The Planning of Ecotourism Opportunities Spectrum of Elephant Related Ecotourism Activities on Sumatran Elephant Home Range in Bukit Barisan Selatan National Park Province Lampung Indonesia

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Abstract

Wildlife ecotourism has economical benefits and become important to be used as a strategy in conserving wildlife. One of the interesting animals that can be utilized as tourism object in Indonesia is wild elephant (*Elephas maximus sumatranus)* in National Park of Bukit Barisan Selatan (NPBBS). In fact, wild elephant is difficult to find, but the satisfaction level of wildlife ecotourism merely can be gained when the tourists successfully encounter the wild animals. Therefore, a design of Elephant Ecotourism Opportunities Spectrum (EEOS) in NPBSS is important to be made. The *ecotourism scientific planning approach* (Avenzora, 2008) has been used to identify the EEOS of the elephants population in Pemerihan and Way Haru Resorts. The *GPS-collar technology* used to detect the elephant moving pattern and home-range; as well as the Landsat Imagery TM-7 with Erdas Imagine was used to analyze the habitat characteristics.

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The design of EEOS was developed by mapping observed potentials into human-attracted points (Avenzora, 2013). The results of this study show that the total area of elephant home range is 15,301.20 Ha, which is equal to 32-folds of Camp Elephant Patrol (CEP) area that has been used as single focal point of elephant ecotourism for the last 6 years. Furthermore, a habitat-characters-based-EEOS design can improve the varieties of elephant tourism activities. Its quantity an quality are increasing into 30 varieties, which can be distributed in the home range for the whole year and improve the benefits of wild elephant ecotourism activities.

Keywords: Sumatran Elephant; NPBBS; Ecotourism Scientific Planning.

1. Introduction

Beside economical benefits, the growth of wildlife ecotourism is also important to be seen as an important strategy to conserve the animal and its habitat. The wildlife ecotourism activities are very potentials to shift the recently *cost center wildlife management* to become a *benefit center wildlife management*.

According to [26], the number of tourists in the worlds reach 637-956 million people in 2000. The Author in [13] state that the high number of tourists can be considered as the biggest industry in the world. Specifically, until 1999 tourism has built 55 million jobs and contributed US $ 3.5 billion income per year.

In relation to ecotourism and wildlife tour, The Author in [10] estimates that there are 30 million trips in the worlds. The Author in [5] states that the global market of wildlife tour is about 12 million trips per year, which increases 10% every year; for instance, the wildlife tourism activities become important in Canada, Congo, Costa Rica, New Zealand, India, and elephant in Thailand, Indonesia, Malaysia, and Maldives. The Author in [8] reports that the tourists who enjoy seeing whale are about 9 million people (financial contribution US $ 1.049 million), tourists who enjoy under sea beauty are about 2 million people (financial contribution US $ 150 million), and tourists who enjoy zoo visit are 600 million people. It is also reported that in Australia there were 68% of tourists who interacted with wild animals.

In the context of wildlife conservation importance, the successfull wildlife tourism in the world is proved in several cases stated by [4]. They state that the developement of ecotourism in National Park of Yala Srilanka has increased farmers' income and replaced the loss of plants caused by elephant. The Author in [6] affirm that the success of wildlife conservation in Costa Rica is linked to a wildlife tourism that contributes to provide a sustainable income. Then, according to [9], elephant ecotourism in Thailand has become an important tourism industry resource and improved elephant population. As well as [24] states that Rwanda and Uganda have became tourism places where the tourists are charged US $ 120-150 to encounter gorilla.

Since Indonesia has a high number of wildlide potential, which is distributed in all conservation areas, therefore there are a great numbers of ecotourism objects that can be developed. According to [22], the percentage of wildlife speciesin Indonesia includes 515 species of mammal (12%), 781 species of reptile and amphibian (16%) and 1539 species of birds (17%). From those varieties of animals species, one of the important and potential animals that can be developed as wildlife ectourism object is elephant (*Elephas maximus sumatranus*).

The recent figure of elephant population in Indonesia can be based on [21] who state that the population of elephantin Indonesia can be found in Sumatera (*E. maximus sumatranus*) and North Kalimantan (*E. maximus borneensis*). The population of elephant in Sumatera is approximately 2,800-4,800 population that are distributed in 44 population groups in Aceh to Lampung provinces.

One of the elephant population group in Lampung is located in NPBBS. The Author in [7] reports that there are 498 elephants in NPBBS, which are distributed in 8 locations, namely Sekincau, Lemong, Bengkunat, Sumberejo, Tampang Belimbing, Way Nipah, Sukaraja and Pemerihan.

Generally, the utilization of elephant as object of ecotourism can be classified into 3 types, as proposed by [9], namely *semi captive elephant attraction*, *captive elephant attraction*, and *wild elephant attraction*. However, up to now those activity patterns are still limited in numbers and have not been well developed.

In the context of wildlife tourism, the difficulty to meet wild animals are caused by several reasons; since the animals have sensitivity to human presence, the animals move dynamically in the forest, as well as the animals will hide whenever they feel predator threat, and the animals are distributed in different areas in the forest. The elephant is even more difficult to find [15], [11]; since it has a high sensitivity. It attacks whenever near, and it leaves whenever far. Elephants also have seismic sensor on their sole of feet and a sharp voice sensor in their ears. Elephants can easily detect human presence.

Further, elephants move in a wide range of area and over dynamically day and night. If those elephant's behaviors are linked to satisfaction level of tourists, therefore the tourists chances to enconter elephant should be assured and this is important to be investigated.

This study is important to be conducted in order to optimalize wild elephants tourism development in their habitat, for at least in its relation to: (a) the pattern of elephants movements, (b) the types of land covers, and (c) other tourism objects related to elephants ecotourism; which is an elephant ecotourism activities can be understood as all activities related to those aforementioned factors.

The objectives of this study are: a). to describe the pattern of elephants movements, b). to identify habitat condition in elephants home range, and c). to arrange the spectrum of elephant ecotourism activities (that so called by [17] as Recreational Opportunity Spectrum /ROS). According to Parkin, the ROS is a conceptual framework designed to help clarify relationships between recreational settings, activities and experiences.

The planning method in this study used the *ecotourism scientific planning approach* [3]. As an output of this study, a measureable, sytematic and objective spectrum of ecotourism activities is expected to be made; as stated by [3] that a main indicator of an academic (*wissenschaftslich*) ecotourism planning and program have to be measureable, systematic dan objectively can enrich the activities and can improve the visitor satisfaction.

2.   Materials and Methods

2.1. Research Site and Schedule

The research was conducted in Pemerihan and Way Haru Resorts, which are located in National Park of Bukit Barisan Selatan (NPBBS). These two resorts are near Pekon Pemerihan, Sumberejo and Way Haru, Kabupaten Pesisir Barat, Lampung.

The data of elephants movement in 3 years (December 2009 - December 2011, and October 2012 - April 2013) were provided by WWF Lampung. The data include geographic coordinate position, time record-keeping, movement distance, altitude, and temperature. Those data were taken from GPS Collar that was installed into the leader of elephant herds (**Table 1**). Meanwhile the ground survey was done in January to September 2014.

Table 1: Data of elephant attached with GPS Collar.

Description	
Date of installment	December 5, 2009
Name of elephant	Prita (female)
Age (estimated)	25 years
Bust and shoulder	321 cm, 195 cm
Front right arm	120 cm
Body length (tail to the front head)	280 cm
Rear right arm	110 cm
Estimated body weight (based on the bust)	1969 kg
No. ID Microchip	145326553A

2.2. Procedure and Technique

There are three important aspects that become focus of this research, namely: a). pattern of elephant movement, b). types of land covers, and c). tourism objects related to elephant home range. First, the pattern of elephant movement is important to determine elephant existance for tourists and tour route of elephant ecotourism based on the space dimension and time. Second, the types of land covers data are used to develop activities in elephant ecotourism which are made based on the types of land covers. Last, the data in related ecotourism objects are used to complete tourists satisfaction.

The measurement of elephant movement pattern uses MCP (*Minimum Convex Polygon*) and Kernel methods. [19] state that MCP is the most used method in measuring home range. While, *Kernel Home-range Estimator* is used because of its consistency and accuracy; it isthemost widely used method that results an estimation of possible distribution of finding animals in certain location in their home range.

In order to get the pattern of home range and the intensity of elephant movement from time to time, hence in this research the data home range area which provided from aforementioned MCP and Kernel methods were mapped into 1 km^2 grids. After that, the pattern of elephant movements from grid to grid can be gained and be used to design a tour track of elephant ecotourism, which provides higher possibility to encounter elephants in their home range.

Further, collected data of land cover age was checked by ground-survey, which then analyzed by using Erdas Imagine program. The observed characteristics of land coverage are forestry area, agriculture areas, garden, residence or opened area, bushes, river, and sea.

The potential of related ecotourism objects and facilities are investigated by using GPS. Then, the data were overlayed into home range map; in order to see the distribution.

The spectrum of elephant ecotourism activities are drawn into 12 months period. The activities were arranging the themes of ecotourism activities and the managing the branding for the market.

The determination of potential ecotourism activities spectrum was done by mapping and defining kinds of resources in elephant home range into interesing activities and attraction. Those activties were donein order to fulfill human's basic attracted points. [3] states that human attracted points can be simplify divided into: a). *physical realm*, b). *five-senses realm*, c). *thought realm*, d). *soul realm*, and e). *spiritual realm*. Specifically explained that *physical realm*is related to human power aspects in moving. In the context of elephant ecotourism, it is related to walking in the forest, riding elephant, swimming, fishing, etc. Next, the *five-senses realm* (eyes, nose, ear, tounge and skin) is linked to activities that rely on human's senses. The *thought realm*is part of brain activities that receives information for the environment to think about natural phemonon. Afterthat, the *soul realm* involves human's feeling to state their happiness, sadness, anxiety, worry, tense, love, and care about the environment. Last, *spiritual realm*is the capacity and effort of human to find many absolute values created by God in the universe.

3. Results

3.1 The Pattern of Elephant Movements

The implementation of MCP method showed that the total area of elephant home range in Pemerihan-Way Haru Resorts is 15,301.20 ha (**Figure 1**). This total area is similar to the total area of Asian Elephant home range; since the total area of elephant home range in South India is about 10,500 – 32,000 ha (Sukamar: 1989, in Suhartono et.al., 2007: 6). In line with this, IUCN (2012) also reports that the total area of female elephant home range in Sri Lanka is about 3,000 – 16,000 ha.

In **Figure 2** can be seen that the concentration of elephants movement in the border of Pemerihan and Sumberejo villages and forest area is involving 25% of Kernel Intensity; with 703 ha total area. This condition is presumably influenced by loads of fodder availability in agriculture area or garden. Another reason is the Pemerihan River also used by the elephants to drink and wallow. According to [18], the pattern of animal

movement and space usage are determined by the environment (like fodder availability, water, etc.), and also interspecific and intraspecific interactions.
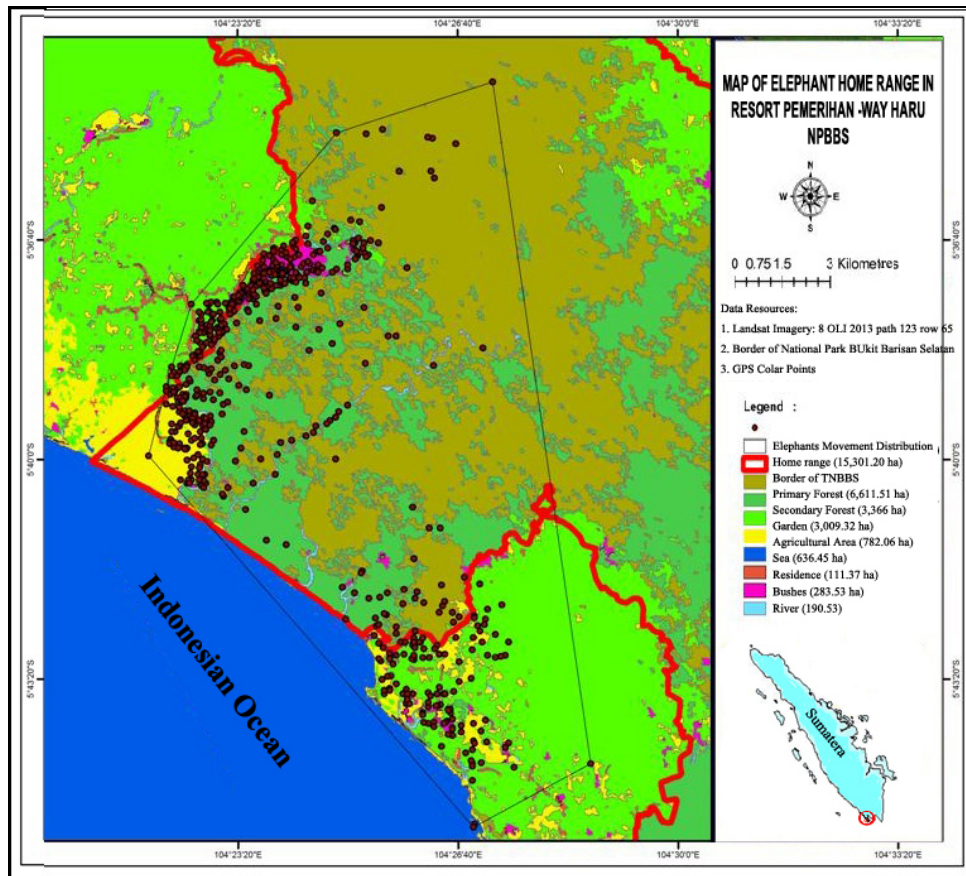

Figure 1: Map of elephant home range in Resort Pemerihan-Way Haru, NPBBS.

The observation showed that elephant herds leave the forest to agriculture area at night, and return to the forest in the morning. They keep doing this moving pattern, specifically they make lines on their way to agriculture area, then spread away when they eat. Bothin Pemerihan and Sumberejo, the elephants like to feed corn (*Zea mays*), rice (*Oryza sativa*), chocolate (*Teobroma cacao)*, and coconut (*Cocos nucifera*).

On the contrary, the total area of African Elephant home range is wider. The Author in [13] state that the total area of elephant home range in Tanzania is about 32,800 – 690,500 ha. The Author in [16] estimates that the difference total area of home range is influenced by the intensity of rainfall. He described that total area of home range is inverse with rainfall intensity; if the intensity of rainfall is low, then the total area of home range is wide, and vice versa. However, a research in Zimbabwe shows that even though the intensity of rainfall is similar, but there is a significant difference between total area of elephant home range in protected areas and people's residence.

Furthermore, the total area of home range is not only influenced by climate and human, but also by elephant's feeding behavior. The Author in [26] report that mammal sexhibit widely diverse movement can sometimes lead them to leave their normal moving area, as response to lack of fodder resources in their home range. This

information shows that extending home range area is temporary, since the elephants will return to their usual track.

In relation to utilizing home range for the activities of elephant ecotourism in NPBBS, the data show that recently there is only a limited part of home range have been used for elephant ecotourism activities. Up to now, the area used for this activity in the NPBBS is only around Camp Elephant Patrol (CEP); which is only around 475 ha. Considering this phenomenon, it can be said that there are a huge potential that can be developed, howeverit is remained unexploited.
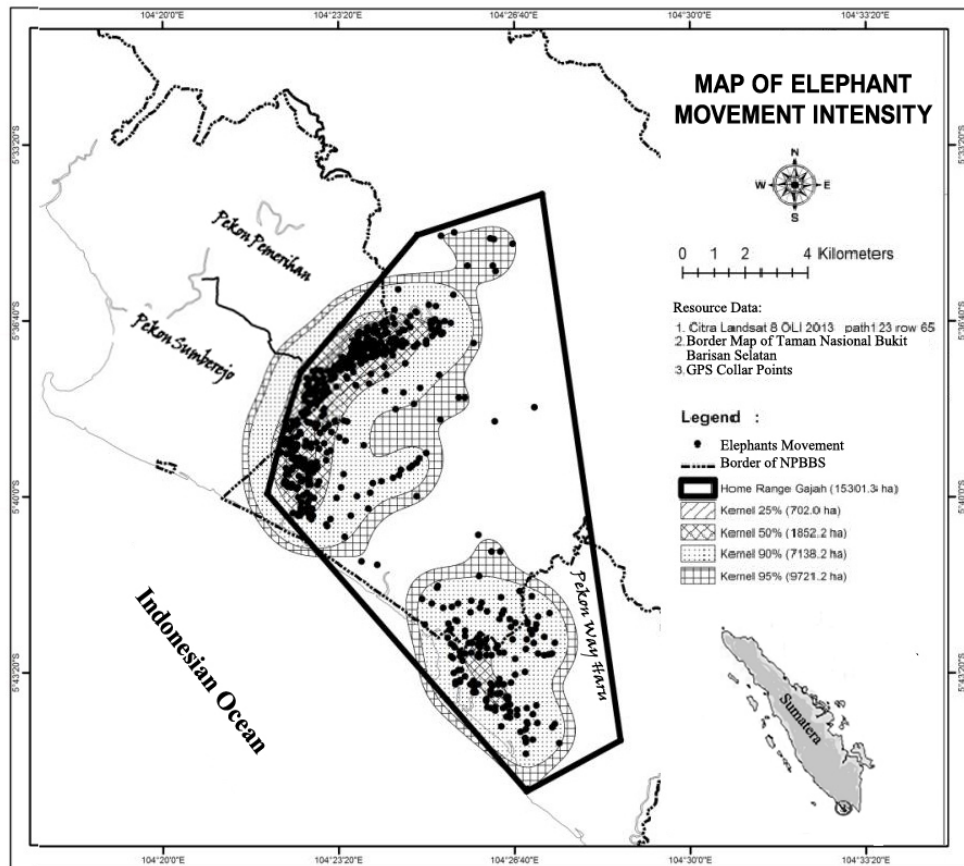

Figure 2: Map of elephants movement intensity based on Kernel Method

From land ownership point of view, the 31% (4,732.31 ha) of elephant homerange lies in human setlemen area, and the rest 69% (10,568.89 ha) is part of the NPBBS forest area. However the data from Kernel Method show that the intensity of elephant existence is concentrated in the border area of human setlemen area and forest areas.

3.2. Daily Movement

The result of data processing from Kernel Method showed a dynamic moving distance of elephant in NPBBS, which forms a symmetric pattern (**Figure 4**). The farthest moving distance is in the morning (at 09.39) that reaches 211 metres, and the nearest distance is in the night (at 23.39) that reaches 56 metres. In the morning,

they perform high movement activities, and in the morning, they perform low movement activities. The mean of moving distance per hour in the afternoon is 153 metres, and 118 metres in the night. In total, their total moving distance in one day is about 3,251 metres or 3.2 Km.

Figure 4 shows that the movement of elephant at the dawn is increasing at 01.39 until 02.40 a.m; in which the moving distance is 178 metres. Then, it is decreasing for 2 hours, and increasing again until 05.41 WIB. As the sun goes up, elephant activitity is decreasing from 05.40 – 08.39a.m. In the morning their movement tends to be high until 11.40 a.m. Then, these movements are decreasing since afternoon until the sunsets.
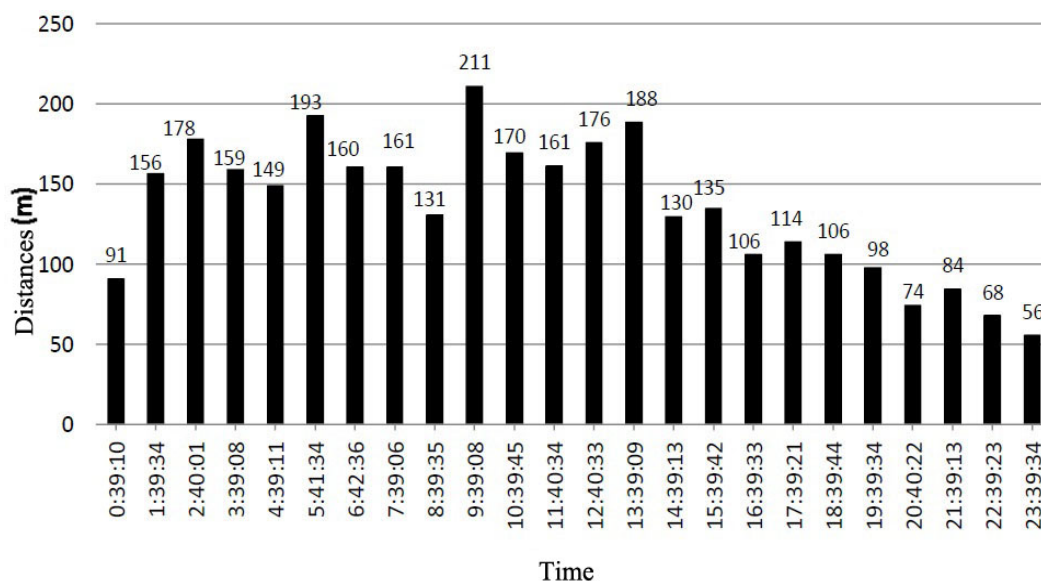

Figure 4: The dynamics of elephants travelled distance per hour for 24 hours

The moving distance of elephant in the night is decreasing until its lowest point at 23.39 p.m. Their rest activity is started from 19.40-23.39 p.m. Their travelled distance during the day and night is significantly different (χ^2calculation $=204 > \chi^2$ table$_{\alpha=0,05, \, df=11}=19$).

The analysis also shows that the intensity of elephant existense is highest in the forest (74.5%), in the garden (15.3%), and agriculture area (4.1%). Whereas, their movement in the night are: a). in the garden (34.8%), b). agriculture area (26.3%), and c). forest (18.3%). All of those data above can be used to design a tourism track, schedule and its recreation activities.

During their moving, the elephants do many activities related to their habitat. The Author in [20] reports that during his research in Bengkulu, in 4,496 hours of observation of 14 elephants, it can be concluded that their daily activities are feeding (82.2 ± 5.0%), moving (9.5 ± 4.0 %), resting (6.6 ± 2.1%) and drinking (1.7 ± 0.6%). Moreover, compared to female elephants, the pattern of male elephant movements is *short-and-short* and do more feeding.

In using technology, the elephant existence and its moving pattern can be investigated using Kernel Method, while in practical field their moving pattern can be recognized from their feces. According to [25], an adult elephant in Sri Lanka, on average, defeacates at least 100 kg of dung per day, or 4 kg dung per hour. In the context of elephant ecotourism, this information is beneficial for the tourists; if they find new feces, it means that their distance with the elephant is 153 metres in the day, and 118 metres in the night.

3.3. *Characteristics of Land Coverage*

The analysis towards Map of Landsat Imagery TM7 (2011) using Erdas Imagine software shows that there are 8 types of land coverage characteristics in elephant home range, namely: a). primary forest (6,611.51 Ha or 43.2%); b). secondary forest (3,663.43 Ha or 24%); c). garden (3,009.32 Ha or 19.7%); d). agriculture area (782.06 ha or 5.1%); e). sea (636.45 Ha or 4.2%); f). bushes (293.53 Ha or 1.9%); g). river (190.53 Ha or 1.2%); and h). human setlemen area (111.37 Ha or 0,7%).

Furthermore, the data of elephant movement pattern analysis result showed that the frequency of elephant visits are: garden (30.86%), forest (29.63%) and agriculture area (21.81%). The detailed data are presented in **Table 2.**

Table 2: The Frequency of Elephant Visits based on Types of Land Coverage in the Home Range.

Types of Land Coverage	Frequency	%
Garden	150	30.86
Forest	144	29.63
Agriculture area	106	21.81
Bushes	70	14.40
River	12	2.47
Sea	2	0.41
Human setlemen area	2	0.41
Total	486	100.00

The utilization of land coverage by elephant becomes an indication that the chances to encounter elephant are in the garden, forest, and agriculture areas. According to [20], the elephants tend to use medium canopy (secondary forest), and opened canopy (opened space) instead of closed canopy (primary forest).

Moreover, The Author in [1] state that elephants choose secondary forest to find food and primary forest to protect themselves, rest and mating. On the other hand, The Author in [12] reports that the elephants in India spend most of their times at mixed forest with 47% of frequency visit, then at agriculture areas (25%), bushes (15%), and meadow (10%).

Based on the slope classification in the home range, the characteristics of elephant habitat are dominated by a

slightly slope area that reaches 9218.98 ha (60.25%), hilly area (316.78 ha or 2%) and steep area (12.99 ha or 0.08%); and they are located in the north side of the home range, whcih are categorized as primary forest (**Figure 5**).
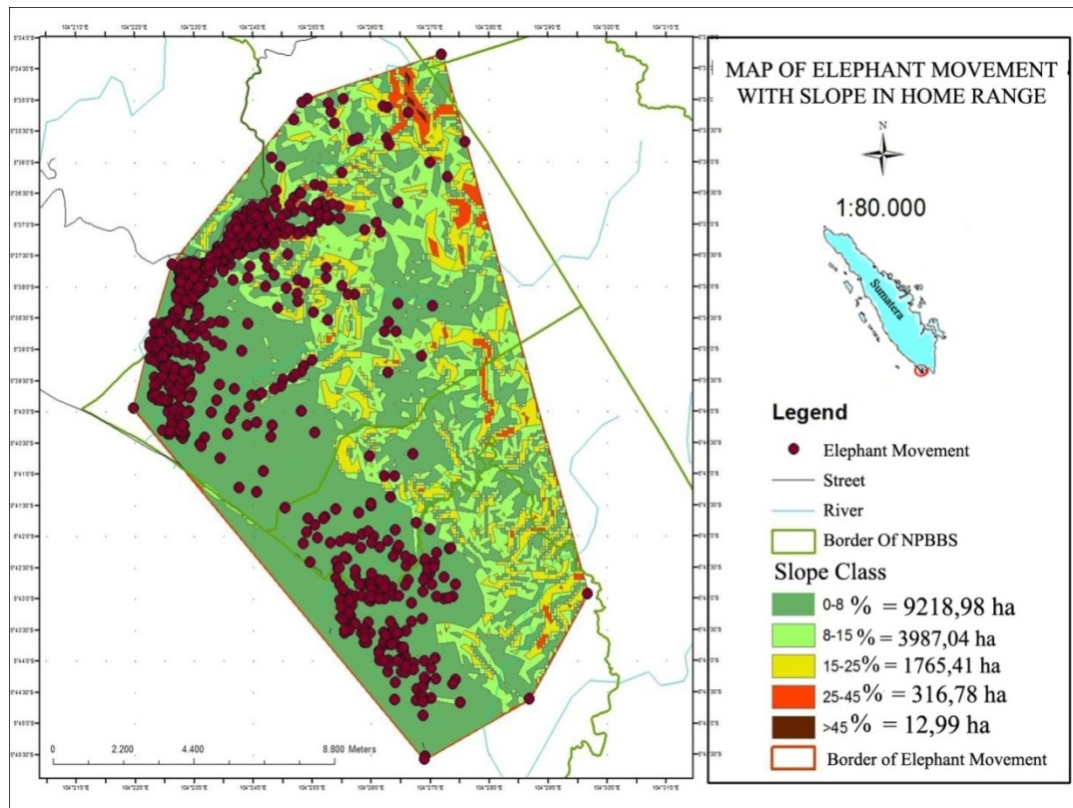

Figure 5: Characteristics of elephants habitat based on the clope classification

These data is veru important to determine suitable design of infrastructure and facilities in the track of elephant ecotourism. Further, the data also important to plan the level of difficulty intensity ofan ecotourism activity that will be offered to the tourists in NPBBS.

The climate condition in elephant home range of NPBBS shows that the monthly rainfall is medium to high. The lowest rainfall is 163 mm in April, and the highest is in October for 642.2 mm in 2010. The mean of monthly rainfall is 335.1 mm. There are no months where the rainfall is below 100 mm during 2010. Referring to the data of elephant moving patterns, it can be concluded that rainfall does not interfere the moving distance of the elephant (**Table 3**). This data is important to be used as consideration in eleminating recreation program threats caused by climate condition.

3.4. The Distribution of Tourism Related Objects in Elephant Home Range

There are at least five tourist attractions associated with elephant ecotourism activities that can be found in elephant home range area in the National Park of Bukit Barisan Selatan (NPBBS), such as: caves, waterfalls, ivory coast, new trees plantation, and other wildlife animals scattered around the elephant home range. There are no less than five caves with different cave comparment characteristic and branched tunnels. Moreover, there is

waterfall with its large and deep pond, and also the Ivory Coast with its clean ivory sands.

The other wildlife animals that can be found in elephant home range are tigers, gibbons, and pheasants. Tigers can be detected by its foot prints on the trail or on the edge of the river. As for gibbons, they will be known from their responsive voicein the morning or when it rains in primary forest, so will the pheasants with its distinctive voice like the sound of people laughing.

Table 3: Monthly rainfall and mean of travelled distances of elephant in Pemerihan-Way Haru Resorts, NPBBS (WCS, 2010)

Month	RF 2010 (mm)	Distance (km)	Tempreatureo C Min	Max
January	206.6	120	21,8	34,6
February	263.5	108	21,4	35,8
March	356.7	185	21,6	37,6
April	163,0	261	22,1	34,1
May	290,0	212	22,1	32,2
June	255.7	164	21.3	29.2
July	457.1	145	21.2	29.1
August	219.6	117	21.8	32.8
September	309.9	54	22.1	35.2
October	642.2	145	22.2	36.8
November	472.9	96	22.4	35.8
December	386.8	73	22.3	35.3
Mean	335,3	140	22,3	34,4

The distribution of potential ecotourism-related object in home range is presented in **Figure 6**. As to the description and the geographical position, they are presented in **Table 4**.

3.5. *The Spectrum of Potential Activities of Elephant Ecotourism*

The pattern of elephant movement in its home range can be utilized as the track of elephant ecotourism activities. Since elephants move around different route every week, this can be used for the basis in making varied activities of elephant ecotourism throughout the year. Employing this approach in the planing of elephant ecotourism activities in National Park of Bukit Barisan Selatan (NPBBS) will increase the rate of assurance that the tourists will encounter wild elephant during the activity; this is expected to offer more satisfaction for the tourist when doing elephant ecotourism activities.

The potential activities and ecotourism track in home range can be developed by recognizing space dimension and time of activity. Based on the grid distribution, it can be seen that some grids were often visited by the elephants and other parts did not even show any sign of activity. In all home range, there are only 81 grids

(42.8%) that show the points of elephant activity.

Along with the different rhythm of elephant movement from grid to grid, the route of ecotourism activity can be drawn as in **Figure 7**. The planning of the track is presented every week according to the rhythm of the elephant's trip. Switching from one grid to another is repeated, while simultaneously tracing the trail of elephant movement in its home range. This can be offered as the program of elephant ecotourism activity in National Park of Bukit Barisan Selatan (NPBBS). The program offers the chance of encountering the elephant, and more importantly delivers deeper values to the tourist to conserve elephants.

By using the [3] approach in ecotourism planning, the spectrum of annual program of elephant ecotourism activities in NPBBS can be mapped into five different concepts (**Figure 8**) comprising: a). elephant conservation socio-cultural value, b). elephant conservation ecological value, c). elephant conservation economic value, d). elephant conservation ethical value, and e). elephant conservation esthetical value. Those values are based on the attractions that are likely to be the main travel destination.

4.   Conclusion

The results of the study above show that the elephant ecotourism activities in the NPBBS, that up to now had only been concentrated in 475 Ha Camp Elephant Patrol (CEP), is quite potential to be developed into various elephant ecotourism activities covering 15,301.2 Ha elephants home range area. The increase of various elephant ecotourism activities will not only improve the economy and empower the local community in the NPBBS, but may also create multiple benefits.

The potential natural resources spread around the elephant home range will offer diverse and extended journey to the tourists. Thus, it will potentially increase the tourists' expense during their visit. On the other hand, the increase of elephant ecotourism activities spectrum will boost the tourists' satisfaction level; that leads to expectation of the next visit and creating effective promotional impact.

Recently, visitors only ride elephant around the CEP (with limited sight of secondary forest dominated by 81 species of trees, bushes, and river), but through the development of elephant ecotourism spectrum generated from this study, elephant ecotourism activities in the NPBBS can be developed into more diverse, meaningful, and valuable activities in many aspects. In addition to the primary forest; the tourists will be able to see at least 112 species of dominant trees as well. In terms of garden habitat varieties, their knowledge will be greatly enriched with the other 23 dominant trees. There are also agricultural fields, beach, and sea that add the richness of attractions and activities in home range area.

The series of elephant ecotourism activities spectrum is not only boosting up the tourists' satisfaction level, but also encourage them to come back again in order to enjoy the other sights that cannot be done during the first trip. The pattern of elephant ecotourism activities, which is now a days inclined to be a daily activities (for about 2-3 hours) only, can be developed further into overnight ecotourism activities. The implementation of this overnight ecotourism will certainly require supported activities that involve the local people and could benefit them economically.

Figure 6: The distribution of potential ecotourism objects in elephant home range.

Table 4: The description of potential ecotourism-object-related in elephant home range

| Ecotourism Objects	Geographical Position	Grid	Remark
Kedung Gupit	S 0435766 ; E 9380616	73	a. Water pond lies between stone hill and dense forest b. Can be reached riding an elephant for around 1.5 hours from CEP or 2 hoursof walking distance.
Si Gupid Waterfall	S 438570; E 9381892	134	a. Waterfall with an approximately 600 m^2pool. b. Estimated height of the waterfall is 15 m. c. The pool is surrounded by 50 m cliff. d. The trip to the waterfall takes two hours on foot from Kedung Gupit.
Si Gupid Cave Balak Cave Mosque Cave Babuta Cave Jemblong Cave	S 438780 ; E 9373316 S 439121 ; E 9373532 S 438807 ; E 9373364 S 438986 ; E 9373554 S 436866 ; E 9373707	126 148 126 148 85	a. The caves are huge and have branched tunnels which are inhabited by thousands of bats. b. Very riches with cave ornaments, such as mosque-dome-like, stalagmite and stalactite, flowed by water stream, and dried river. c. It takes 3 hours on foot to get here from SumberejoViilage.
Pantai Gading (Ivory Coast)	S 430597; E 9372424 S 435958; E 9368435	3, 9, 18, 19,31, 45, 46, 52, 60, 61, 78, 79, 80, 97, 98, 116, 117, 118, 138	a. This beach is called ivory coast because of its ivory sands. b. A beautiful beach extends as far as 6 km from Sumber Sari to Sepandan. c. The landscape variation consists of sea with high waves, wide and sloping beach, with natural forest in the background, river, rock cliff and estuary. d. The trip to the beach is 6 km away from CEP and can be reached by car in 20 minutes.
New Trees Plantation	S 434507 ; E 9379220	72	a. New Trees Plantation (NTP) is forest restoration plants inside the national park area. b. The planted plants are bayur (*Pterospermum javanicum*), ketapang (*Terminalia catappa*), medang (*Litsea* sp.), ficus tree (*Ficus benghalensis*), cempaka (*Michelia champaca*) and damar/resin (*Shorea javanica*). c. It takes 15 minutes by riding elephant from CEP
Other Wildlife Animals	S 433532; E 9374565 S 434029; E 9374898	14, 24, 35, 36,50, 113	a. Tiger can be seen at grid no. 14, 113 b. Bearon, grid no. 24 c. Tapiron, grid no. 24 d. Deeron, grid no. 14, 24, 35, 36, 50 e. Pigon, grid no. 14, 24, 35, 36, 50, f. Gibbonon, grid no. 50, g. Pheasant, on grid no.24.
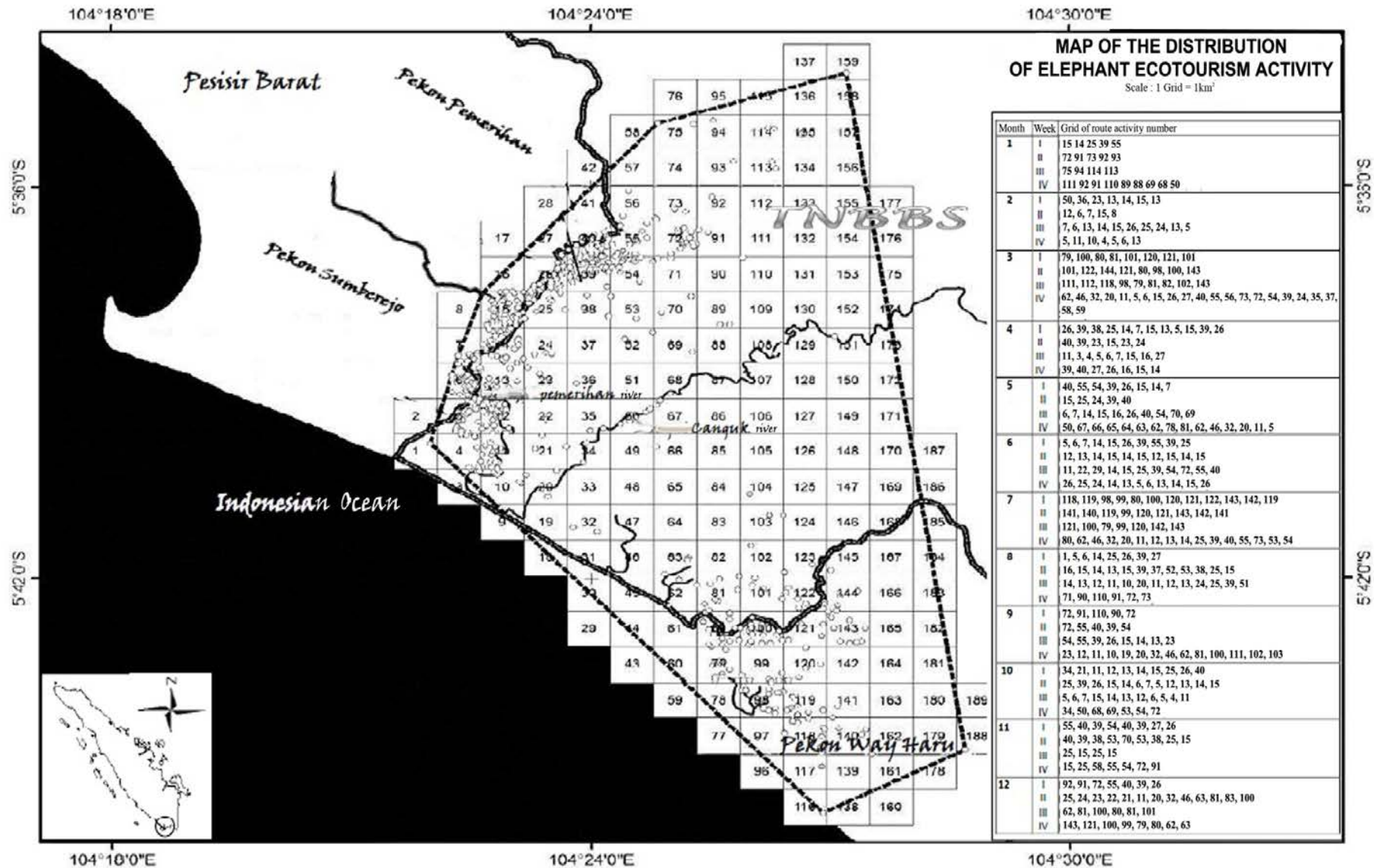
Figure 7: The map of elephant ecotourism activity route in Resort Pemerihan-Way Haru, National Park of Bukit Barisan Selatan Lampung Province.

Figure 8: The 12 months spectrum of elephant ecotourism activity opportunity in elephant home range.

The service of tour guides, porters, and even logistic services (such as rented tent, lighting tools, cooking utensils, and foods seasoning) needed during the overnight ecotourism activities is an example of services that can be provided by the local people.

Furthermore, the improvement of tourism activities area will not only increase the spectrum of potential tourism activity, but also will increase the tourism capacity that can be distributed into the elephant home rangeon land cover basis; as well as due to the 24 hours time of acitivies, weekly and monrhly during the year.The visitor capacity, can also be upgraded by tenfold; through the development of new focal points inside the home range. Further, in line with the tourist distribution in those new focal points, it is also expected to create equitable distribution of economy among local people.

As the ecotourism program can be promoted and will be equally distributed in terms of time and space (throughout the year from week to week), thusthe thebeneficial not only for improving the quality and quantity of elephant tourism product, but also for equalizing the distribution of the tourist that will influence job opportunities for local people. In addition, it will also reduce the damage to the environment caused by the increase of visitors in CEP.

5. Recommendations

In order to attain the efficiency and effectiveness of the implementation of overall ecotourism activities explained above, it will require further research related to the market behavior and the level of tourist satisfaction towards current condition. Next, in line with the results of the study, the spectrum of potential elephant ecotourism activities is still relatively in a potential status, thus however it is necessary to conduct further research on program branding, market penetration strategy, and the measurement of environment carrying capacity for the sustainable implementation of elephant ecotourism program.

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