UNIVERSITI PUTRA MALAYSIA

EVALUATION OF NATURAL RESOURCES FOR CONSERVATION AND RECREATION OPPORTUNITIES IN GREENWAY DEVELOPMENT OF SETIU WETLAND, MALAYSIA

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By

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September 2012

Chairman : Ebil Yusof, PhD

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Setiu Wetland is a unique nine inter-connected ecosystem that offers great opportunities for both recreation and wildlife conservation in Terengganu. However, conservation on the area is limited due to habitat fragmentation. Sustainable management is a possible solution to the problem. Such development may also support the State Government of Terengganu in terms of increasing revenue (or benefits) through ecotourism. The purpose of this study was to identify the greenway zone in Setiu Wetland, Terengganu for wildlife conservation and recreation opportunities using the greenway conceptual diagram model with the adaption of conceptual relation framework of wildlife conservation and recreation opportunities. The objective will be achieved through determination of vegetation and habitat mapping of Setiu Wetland, estimation of wildlife diversity, examination and comparison of wildlife

composition between sites, examining the recreational resources in the area, and to propose the location to be zoned as greenway system on Setiu Wetland. Evaluations were made on 12 potential sites in Setiu Wetland consisting Avicennia-ceriops, beach forest/Casuarina, coconut, mixed-mangrove and peat swamp habitats. Point-count methods, Sherman traps, casual observations and RRI were conducted on the sites. Data analysis involved the application of MVSP, Neighbour clustering technique and chi-square test. Based on the number of wildlife, their diversities, habitats density and the recreation resources found in the areas, the sites S1, S4, S5, S6, S7, S8, S9, and S10 were chosen to be the hubs of greenway, while S2, S3, S11 and S12 the links which connect these hubs from one to another to complete the greenway system. The results also indicated that there is a relationship between wildlife conservation and recreation opportunities in Setiu Wetland. Landscape linearity, connectivity and biodiversity not only provide conservation of wildlife in the area but also opportunities for recreation, ecotourism and nature study. Hence the implementation of greenway zone in Setiu Wetland is seen as highly feasible.

Abstrak tesis yang dikemukan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Sarjana Sains

PENILAIAN SUMBER SEMULAJADI UNTUK KONSERVASI DAN PELUANG REKREASI DALAM PEMBANGUNAN 'LALUAN-HIJAU' DI TANAH BENCAH SETIU, MALAYSIA

Oleh

MOHD ZAKARIA HJ. HAMZAH

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Tanah Bencah Setiu adalah sebuah ekosistem 'sembilan-bersambungan' yang unik, menawarkan peluang rekreasi dan konservasi hidupan liar yang berpotensi di Terengganu. Bagaimanapun, konservasi di kawasan ini terhad disebabkan pemecahan habitat. Pengurusan mapan berkemungkinan merupakan satu penyelesaian terhadap masalah ini. Ia juga boleh membantu Kerajaan Negeri Terengganu dalam usaha meningkatkan hasil negeri melalui ekopelancongan. Kajian ini bertujuan mengenal pasti zon 'laluan-hijau' di Setiu untuk tujuan konservasi hidupan liar dan peluang rekreasi dengan menggunakan konsep model diagram 'laluan-hijau' serta mengadaptasi konsep hubungan antara konservasi hidupan liar dan peluang rekreasi. Objektif ini akan dicapai melalui penentuan vegetasi dan pemetaan habitat, penilaian kepelbagaian dan

perbandingan komposisi hidupan liar antara kawasan, mengkaji sumber-sumber rekreasi dan mencadangkan lokasi yang akan dizonkan sebagai ‘laluan–hijau’ di situ. Penilaian telah dibuat di 12 lokasi berpotensi yang terdiri daripada habitat Avicennia-ceriops, hutan pantai, kelapa, bakau-campuran dan paya gambut dengan menggunakan kaedah bilang-titik, Perangkap Sherman, pemerhatian kasual, Survei tinjauan dan Inventori Sumber Rekreasi (RRI). Analisis statistik seperti Pakej Statistik Multivariat, Teknik Kluster Berjiran, dan Ujian Chi-square telah digunakan. Berdasarkan bilangan dan kepelbagaian hidupan liar, kepadatan habitat dan sumber rekreasi yang ada, kawasan S1, S4, S5, S6, S7, S8, S9, dan S10 dipilih sebagai hub-hub ‘laluan-hijau’, manakala S2, S3, S11 dan S12 pula dijadikan sebagai penghubung yang menghubung kesemua hub tersebut. Kajian juga membuktikan bahawa wujudnya hubungan diantara konservasi hidupan liar dan peluang rekreasi di Tanah-bencah Setiu. Kelinearan dan kesalinghubungan lanskap serta kepelbagaian hidupan liar bukan sahaja menyediakan konservasi di kawasan tersebut bahkan menyediakan peluang rekreasi, ekopelancongan dan pembelajaran tentang alam semulajadi. Lantaran itu, pelaksanaan zon ‘laluan-hijau’ di Tanah-bencah Setiu dilihat sangat sesuai.

Specially dedicated to

My dearest Wife, Nur Halawati
My beloved Mother, Indun and my loving late Father, Hamzah
My late Grandpa and Grandma, Tokki Cer and Tok Nab
My Brothers and Sisters; Bro Zaki, Bro Zuki, Bro Sukri,
Bro Yusri, Bro Awie, Sis Na and Sis Zah and their families,
And to all my fellow Friends

Thank you for your love
Prayers, patience and encouragement
Without your support
I will not be where I am today (insyaAllah)
I love you all

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APPROVAL SHEET

I certify that an Examination Committee has met on date of viva to conduct the final examination of name of student on his degree thesis entitled "Greenway Zones For Wildlife Conservation and Recreation Opportunities at Setiu Wetland, Terengganu" in accordance with Universiti Pertanian Malaysia (Higher Degree) Act 1980 and Universiti Pertanian Malaysia (Higher Degree) Regulations 1981. The Committee recommends that the candidate be awarded the relevant degree. Members of the Examination Committee are as follows:

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This thesis submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfillment of the requirement for the degree of Master Science. The members of the Supervisory Committee are as follows:

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DECLARATION

I declare that the thesis is my original work except for quotations and citations which have been previously, and is not concurrently, submitted for any other degree at Universiti Putra Malaysia or at any other institutions.

MOHD ZAKARIA HJ. HAMZAH

Date: 11 March 2013

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