcher (2009) and Wearing and Neil (2009), ecotourism is a broad term that has been defined as "environmentally responsible travel and visitation to relatively undisturbed natural areas, in order to enjoy and appreciate nature and provides for beneficially active socio-economic involvement of local populations". Ecotourism has the potential for the enhancement of an understanding of environmental values, support of local communities' economies, and appreciate the senses of cultures (Wearing and Neil, 2009; King and Nair, 2013). Three goals of ecotourism are to bring benefits to local communities, protect the natural and cultural heritage, as well as promote adherence to ethical standards by tourists and operators (Dawson, 2001; King and Nair, 2013).

## **2.2 Wildlife Tourism Framework and Impact**

Figure 2.1 shows the dynamic relationships which are present in a wildlife tourism system. There are three main components in a wildlife tourism framework; (1) historical relationship, (2) wildlife, and (3) people (Rodger *et al.*, 2009; Catlin *et al.*, 2011; Higham and Shelton, 2011).



**Figure 2.1: Wildlife Tourism Framework.**

Source: Catlin *et al.* (2011)

Popularity of a species for tourism purposes is largely dictated by the historical relationship between human and that particular species. Tourists are drawn to species that are rare or uncommon with negative anthropogenic pressure. In addition, cultural perceptions also govern the degree to which species they will hold in high degree. The second component of the framework concerns about the wildlife itself. Typically, wildlife tourism relies on the regular appearance of the target species over a relatively small area. The last component of the frame is about the people seeking non-consumptive encounters with the wildlife for pleasure purposes. Combination of the personality, motivation and socio-economic enable and drive individuals to seek wildlife encounters (Catlin *et al.*, 2011). The interaction between ecology and wildlife raises two important points; (1) Behavior of wild animals over time and (2) Animal responses to external stimuli (Rodger *et al.*, 2009; Semeniuk *et al.*, 2010; Higham and Shelton, 2011). Besides, wildlife tolerances of human stimuli arise from various factors;