Psychological carrying capacity of snorkeling activity at Mo Koh Chang National Park

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In order to manage the quality of visitor experience in snorkeling activity, psychological carrying capacity has been studied at Mo Koh Chang National Park in Thailand. The study followed Shelby and Herberlein's (1986) definition of recreation carrying capacity. Visitor's perceived crowding is employed as an indicator to measure the negative experience caused by the number of visitors. Perceived crowding combines descriptive information of the reported number of encounters with the evaluative information of the value judgement of that number of encounters if they had exceeded their definition of an acceptable standard. Several studies have focused on crowding perception in various natural recreational areas (Manning 1999), but in southeast Asia, especially Thailand, there have been only few studies (Emphandhu el al 2006).

The objectives of this research were to find out the average perceived crowding at three snorkeling sites, to study the relationship between the number of snorkelers and the perceived crowding, and to estimate the acceptable number of snorkelers at perceived crowding level 5.

The target population for this study were snorkelers at reef sites around Koh Thong Lang, Koh Yak Lek, and Koh Yak Yai. A quota sampling technique was employed to select research samples from the sampling population based on the official report (DNP 2005) on annual visitor number of Mo Koh Chang National Park. Data collection was conducted between November 2006 and January 2007 totaling 26 days of weekends and long holidays. All respondents were selected based on their willingness to volunteer their personal information and by accidental sampling on site. The questionnaire survey of 239, 413, 260 Thai and foreigner respondents at Koh Thong Lang, Koh Yak Lek, and Koh Yak Yai was employed. The respondent's background information, recreation pattern and motivation, opinions on perceived crowding and number of snorkelers encountered were collected. The simple regression analysis with a significance level of $p < 0.05$ was used. The Likert scale developed by Heberlein and Vaske (1977) was adopted in this study to measure crowding perception. In this scale ranging from 0 to 9, the 0-2 labeled situation as slightly crowded, 3-5 is moderately crowded and the remaining 6-9 points as extremely crowded. Snorkelers then were asked if they felt disturbed by the number of other snorkelers and were instructed to rank their perception of crowding on a 0 to 9 point-scale and recorded the number of encounters of other snorkelers.

The average Thai and foreigner snorkeler perceptions towards crowding were relatively low to medium. The perception for Thai and foreigners respectively at Koh Thong Lang were 2.95 and 4.36, Koh Yak Lek 2.72 and 4.26, and Koh Yak Yai 2.26 and 4.12. It is obvious that the perception of crowding for Thai and foreigners are quite different, but neither were exceeded the acceptable limits. The analysis of linear equation between perception level towards crowded snorkelers and a number of snorkelers on site at Koh Thong Lang, pointed out the significant level at 0.004 and $R2 = 0.752$ and from the simple regression prediction, it is estimated that 154 persons/time was accepted as the perceived crowding level 5. At Koh Yak Lek, the significant level was 0.026, $R2 = 0.389$ and 218 persons/time. At Koh Yak Yai, the significant level was 0.011, $R2 = 0.511$ and 118 persons/time (Fig.1).

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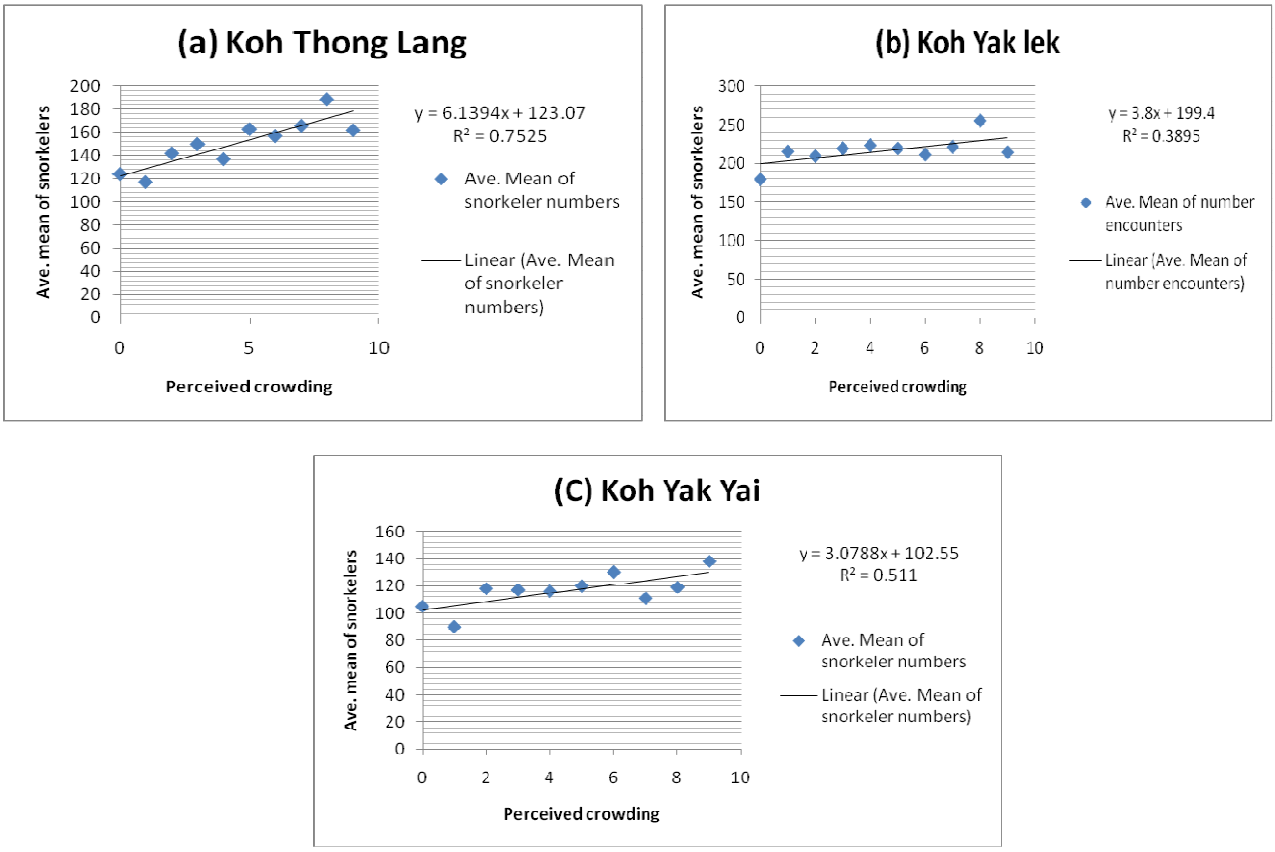

Figure 1: Linear correlation of perceived crowding and number of snorkelers at Koh Thong Lang, Koh Yak Lek, and Koh Yak Yai

Table 1 shows the comparison between the actual number of snorkelers in 2006 – 2007 and the predicted maximum number of snorkelers from linear equations. It indicated that the number of snorkelers at all sites exceeded the psychological carrying capacity in some days (see max. number). However, on average, the number of snorkelers was still in below carrying capacity except Koh Thong Lang which needed immediate measures to solve the crowding impact. Snorkel activity at Koh Yak Lek also needed some attention since there was evidence of high frequency of days showing the number of snorkelers exceeding the limits as well as the exceeding numbers were relatively large.

Table 1: The comparison between the actual number of snorkelers in 2006 – 2007 and the predicted maximum number of snorkelers from linear equations

Snorkel sites	Max. Number of snorkelers	Average Number of snorkelers	Psychological carrying capacity levels		
			Below CC (perceived crowding=0-2) (PAOT)	At or Approach CC (perceived crowding=3-5) (PAOT)	Exceed CC (perceived crowding>5) (PAOT)
1. Koh Thong Lang	253	158	135	154	>154 Max (253) Average (158)
2. Koh Yak Lek	403	194	207 Average (194)	218	>218 Max (403)
3. Koh Yak Yai	192	108	109	118	>118

			Average (108)		Max (192)

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