

## **THE PRESENCE OF WILDLIFE SPECIES AT ARTIFICIAL PASTURE AND ARTIFICIAL SALT LICK SITES AT PROTECTED AREAS IN PENINSULAR MALAYSIA**

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### **ABSTRACT**

Minerals are essential requirement for wildlife and lack of it can affect the species population and health of the individuals. In the tropical rainforest such minerals can be obtained from natural salt licks. However, such areas are limited since some had been destroyed by developments. As part of wildlife management strategy, the Department of Wildlife and National Parks of Peninsular Malaysia (PERHILITAN) has developed a number of artificial pastures and artificial salt licks sites. A study was conducted to determine the type of wildlife species visiting both the artificial salt licks and artificial pasture sites, using camera trap, direct and indirect observation methods. The study was conducted from August 2014 until November 2015. In this study, six artificial pasture sites and 20 artificial salt lick sites were selected. During this study, 11 wildlife species were observed visiting the artificial pasture sites while 33 species visited the artificial salt lick sites. This study indicates that artificial salt licks and artificial pasture areas can attract wildlife species by providing essential food and minerals for wildlife in their natural habitat.

**Keywords:** Presence of wildlife species, artificial salt lick, artificial pasture

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## INTRODUCTION

Malaysia among the 12 mega diverse country in the world (WWF Malaysia, 2017). In 2007, 18.30 million ha, or approximately 55 percent of the total land area of Malaysia was still forested (NRE, 2011) and there are many species of flora and fauna that live in this forest ecosystem. Ecosystem consists of abiotic and biotic components. Biotic component are living things that influence other organism, including animal that consume organism and food that organism consume. Among the abiotic components are oxygen, water, mineral, salt and light.

Salt licks are an important component in the tropical and temperate forest in supplying essential minerals to wildlife, especially in a nutrient-poor ecosystem. These minerals are essential for a healthy growth of herbivores such as Sambar deer, Barking deer, elephants and tapirs (Hogan, 2010).

The creation of artificial salt licks has been an important management intervention that is used in the *in-situ* and *ex-situ* conservation to support larger population of healthy wildlife, including attracting wildlife (Atwood & Week, 2003). Another important management intervention to increase wildlife population is the creation of artificial pastures. Such artificial pasture provide additional food source for herbivores including Sambar deer, elephants and gaur.

In Malaysia, PERHILITAN has created and developed a number of artificial pastures and salt licks areas within the protected areas and *ex-situ* conservation centres across the Peninsular Malaysia. Most of the artificial pastures and salt licks were already created but there is less study undertaken prior to the creation of these sites. Magintan *et al.* (2015) observe the species visiting merely the artificial salt lick using camera trapping method. In order to know the presence of wildlife species at these artificial salt lick and artificial pasture sites, a study was undertaken to determine the presence of wildlife species at artificial salt lick and artificial pasture site. This study was undertaken jointly by PERHILITAN and Universiti Putra Malaysia (UPM) to study the presence of wildlife species at artificial salt licks and artificial pastures.

## MATERIALS AND METHODS

A total of 26 sites consisting of six artificial pastures sites (Figure 1) and 20 artificial salt lick sites (Figure 2) were selected for this study (Table 1). The study was conducted from August 2014 until November 2014. The presence of wildlife species at these sites were recorded using camera traps deployed by PERHILITAN's staff. In addition, the wildlife species presence was also obtained through direct and indirect observations (foot prints and faeces).

**Table 1** List of artificial pasture and salt licks sites

<b>Site Type</b>	<b>Location</b>	<b>Size (Hectare)</b>
<b>Artificial Pasture Sites</b>	Pasture A, Jenderak Selatan, Krau WR, Pahang	5.67
	Sungai Relau, Pahang NP, Pahang	2.50
	Chegar Anjing, Pahang NP, Pahang	0.80
	Kuala Koh, Kelantan NP, Kelantan	1.00
	Sungai Deka, Hulu Terengganu, Terengganu	2.02
	Tasek Bera Ramsar Site, Pahang	1.20
<b>Artificial Salt Lick Sites</b>	Suau, Sungkai WR, Perak	-
	Ped, Sungkai WR, Perak	-
	Milo, Sungkai WR, Perak	-
	Bukit, Sungkai WR, Perak	-
	Banir, Sungai Dusun WR, Selangor	-
	Lurah, Sungai Dusun, Selangor	-
	Bukit Rengit, Krau WR, Pahang	-
	Perlok, Krau WR, Pahang	-
	Terjun, Krau WR, Pahang	-
	KPI, Krau WR, Pahang	-
	Padang Dusun, Krau WR, Pahang	-
	Kelawar, Krau WR, Pahang	-
	Belinang, Tasek Bera Ramsar Site, Pahang	-
	Semelai, Tasek Bera Ramsar Site, Pahang	-
	Chegar Anjing, Kuala Tahan, Pahang NP, Pahang	-
	Ranting (Viaduct 2), Sungai Deka, Terengganu	-
	Gajah (Viaduct 1), Sungai Deka, Terengganu	-
	Sungai (Viaduct 3), Sungai Deka, Terengganu	-
	Simpang Bumbun, Kuala Koh, Kelantan NP, Kelantan	-
	Bumbun Impian, Kuala Koh, Kelantan NP, Kelantan	-

\*Note: WR=Wildlife Reserve, NP=National Park

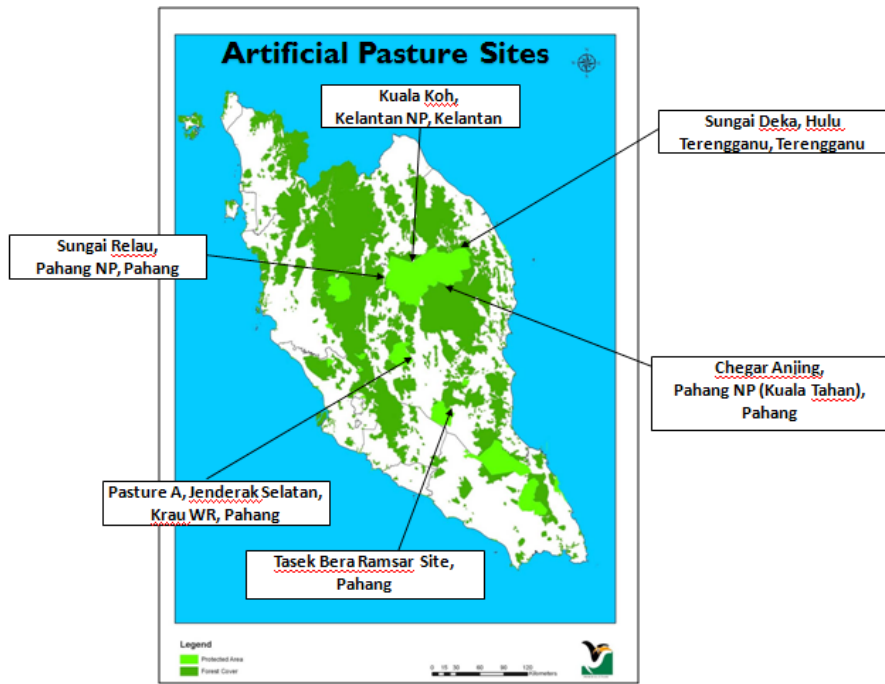


Figure 1 Map of artificial pasture sites

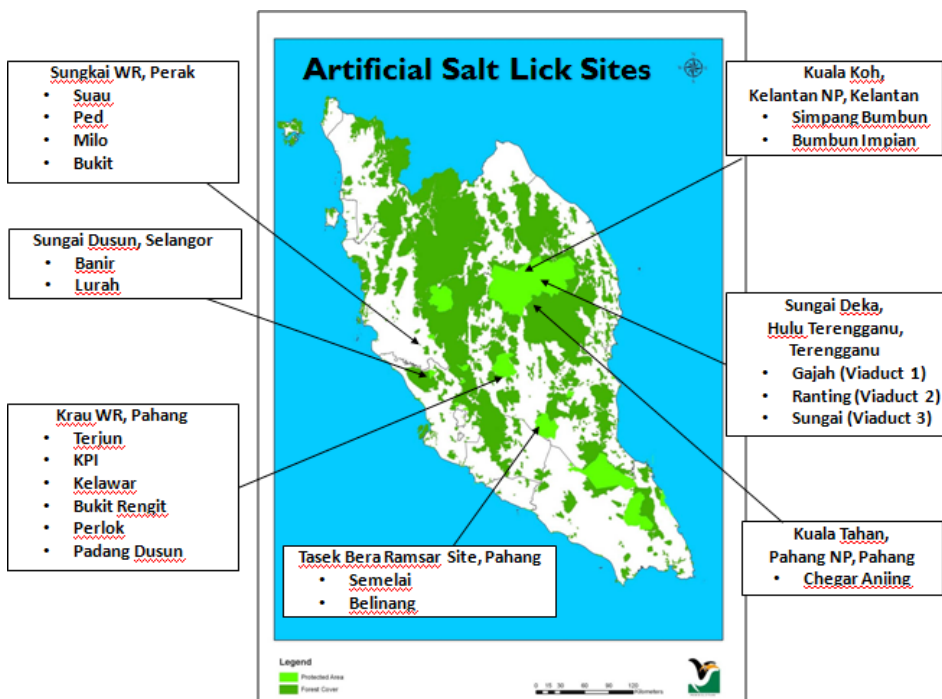


Figure 2 Map of artificial salt lick site

## RESULTS AND DISCUSSION

A cumulative total of 32 wildlife species were recorded in both the artificial pasture and salt lick sites in this study (Table 2). Eleven species were recorded present at the six selected artificial pasture sites. Among these sites, the artificial pastures at Sungai Relau and Chegar Anjing (Pahang NP) and Sungai Deka (Hulu Terengganu) recorded the highest presence with six wildlife species recorded. This was followed by Kuala Koh (Kelantan NP) with five wildlife species presence. On the other hand, Pasture A (Krau WR) and Tasek Bera Ramsar Site (Pahang) showed the least presence, with four wildlife species recorded.

Among the 11 species recorded at the six artificial pastures sites, the most frequently occurring species was wild boar (*Sus scrofa*) and Sambar deer (*Rusa unicolor*). Asian elephant (*Elephas maximus*) was present at five of the pastures sites, but was absent at the Pasture A site while Barking deer (*Muntiacus muntjak*) was not recorded at two artificial pastures, namely, Pasture A, and Tasek Bera Ramsar Site. On the other hand, leopard (*Panthera pardus*), Malayan porcupine (*Hystrix brachyura*), otter civet (*Cynogale bennettii*), lesser mouse deer (*Tragulus kanchil*) and gaur (*Bos gaurus*) were present at only one pasture sites each.

A total of 29 wildlife species were recorded present at the 20 selected artificial salt lick sites. The salt lick at Bukit Rengit (Krau WR, Pahang) recorded the highest number of wildlife species presence with 12 species. This was followed by bats (Krau WR, Pahang), Semelai (Tasek Bera Ramsar Site, Pahang) and Belinang (Tasek Bera Ramsar Site, Pahang) with the presence of nine wildlife species each.

**Table 2** List of wildlife species recorded at each artificial pasture and salt lick sites

Site Type/Location	Wildlife Species		No. of species recorded
	<i>Aonyx cinerea</i>		
	<i>Atherurus macrourus</i>		
	<i>Bos gaurus</i>		
	<i>Callosciurus notatus</i>		
	<i>Catopuma temminckii</i>		
	<i>Chalcophaps indica</i>		
	<i>Cynogale bennetti</i>		
	<i>Elephas maximus</i>		
	<i>Helarctos malayanus</i>		
	<i>Hemigalus derbyanus</i>		
	<i>Hepstes brachyurus</i>		
	<i>Hystrix brachyura</i>		
	<i>Lariscus insignis</i>		
	<i>Lutrogale perspicillata</i>		
	<i>Macaca fascicularis</i>		
	<i>Macaca nemestrina</i>		
	<i>Martes flavigula</i>		
	<i>Muntiacus muntjak</i>		
	<i>Panthera pardus</i>		
	<i>Presbytis femoralis</i>		
	<i>Prionailurus bengalensis</i>		
	<i>Rusa unicolor</i>		
	<i>Sus scrofa</i>		
	<i>Tapirus indicus</i>		
	<i>Trachypithecus cristatus</i>		
	<i>Tragulus kanchil</i>		
	<i>Tragulus napu</i>		
	<i>Varanus salvator</i>		
	<i>Viverra zibethica</i>		
	Bat (unknown)		
	Rat (unknown)		
	Squirrel (unknown)		
<b>Artificial Pasture</b>			
1. Pasture A, Jenderal Selatan, Krau WR, Pahang	✓		4
2. Sungai Relau, Pahang NP, Pahang		✓	6
3. Chegar Anjing, Pahang NP, Pahang		✓	6
4. Kuala Koh, Kelantan NP, Kelantan		✓	5
5. Sungai Deka, Hulu Terengganu, Terengganu		✓	6
6. Tasek Bera Ramsar Site, Pahang		✓	4
<b>Artificial Salt Lick</b>			
1. Suau, Sungkai WR, Perak		✓	4
2. Ped, Sungkai WR, Perak		✓	3
3. Milo, Sungkai WR, Perak		✓	3
4. Bukit, Sungkai WR, Perak		✓	4

Site Type/Location	Wildlife Species												
5. Banir, Sungai Dusun WR, Selangor	✓	✓											2
6. Lurah, Sungai Dusun, Selangor		✓	✓										4
7. Bukit Rengit, Krau WR, Pahang	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	12
8. Perlak, Krau WR, Pahang	✓		✓	✓								✓	7
9. Terjun, Krau WR, Pahang		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	7
10. KPI, Krau WR, Pahang			✓		✓							✓	6
11. Padang Dusun, Krau WR, Pahang						✓						✓	3
12. Kelawar, Krau WR, Pahang	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	9
13. Belinang, Tasek Bera Ramsar Site, Pahang				✓	✓	✓	✓	✓	✓	✓	✓	✓	9
14. Semelai, Tasek Bera Ramsar Site, Pahang		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	9
15. ChegarAnjing, Kuala Tahan, Pahang NP, Pahang			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	6
16. Ranting (Viaduct 2), Sungai Deka, Terengganu				✓						✓	✓	✓	4
17. Gajah (Viaduct 1), Sungai Deka, Terengganu				✓						✓	✓	✓	4
18. Sungai (Viaduct 3), Sungai Deka, Terengganu				✓								✓	2
19. Simpang Bumbun, Kuala Koh, Kelantan NP, Kelantan					✓						✓	✓	5
20. Bumbun Impian, Kuala Koh, Kelantan NP, Kelantan					✓						✓	✓	5

\*Note: SWR= Sungai Wildlife Reserve; SDWR= Sungai Dusun Wildlife Reserve; KWR= Krau Wildlife Reserve; TBRS= Tasek Bera Ramsar Site

Wild boar was the most common wildlife species found visiting all the 20 artificial salt licks sites. Barking deer is present at almost all artificial salt licks except for Banir, Lurah, Milo, Gajah (Viaduct 1), Ranting (Viaduct 2), and Sungai (Viaduct 3) salt licks. Malayan porcupine is presence at 10 areas; Asian elephant greater mousedeer (*Tragulus napu*), and Sambar deer are present at seven artificial salt lick areas; Malayan tapir (*Tapirus indicus*) and Piq-tailed macaque (*Macaca nemestrina*) are present at 6 areas. The presence of the other wildlife species are summarised in Table 2.

## CONCLUSION

This study showed that artificial pastures and salt licks attract several number of wildlife species, both protected and totally protected under the Wildlife Conservation Act 2010. It is clear that the creation of artificial pastures and artificial salt licks would be able to increase the food and mineral source for the wildlife population present nearby or within vicinity of these sites which will attracting the diverse species of endangered wildlife to the areas and probably increase the numbers in their population.

The data obtained from this study will be very useful for PERHILITAN in managing of the protected areas and the wildlife species. Through repeated study at fixed interval, PERHILITAN would be able to compare the data and identify if these artificial pastures and salt licks keep attracting wildlife and if the number of species increase over time. Additionally, more artificial pastures and salt licks sites are needed to be created and develop at other forest areas to provide the opportunity for wildlife species to get additional food sources and nutrients.

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